

Data Base
for
Marine HNS Spill Disaster Response
(English)

Mar. 2004

The Japan Association of Marine Safety(JAMS)
Marine Disaster Prevention Center(MDPC)

Introduction

As many kinds, types and characteristics of the substances are transported by sea, no contingency measures against the spill of HNS (Hazardous and Noxious Substances) at sea do not exist in a fixed form in the current circumstances of the world.

Therefore, our association, supported by the Nippon Foundation and in cooperation with the Marine Disaster Prevention Center, has made a survey of related information necessary for making contingency measures.

This document is compiled the results of our survey in the form of database on each item of HNS carried by sea domestically in Japan (in the order of volumes of the items carried).

We expect that this document may contribute so much toward preparation for the spill accidents of HNS at sea and toward development of the faculties to cope with the situation.

March 2004

The Japan Association of Marine Safety

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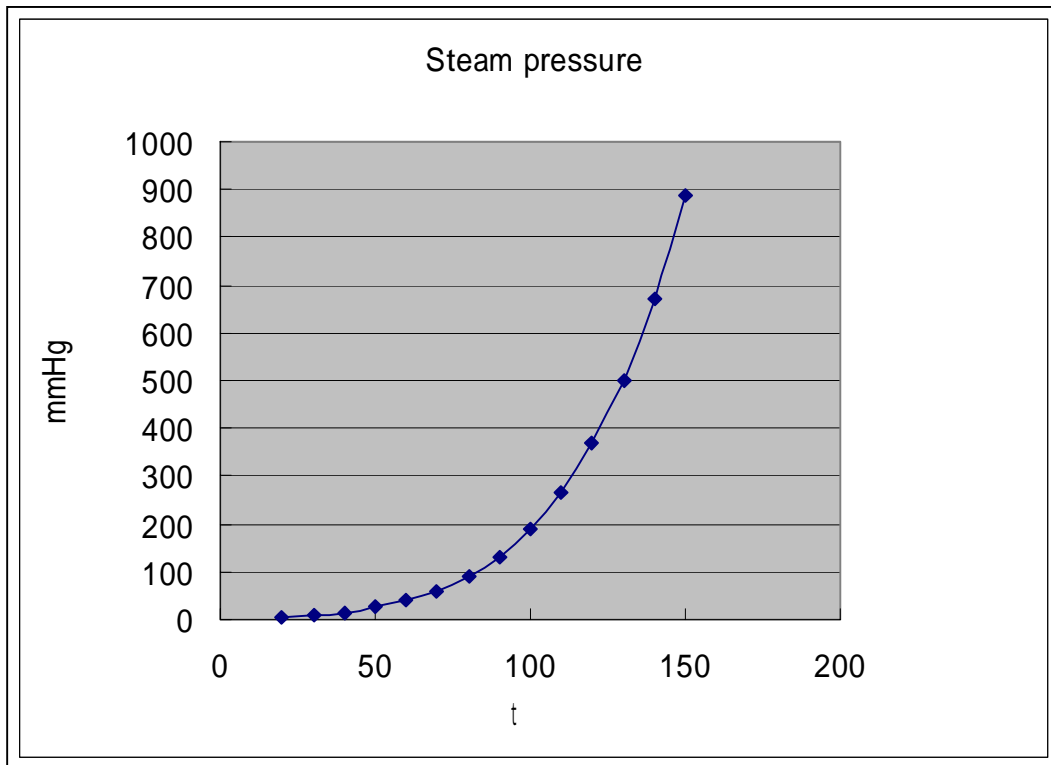
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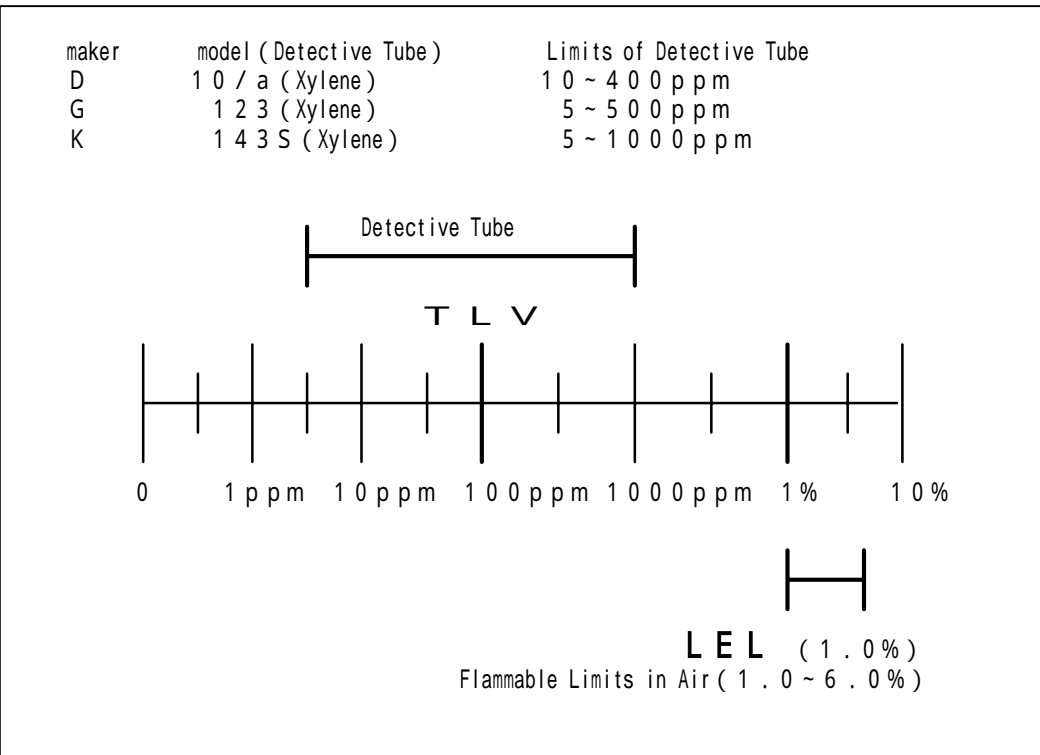
Material name	Xylene				
Common synonyms	Dimethyl benzeze, Xylol (o,m,p)				
UN Number	1307	C A S Number	1330-20-7	IMDG CODE	Class3.3/P3394
IMO Pollution Category	C				
Formula	C ₆ H ₄ (CH ₃) ₂	Molecular Weight	106.17	Flammable Limits in Air (%)	1.0 ~ 6.0
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.88	Vapor Specific Gravity	3.66	Boiling Point at 1 ATM ()	144.41
Freezing Point ()	-25.18	Flash Point ()	17	Ignition Point ()	463
Steam Pressure	0.64Kpa/4.83mmHg (2 0)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 5 0 ppm ACGIH : 1 0 0 ppm TWA 1 5 0 ppm STEL A4 LD50 5 0 0 0 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action. Poisoning condition may appear behind time. There are worries about the cancer possibility to people.</p> <p>Environmental influence : There is biodegradation nature. It is detrimental to an aquatic life living thing. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

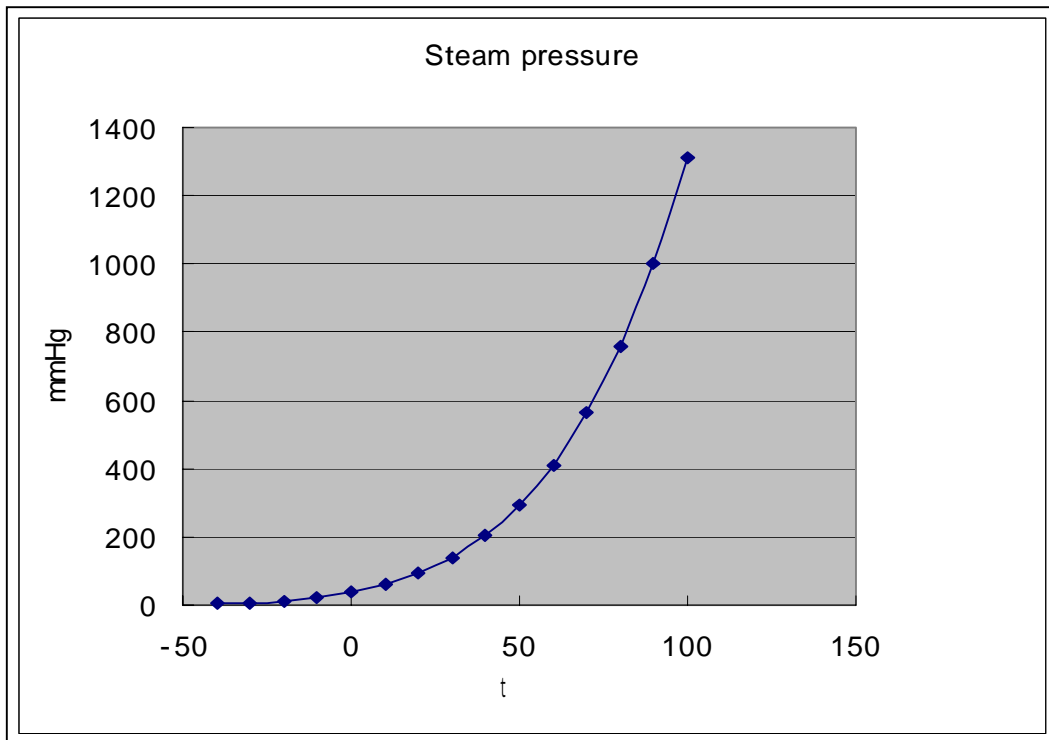


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

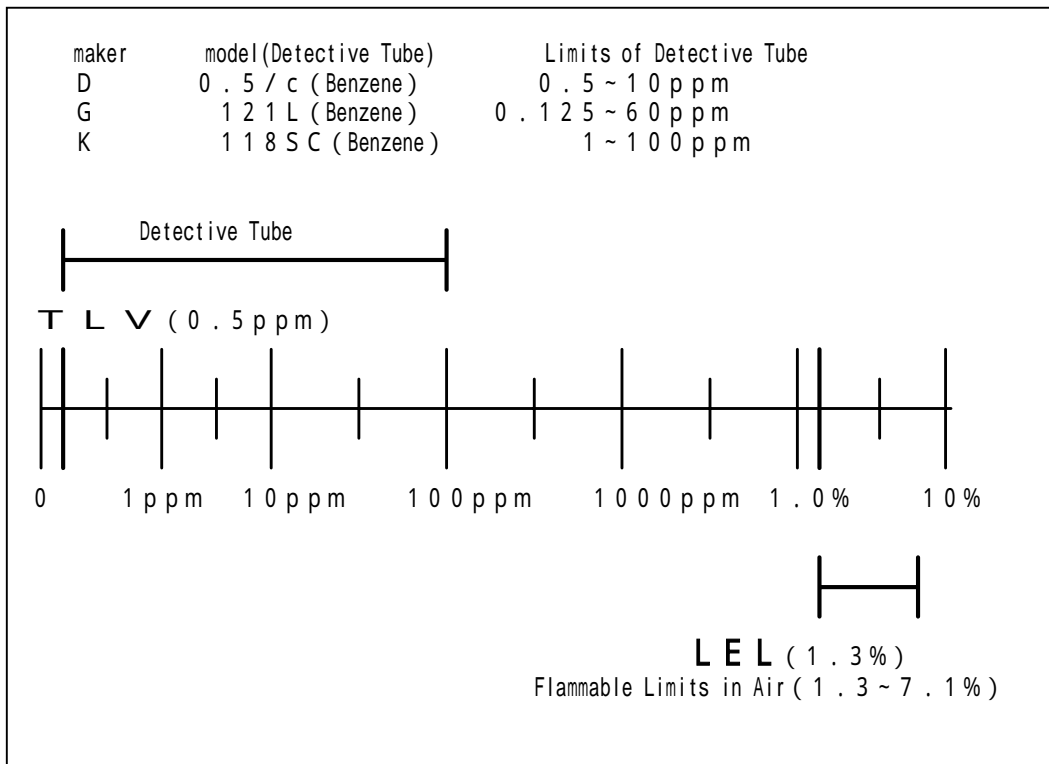
Material name	Benzene				
Common synonyms	Benzol, Cyclohexatriene, Phenyl hydride				
UN Number	1114	C A S Number	71-43-2	IMDG CODE	Class3.2/P3185
IMO Pollution Category	C				
Formula	C ₆ H ₆	Molecurar Weight	78.12	Flammable Limits in Air(%)	1.3 ~ 7.1
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.88	Vapor Specific Gravity	2.73	Boiling Point at 1 ATM()	80.1
Freezing Point ()	5.53	Flash Point ()	-11	Ignition Point ()	498
Steam Pressure	12.69Kpa/95.18mmHg (25)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 0.5 ppm TWA 2.5 ppm STEL A1 skin LD50 3800 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable, Acute toxicity substance Noxiousness : Irritating to skin, eyes and throat.. There is a central-nerves control action. A carcinogenic substance. Poisoning condition may appear behind time. There is danger of skin absorption. Carcinogenic [to people] is checked. Environmental influence : There is biodegradation nature. It is detrimental to an aquatic life living thing. The accumulation nature to an aquatic life living thing is low. Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respies artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
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Steam pressure curve



Limits of Detective Tube

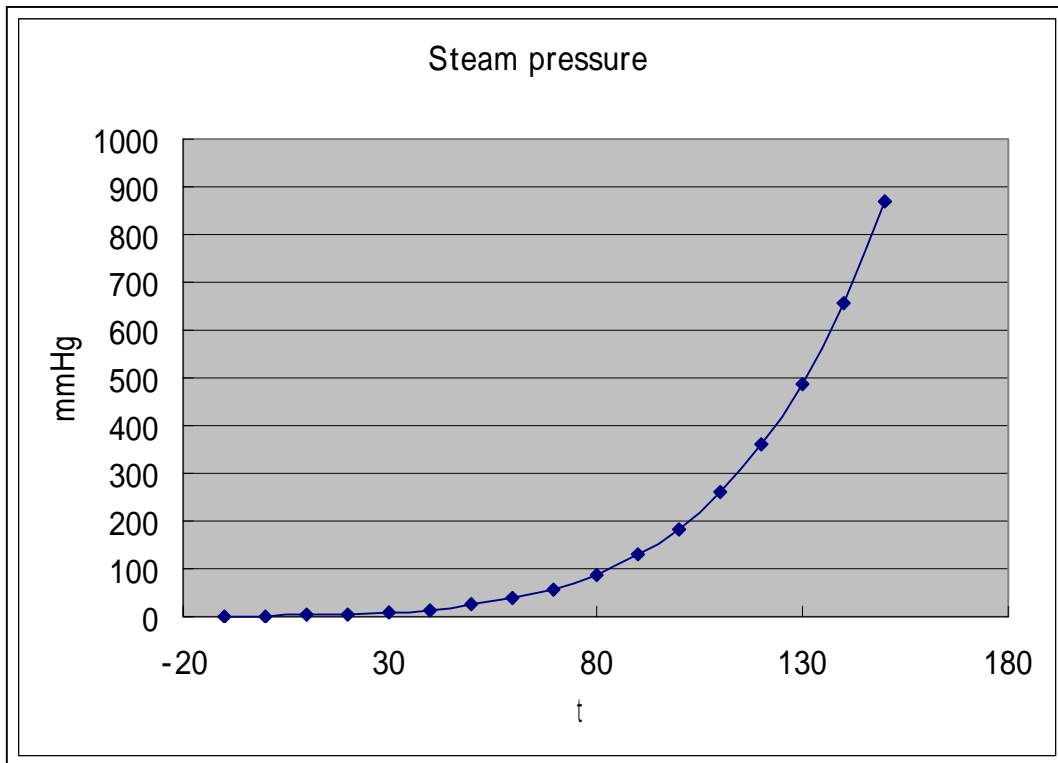


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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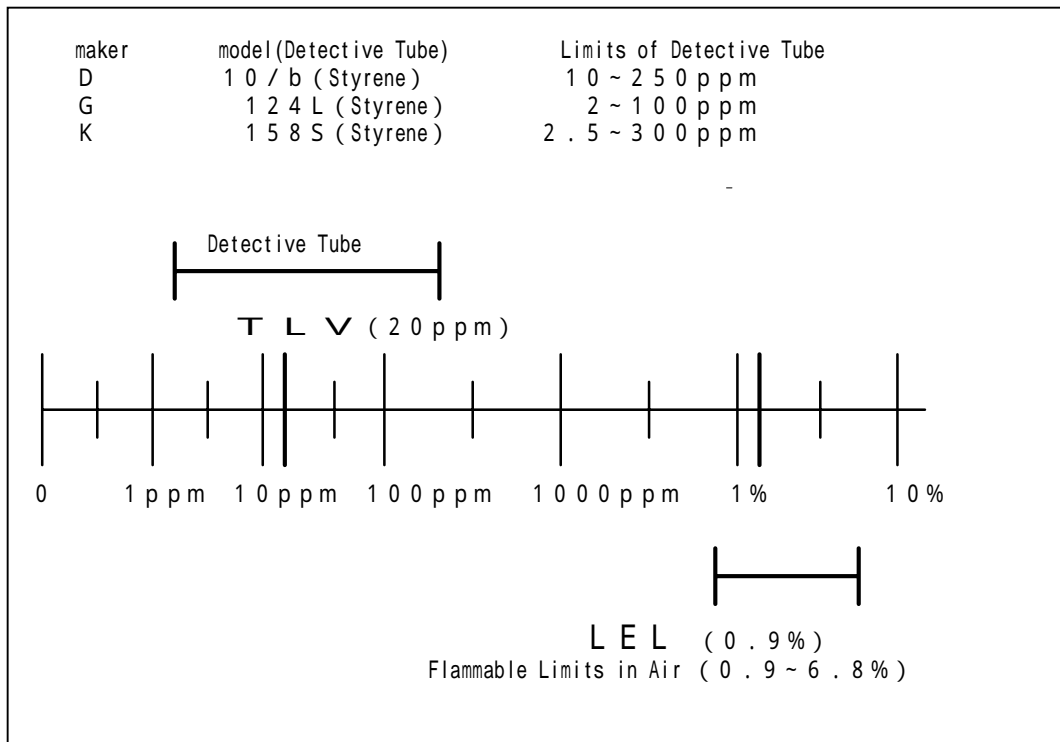
Material name	Styrene				
Common synonyms	Styrol, Vinylbenzene, Phenylethylene, Cinnamene,				
UN Number	2055	CAS Number	100-42-5	IMDG CODE	Class3.3/P3381
IMO Pollution Category	B				
Formula	C ₆ H ₅ CH=CH ₂	Molecular Weight	104.15	Flammable Limits in Air(%)	0.9 ~ 6.8
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.9	Vapor Specific Gravity	3.6	Boiling Point at 1 ATM()	145.2
Freezing Point ()	-30.69	Flash Point ()	32	Ignition Point ()	490
Steam Pressure	0.60Kpa/4.5mmHg (20)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 20 ppm ACGIH : 20 ppm TWA 40 ppm STEL A4 LD50 5000 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable, Acute toxicity substance</p> <p>Noxiousness : There is lachrymal and irritating to skin, eyes and throat. An eye is made to produce intense an itch.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. Intense polymerization may be caused by heating or contamination by other substances. Heating etc. decomposes and poisonous oxidization styrene gas is produced.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

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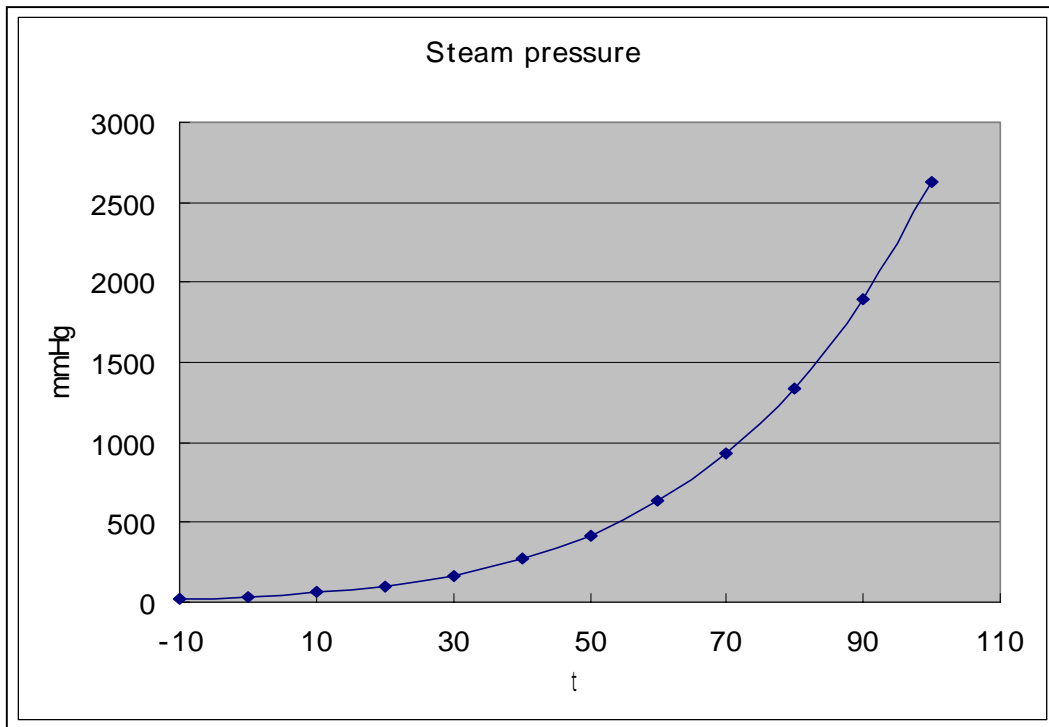


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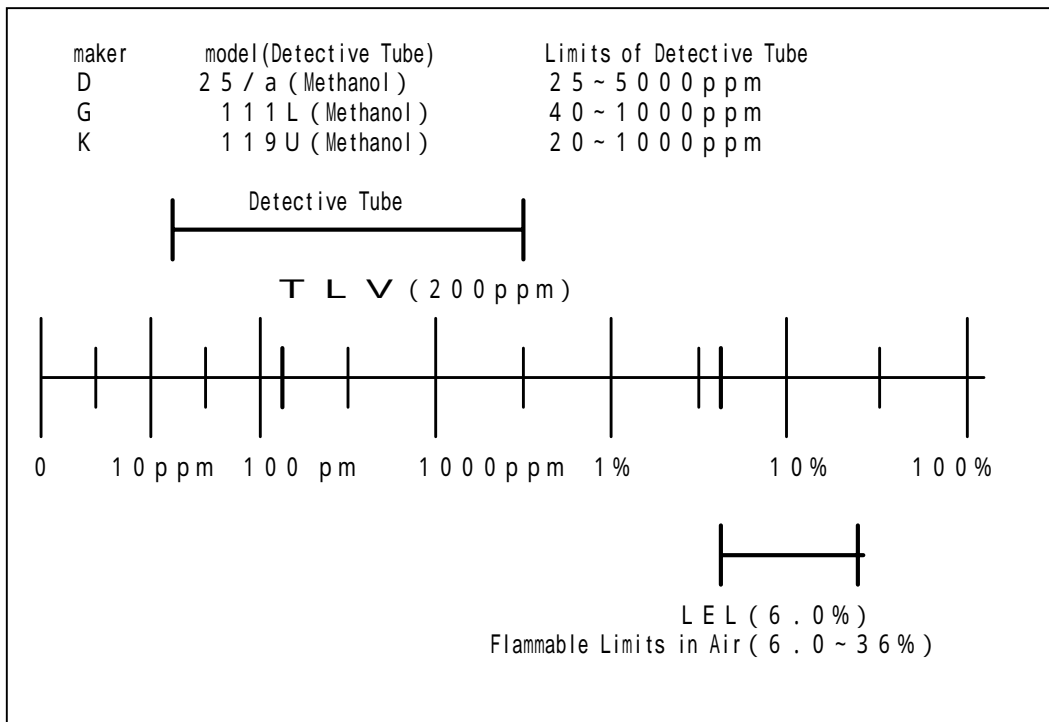
Material name	Methanol				
Common synonyms	Methyl alcohol, Carbinol, Wood spirit				
UN Number	1230	CAS Number	67-56-1	IMDG CODE	Class 3 . 2 / P3251
IMO Pollution Category	D				
Formula	CH ₃ OH	Molecular Weight	32.04	Flammable Limits in Air (%)	6 . 0 ~ 3 6
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.79	Vapor Specific Gravity	1.1	Boiling Point at 1 ATM ()	64.7
Freezing Point ()	-93.9	Flash Point ()	11	Ignition Point ()	385
Steam Pressure	1 0 0 mmHg (2 0)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 2 0 0 ppm ACGIH : 2 0 0 ppm TWA 2 5 0 ppm STEL skin LD50 5 6 2 8 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action. It may become blind when poisoned. Poisoning condition may appear behind time. There is danger of skin absorption.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

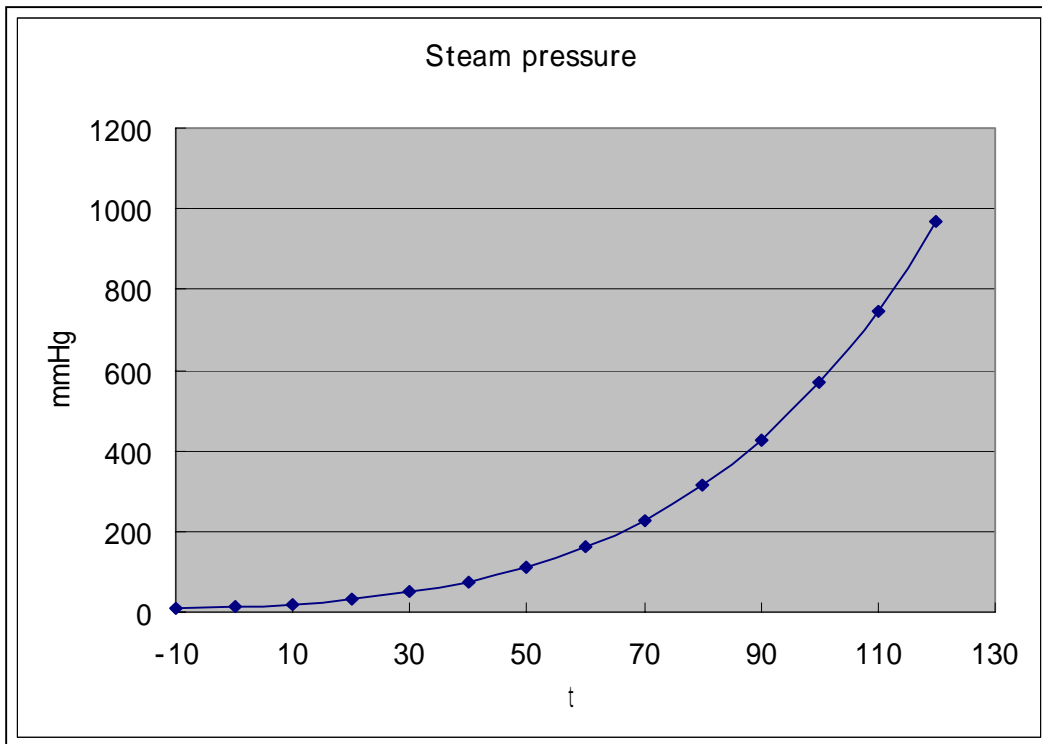


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

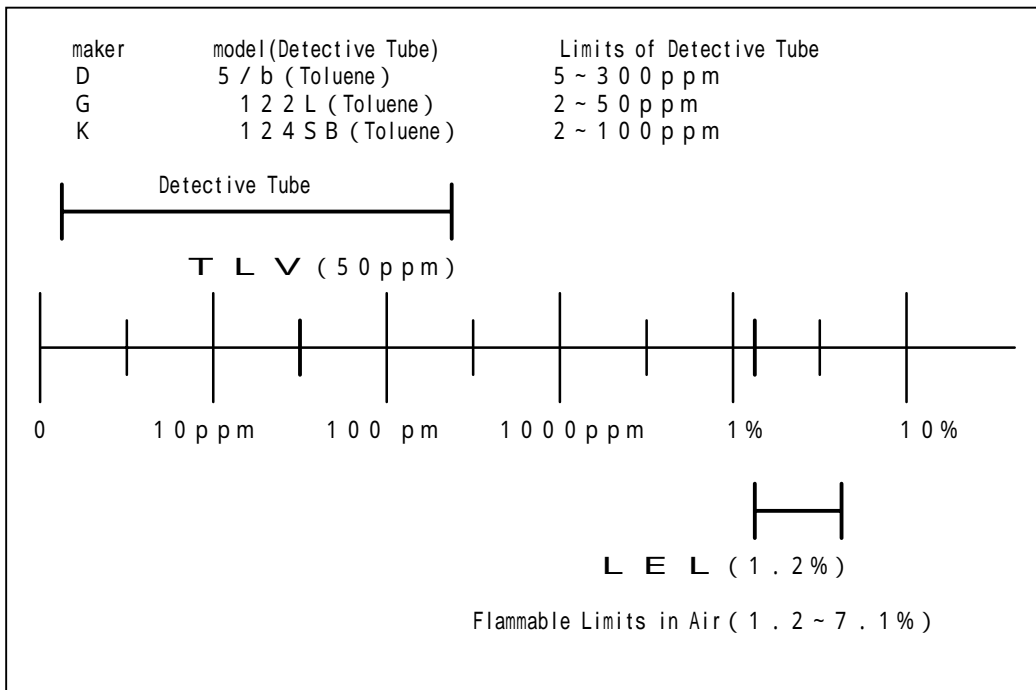
Material name	Toluene				
Common synonyms	Toluol, Methylbenzene, Phenylmethane, Methylbenzol, Methacide				
UN Number	1294	CAS Number	108-88-3	IMDG CODE	Class 3 . 2 / P3285
IMO Pollution Category	C				
Formula	C ₆ H ₅ CH ₃	Molecular Weight	92.14	Flammable limits in Air (%)	1 . 2 ~ 7 . 1
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.87	Vapor Specific Gravity	3.1	Boiling Point at 1 ATM ()	110.6
Freezing Point ()	-94.9	Flash Point ()	4	Ignition Point ()	480
Steam Pressure	24 . 3 mmHg (20)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 50 ppm LD50 5000 mg / kg (oral rat)		ACGIH : 50 ppm TWA	A4 skin	
Hazard and Noxiousness	<p>Classification : Flammable, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action. Poisoning condition may appear behind time. There are worries about the cancer possibility to people.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low or middle.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

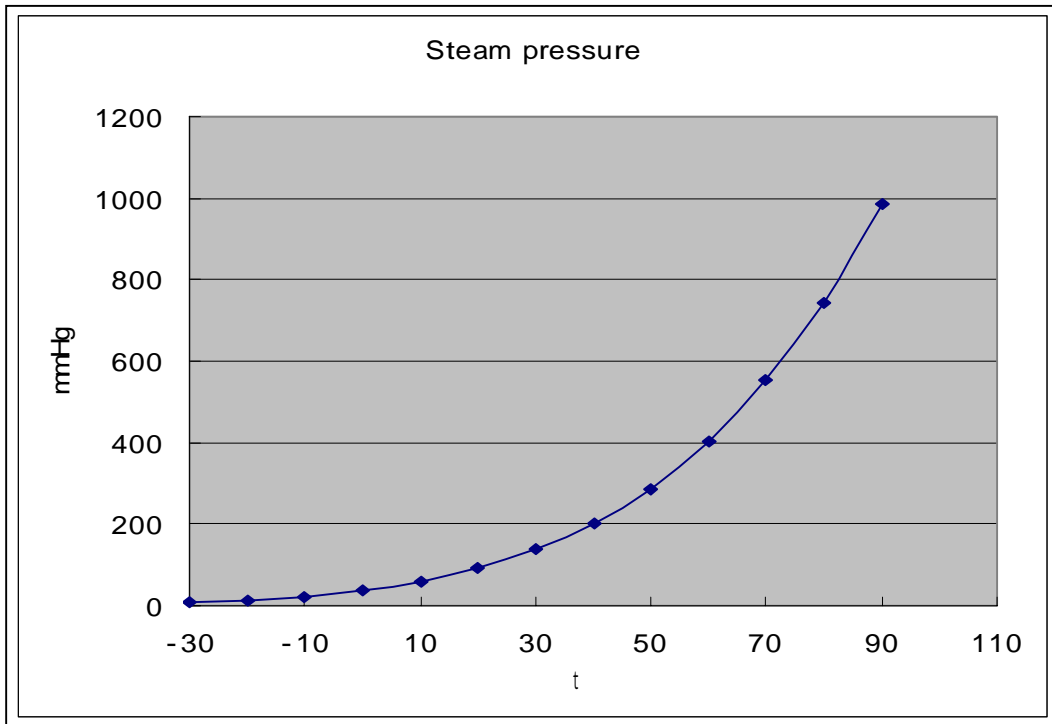


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

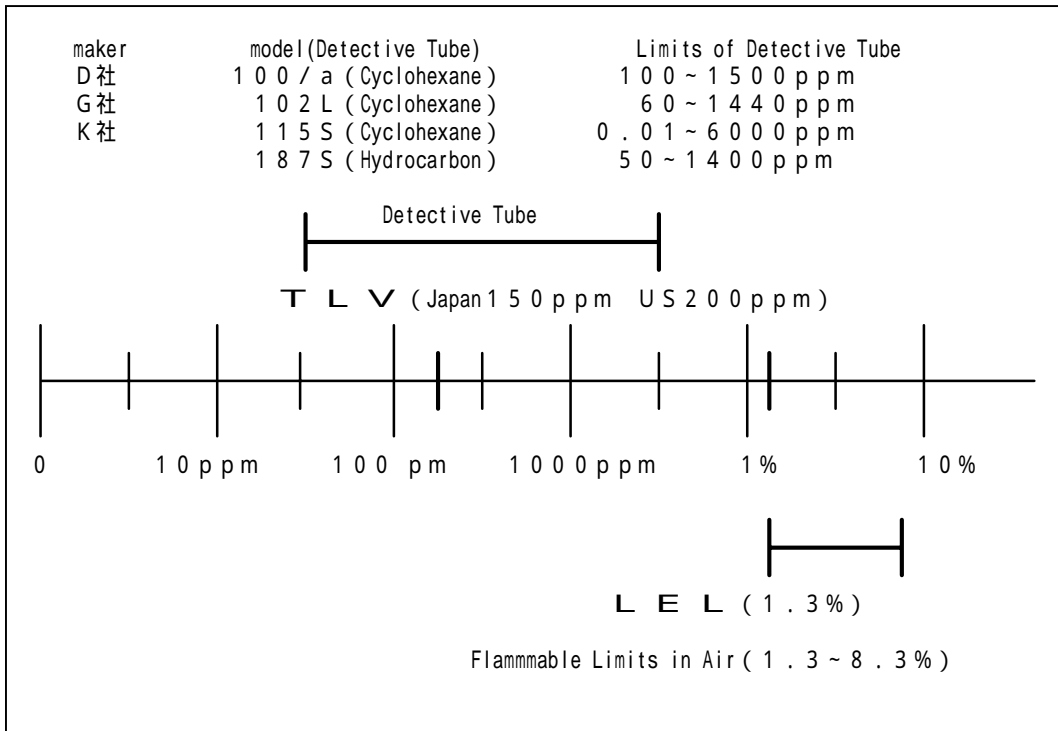
Material name	Cyclohexane				
Common synonyms	Hexamethylene, Hexahydrobenzene, Hexanaphthene				
UN Number	1145	CAS Number	110-82-7	IMDG CODE	Class 3 . 1 / P3114
IMO Pollution Category	C				
Formula	C ₆ H ₁₂	Molecular Weight	84.18	Flammable limits in Air (%)	1 . 3 ~ 8 . 3
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.77	Vapor Specific Gravity	2.9	Boiling Point at 1 ATM ()	80.74
Freezing Point ()	6.47	Flash Point ()	-18	Ignition Point ()	245
Steam Pressure	16 . 2 kpa / 121 . 6 mmHg (30)				
Corrosion	human : no metal : no		Oxidation		
TLV, Toxicity by Ingestion	Japan : 150 ppm LD50 2982mg / kg (oral rat) ACGIH : 200 ppm TWA 400 ppm STEL				
Hazard and Noxiousness	<p>Classification : Flammable, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. High concentration vapor has an anesthesia action. . Poisoning condition may appear behind time.</p> <p>Environmental influence : There is biodegradation nature. It is detrimental to an aquatic life living thing. The accumulation nature to an aquatic life living thing is middle.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

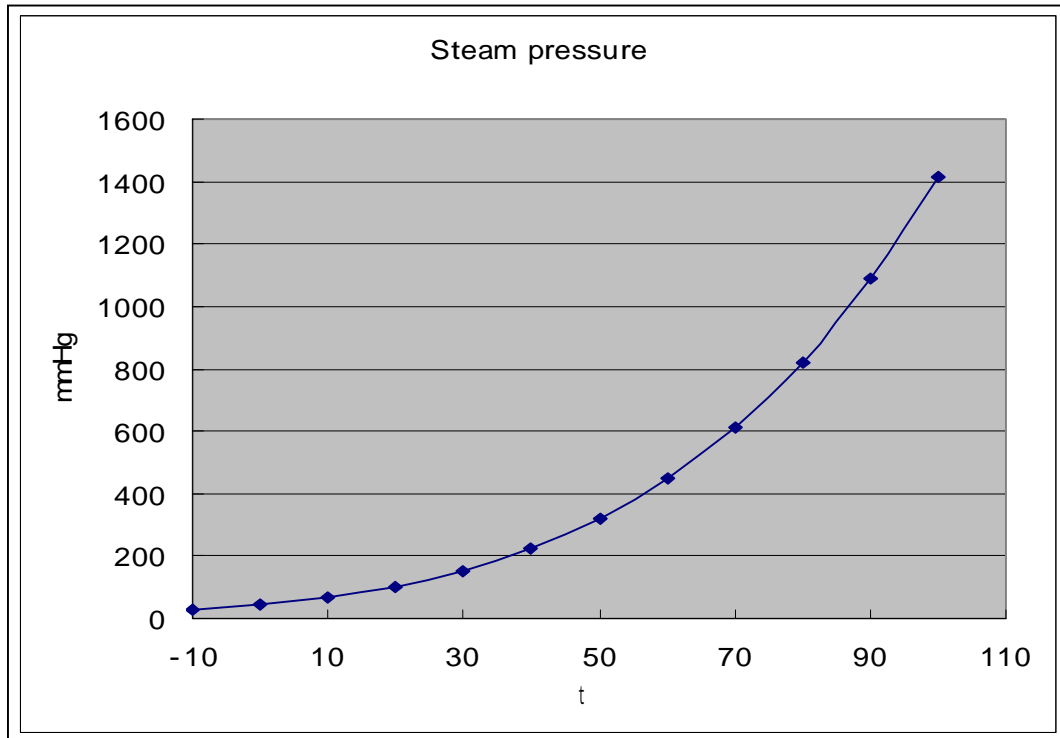


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

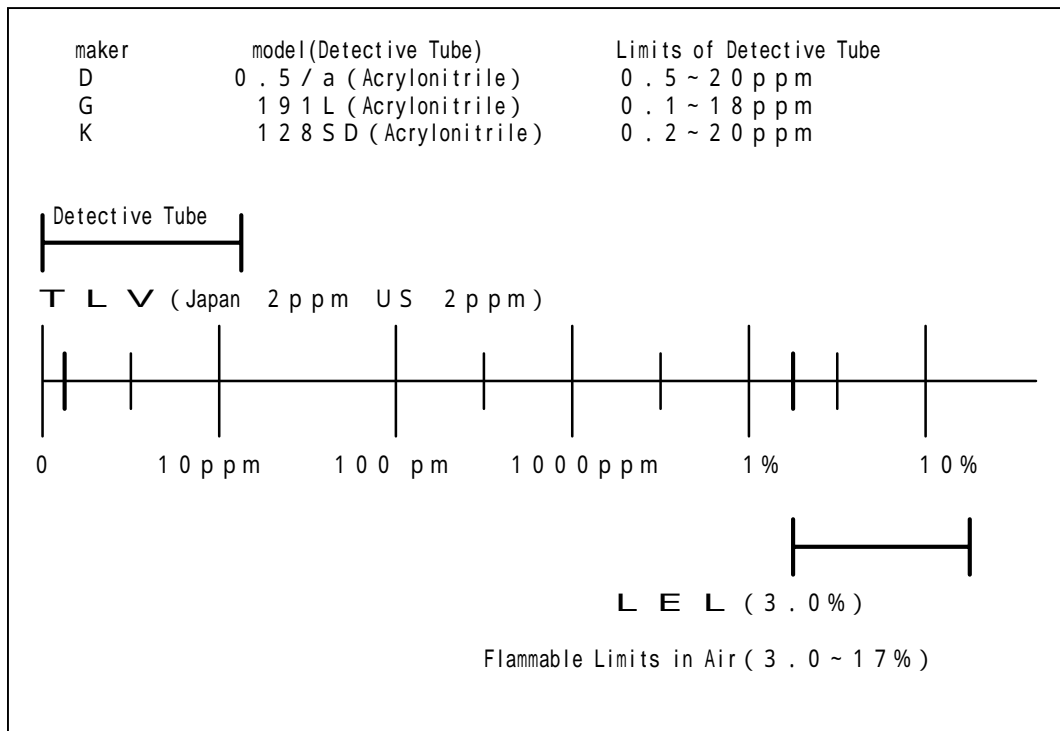
Material name	Acrylonitrile				
Common synonyms	Propenenitrile, Vinyl cyanide, Cyanoethylene, Acrylon				
UN Number	1093	CAS Number	107-13-1	IMDG CODE	Class 3 . 2 / P3173
IMO Pollution Category	B				
Formula	CH ₂ =CHCN	Molecular Weight	53.06	Flammable Limits in Air (%)	3.0 ~ 17.0
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.8	Vapor Specific Gravity	1.8	Boiling Point at 1 ATM()	77.3
Freezing Point ()	-83.55	Flash Point ()	-6	Ignition Point ()	480
Steam Pressure	18.3 kpa / 137 mmHg (30)				
Corrosion	human: no metal: no		Oxidation		
TLV, Toxicity by Ingestion	Japan: 2 ppm ACGIH: 2 ppm TWA skin A3 LD50 82 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification: Flammable, Acute toxicity substance</p> <p>Noxiousness: There is lachrymal and irritating to skin, eyes and throat. Poisoning condition may appear behind time. There are worries about the cancer possibility to people. There is danger of skin absorption.</p> <p>Environmental influence: There is biodegradation nature. It is detrimental to an aquatic life living thing. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. Intense polymerization may be caused by heating or contamination by other substances. Heating etc. decomposes and poisonous hydrogen cyanide gas etc. is produced. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Liimits of Detective Tube

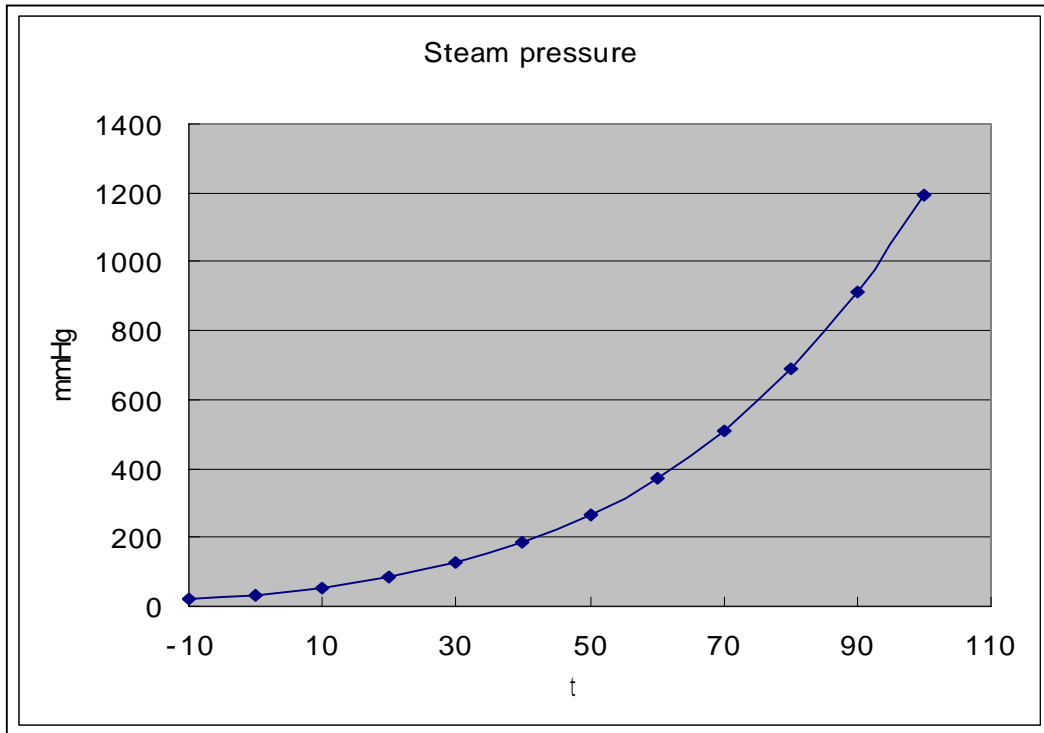


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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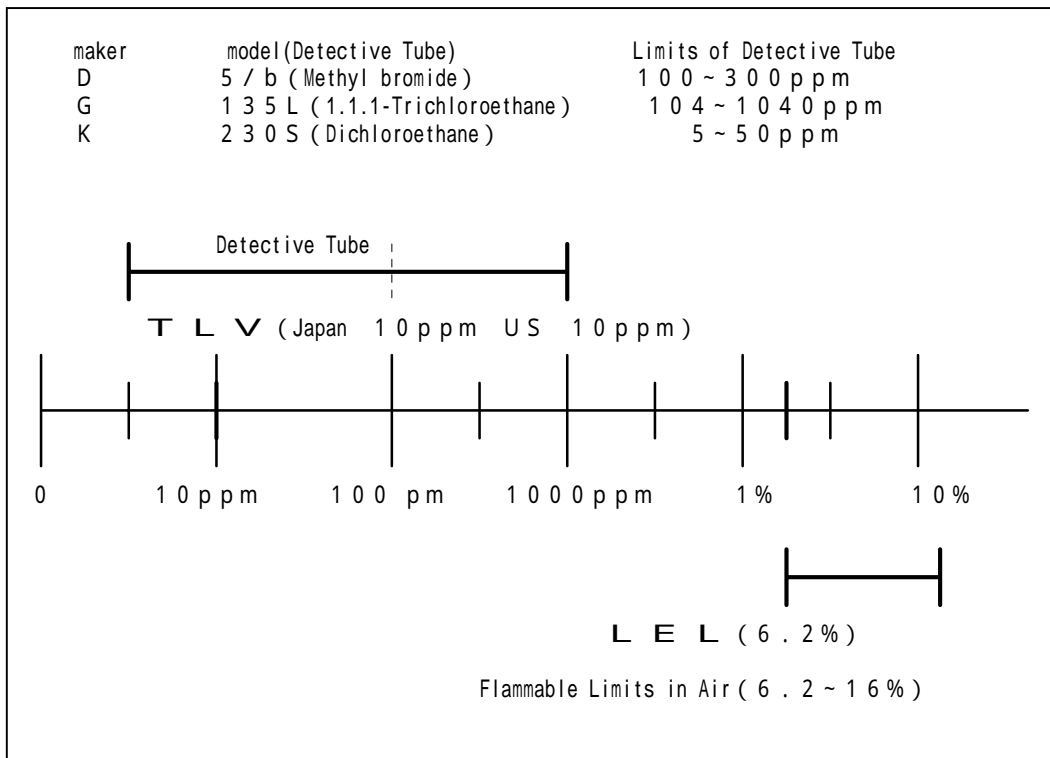
Material name	Dichloroethane				
Common synonyms	Ethylene dichloride, Glycol dichloride, EDC				
UN Number	1184	CAS Number	107-06-2	IMDG CODE	Class 3.2 / P3224
IMO Pollution Category	B				
Formula	C ₂ H ₄ Cl ₂	Molecular Weight	98.96	Flammable Limits in Air (%)	6.2 ~ 16.0
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	1.26	Vapor Specific Gravity	3.4	Boiling Point at 1 ATM ()	83.5
Freezing Point ()	-35.3	Flash Point ()	13	Ignition Point ()	440
Steam Pressure	8.13 kpa / 61 mmHg (20)				
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan: 10 ppm LD50 670 mg / kg (oral rat)		ACGIH: 10 ppm TWA	A4	
Hazard and Noxiousness	<p>Classification: Flammable, Noxiousness: Irritating to skin, eyes and throat. Poisoning condition may appear behind time. There are worries about the cancer possibility to people. Environmental influence: There is biodegradation nature. Danger: It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. Heating and combustion decompose and poisonous phosgen is produced. A plastic is corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

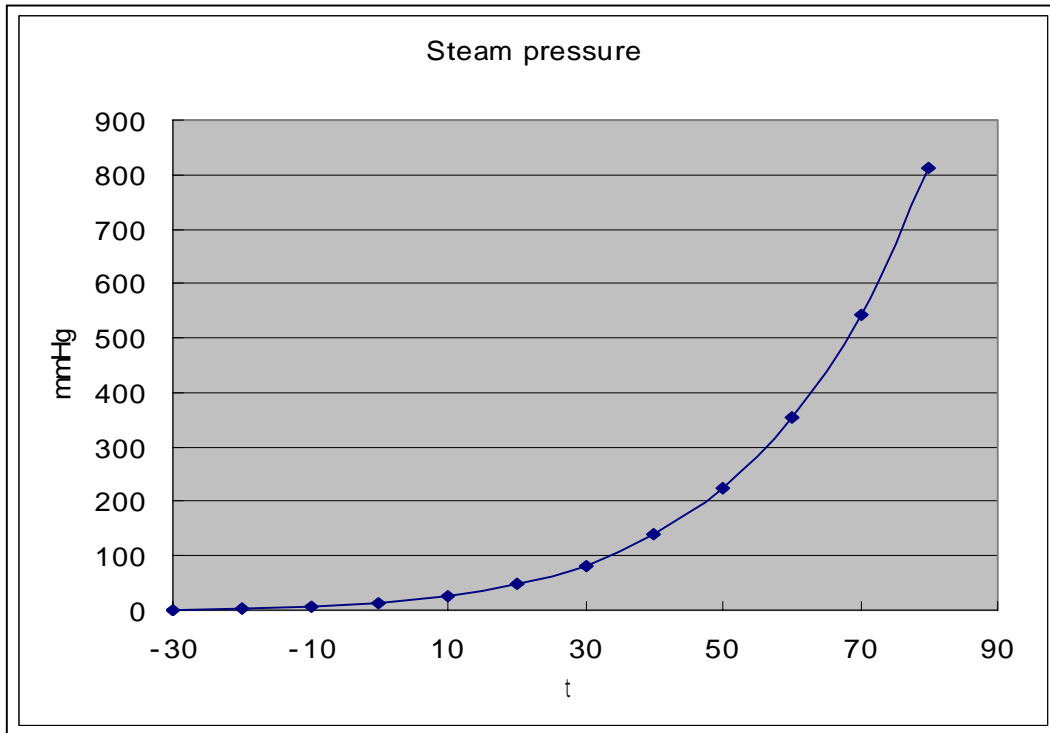


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

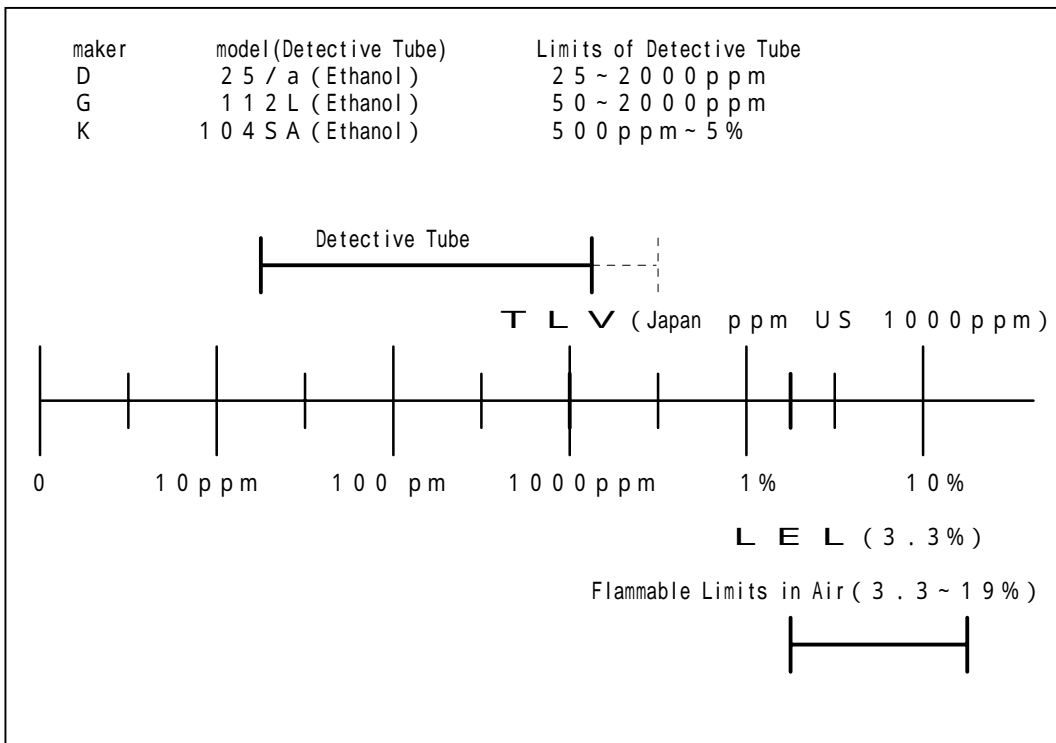
Material name	Ethanol				
Common synonyms	Ethyl alcohol, Alcohol, Alcohol denatured, Alcohol industrial				
UN Number	1170	CAS Number	64-17-5	IMDG CODE	Class 3 . 2 / P 3 2 1 9
IMO Pollution Category					
Formula	C ₂ H ₅ OH	Molecular Weight	46.07	Flammable Limits in Air (%)	3 . 3 ~ 1 9 . 0
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.79	Vapor Specific Gravity	1.6	Boiling Point at 1 ATM ()	78.3
Freezing Point ()	-114.2	Flash Point ()	13	Ignition Point ()	363
Steam Pressure	5 . 8 7 k p a / 4 4 m m H g (2 0)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH : 1 0 0 0 p p m T W A A4 LD50 7060mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable, Noxiousness : Irritating to skin, eyes and throat. High concentration vapor has an anesthesia action. There are worries about the cancer possibility to people. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

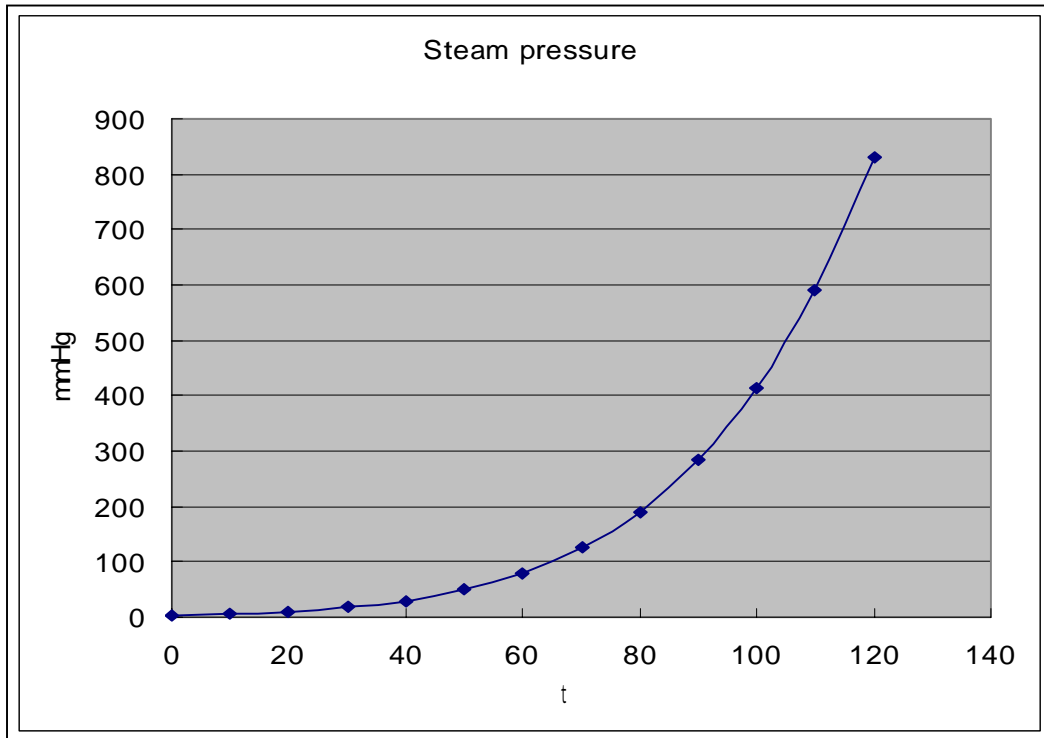


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

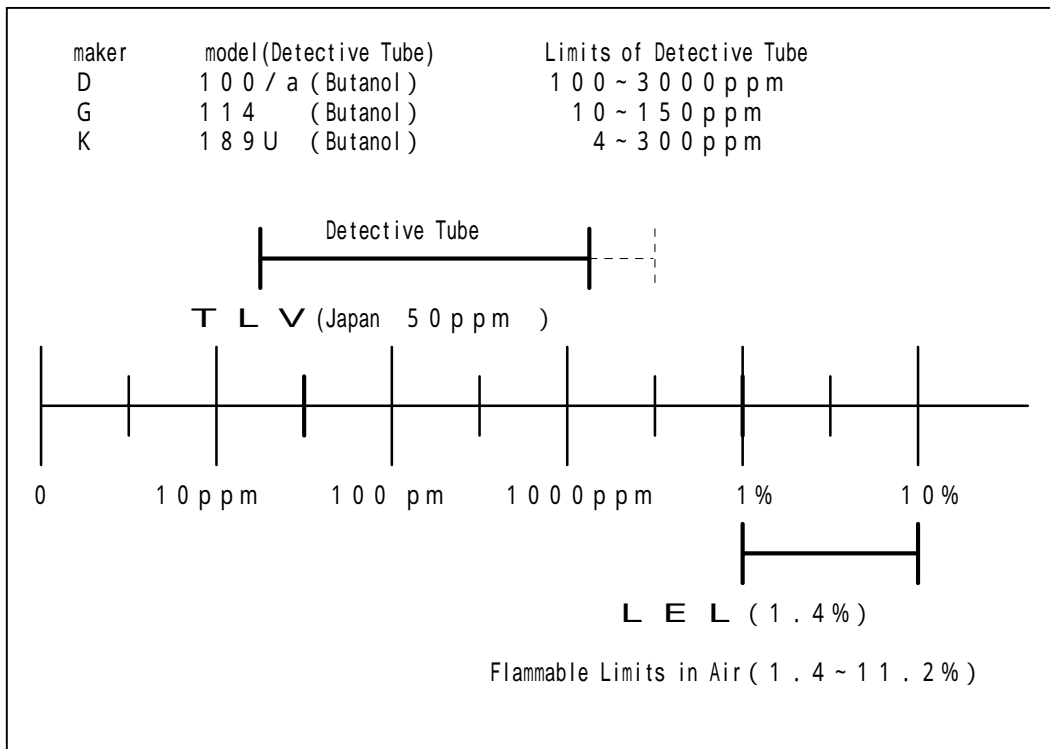
Material name	Butanol				
Common synonyms	Butyl alcohol, Propyl carbinol				
UN Number	1120	CAS Number	71-36-3	IMDG CODE	Class 3 . 3 / P 3 3 1 3
IMO Pollution Category					
Formula	C4H9OH	Molecular Weight	74.12	Flammable Limits in Air (%)	1 . 4 ~ 1 1 . 2
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.81	Vapor Specific Gravity	2.6	Boiling Point at 1 ATM ()	117.3
Freezing Point ()	-89.5	Flash Point ()	29	Ignition Point ()	343
Steam Pressure	0.73 k p a / 5.5mmHg (2 0)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 5 0 p p m ACGIH : 2 5 p p m TLV-C skin L D 5 0 7 9 0 m g / k g (o r a l r a t)				
Hazard and Noxiousness	<p>Classification : Flammable, Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. Inflammability is high. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits Detective Tube

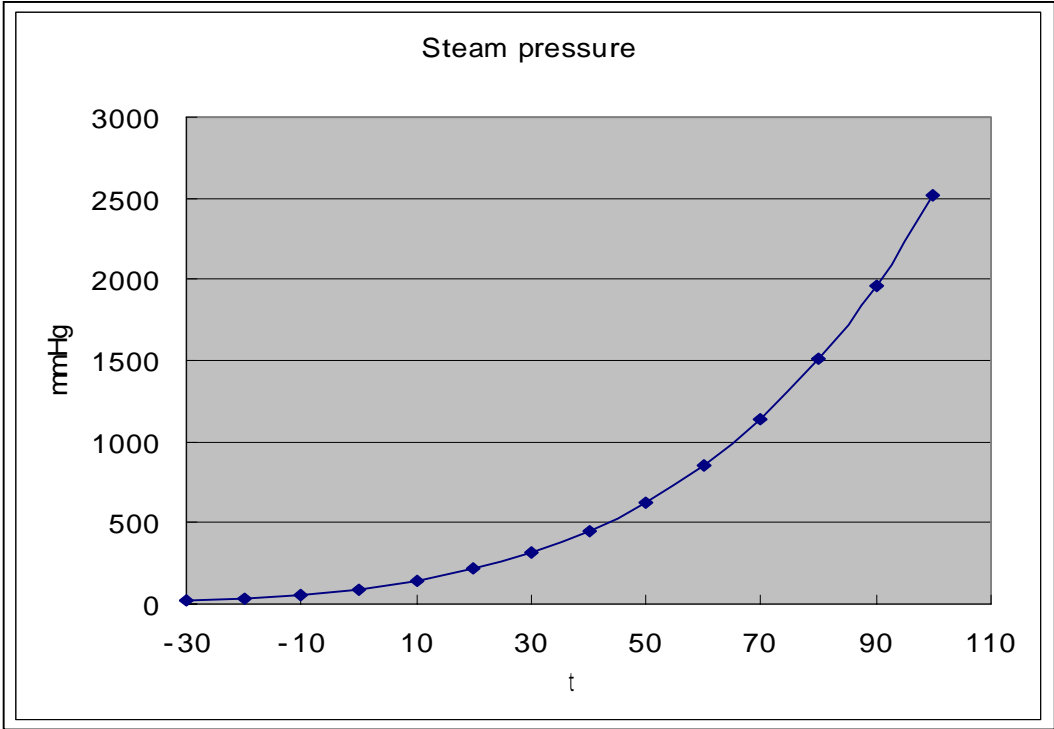


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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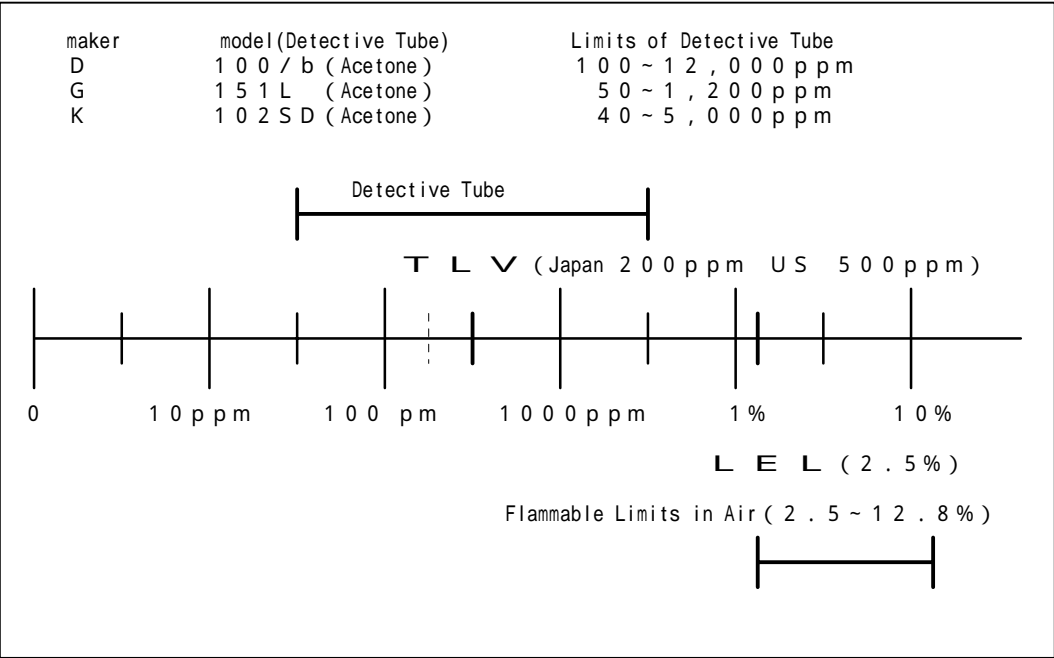
Material Name	Acetone				
Common synonyms	2-Propanone, Dimethyl ketone				
UN Number	1090	CAS Number	67 - 64 - 1	IMDG CODE	Class 3 . 1 / P 3 1 0 2
IMO Pollution Category	C				
Formula	CH ₃ COCH ₃	Molecular Weight	58.08	Flammable Limits in Air (%)	2.5 ~ 12.8
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.79	Vapor Specific Gravity	2	Boiling Point at 1 ATM ()	56.3
Freezing Point ()	-94.8	Flash Point ()	-20	Ignition Point ()	558
Steam Pressure	24.2 kpa / 181.7 mmHg (20)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 200 ppm ACGIH : 500 ppm TWA 750 ppm STEL A4 LD50 9750 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable liquids, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. High concentration vapor has an anesthesia action. There are worries about the cancer possibility to people.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. A plastic is corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
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Steam pressure curve



Limits of Detective Tube

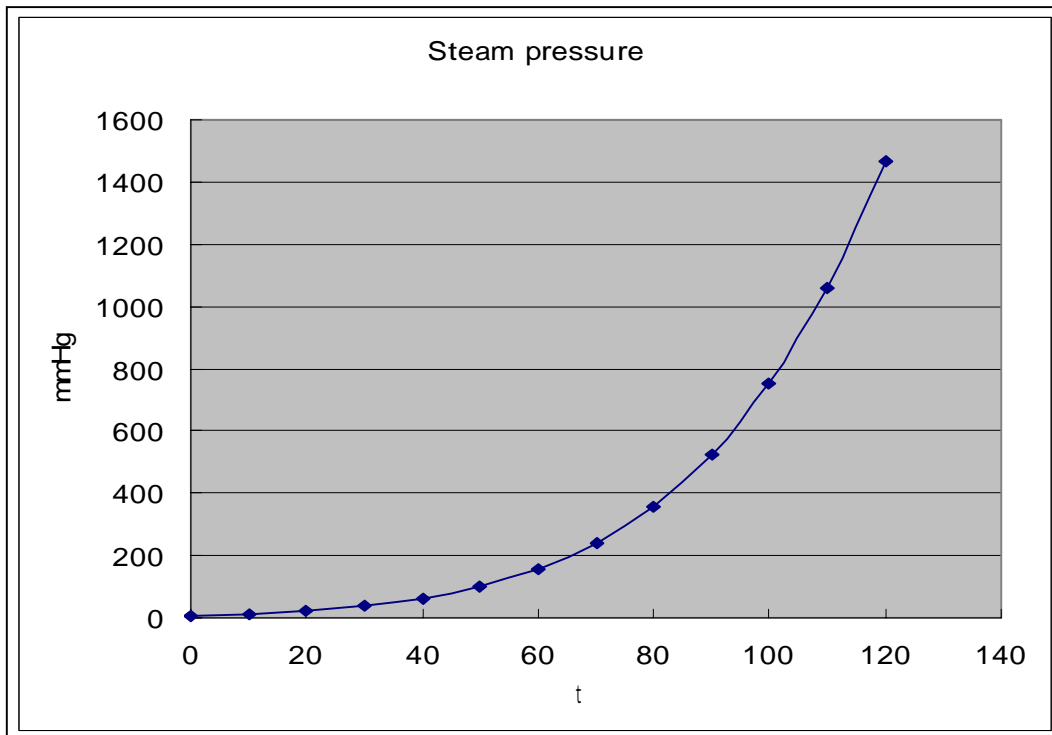


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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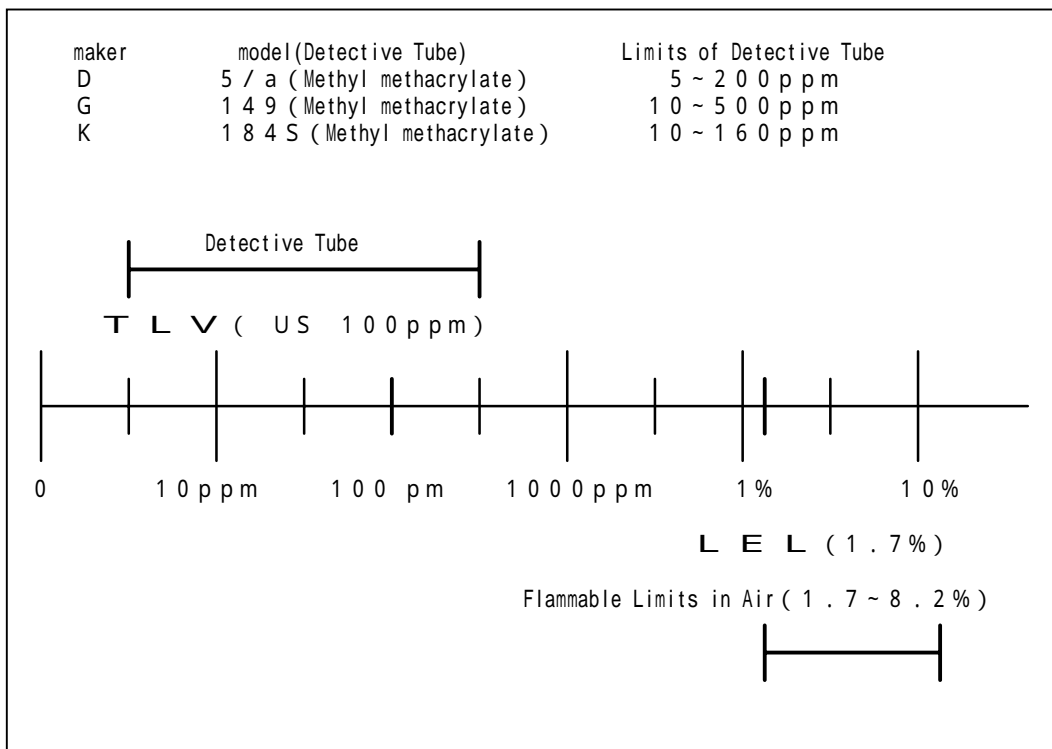
Material Name	Methyl methacrylate				
Common synonyms	M M A, Methacrylic acid methyl ester				
UN Number	1247	CAS Number	80-62-6	IMDG CODE	Class 3 . 2 / P3259
IMO Pollution Category	D				
Formula	CH ₂ =C(CH ₃)COOCH ₃	Molecular Weight	100.1	Flammable Limits in Air (%)	1 . 7 ~ 8 . 2
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.94	Vapor Specific Gravity	3.5	Boiling Point at 1 ATM ()	100.3
Freezing Point ()	-48.2	Flash Point ()	10	Ignition Point ()	421
Steam Pressure	4.13k p a / 31mmHg (2 0)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : ACGIH : 1 0 0 p p m T W A A 4 L D 5 0 8 0 0 0 m g / k g (o r a l r a t)				
Hazard and Noxiousness	<p>Classification : Flammable liquids Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time. There are worries about the cancer possibility to people. Sensitization is in the skin. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. Intense polymerization may be caused by heating or contamination by other substances.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

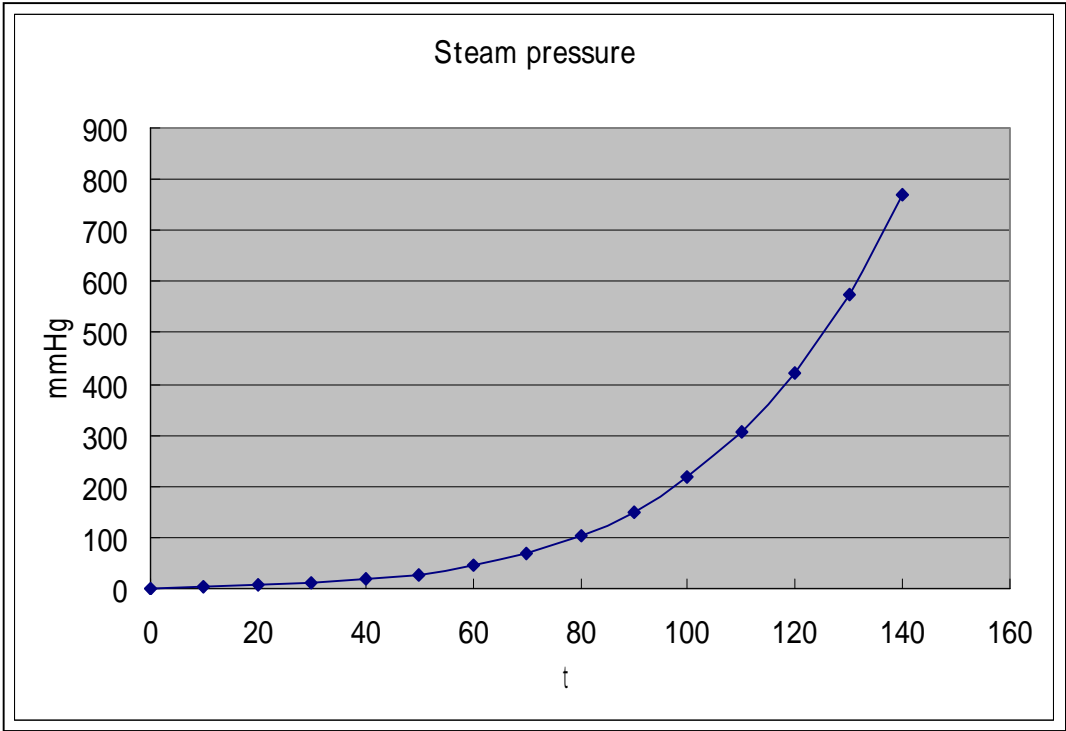


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

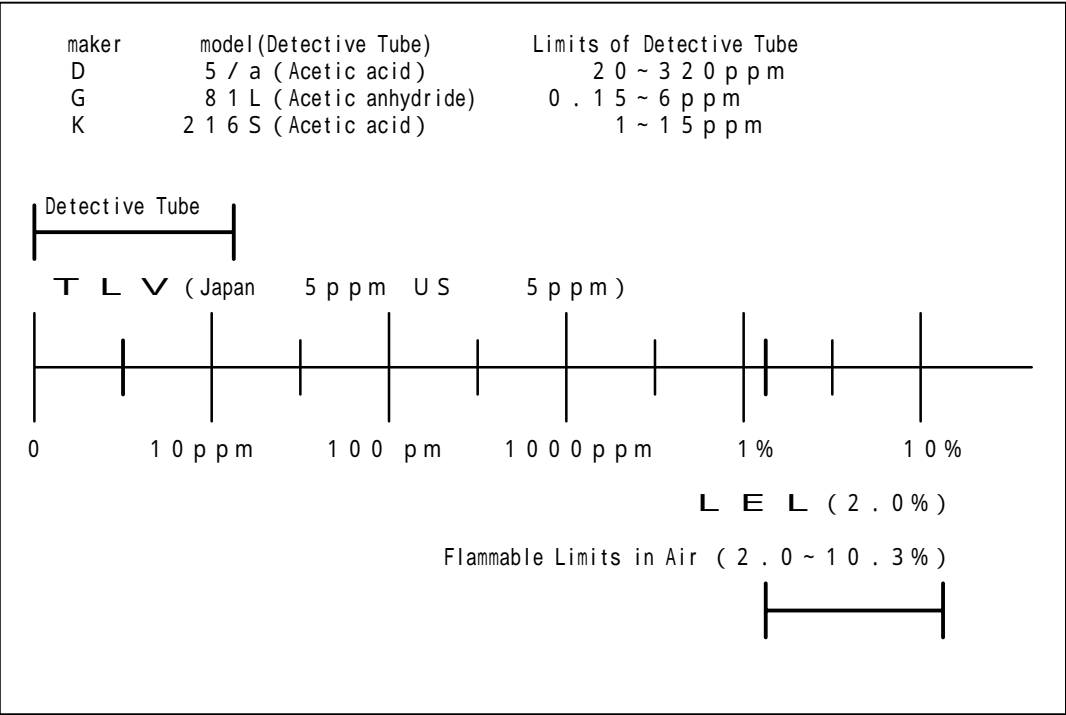
Material Name	Acetic anhydride				
Common synonyms	Acetic oxide, Ethanoic anhydride, Acetyl oxide				
UN Number	1715	CAS Number	108-24-7	IMDG CODE	Class 8 / P 8 1 0 1
IMO Pollution Category	D				
Formula	(CH ₃ CO) ₂ O	Molecular Weight	102.1	Flammable Limits in Air (%)	2.0 ~ 10.3
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.08	Vapor Specific Gravity	3.5	Boiling Point at 1 ATM ()	139.5
Freezing Point ()	-73	Flash Point ()	49	Ignition Point ()	316
Steam Pressure	0.5 kpa / 10mmHg (20)				
Corrosion	human : no metal : yes		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 5 ppm LD50 1780 mg / kg (oral rat)		ACGIH : 5 ppm TWA		
Hazard and Noxiousness	<p>Classification : Corrosion substance, Flammable liquids</p> <p>Noxiousness : Irritating to skin, eyes and throat.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. It is weak acidity and much metal is invaded. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

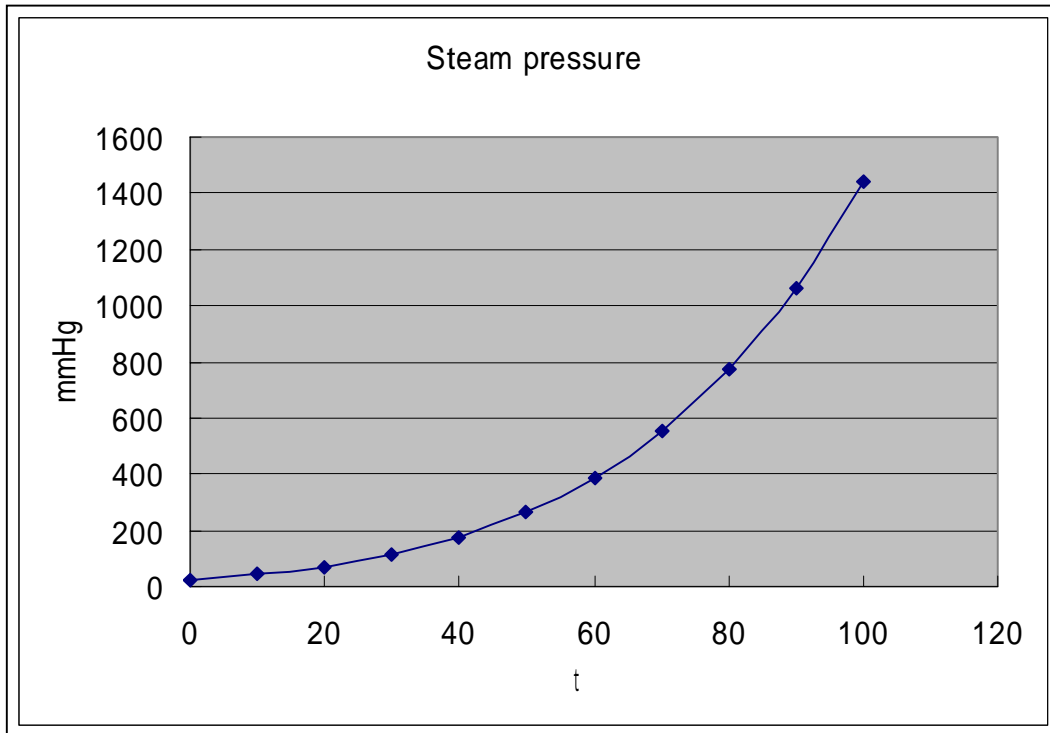


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

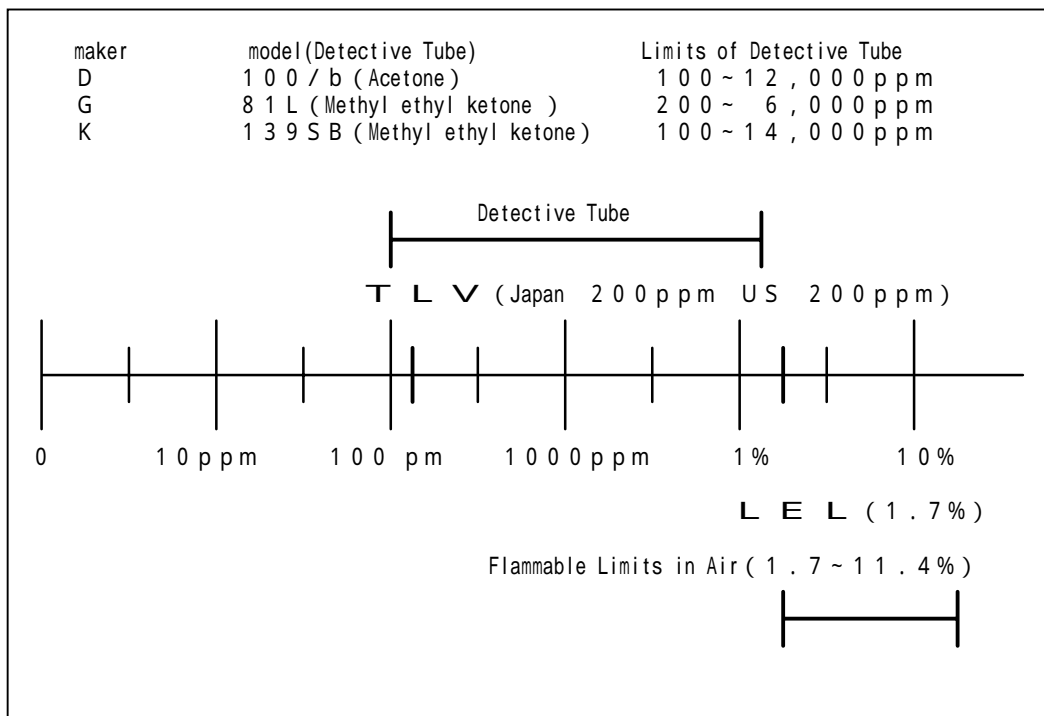
Material Name	Methyl ethyl ketone				
Common synonyms	M E K, Ethyl methyl ketone, Methyl acetone				
UN Number	1193	CAS Number	78 - 93 - 3	IMDG CODE	Class3 . 2 / P3 2 2 6
IMO Pollution Category	D				
Formula	CH3COC2H5	Molecular Weight	72.11	Flammable limits in Air (%)	1 . 7 ~ 1 1 . 4
Appearance	light yellow			Solubility in Water	easily soluble
Specific Gravity	0.8	Vapor Specific Gravity	2.5	Boiling Point at 1 ATM ()	79.5
Freezing Point ()	-87	Flash Point ()	-9	Ignition Point ()	404
Steam Pressure	9.5kpa / 71.2mmHg (20)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 200ppm LD50 3400mg / kg (oral rat)		ACGIH: 200ppmTWA	300ppmSTEL	
Hazard and Noxiousness	<p>Classification : Flammable liquids, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. High concentration vapor has an anesthesia action.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. A plastic is corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

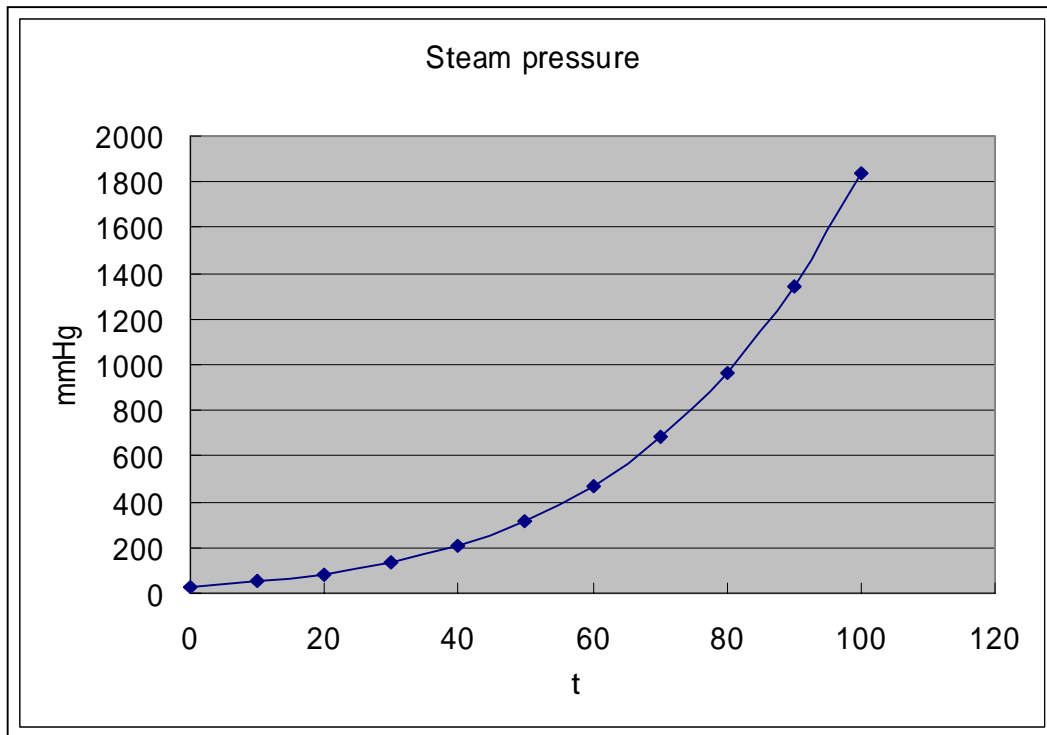


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

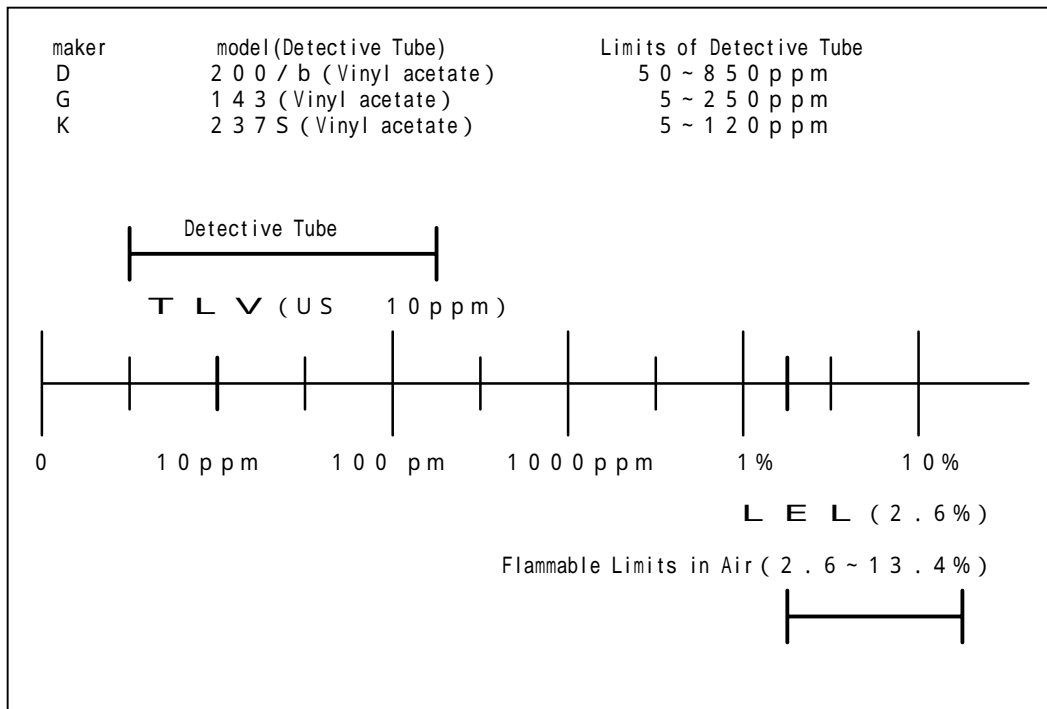
Material Name	Vinyl acetate				
Common synonyms	1-Acetoxyethylene, Ethenyl acetate, Vinyl acetate monomer				
UN Number	1301	CAS Number	108-05-4	IMDG CODE	Class 3 . 2 / P 3 2 8 9
IMO Pollution Category	C				
Formula	CH ₃ COOCH=CH ₂	Molecular Weight	86.09	Flammable limits in Air (%)	2 . 6 ~ 1 3 . 4
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.93	Vapor Specific Gravity	3	Boiling Point at 1 ATM ()	73.1
Freezing Point ()	-93	Flash Point ()	-8	Ignition Point ()	402
Steam Pressure	11 k p a / 83mmHg (2 0)				
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 1 0 p p m T W A 1 5 p p m S T E L A 3 L D 5 0 2 9 2 0 m g / k g (o r a l r a t)				
Hazard and Noxiousness	<p>Classification : Flammable liquids</p> <p>Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time.</p> <p>Environmental influence : There is biodegradation nature. It is detrimental to an aquatic life living thing.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. Intense polymerization may be caused by heating or contamination by other substances.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

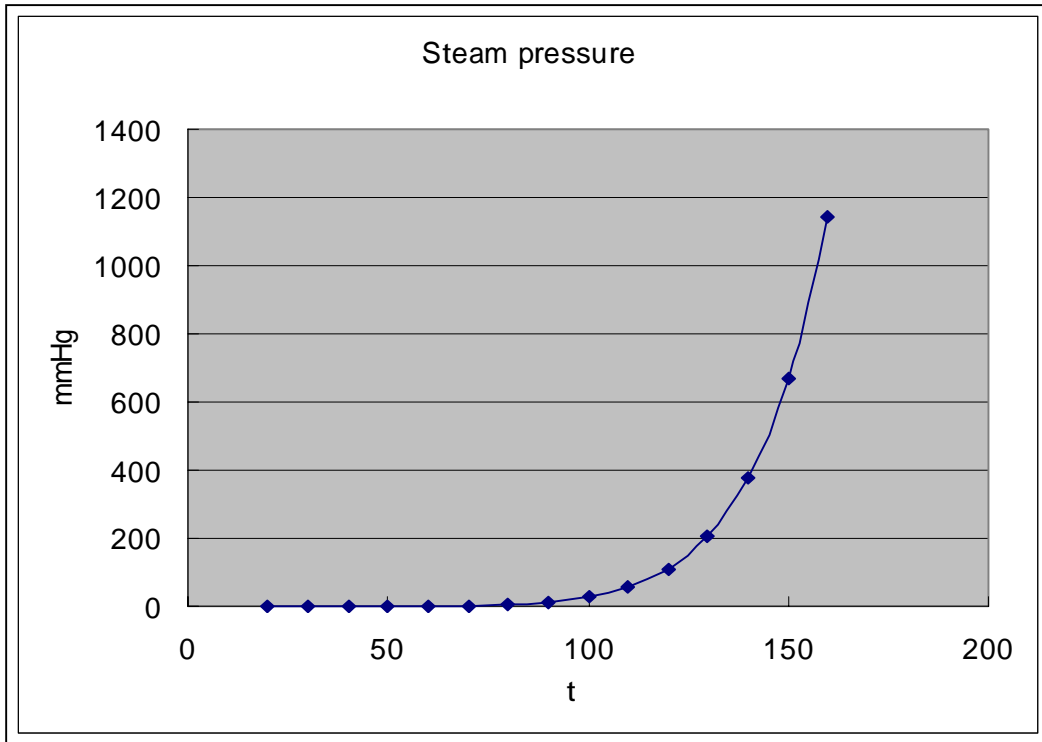


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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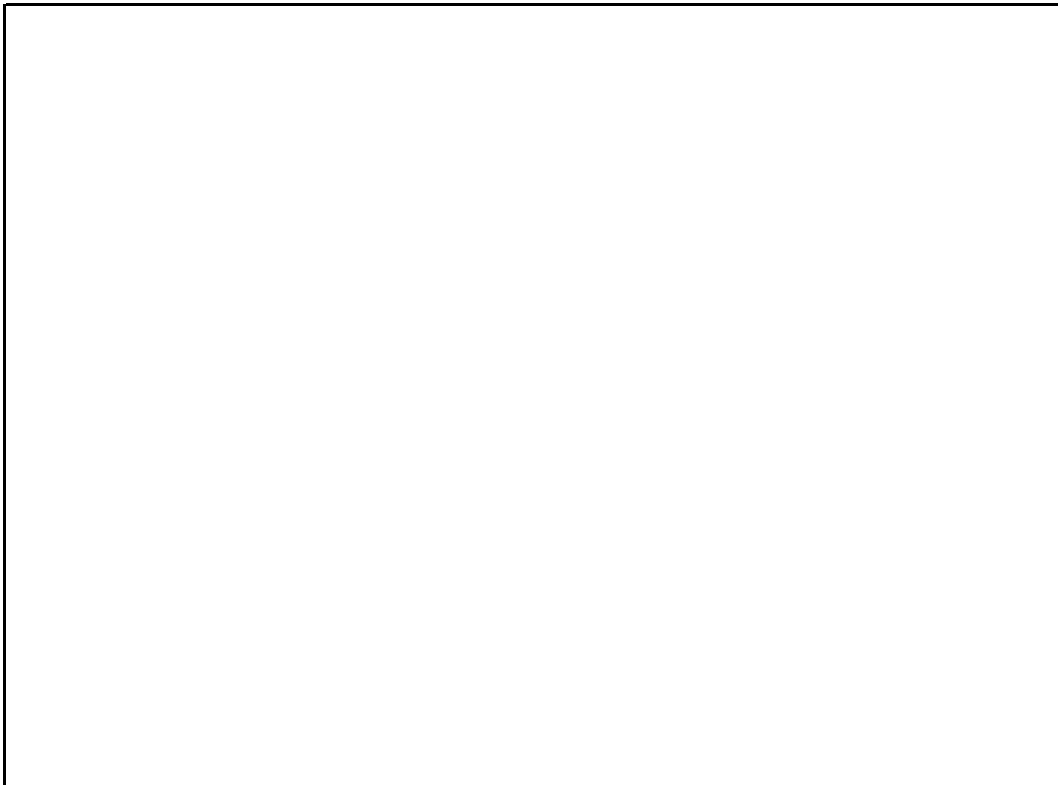
Material Name	Propylbenzene				
Common synonyms	Cumene, Cumol, 2-Phenyl propane				
UN Number	1918	CAS Number	98-82-8	IMDG CODE	Class3.3/P3357
IMO Pollution Category	A				
Formula	C9H12	Molecular Weight	120.19	Flammable limits in Air (%)	0.9 ~ 6.5
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.862	Vapor Specific Gravity	4.1	Boiling Point at 1 ATM ()	152.39
Freezing Point ()	-96	Flash Point ()	36	Ignition Point ()	424
Steam Pressure	3.2pa/0.02mmHg (20)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH : 5 0 p p m TWA LD50 1 4 0 0 m g / k g (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable liquids</p> <p>Noxiousness : Irritating to skin, eyes and throat. High concentration vapor has an anesthesia action.</p> <p>Environmental influence : There is biodegradation nature. It is detrimental to an aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

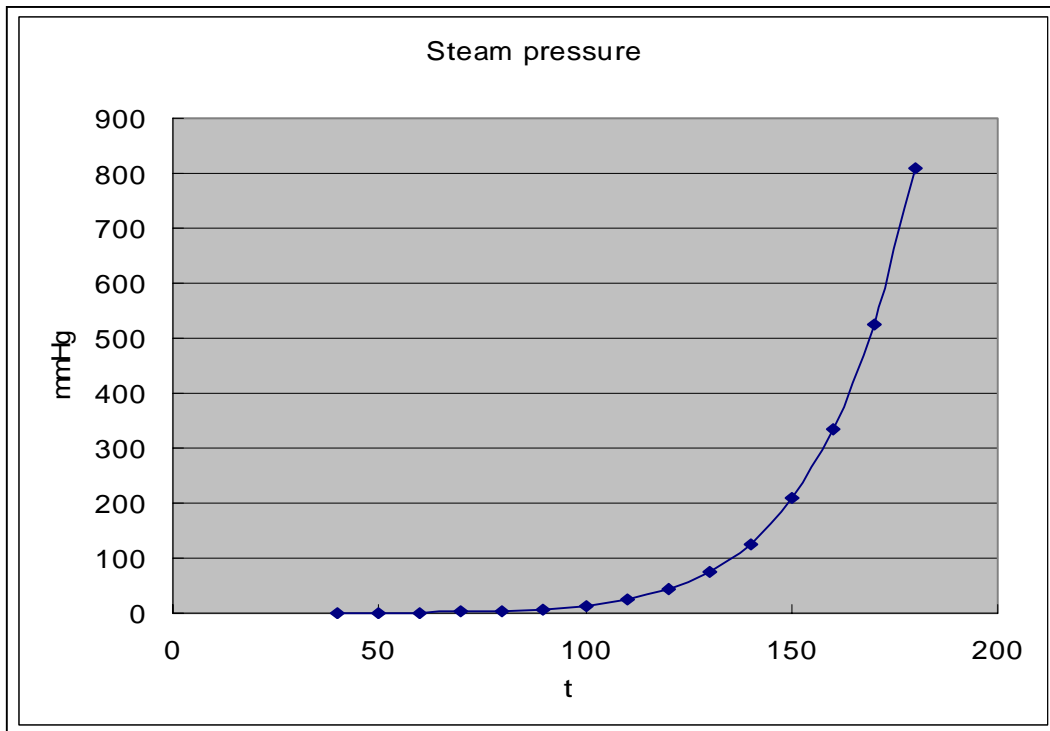


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Octanol				
Common synonyms	Octyl alcohol, Alcohol C9, Heptyl carbinol				
UN Number	3082	CAS Number	111-87-5	IMDG CODE	Class9 / P 9 0 2 8
IMO Pollution Category	C				
Formula	CH ₃ (CH ₂) ₇ OH	Molecular Weight	130.23	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.82	Vapor Specific Gravity	4.5	Boiling Point at 1 ATM ()	178.5
Freezing Point ()	-38.6	Flash Point ()	60	Ignition Point ()	
Steam Pressure	0.2mmHg (2 0)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion					
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Stimulative of skin, eyes and throat is weak. High concentration vapor has an anesthesia action. There is danger of skin absorption.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



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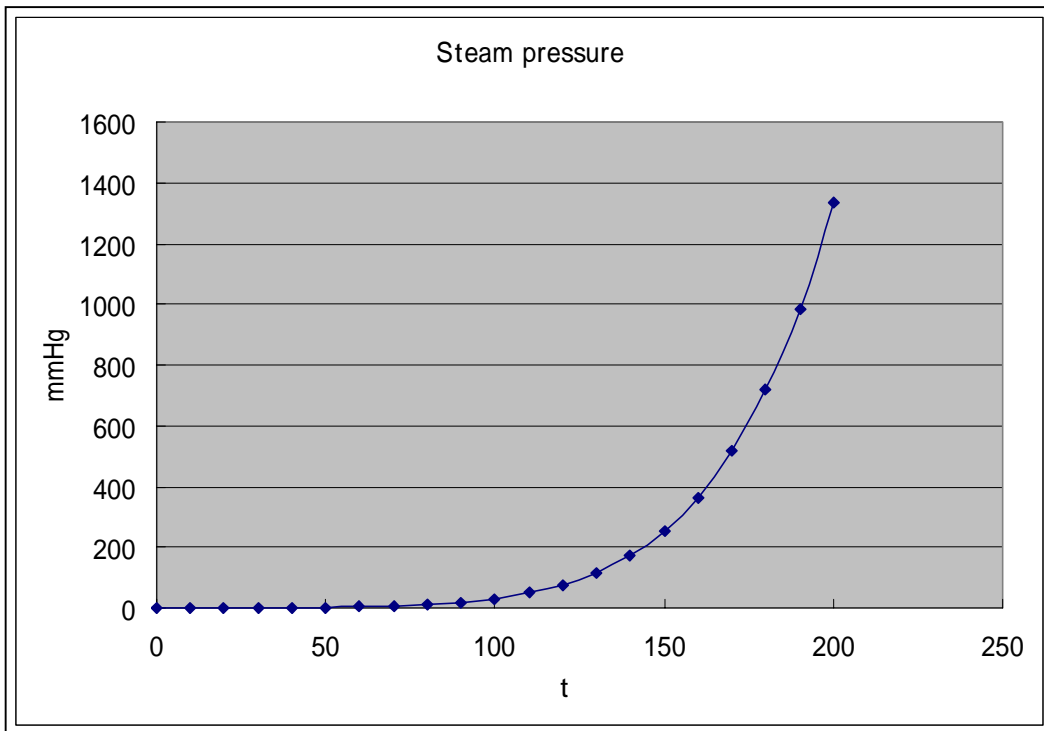


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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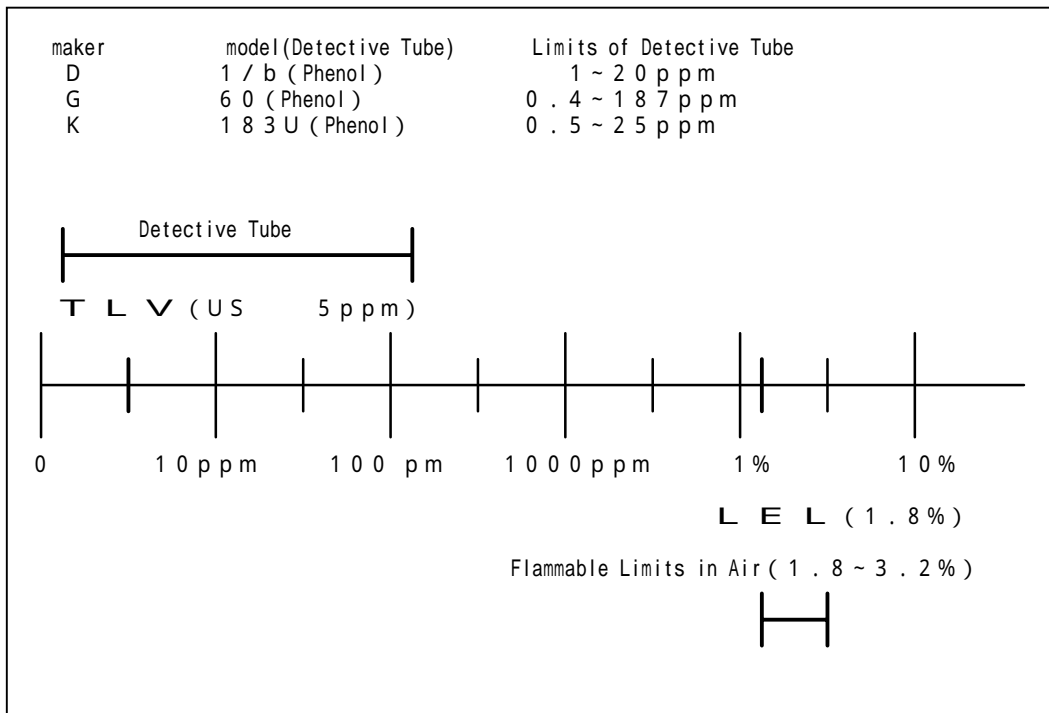
Material Name	Phenol				
Common synonyms	Carbolic acid, Hydroxybenzene, Monohydroxybenzene,				
UN Number	2821	CAS Number	108-95-2	IMDG CODE	Class6.1 / P6225
IMO Pollution Category	C				
Formula	C6H5OH	Molecular Weight	94.11	Flammable limits in Air (%)	1.8 ~ 3.2
Appearance	light pink			Solubility in Water	easily soluble
Specific Gravity	1.049	Vapor Specific Gravity	3.3	Boiling Point at 1 ATM ()	181.75
Freezing Point ()	40.9	Flash Point ()	79	Ignition Point ()	715
Steam Pressure	0.05 kPa / 0.35 mmHg (25)				
Corrosion	human: yes metal: yes		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 5 ppm TWA skin A4 LD50 414 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification: Acute toxicity substance Noxiousness: There is corrosive strong to a living body. Poisoning condition may appear behind time. There is danger of skin absorption. There are worries about the cancer possibility to people. Environmental influence: Speed is slow although there is biodegradation nature. Accumulation nature is in a living thing. It is detrimental to an aquatic life living thing. Danger: It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air It is weak acidity</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



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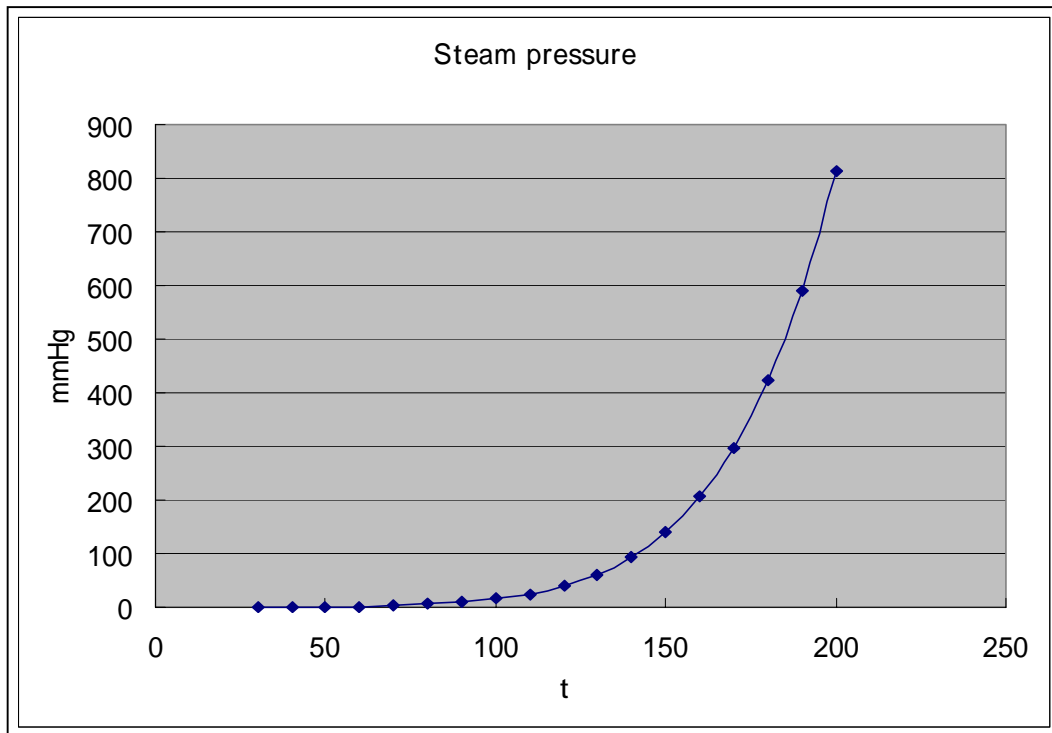


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

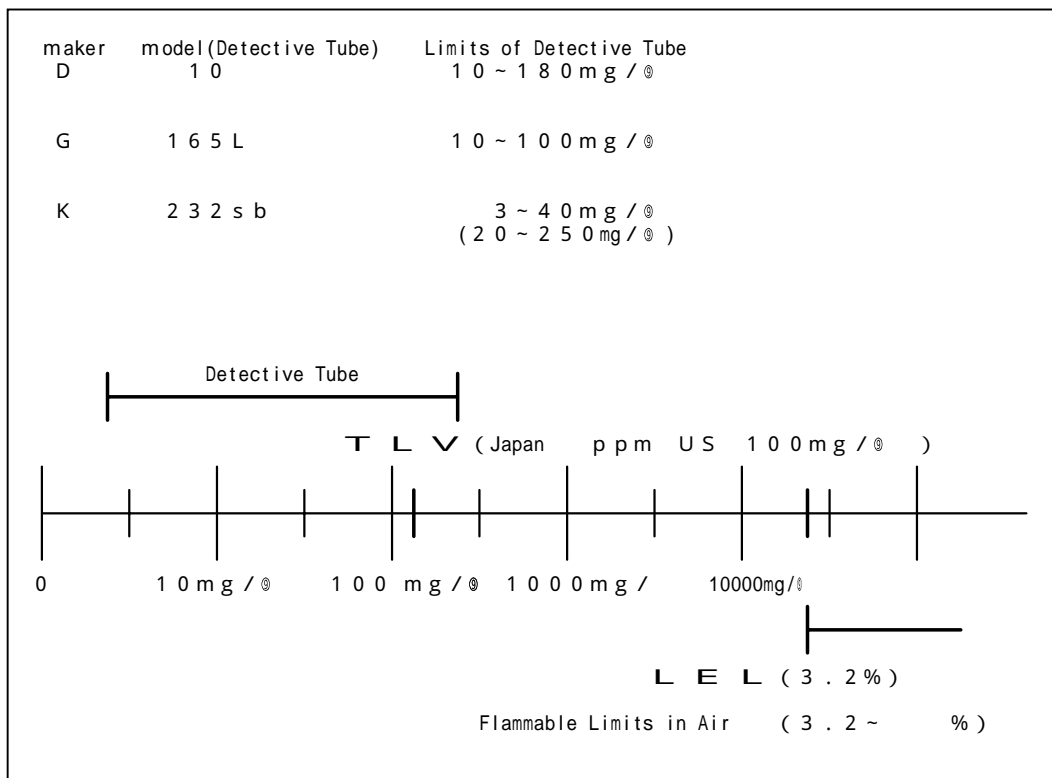
Material Name	Ethyleneglycol				
Common synonyms	Ethylene alcohol, Glycol alcohol, 1,2-Ethanediol				
UN Number		CAS Number	107-21-1	IMDG CODE	
IMO Pollution Category	D				
Formula	HOCH ₂ CH ₂ OH	Molecular Weight	62.07	Flammable limits in Air (%)	3.2 ~
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.11	Vapor Specific Gravity	2.1	Boiling Point at 1 ATM ()	197.85
Freezing Point ()	-12.6	Flash Point ()	111.1	Ignition Point ()	398
Steam Pressure	1 mm Hg (53)				
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 100mg / m ³ TLV - C A 4 LD50 5 2 2 0 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification:</p> <p>Noxiousness: Irritating to skin, eyes and throat. In normal temperature, there are few cases which are hard to evaporate and are exposed to steam. There are worries about the cancer possibility to people.</p> <p>Environmental influence: There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger: It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



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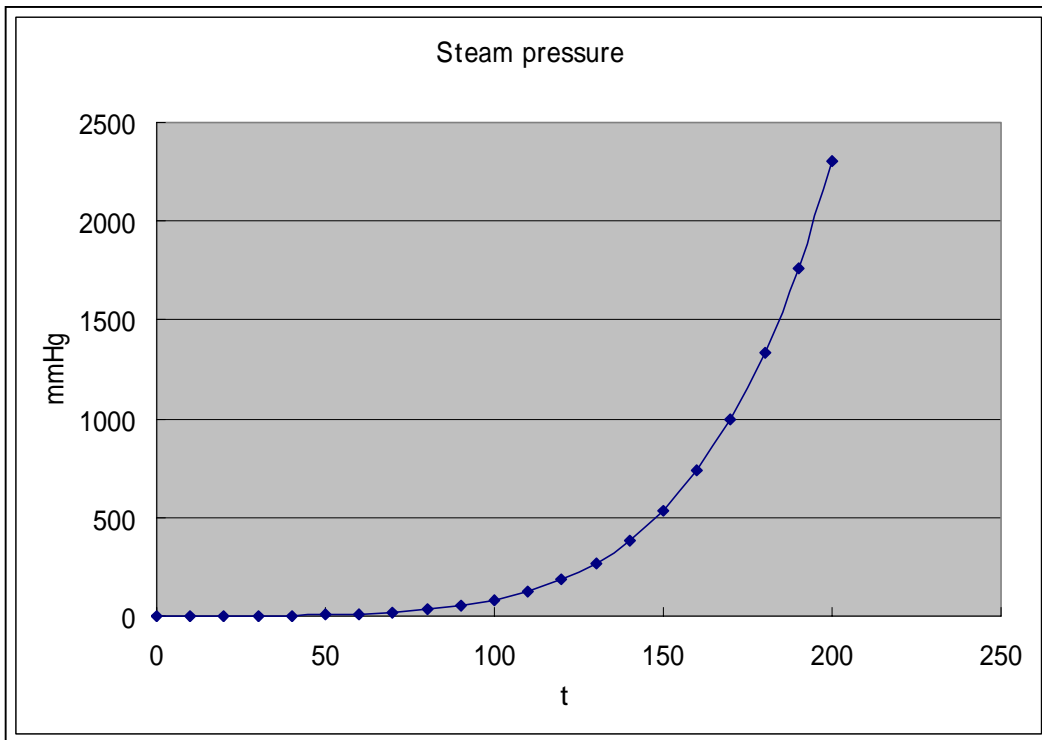


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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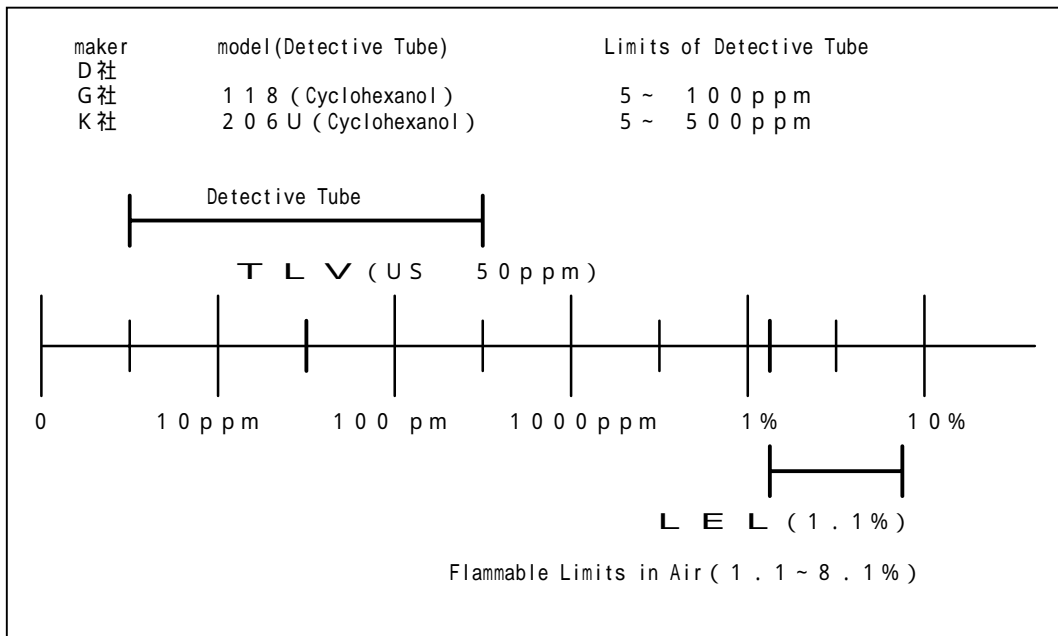
Material Name	Cyclohexanol				
Common synonyms	Cyclohexyl alcohol, Hexahydrophenol, Hydroxycyclohexane				
UN Number		CAS Number	108-93-0	IMDG CODE	
IMO Pollution Category	D				
Formula	C6H11OH	Molecular Weight	100.16	Flammable limits in Air (%)	1.1 ~ 8.1
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.96	Vapor Specific Gravity	3.5	Boiling Point at 1 ATM ()	161.1
Freezing Point ()	25.15	Flash Point ()	68	Ignition Point ()	300
Steam Pressure	10 mm Hg (56)				
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 50 ppm TWA skin LD50 2060 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification: Flammable liquids, Acute toxicity substance</p> <p>Noxiousness: In normal temperature, it is hard to reach detrimental concentration. Irritating to skin, eyes and throat. There is danger of skin absorption.</p> <p>Environmental influence: There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger: It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. A plastic is corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respired artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

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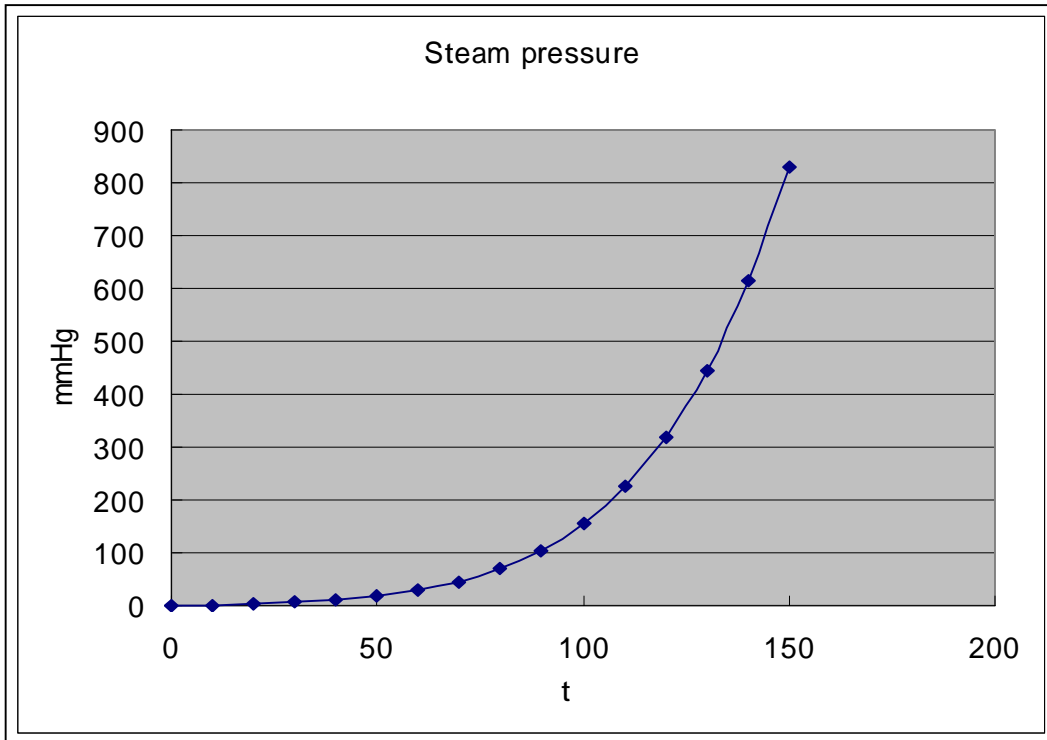


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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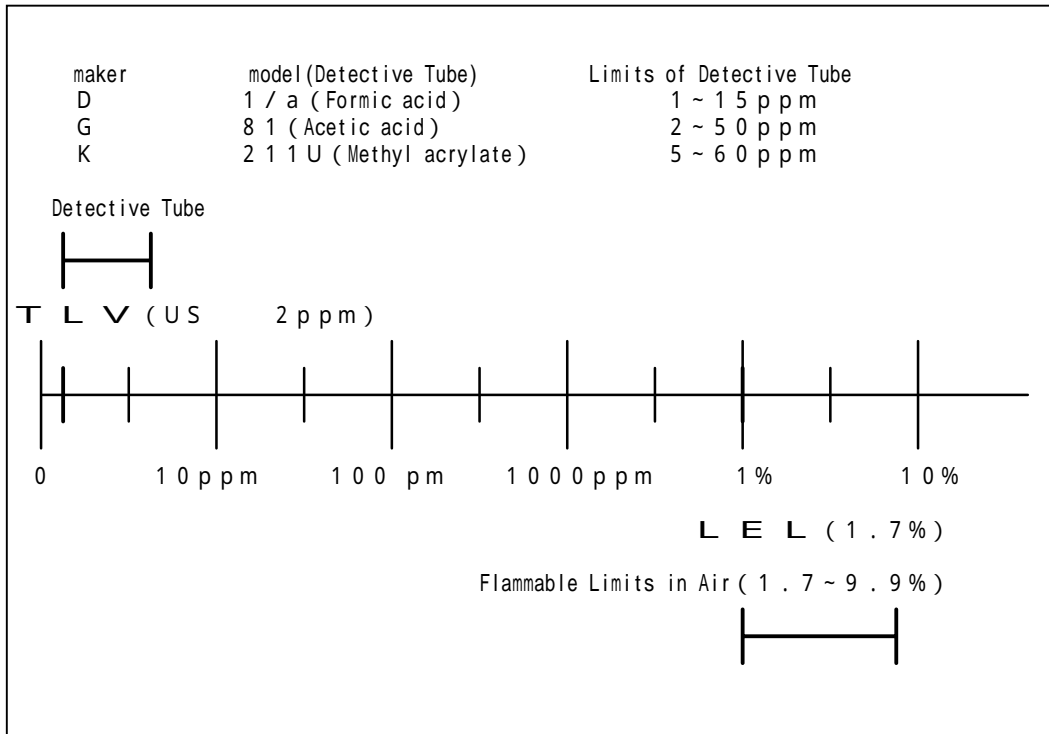
Material Name	Butyl acrylate				
Common synonyms	Acrylic acid butyl ester, Butyl-2-propenoate				
UN Number	2348	CAS Number	141-32-2	IMDG CODE	Class 3 . 3 / P 3 3 1 5
IMO Pollution Category	B				
Formula	CH ₂ =CHCOOC ₄ H ₉	Molecular Weight	128.17	Flammable limits in Air (%)	1 . 7 ~ 9 . 9
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.89	Vapor Specific Gravity	4.4	Boiling Point at 1 ATM ()	147
Freezing Point ()	-64.4	Flash Point ()	48.9	Ignition Point ()	292
Steam Pressure	0.44kPa/3.2mmHg (20)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH : 2 ppm TWA A 4 LD50 3730mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable liquids Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time. Sensitization is in the skin. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Intense polymerization may be caused by heating or contamination by other substances.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

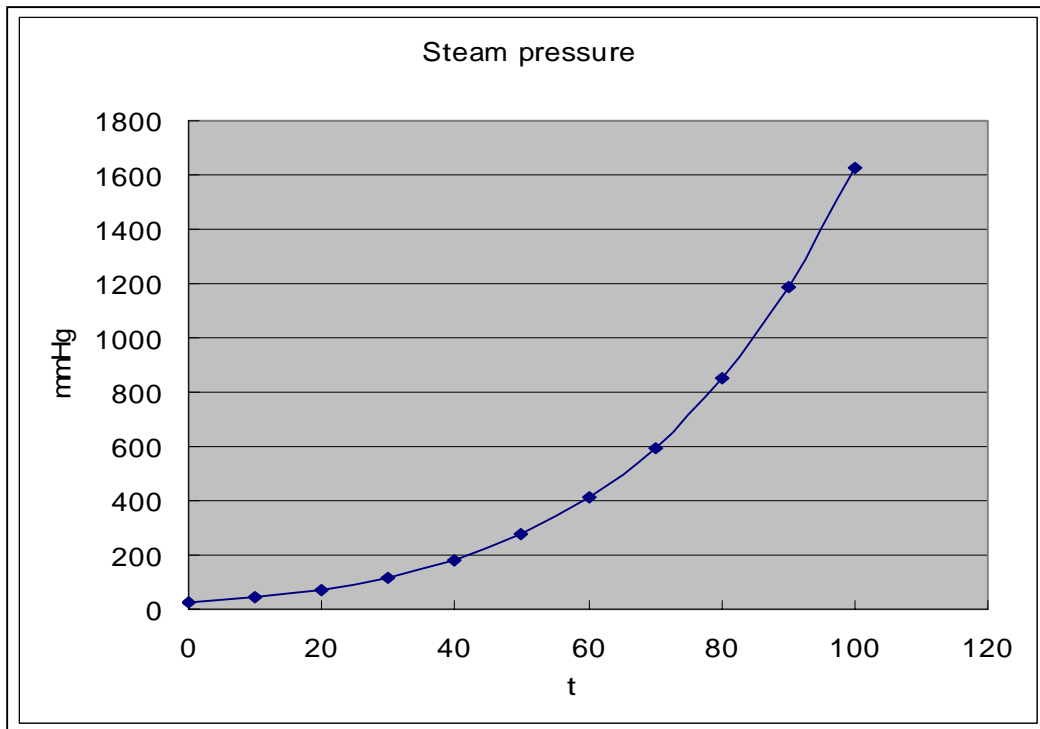


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

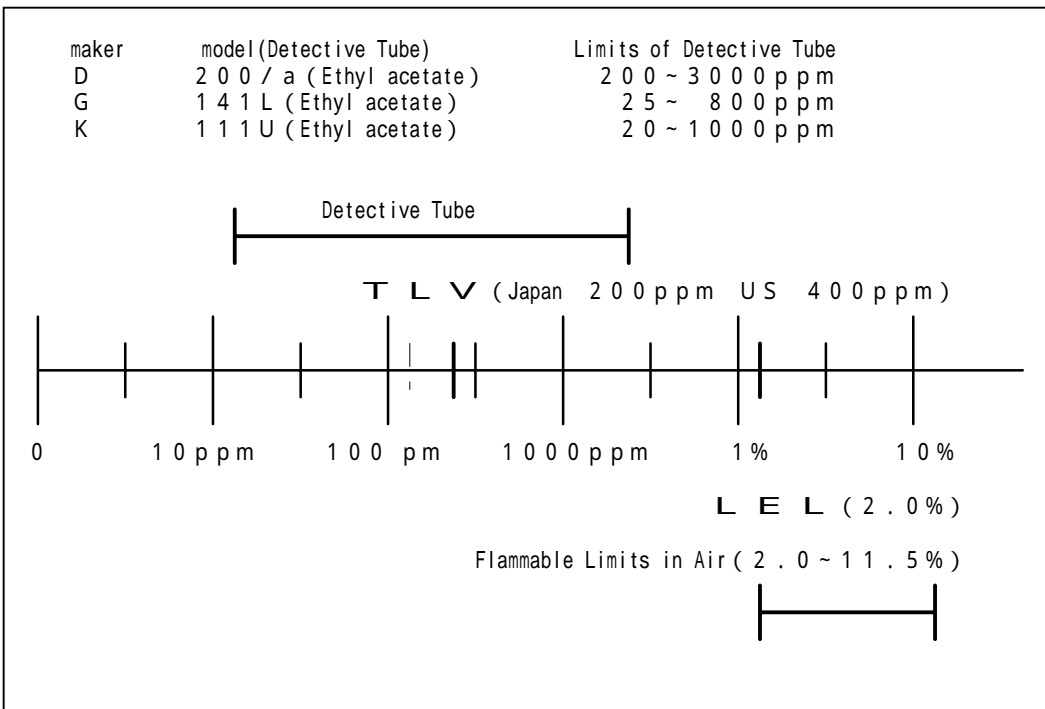
Material Name	Ethyl acetate				
Common synonyms	Acetic ether, Ethyl ethanoate, Acetic ethyl ether				
UN Number	1173	CAS Number	141-78-6	IMDG CODE	Class 3 . 2 / P 3 2 2 0
IMO Pollution Category	D				
Formula	CH ₃ COOC ₂ H ₅	Molecular Weight	88.11	Flammable limits in Air (%)	2 . 0 ~ 1 1 . 5
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.9	Vapor Specific Gravity	3.1	Boiling Point at 1 ATM ()	76.82
Freezing Point ()	-83.6	Flash Point ()	-4	Ignition Point ()	426
Steam Pressure	13.3kPa/100mmHg (27)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 200ppm LD50 11000mg / kg (oral rat) ACGIH : 400ppm TWA				
Hazard and Noxiousness	<p>Classification : Flammable liquids, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. A plastic and aluminium are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

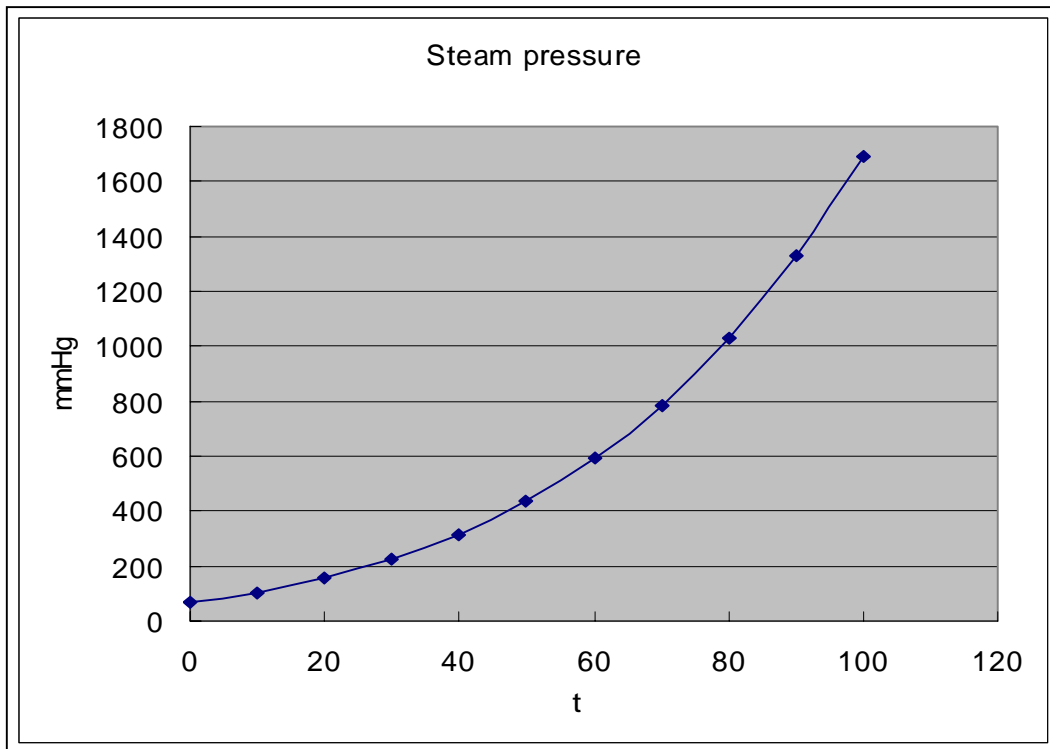


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

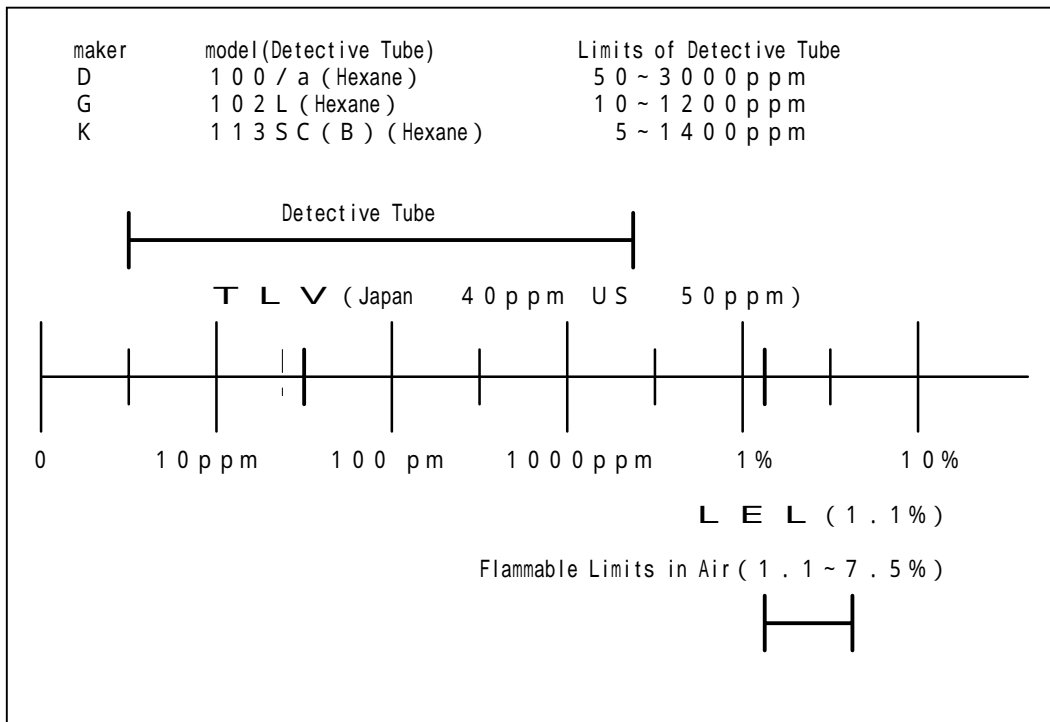
Material Name	Hexane				
Common synonyms	Methylpentane				
UN Number	1208	CAS Number	110-54-3	IMDG CODE	Class 3 . 1 / P 3 1 2 9
IMO Pollution Category	C				
Formula	CH ₃ (CH ₂) ₄ CH ₃	Molecular weight	86.18	flammable limits in Air (%)	1 . 1 ~ 7 . 5
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	0.65	Vapor Specific Gravity	3	Boiling Point at 1 ATM ()	68.74
Freezing Point ()	-95.3	Flash Point ()	-22	Ignition Point ()	223
Steam Pressure	20.7kPa/155mmHg (20)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 4 0 ppm L D 50 28.7 mg / kg (oral rat)		ACGIH : 5 0 ppm TWA skin		
Hazard and Noxiousness	<p>Classification : Flammable liquids, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat.</p> <p>Environmental influence : There is biodegradation nature. It is detrimental to an aquatic life living thing.</p> <p>Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

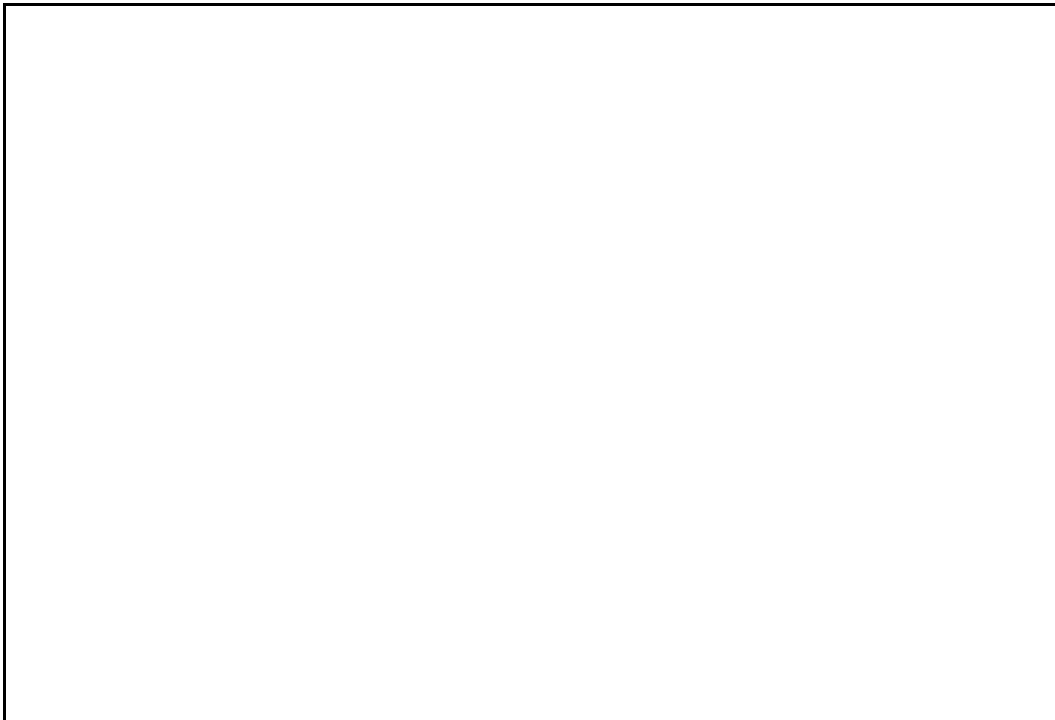


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

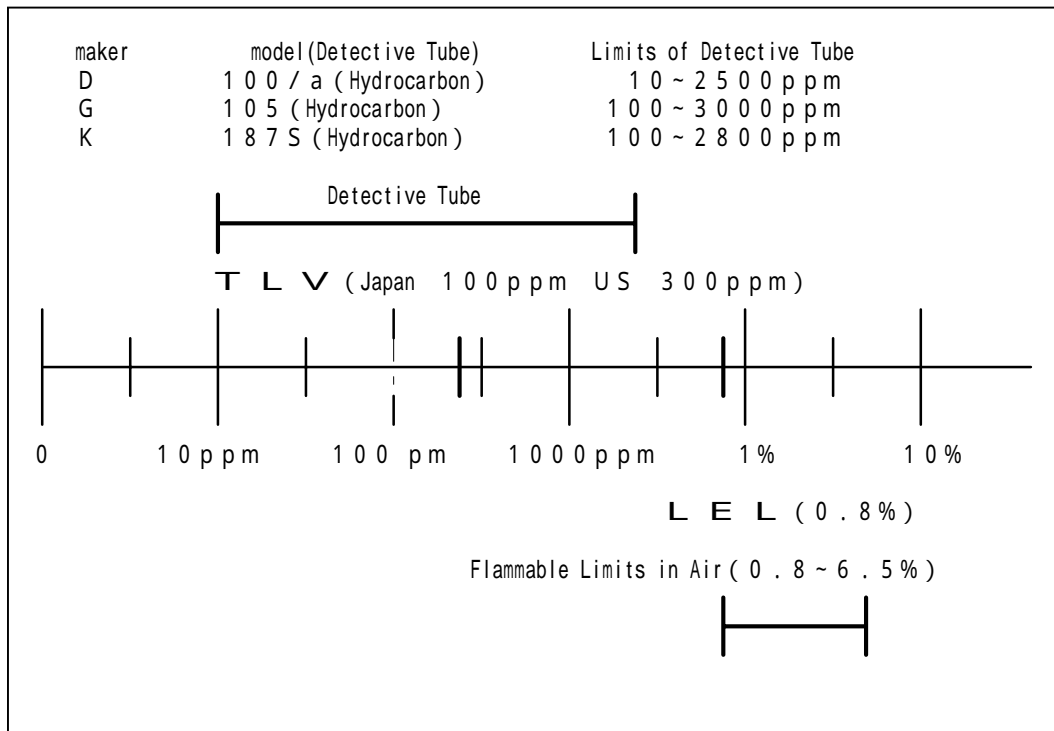
Material Name	Octene				
Common	Octylene, Isooctene				
UN Number	1993	CAS Number	111-66-0	IMDG CODE	Class 3 . 2 / P 3 2 3 0
IMO Pollution Category	B				
Formula	C ₆ H ₁₆	Molecular Weight	112	Flammable limits in Air (%)	0.8 ~ 6.5
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.71	Vapor Specific Gravity	3.9	Boiling Point at 1 ATM ()	101.44
Freezing Point ()	-106.4	Flash Point ()	-5	Ignition Point ()	391
Steam Pressure					
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion					
Hazard and Noxiousness	<p>Classification : Flammable liquids, Noxiousness : The central nerves may be affected. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air. Inflammability is high.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

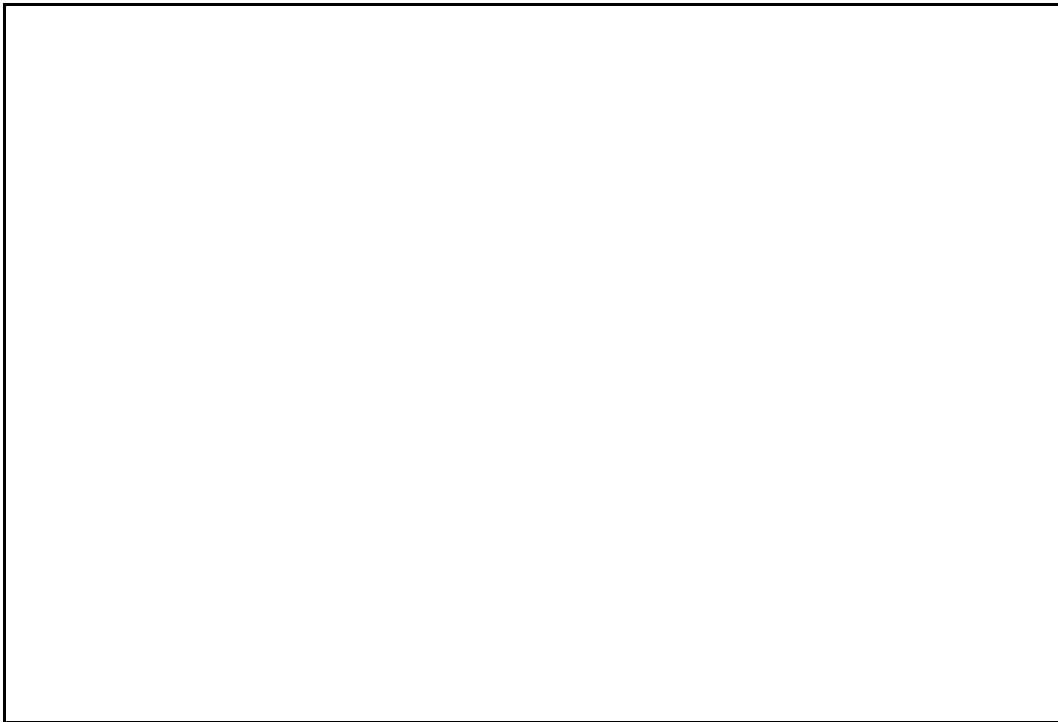


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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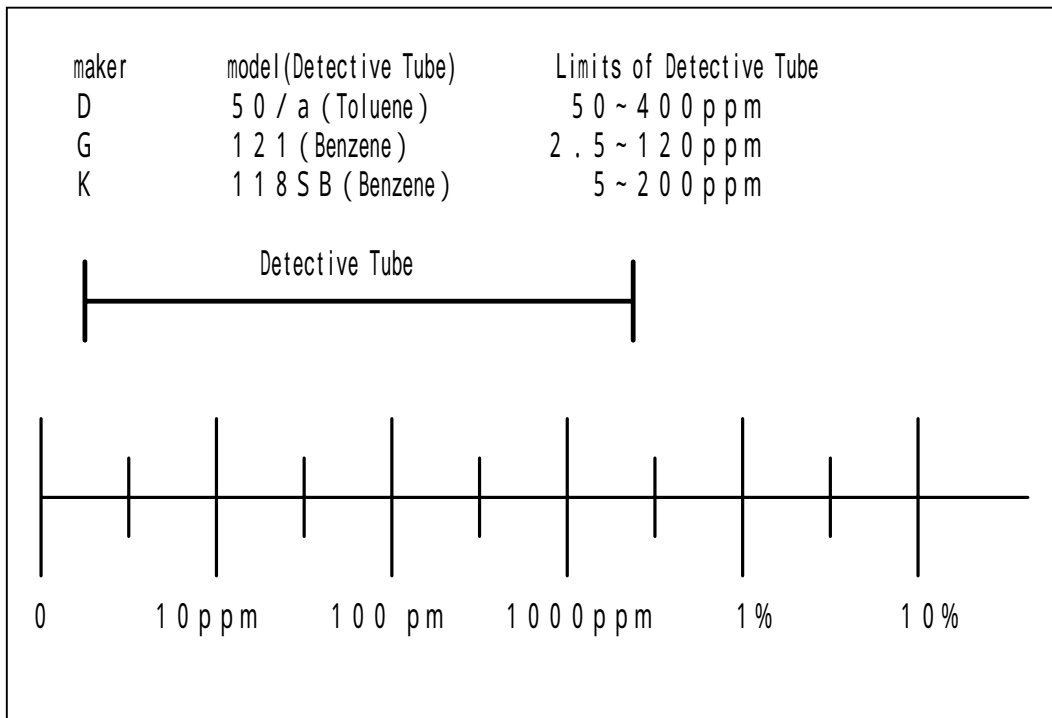
Material Name	Alkyl benzene				
Common synonyms	Mesitylene, Dodecylbenzene				
UN Number	2325	CAS Number	108-67-8	IMDG CODE	Class3.3/P3389-1
IMO Pollution Category	A				
Formula	C9H12	Molecular Weight	120.19	Flammable limits in Air (%)	0.9 ~ 6.1
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.86	Vapor Specific Gravity	4.2	Boiling Point at 1 ATM ()	164.72
Freezing Point ()	-44.7	Flash Point ()	46	Ignition Point ()	531
Steam Pressure					
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH : 25ppmTWA				
Hazard and Noxiousness	<p>Classification : Flammable liquids Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Danger : It mixes with air, vapor becomes explosive gas, and vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance: Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves: Solvent-proof nature protection glove, Rubber gloves. Eye: Goggles, Face shields, Eye protectors. Body: Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

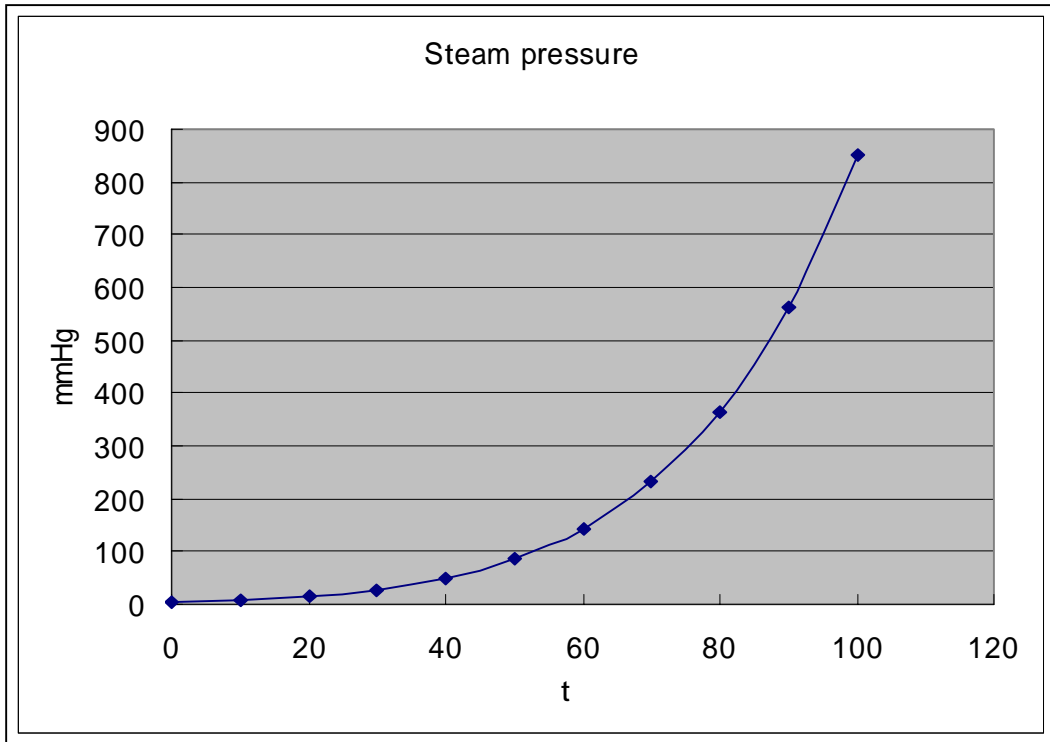


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

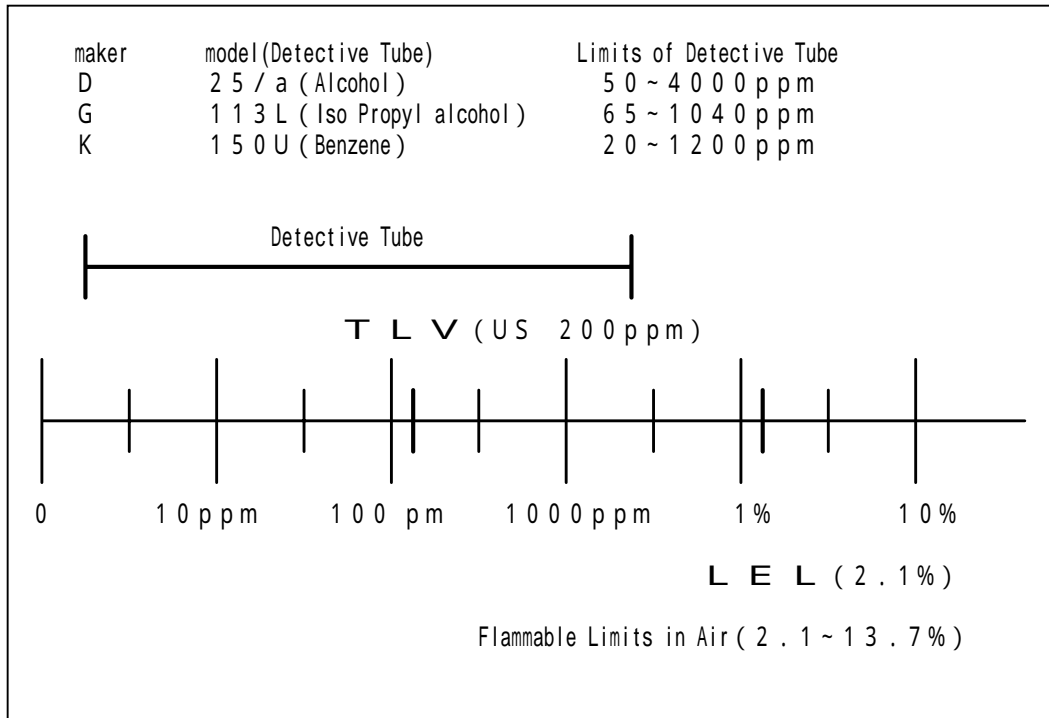
Material Name	Propanol				
Common synonyms	Propyl alcohol				
UN Number	1274	CAS Number	71-23-8	IMDG CODE	Class3.2/P3272-1
IMO Pollution Category	C				
Formula	C3H7OH	Molecular Weight	60.1	Flammable limits in Air (%)	2.1 ~ 13.7
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.8	Vapor Specific Gravity	2.1	Boiling Point at 1 ATM ()	97.2
Freezing Point ()	-126.5	Flash Point ()	23	Ignition Point ()	412
Steam Pressure	20mmHg(25)				
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 200ppmTWA 250ppmSTEL skin LD50 5400mg/kg(oral rat)				
Hazard and Noxiousness	<p>Classification: Flammable liquids, Acute toxicity substance</p> <p>Noxiousness: Irritating to skin, eyes and throat. Poisoning condition may appear behind time. There is danger of skin absorption.</p> <p>Environmental influence: There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger: It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. Inflammability is high. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

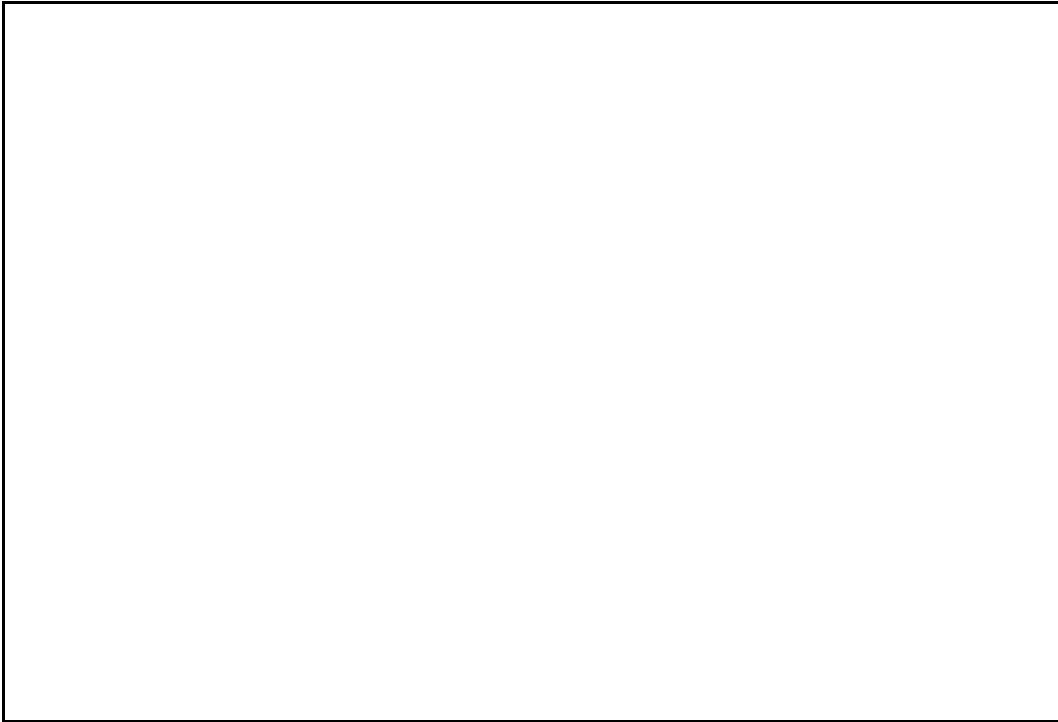


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

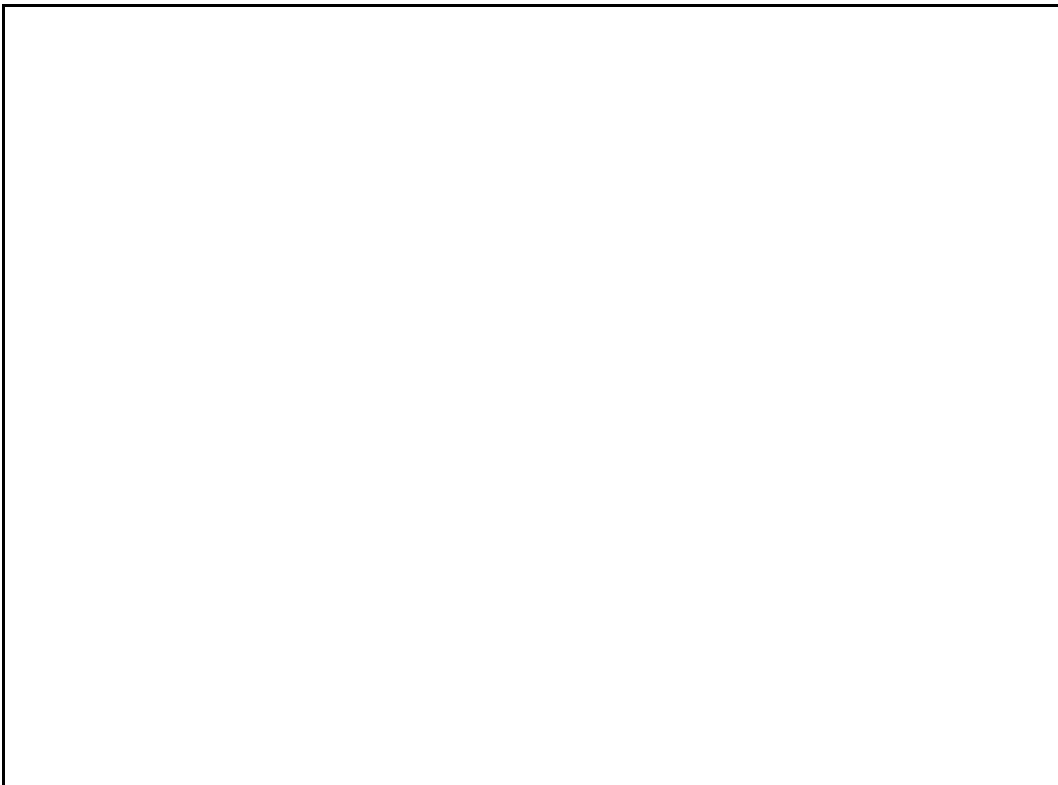
Material Name	Sodium hydroxide				
Common synonyms	Caustic soda, Sodium hydrate, Soda lye, White caustic				
UN Number	1824	CAS Number	1310-73-2	IMDG CODE	Class8/P8226
IMO Pollution Category	D				
Formula	NaOH	Molecular Weight	40	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	2.1	Vapor Specific Gravity		Boiling Point at 1 ATM ()	1390
Freezing Point ()	318.4	Flash Point ()		Ignition Point ()	
Steam Pressure	1 mmHg (7 6 7)				
Corrosion	human : yes metal : yes		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 2 mg / m ³ ACGIH : 2 mg / m ³ TLV-C LD50 40 mg / kg (the abdominal cavity mouse)				
Hazard and Noxiousness	<p>Classification : Acute toxicity substance, Anesthetic substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is corrosive strong to a living body. Poisoning condition may appear behind time.</p> <p>Environmental influence : It is detrimental to an aquatic life living thing.</p> <p>Danger : It is nonflammability. If moisture and water are contacted, sufficient heat for ignition of an inflammable substance will be generated. Strong alkalinity is shown. Zinc and aluminum are corroded and hydrogen gas is generated.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method In case of a surrounding fire, use of all fire-extinguishing agents is possible. Cool containers with flooding quantities of water. Move containers from fire area if you can do it without risk. It is cautious of generating of the hydrogen gas by contact with zinc, aluminum, etc. in especially a closing place.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p> <p>Detector pH examination paper. It is based on a flame reaction.</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

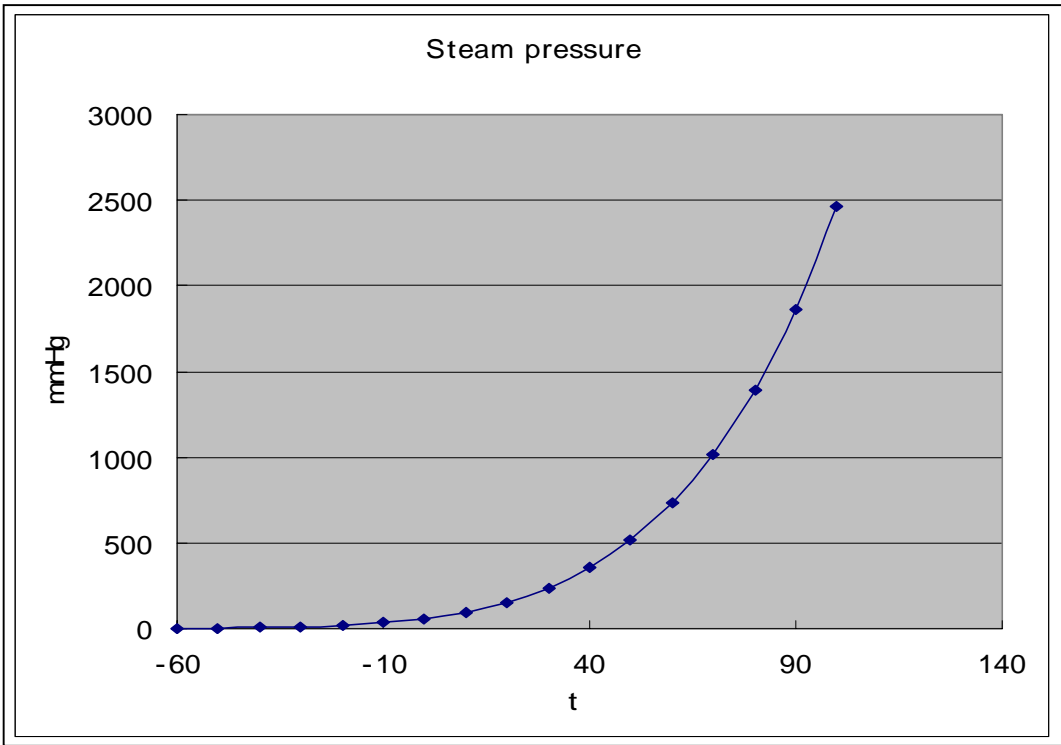


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

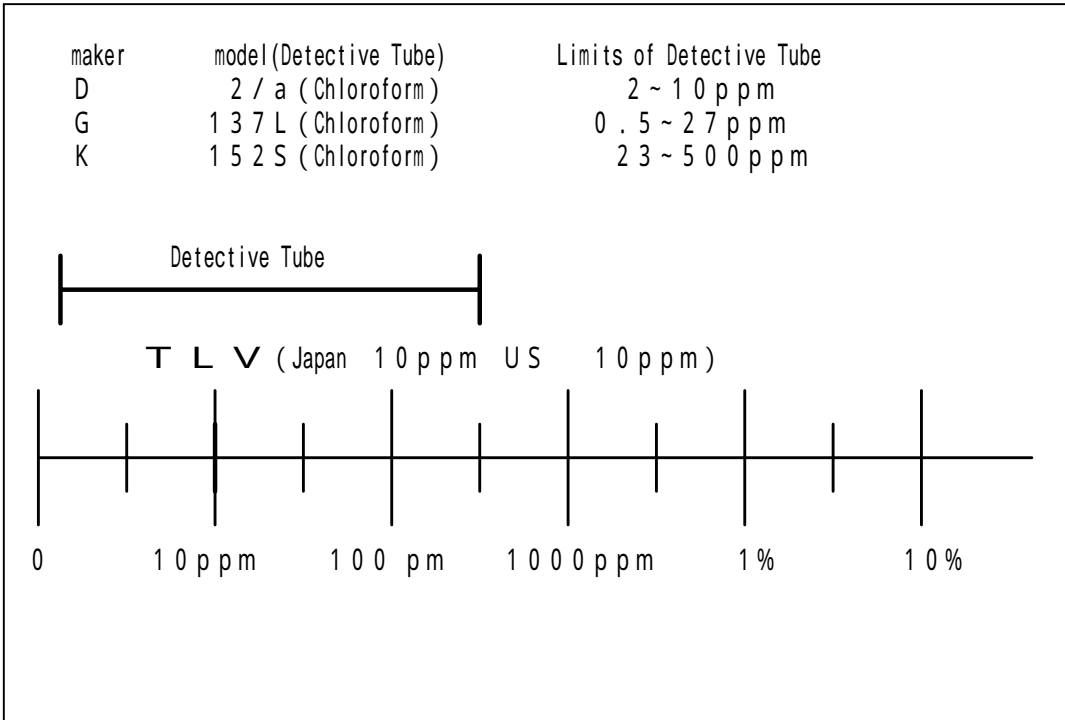
Material Name	Chloroform				
Common synonyms	Trichloromethane, Formyl trichloride, Methenyl trichloride				
UN Number	1888	CAS Number	67-66-3	IMDG CODE	Class6.1/P6103
IMO Pollution Category	B				
Formula	CHCl ₃	Molecular Weight	119.4	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	1.5	Vapor Specific Gravity	4.1	Boiling Point at 1 ATM ()	61.2
Freezing Point ()	-63.5	Flash Point ()		Ignition Point ()	
Steam Pressure	200mmHg(25.9)				
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan: 10 ppm LD50 903mg / kg(oral rat) ACGIH: 10 ppm TWA A3				
Hazard and Noxiousness	<p>Classification: Acute toxicity substance Noxiousness: Irritating to skin, eyes and throat. Poisoning condition may appear behind time. There is a strong anesthesia action. There is danger of skin absorption. If it is not unusual exposure, there will be no danger of carcinogenic. Environmental influence: Speed is slow although there is biodegradation nature. It is bad to an aquatic life living thing. It is detrimental to an aquatic life living thing. Danger: It is nonflammability. Vapor is heavier than air. Heating and combustion decompose and poisonous phosgen is produced. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method In case of a surrounding fire, use of all fire-extinguishing agents is possible. Cool containers with flooding quantities of water. Move containers from fire area if you can do it without risk.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p> <p>Detector Detector Tube</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

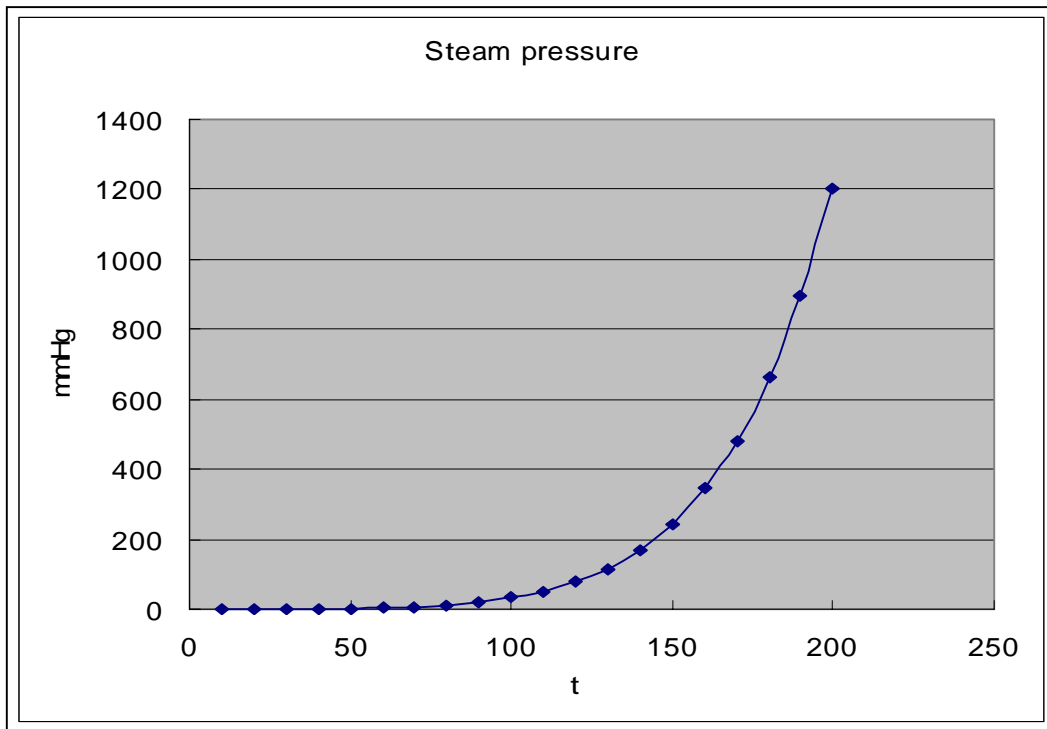


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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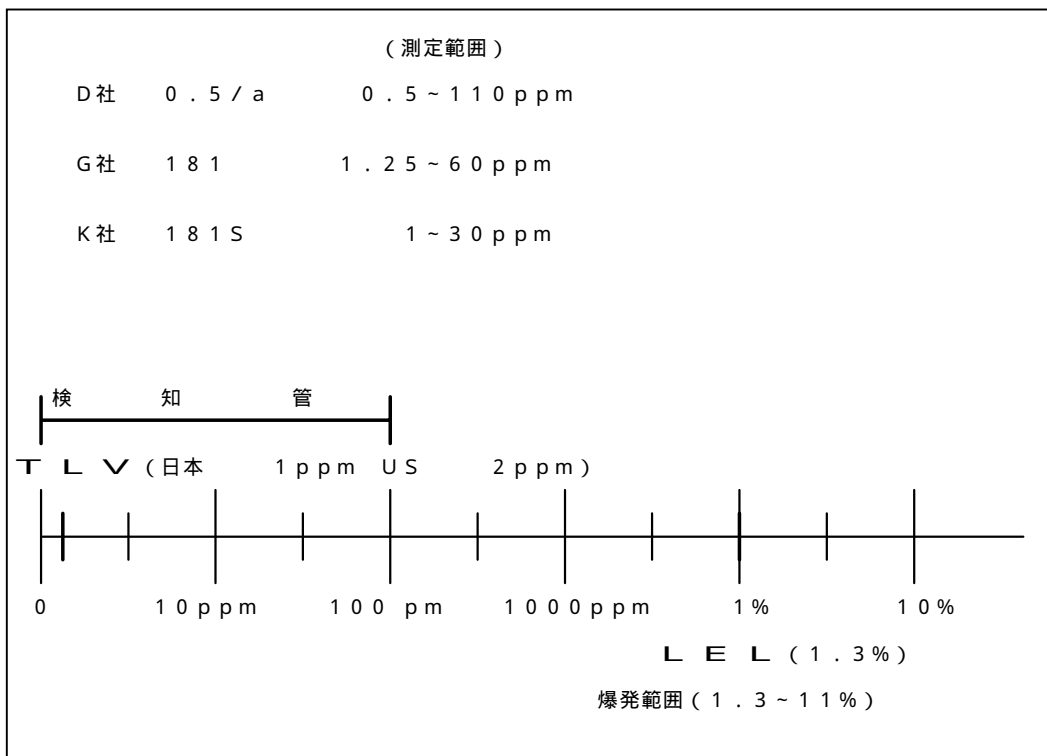
Material Name	Aniline				
Common synonyms	Aminobenzene, Phenylamine, Aniline oil, Benzenamine				
UN Number	1547	CAS Number	62-53-3	IMDG CODE	Class6.1/P6068
IMO Pollution Category	C				
Formula	C6H5NH2	Molecular Weight	93.13	Flammable limits in Air (%)	1.3 ~ 11.0
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.02	Vapor Specific Gravity	3.2	Boiling Point()	184.5
Freezing Point ()	-5.98	Flash Point ()	70	Ignition Point ()	615
Steam Pressure	0.3mmHg(20)				
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan: 1 ppm ACGIH: 2 ppm TWA skin A 3 LD50 250 mg / kg (oral rat)				
Hazard and Noxiousness	<p>Classification: Acute toxicity substance</p> <p>Noxiousness: Irritating to skin, eyes and throat. Poisoning condition may appear behind time. There is danger of skin absorption. If it is not unusual exposure, there will be no danger of carcinogenic.</p> <p>Environmental influence: There is biodegradation nature. It is detrimental to an aquatic life living thing. It is very detrimental to an aquatic life living thing.</p> <p>Danger: It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. Weak alkalinity is shown.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

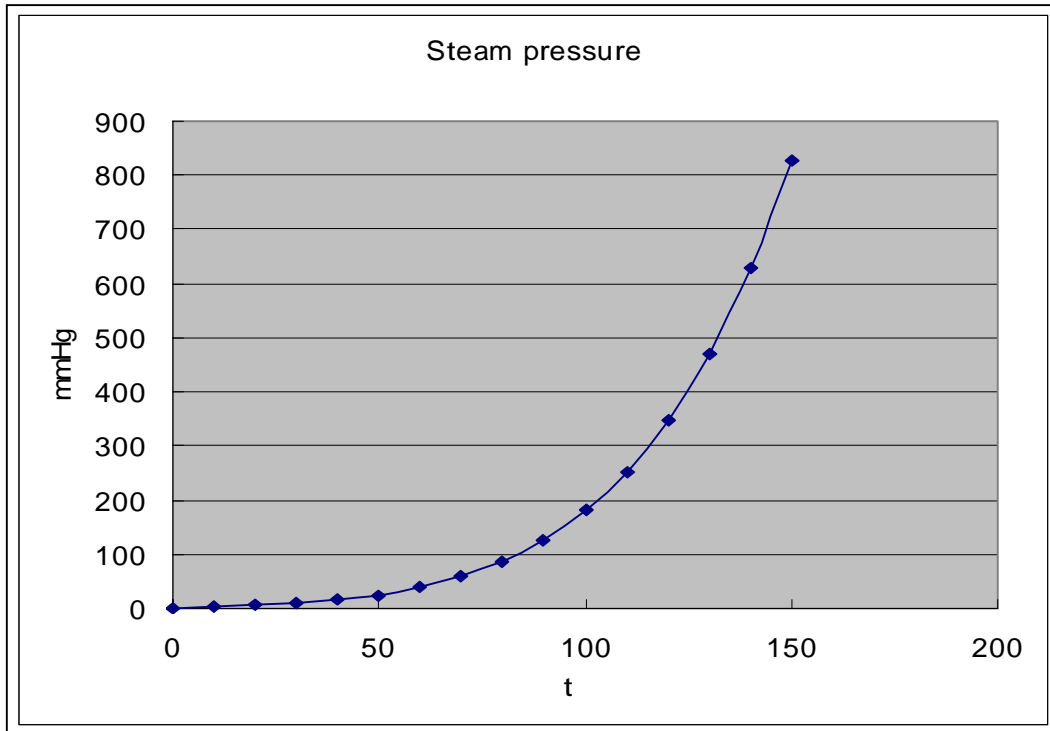


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Nonene				
Common synonyms	Tripropylene, Propylene trimer, Nonylene				
UN Number	3295	CAS Number	124-11-8	IMDG CODE	Class3.3/P3352
IMO Pollution Category	B				
Formula	CH ₃ (CH) ₆ CH=	Molecular Weight	126.23	Flammable limits in Air (%)	0.7 ~ 3.9
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	0.74	Vapor Specific Gravity	4.4	Boiling Point()	146.9
Freezing Point ()	-81	Flash Point ()	25.6	Ignition Point ()	
Steam Pressure	5.34mmHg(20)				
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion					
Hazard and Noxiousness	<p>Classification: Flammable liquids</p> <p>Noxiousness: Irritating to skin, eyes and throat. The central nerves may be affected.</p> <p>Environmental influence: There is biodegradation nature. It is detrimental to an aquatic life living thing.</p> <p>Danger: It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



Limits of Detective Tube

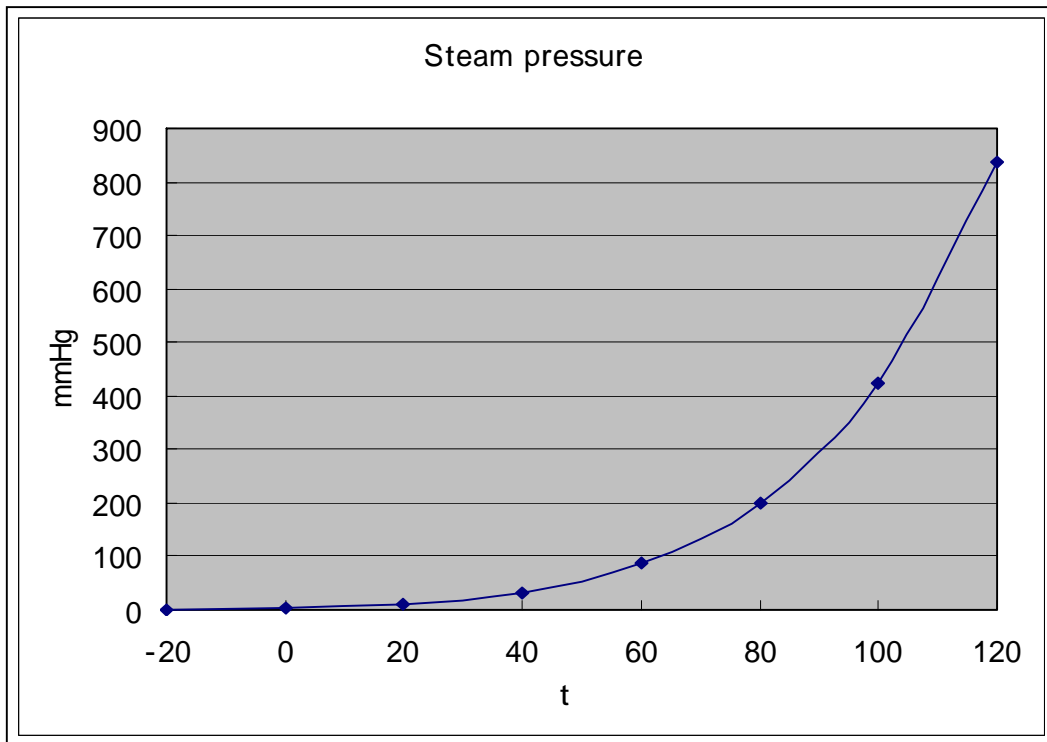


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

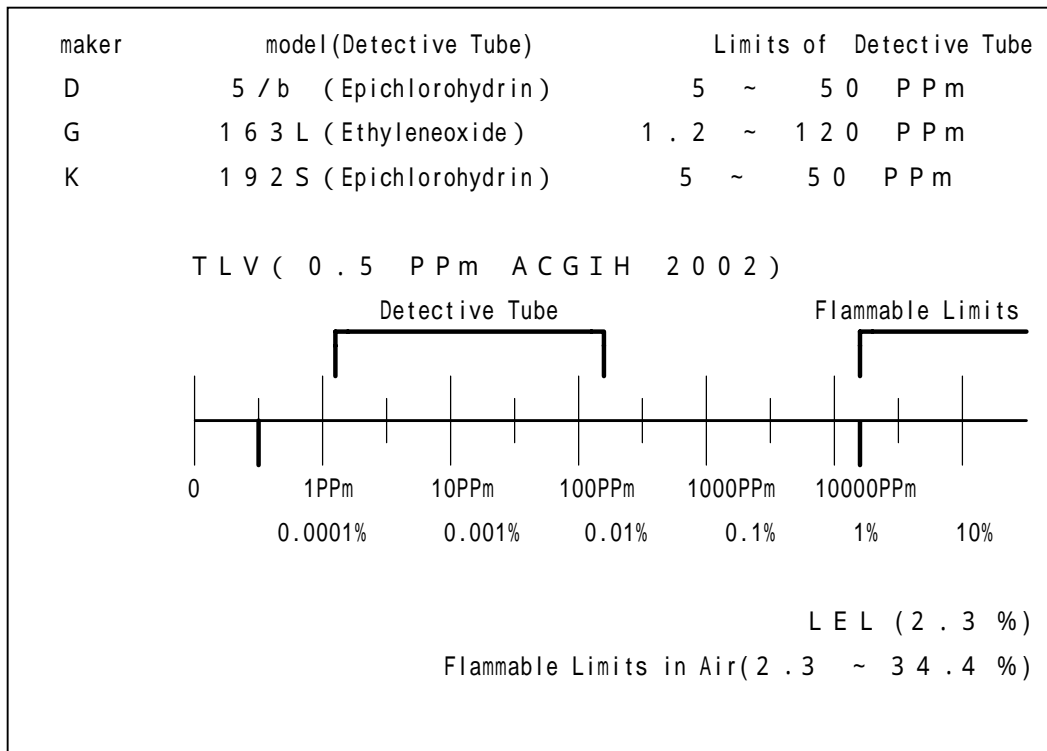
Material Name	Epichlorohydrin				
Common synonyms	1-Chloro-2,3-epoxypropane, 3-Chloropropylene oxide epi				
UN Number	2023	CAS Number	106-89-8	IMDG CODE	Class6.1/P6143
IMO Pollution Category	A				
Formula	OCH ₂ CHCH ₂ Cl	Molecular Weight	92.5	Flammable limits in Air (%)	2.3 ~ 34.4
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	1.1801	Vapor Specific Gravity	3.2	Boiling Point()	115
Freezing Point ()	-48	Flash Point()	32	Ignition Point()	411
Steam Pressure	13mmHg(20)				
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH : 0.5ppmTWA A3 skin L D50 90mg/kg(oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable substance, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action. Poisoning condition may appear behind time. Carcinogenic is checked.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. When it heats with strong acid and a base, polymerization may be carried out violently. Combustion generates poisonous gas, such as hydrogen chloride and phosgen.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

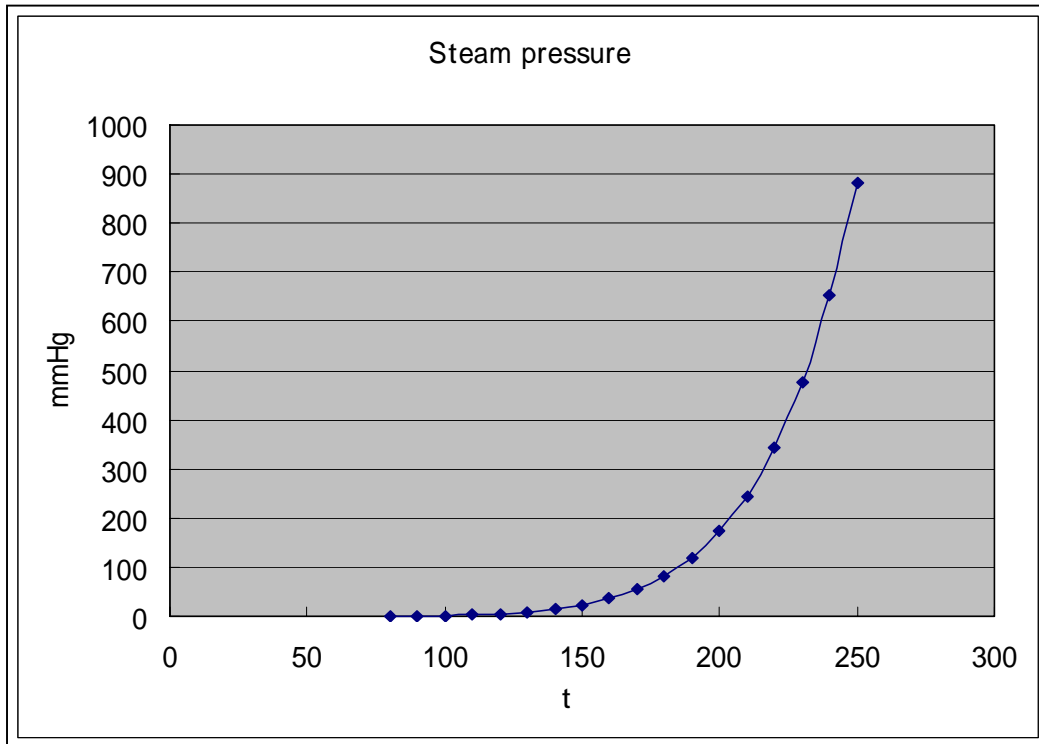


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

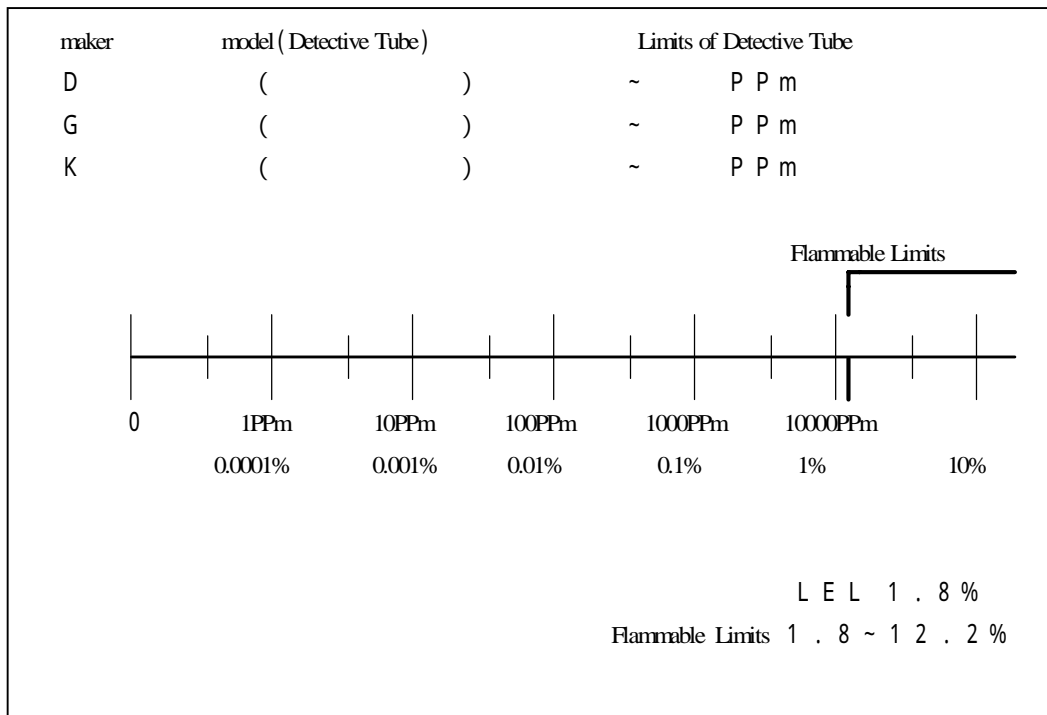
Material Name	Diethylene glycol				
Common synonyms	Bis ether, Glycol ethyl ether, Diglycol				
UN Number		CAS Number	111-46-6	IMDG CODE	
IMO Pollution Category	D				
Formula	C4H10O3	Molecular Weight	106.14	Flammable limits in Air (%)	1.6 ~ 10.8
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.1122	Vapor Specific Gravity	3.7	Boiling Point()	245
Freezing Point ()	-11.5	Flash Point ()	124	Ignition Point ()	229
Steam Pressure					
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion	LD50 12565mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Since volatility is low, detrimental concentration is not reached in normal temperature. Stimulative of skin, eyes and throat is weak. There is a central-nerves control action.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

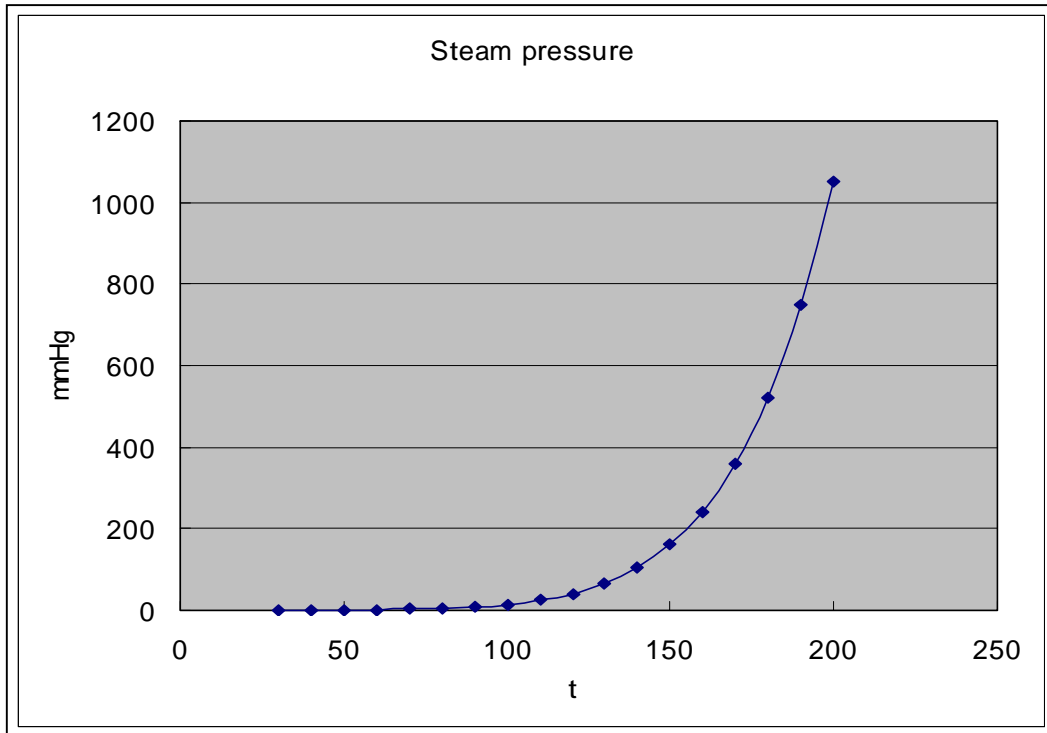


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Butylene glycol				
Common synonyms	Butanediol, Dihydroxybutane				
UN Number		CAS Number	107-88-0	IMDG CODE	
IMO Pollution Category	D				
Formula	C4H10O2	Molecular Weight	90.12	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.0024	Vapor Specific Gravity	3.2	Boiling Point()	190.5
Freezing Point ()		Flash Point ()	90	Ignition Point ()	394
Steam Pressure					
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	L D50 3730mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Since volatility is low, detrimental concentration is not reached in normal temperature. Stimulative of skin, eyes and throat is weak. There is a central-nerves control action.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

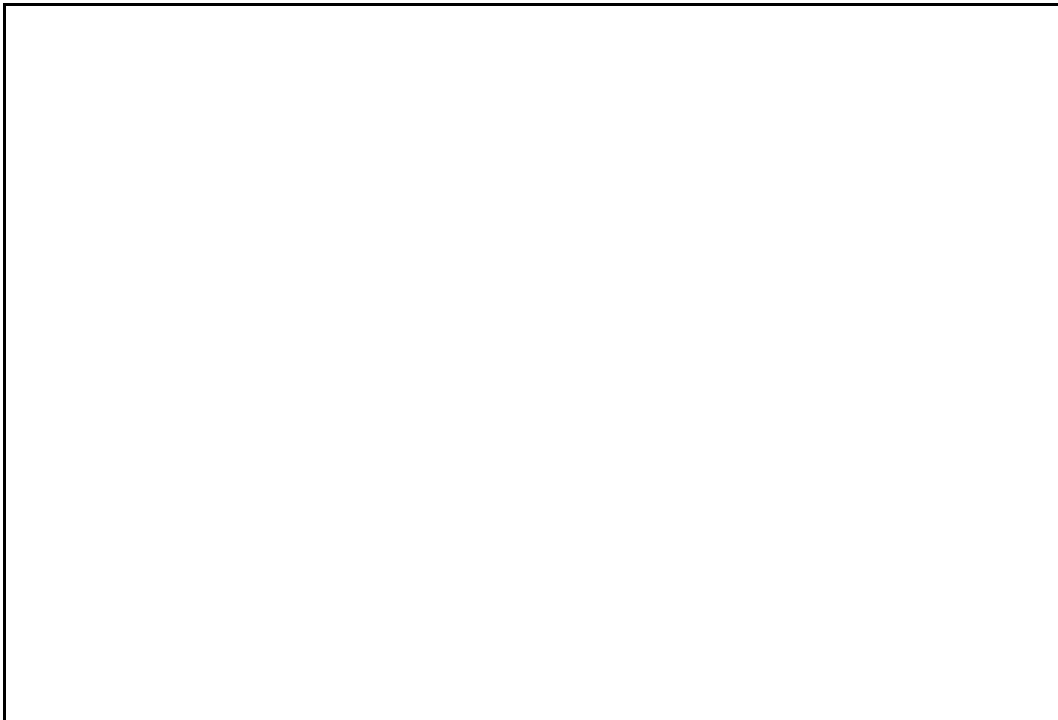


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

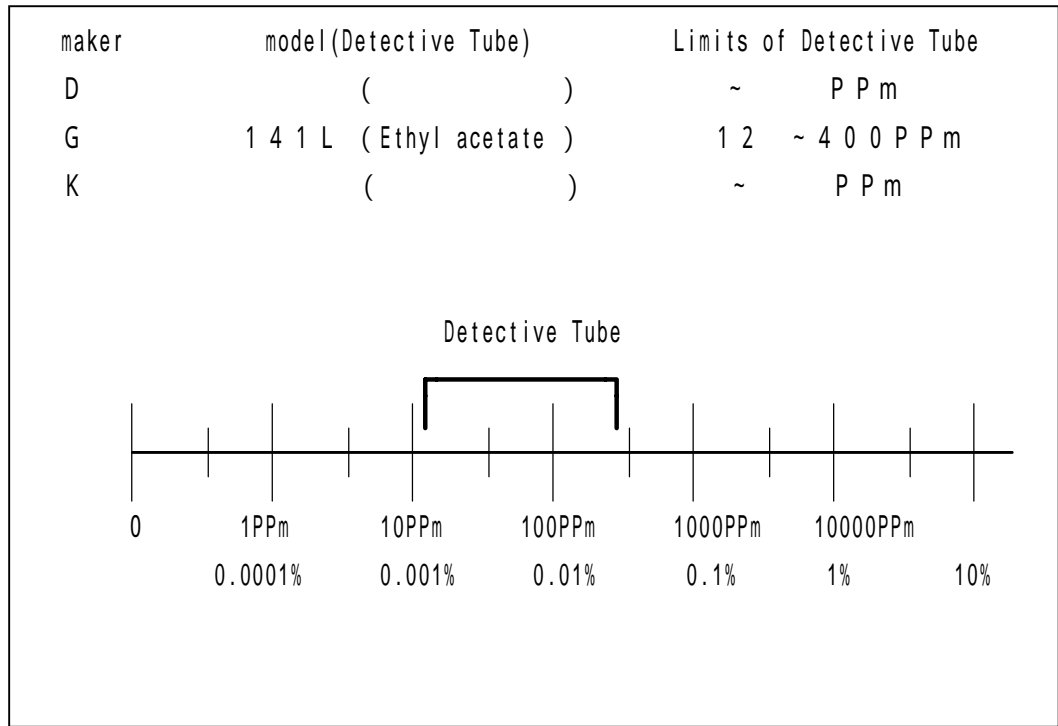
Material Name	Diisopropylbenzene				
Common synonyms	Bis benzene, DIPB				
UN Number	3082	CAS Number		IMDG CODE	Class9/P9028
IMO Pollution Category	A				
Formula	C12H18	Molecular Weight		Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.8701	Vapor Specific Gravity	5.6	Boiling Point()	204
Freezing Point ()	-57	Flash Point ()	77	Ignition Point ()	449
Steam Pressure					
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	L D50 5000mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Irritating to skin, eyes and throat.</p> <p>Environmental influence : There is little data about biodegradation nature to carry out. It is detrimental to an aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

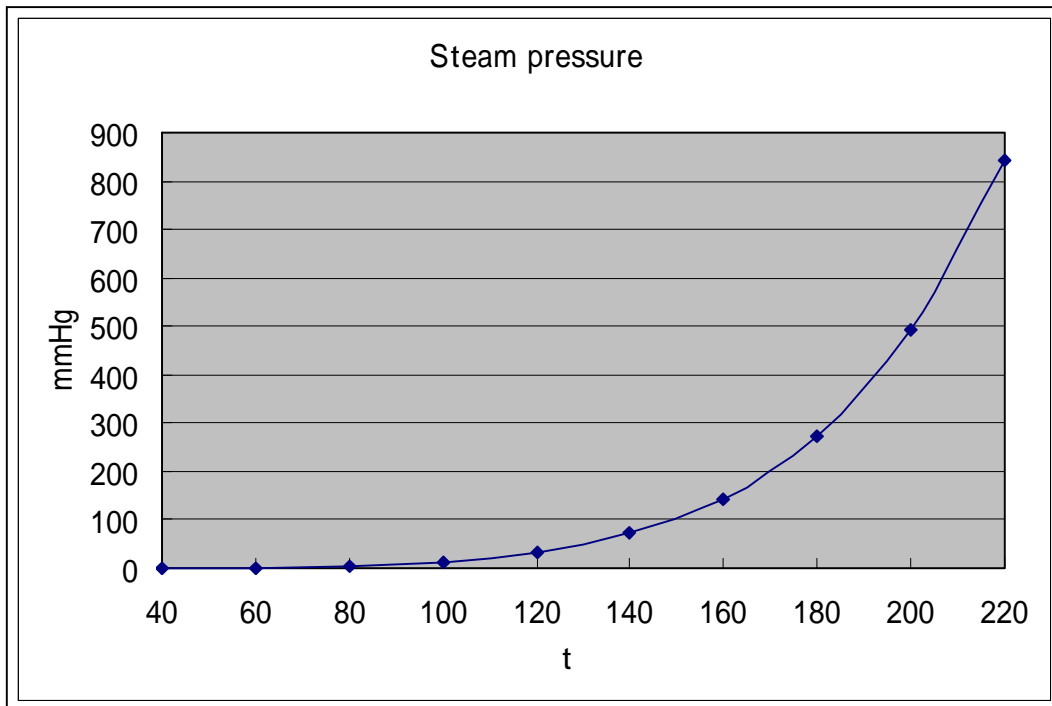


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	2-Ethyl hexyl acrylate				
Common synonyms					
UN Number		CAS Number	103-11-7	IMDG CODE	
IMO Pollution Category	B				
Formula	C11H20O2	Molecular Weight	184.27	Flammable limits in Air (%)	0.8 ~ 6.4
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.8869	Vapor Specific Gravity	6.4	Boiling Point()	216
Freezing Point ()	-90	Flash Point ()	82	Ignition Point ()	252
Steam Pressure					
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	L D50 5660mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Irritating to skin, eyes and throat.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

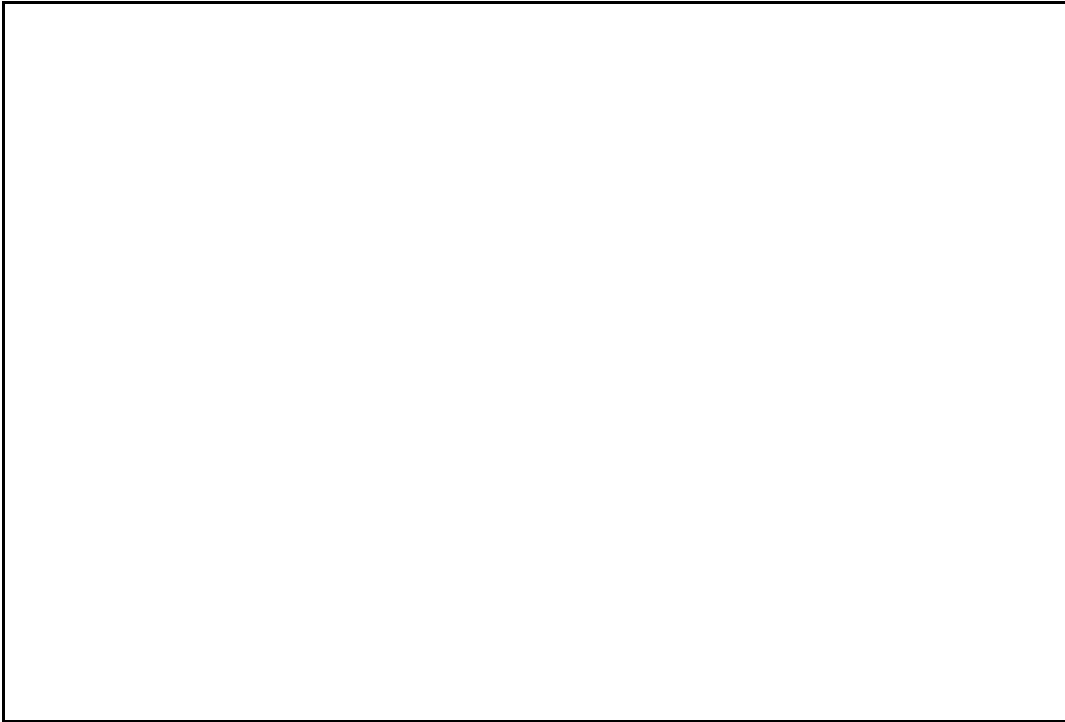


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

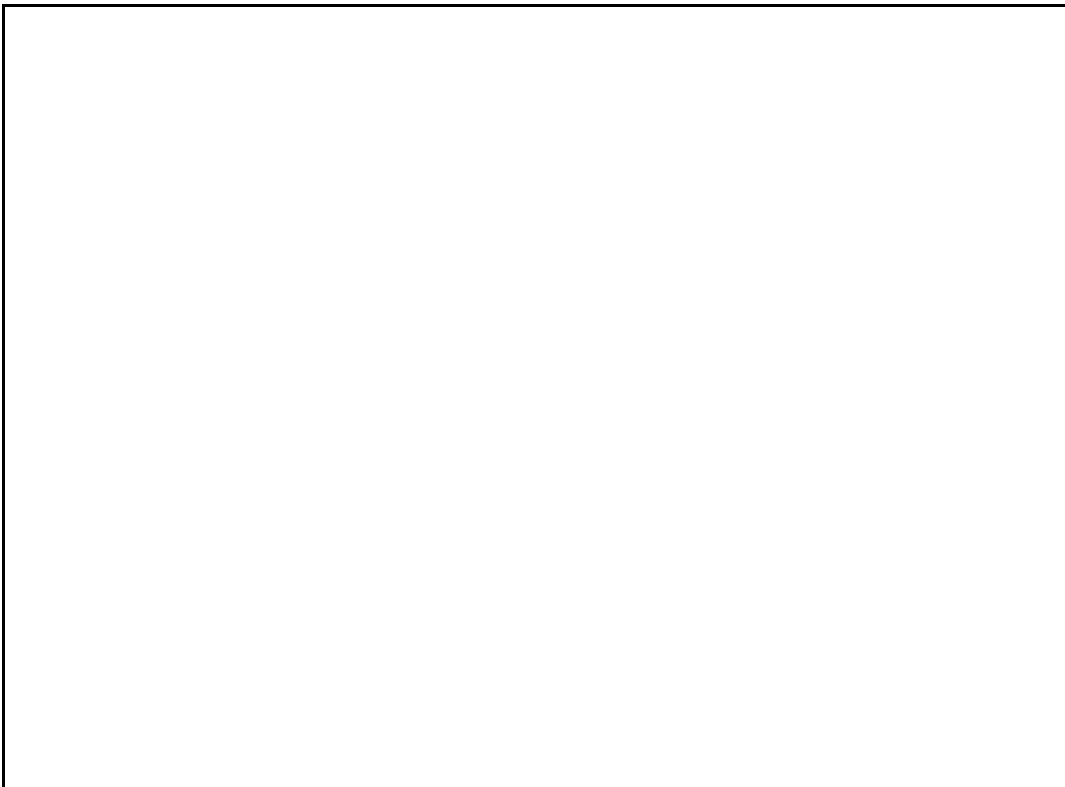
Material Name	1,3-Cyclopentadiene				
Common synonyms					
UN Number	2048	CAS Number		IMDG CODE	Class3.3/P3330
IMO Pollution Category	B				
Formula	C10H12	Molecular Weight		Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	1.012	Vapor Specific Gravity	4.6	Boiling Point()	170
Freezing Point ()	33.6	Flash Point ()	32.2	Ignition Point ()	503
Steam Pressure					
Corrosion	human : no metal : no		Oxidation	no	
TLV, Toxicity by Ingestion	L D50 353mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable substance Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time. Environmental influence : There is little data about biodegradation nature to carry out. The accumulation nature to an aquatic life living thing is low. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of detective Tube

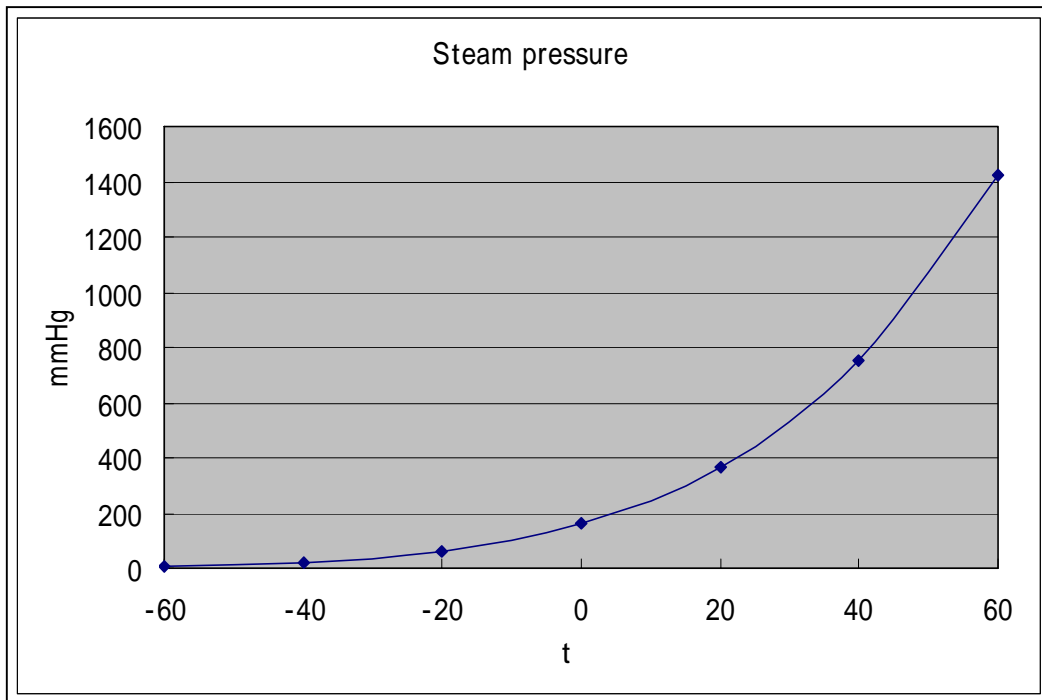


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

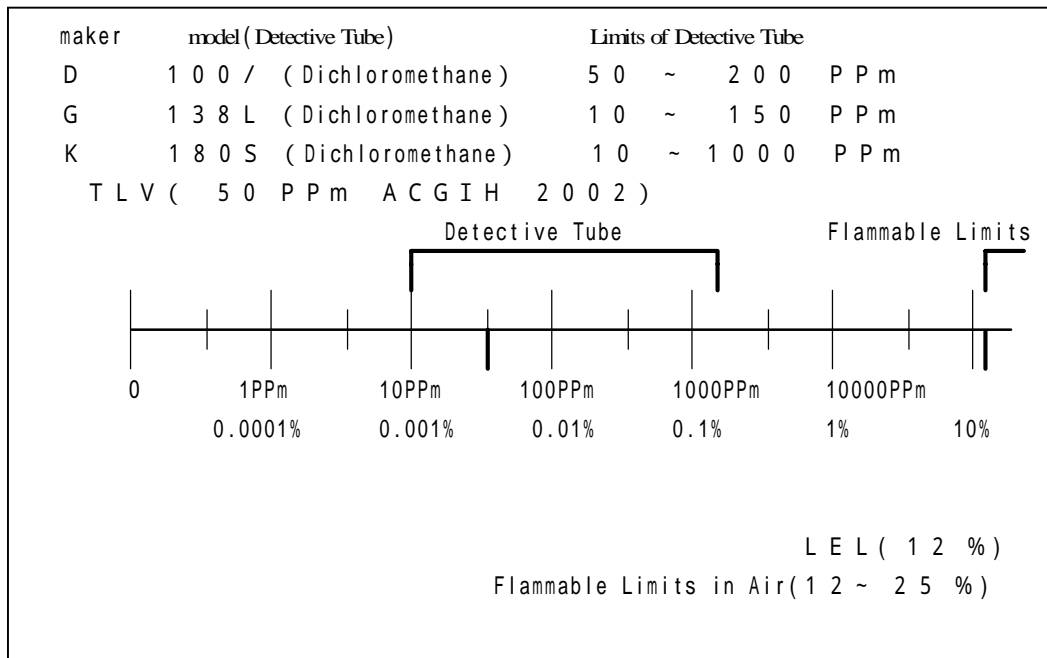
Material Name	Dichloromethane				
Common synonyms	Methylene dichloride, Methylene chloride				
UN Number	1593	CAS Number	75 - 9 - 2	IMDG CODE	Class6.1/P6127
IMO Pollution Category	D				
Formula	CH ₂ Cl ₂	Molecular Weight	84.94	Flammable limits in Air (%)	1.2 ~ 2.5
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.3266	Vapor Specific Gravity	2.9	Boiling Point()	40.21
Freezing Point ()	-96.8	Flash Point ()		Ignition Point ()	556
Steam Pressure					
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion	Japan: 50ppm ACGIH: 50ppmTWA A3 LD50 1600mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification: Acute toxicity substance, Other noxiousness substance</p> <p>Noxiousness: Irritating to skin, eyes and throat. Carcinogenic is checked.</p> <p>Environmental influence: Speed is slow although there is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger: It is nonflammability. Vapor is heavier than air. Heating and combustion decompose and poisonous phosgen is produced. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

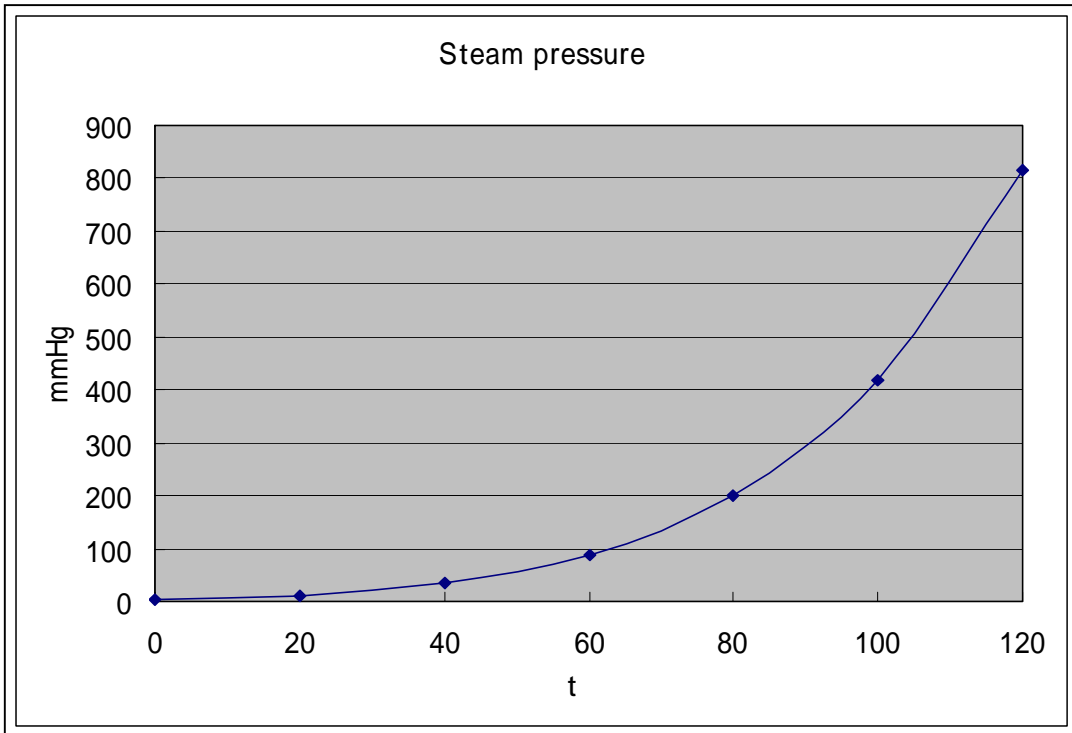


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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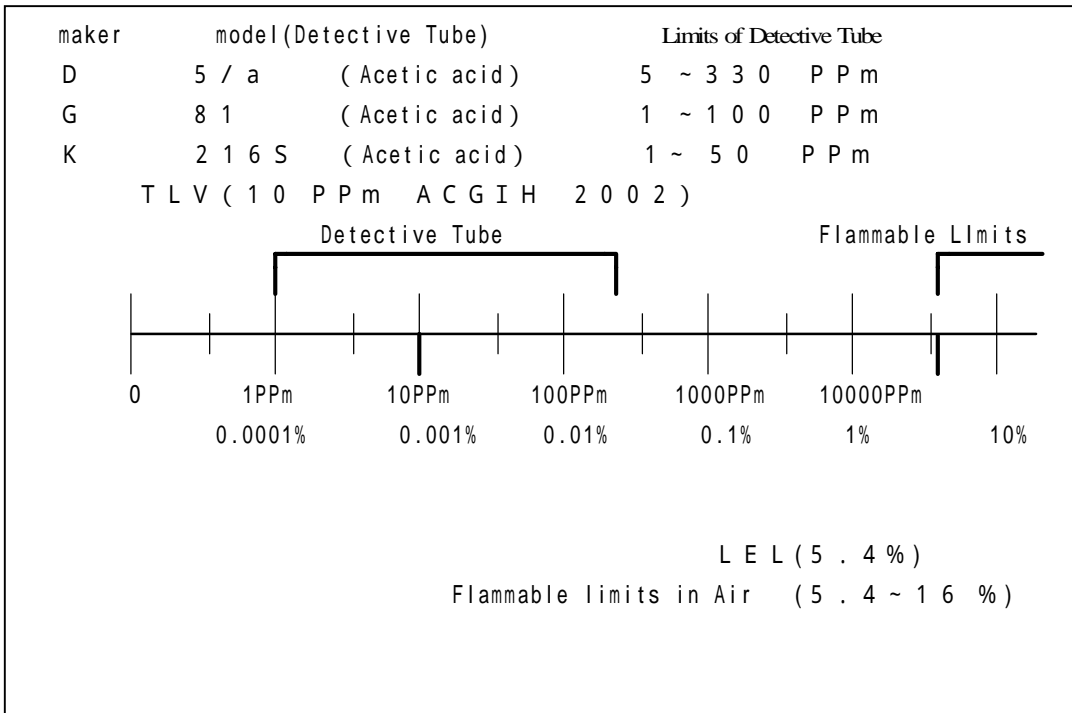
Material Name	Acetic acid				
Common synonyms	Glacial acetic acid, Ethanoic acid, Vinegar acid				
UN Number	2789 2790	CAS Number	64-19-7	IMDG CODE	Class8/P8100
IMO Pollution Category	D				
Formula	CH ₃ COOH	Molecular Weight	60.05	Flammable limits in Air (%)	5.4 ~ 16
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.0492	Vapor Specific Gravity	2.1	Boiling Point()	117.8
Freezing Point ()	16.6	Flash Point ()	39	Ignition Point ()	463
Steam Pressure					
Corrosion	human : yes metal : yes		Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 10ppm ACGIH : 10ppmTWA 15ppmSTEL L D50 3310mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Corrosion substance, Flammable substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. It is detrimental to an aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. It is weak acidity and much metal is corroded. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

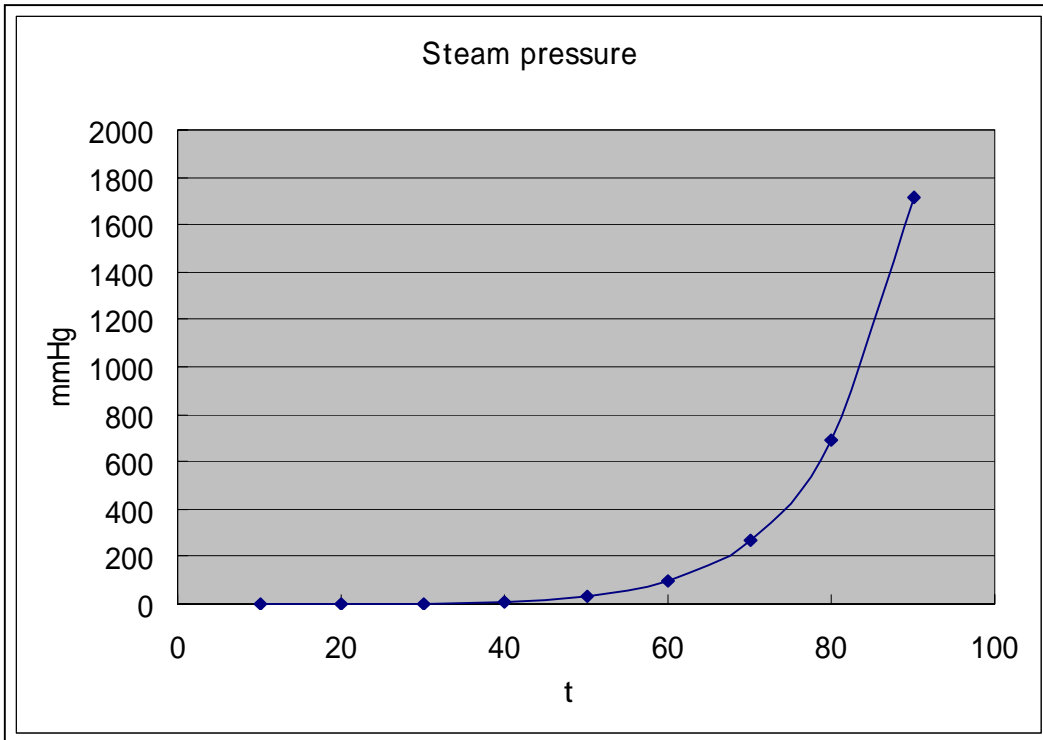


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

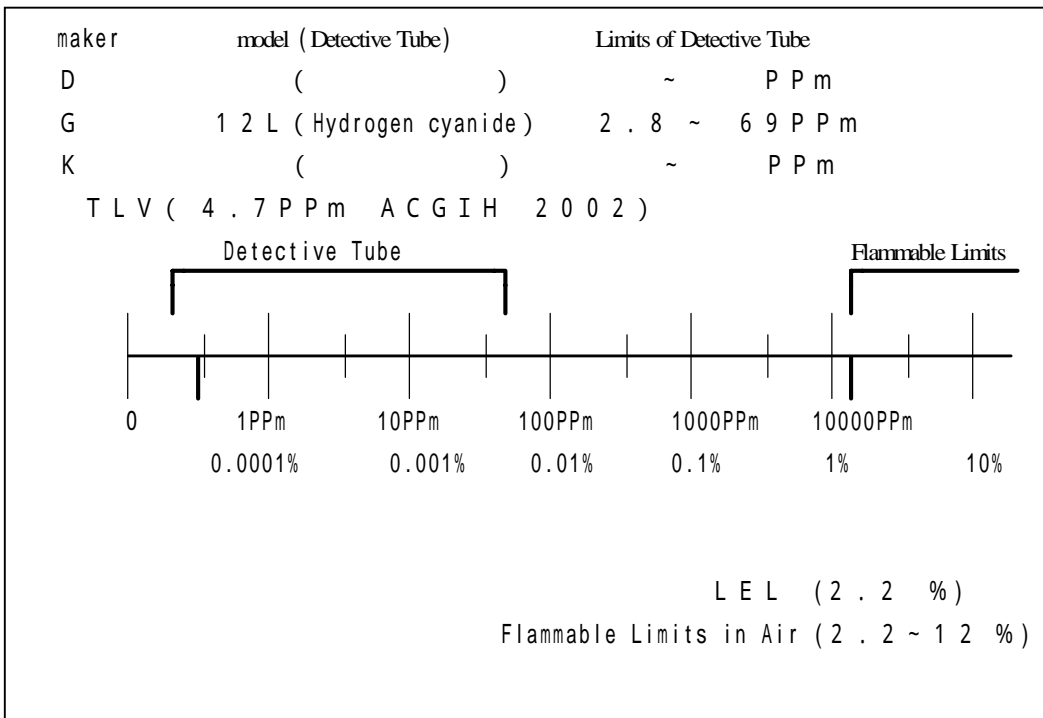
Material Name	Acetone cyanohydrin				
Common synonyms	Isopropyl cyanohydrin, 2-Hydroxy-2-methylpropanenitrile				
UN Number	1541	CAS Number	75-86-5	IMDG CODE	Class6.1/P6051
IMO Pollution Category	A				
Formula	C4H7ON	Molecular Weight	85.11	Flammable limits in Air (%)	2.2 ~ 12
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.9267	Vapor Specific Gravity	3	Boiling Point()	81
Freezing Point ()	-19	Flash Point ()	74	Ignition Point ()	688
Steam Pressure					
Corrosion	human: no metal: no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 4.7ppmC skin LD50 17mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification: Acute toxicity substance</p> <p>Noxiousness: Irritating to skin, eyes and throat. There is a central-nerves control action. heating or contact with water decomposes and toxic high hydrogen cyanide is produced. There is danger of skin absorption.</p> <p>Environmental influence: The accumulation nature to an aquatic life living thing is low. It is very detrimental to an aquatic life living thing.</p> <p>Danger: It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air..</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

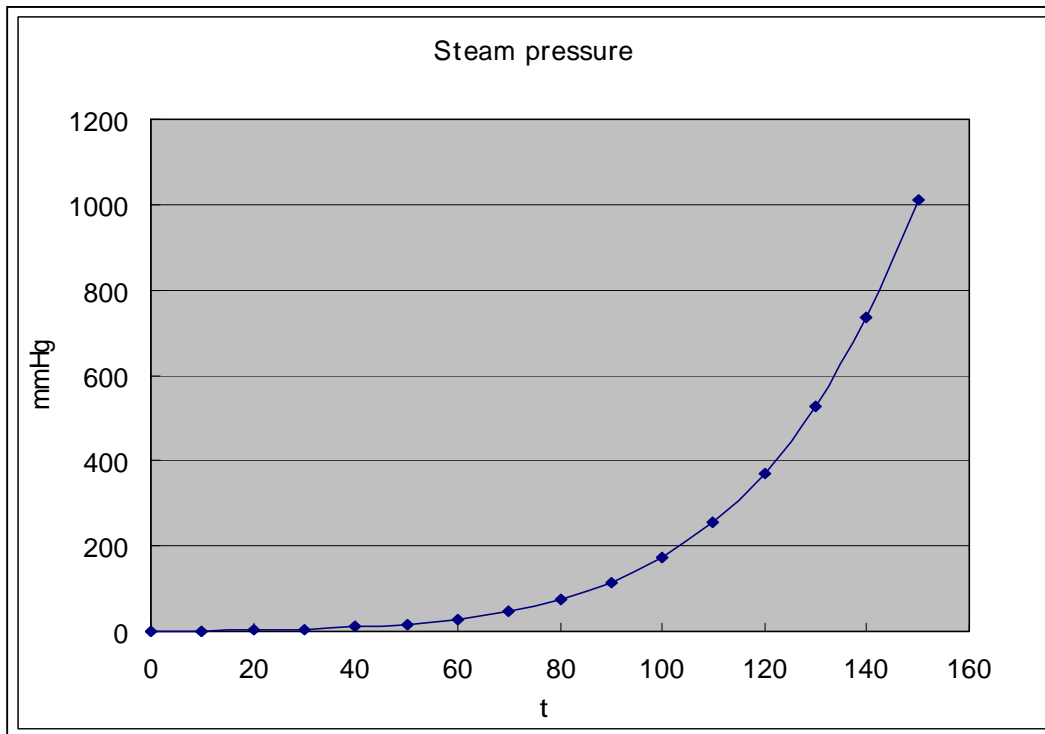


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

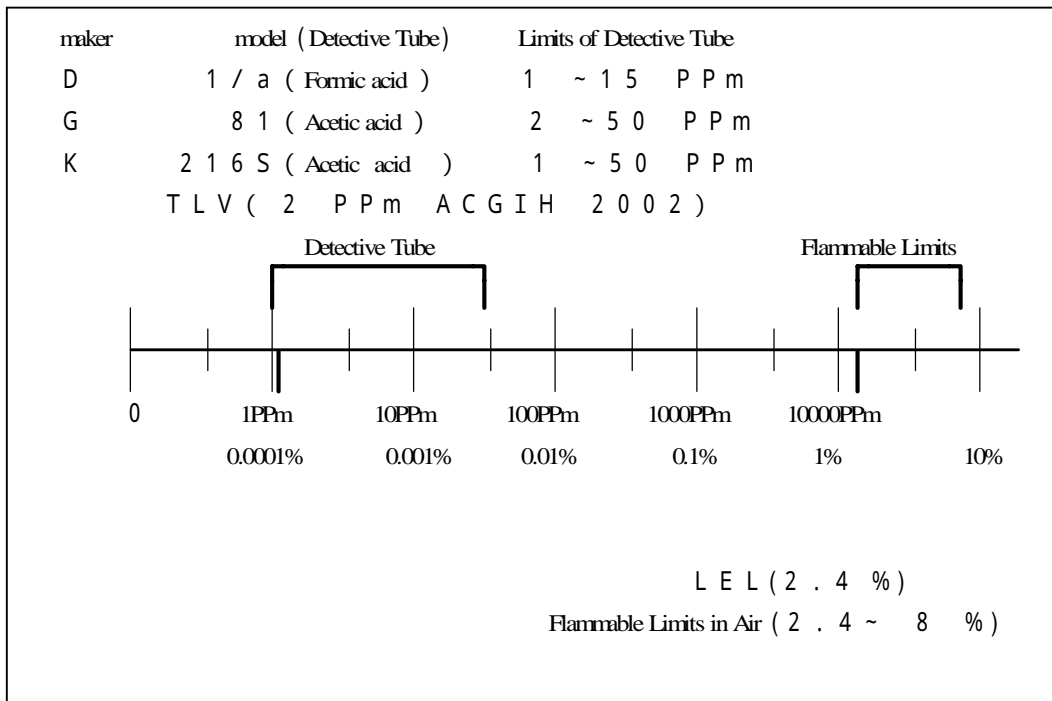
Material Name	Acrylic acid				
Common synonyms	Acroleic acid, Propenoic acid				
UN Number	2218	CAS Number	79-10-7	IMDG CODE	Class8/P8102
IMO Pollution Category	D				
Formula	CH ₂ =CHCOOH	Molecular Weight	72.1	Flammable limits in Air (%)	2 . 4 ~ 8
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	1.062	Vapor Specific Gravity	2.5	Boiling Point()	141.9
Freezing Point ()	14	Flash Point ()	50	Ignition Point ()	438
Steam Pressure	3.1mmHg (2 0)				
Corrosion	human :yes metal :yes		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH : 2ppmTWA A4 skin L D50 340mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Corrosion substance, Acute toxicity, Flammable substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time. There is danger of skin absorption.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and abobe the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. It is acidity and much metal is corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

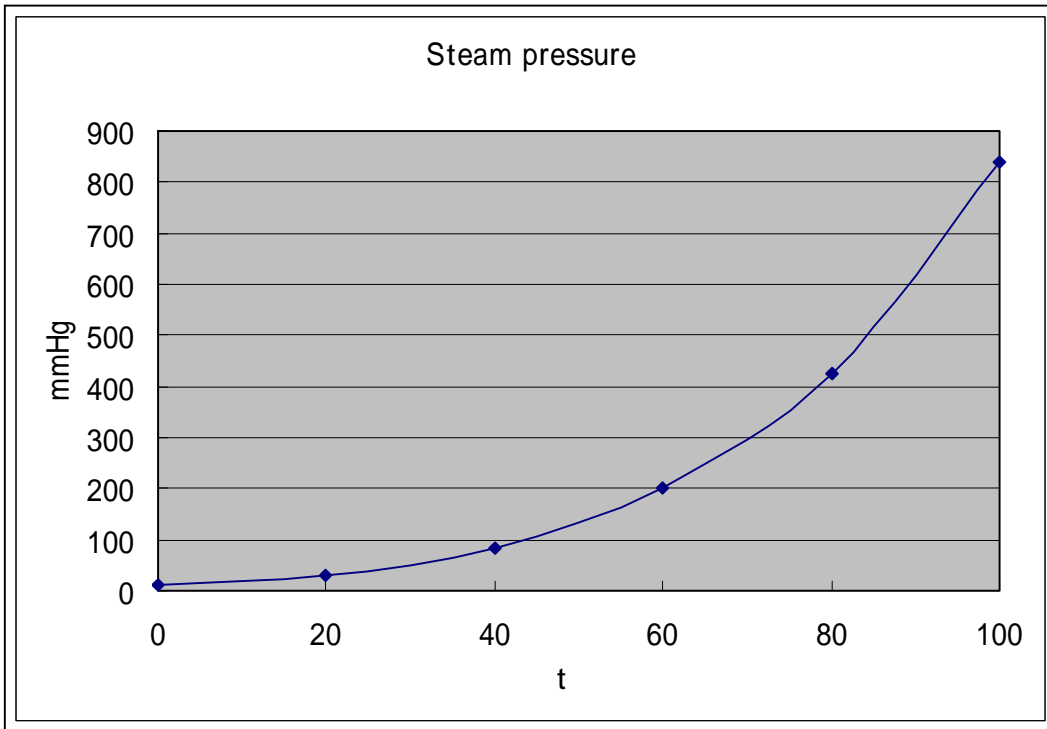


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

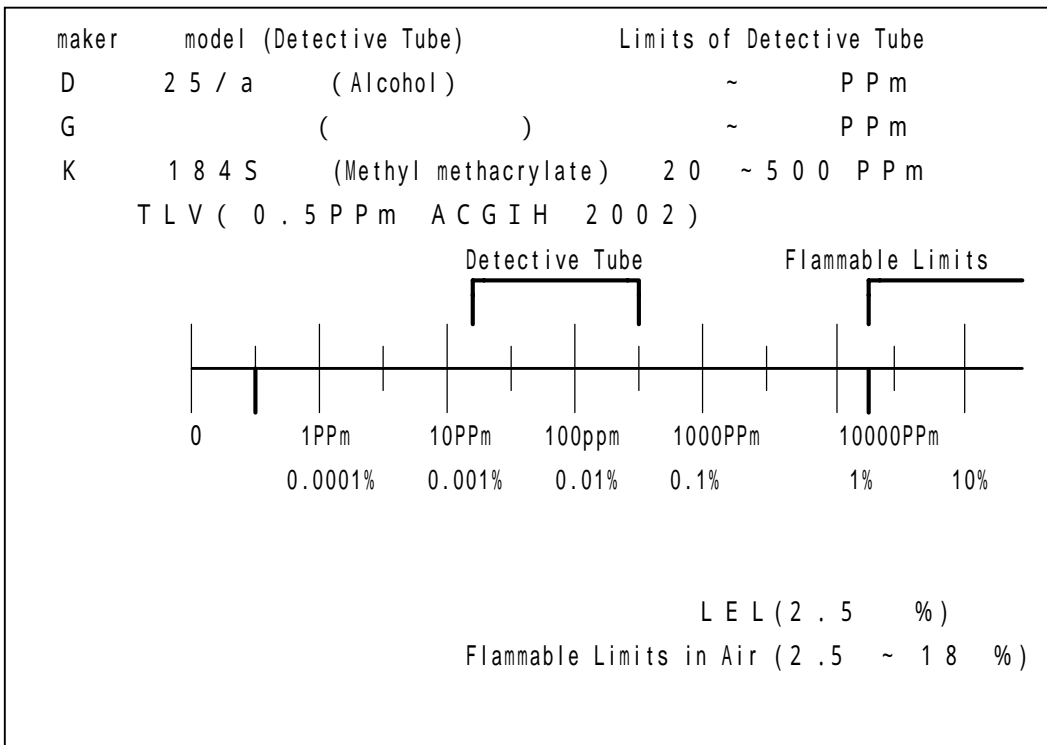
Material Name	Allyl alcohol				
Common synonyms	Propenyl alcohol, AA, Propenol				
UN Number	1098	CAS Number	107-18-6	IMDG CODE	Class6.1/P6058
IMO Pollution Category	B				
Formula	CH ₂ =CHCH ₂ OH	Molecular Weight	58.08	Flammable limits in Air (%)	2.5 ~ 18.0
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	0.854	Vapor Specific Gravity	2	Boiling Point()	96.9
Freezing Point ()	-129	Flash Point ()	21	Ignition Point ()	378
Steam Pressure	10mmHg(20)				
Corrosion	human:yes metal:no		Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH:0.5ppmTWA A4 skin LD50 64mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification: Acute toxicity substance, Flammable substance</p> <p>Noxiousness: There is lachrymal and irritating to skin, eyes and throat. Poisoning condition may appear behind time. There is danger of skin absorption.</p> <p>Environmental influence: There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Toxicity is strong to an aquatic life living thing.</p> <p>Danger: It is inflammability, it mixes with air, vapor becomes explosive gas, and vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

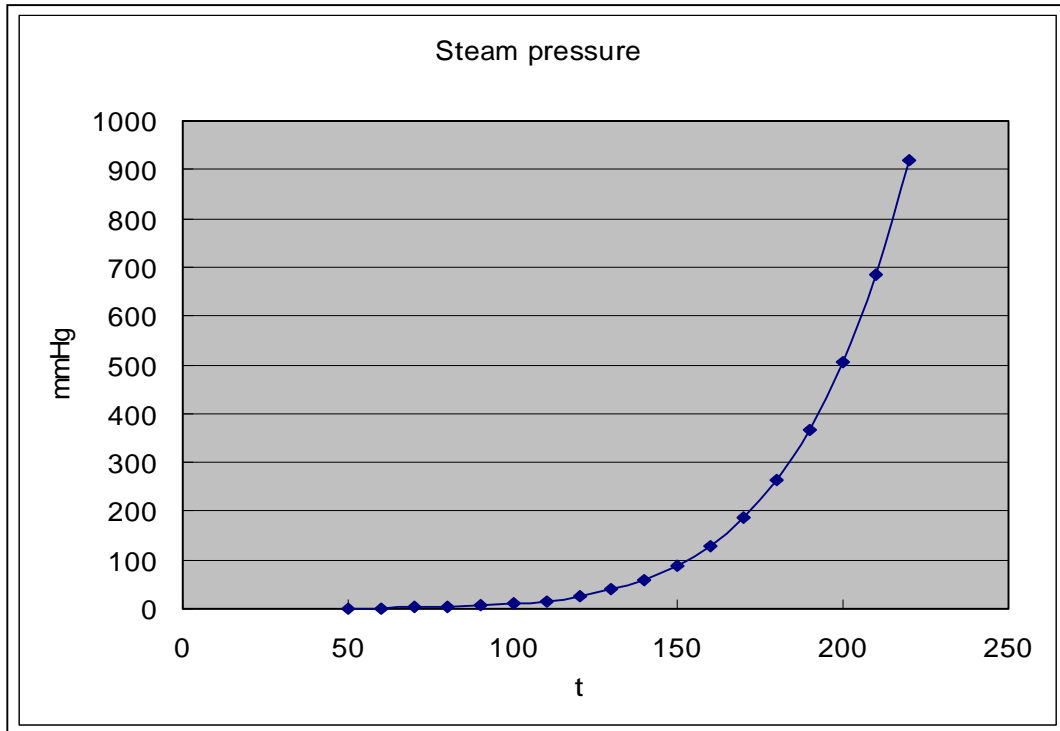


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Nonanol				
Common synonyms	Nonyl alcohol, Nonanol, Octyl carbinol				
UN Number	3082	CAS Number	143-08-8	IMDG CODE	Class9/P9028
IMO Pollution Category	C				
Formula	C9H19OH	Molecular Weight	144.3	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.8274	Vapor Specific Gravity	5	Boiling Point()	213.5
Freezing Point ()	-5.5	Flash Point ()	79	Ignition Point ()	
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	LD50 1400 mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : There is a central-nerves control action.</p> <p>Environmental influence : Speed is slow although there is biodegradation nature. It is detrimental to an aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



Limits of Detective Tube

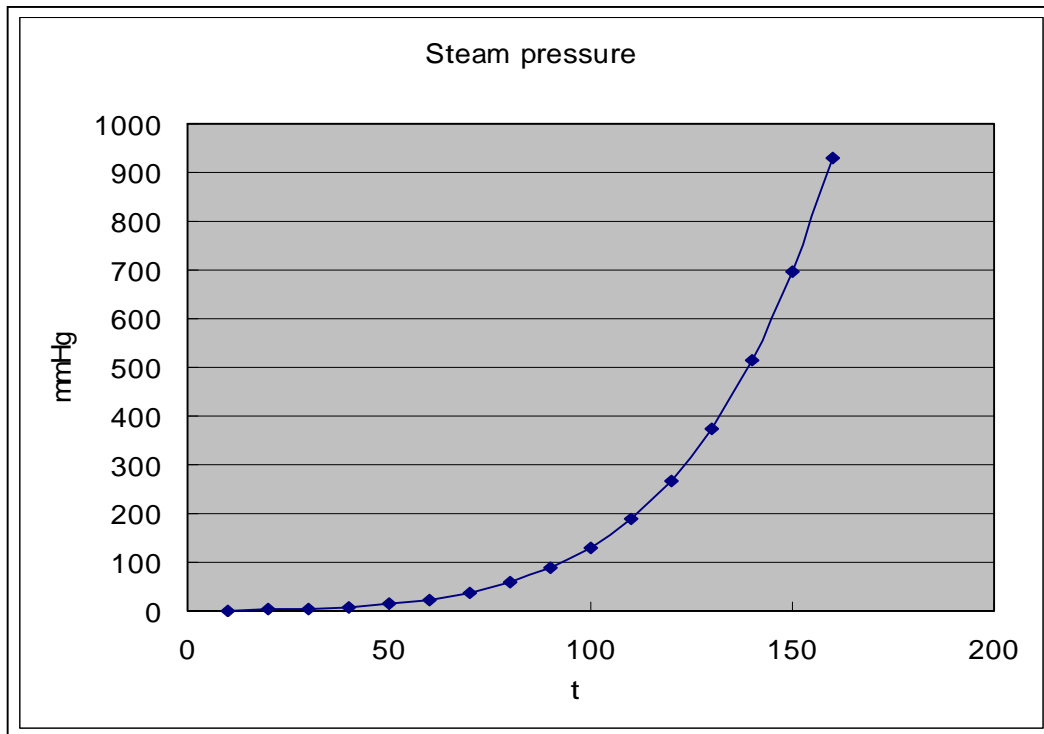


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

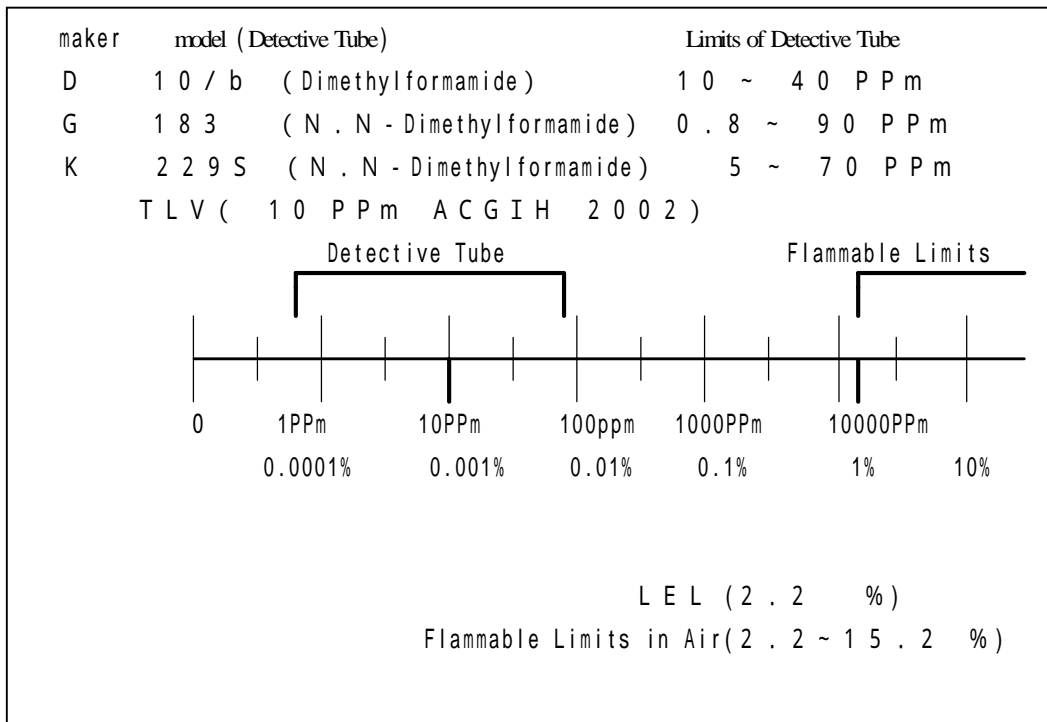
Material Name	Dimethylformamide				
Common synonyms	Formyldimethylamine, DMFA, DMF				
UN Number	2265	CAS Number	68-12-2	IMDG CODE	Class3.3/P3335
IMO Pollution Category	D				
Formula	C3H7ON	Molecular Weight	73.1	Flammable limits in Air (%)	2.2 ~ 15.2
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.9445	Vapor Specific Gravity	2.5	Boiling Point()	153
Freezing Point ()	-61	Flash Point ()	58	Ignition Point ()	445
Steam Pressure	2.7mmHg (20)				
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 10ppm LD50 2800mg/kg (oral rat) ACGIH : 10ppmTWA A4 skin				
Hazard and Noxiousness	<p>Classification : Acute toxicity substance, Flammable substance</p> <p>Noxiousness : Irritating to eyes. There is danger of skin absorption.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, it mixes with air, vapor becomes explosive gas, and vapor is heavier than air. A plastic and rubber are corroded. Intence polymerization may be caused by heating or contamination by other substances.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

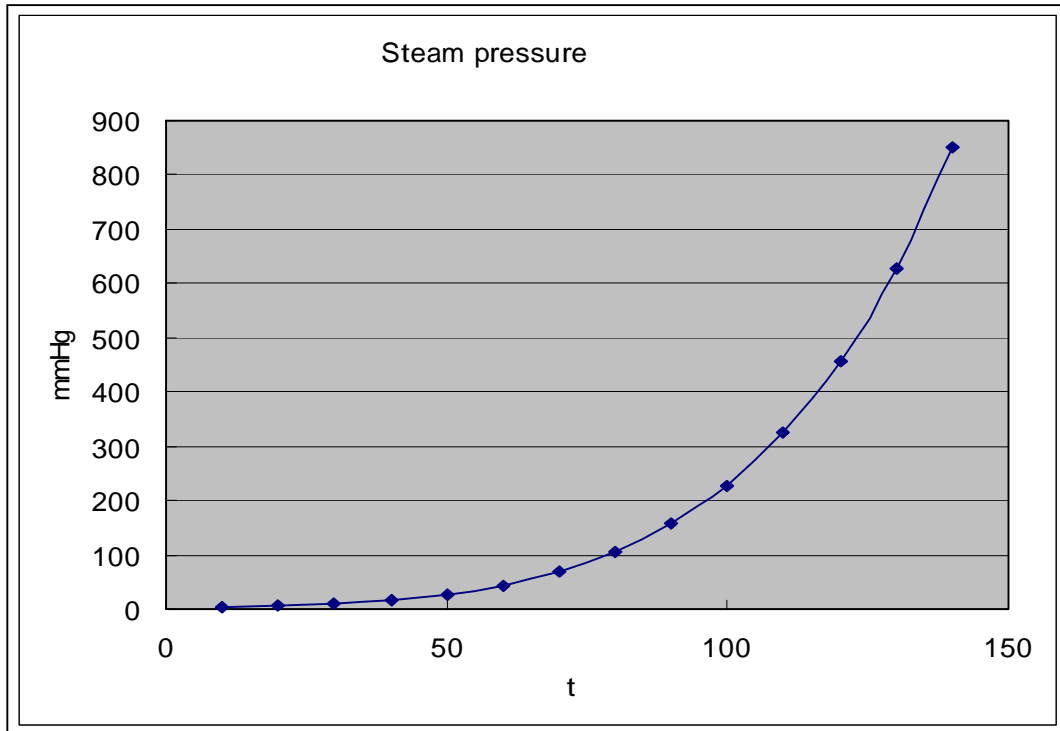


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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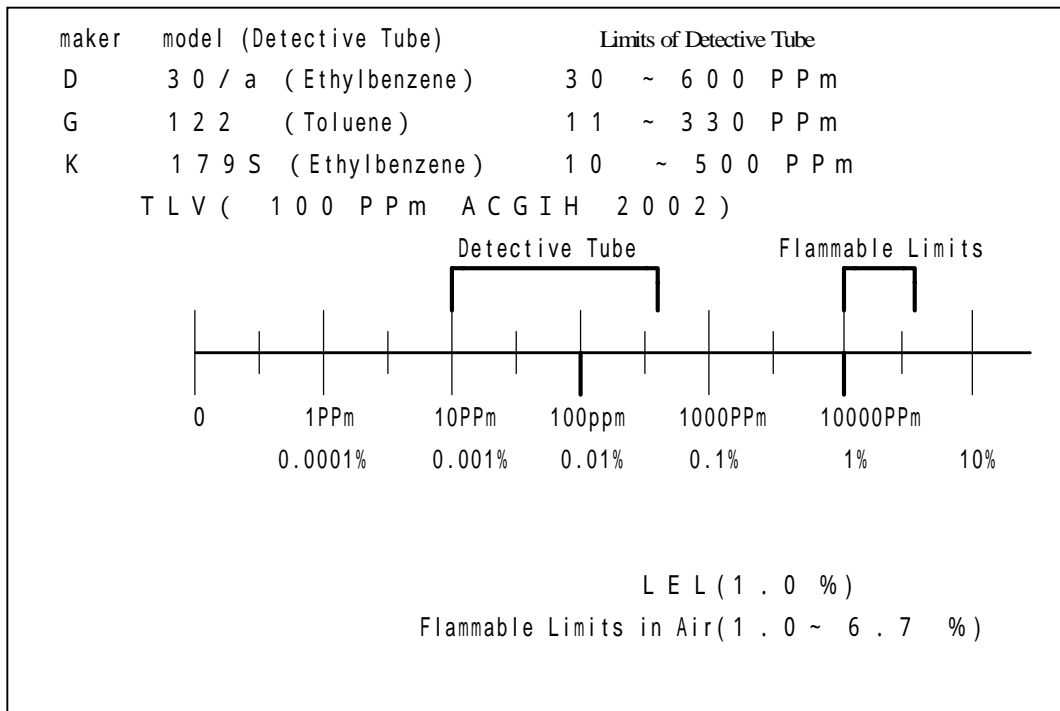
Material Name	Ethylbenzene				
Common synonyms	Ethylbenzol, Phenylethane				
UN Number	1175	CAS Number	100-41-4	IMDG CODE	Class3.2/P3222
IMO Pollution Category	B				
Formula	C8H10	Molecular Weight	106.2	Flammable limits in Air (%)	1.0 ~ 6.7
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.8669	Vapor Specific Gravity	3.7	Boiling Point()	136.19
Freezing Point ()	-94.98	Flash Point ()	21	Ignition Point ()	432
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 50ppm LD50 3500mg/kg (oral rat) ACGIH : 100ppmTWA 125ppmSTEL				
Hazard and Noxiousness	<p>Classification : Flammable substance Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action. Environmental influence : Biodegradation nature is low. The accumulation nature to an aquatic life living thing is low. It is detrimental to an aquatic life living thing. Danger : It is inflammability, it mixes with air, vapor becomes explosive gas, and vapor is heavier than air. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

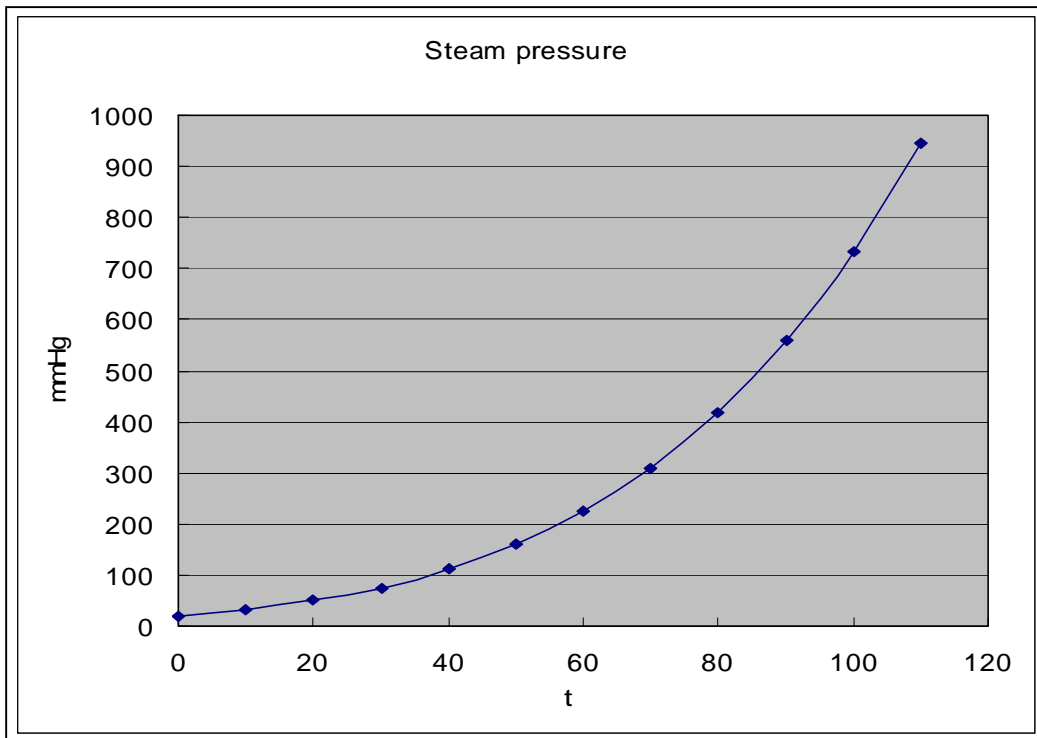


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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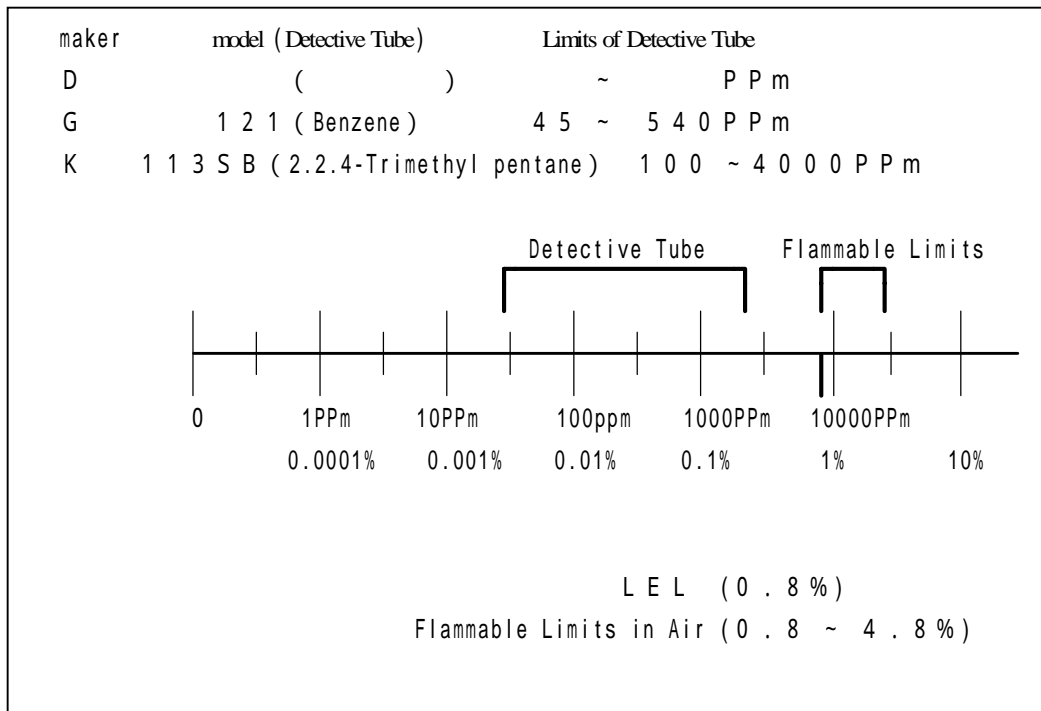
Material Name	Diisobutylene				
Common synonyms	Isooctene, DIB				
UN Number	2050	CAS Number	11071-47-9	IMDG CODE	Class3.2/P3210
IMO Pollution Category	B				
Formula	(C4H8)2	Molecular Weight	112.22	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.715	Vapor Specific Gravity	3.9	Boiling Point()	101.44
Freezing Point ()		Flash Point ()	-6.6	Ignition Point ()	415
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion					
Hazard and Noxiousness	<p>Classification : Flammable substance, Acute toxicity substance</p> <p>Noxiousness : There is a central-nerves control action.</p> <p>Environmental influence : Biodegradation nature is low. The accumulation nature to an aquatic life living thing is high.</p> <p>Danger : It is inflammability, it mixes with air, vapor becomes explosive gas, and vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



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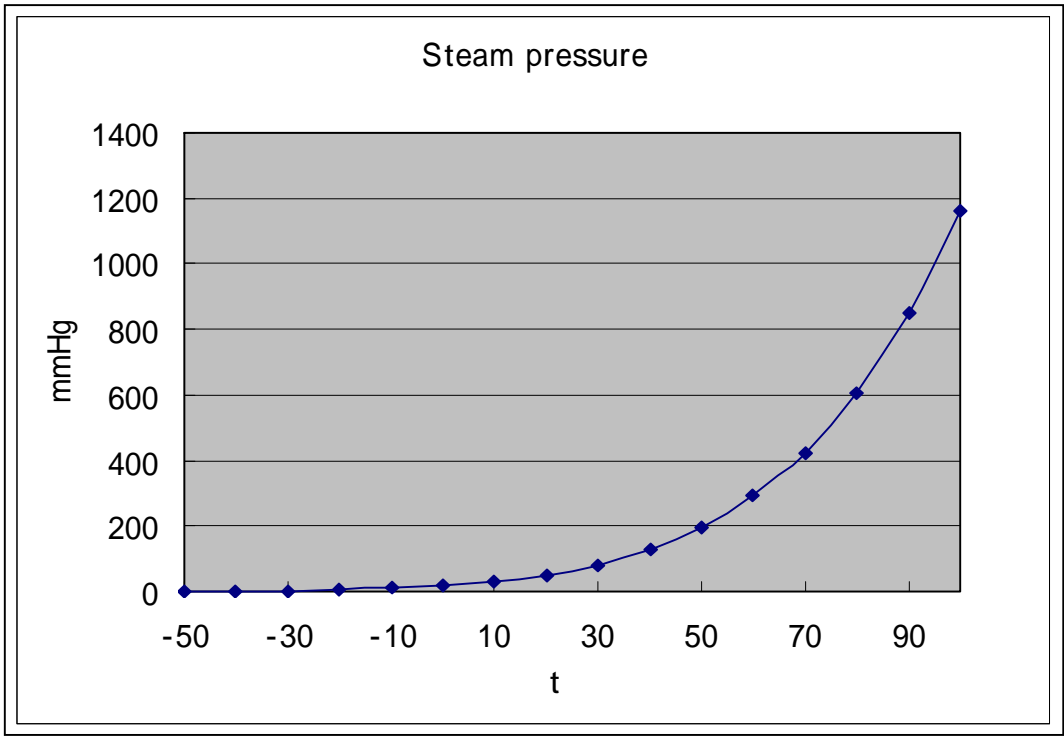


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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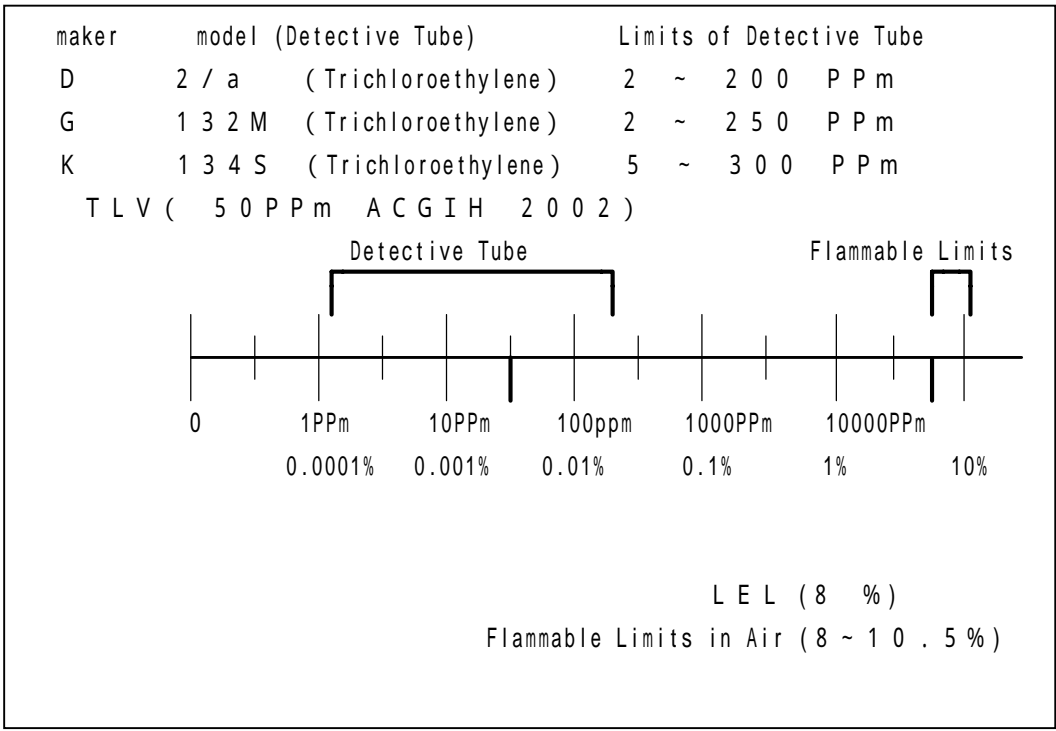
Material Name	Trichloroethylene				
Common synonyms	Ethylene trichloride, Ethinyl trichloride, Trial				
UN Number	1710	CAS Number	79-01-6	IMDG CODE	Class6.1/P6273
IMO Pollution Category	C				
Formula	CHCl=CCl2	Molecular Weight	131.4	Flammable limits in Air (%)	8 ~ 10 . 5
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	1.4556	Vapor Specific Gravity	4.5	Boiling Point()	86.7
Freezing Point ()	-88	Flash Point()	32	Ignition Point()	420
Steam Pressure	58.6mmHg (2 0)				
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 50ppmTWA 100ppmSTEL A5 L D50 4920mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Acute toxicity substance Noxiousness : Irritating to skin and eyes. There is a central-nerves control action. Environmental influence : There is not biodegradation nature. The accumulation nature to an aquatic life living thing is medium. It is detrimental to an aquatic life living thing. Danger : It is nonflammability. Vapor is heavier than air. Heating and combustion decompose and poisonous phosgen is produced. Aluminum is corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
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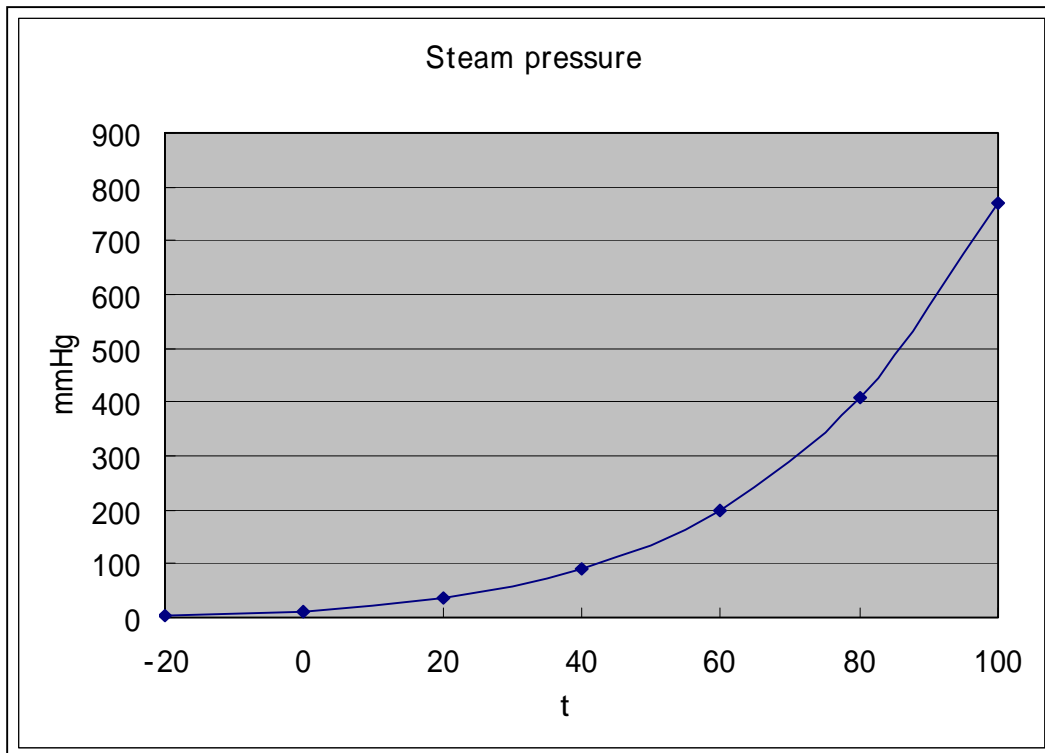


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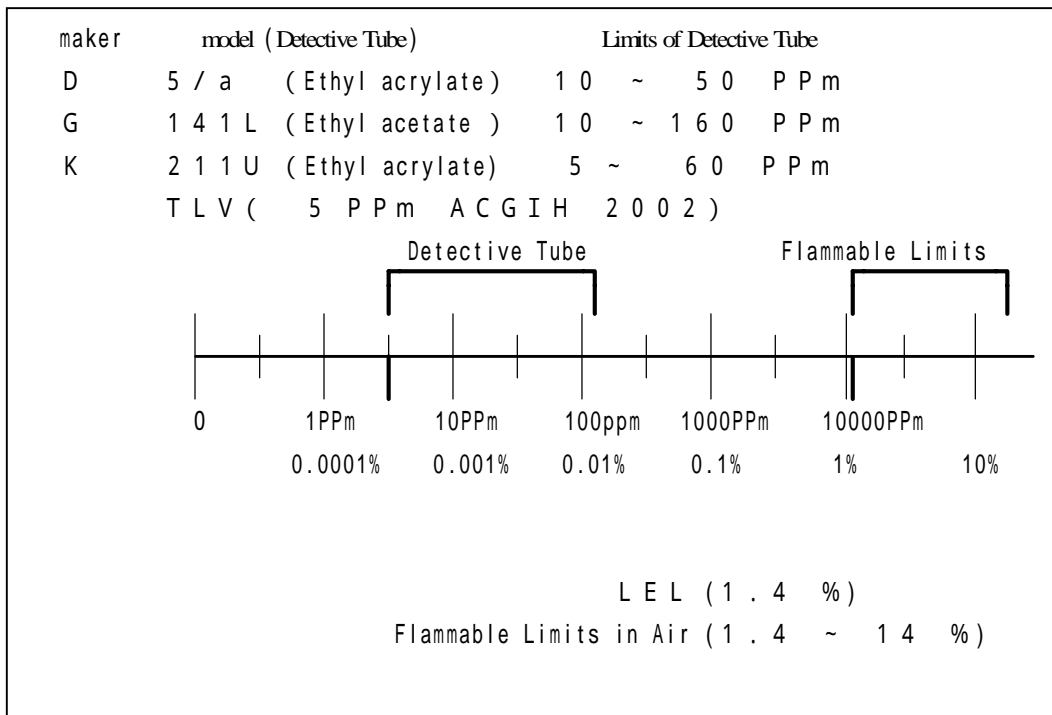
Material Name	Ethyl acrylate				
Common synonyms	Ethyl propenoate, 2-Propenoic acid ethyl ester				
UN Number	1917	CAS Number	140-88-5	IMDG CODE	Class3.2/P3220
IMO Pollution Category	A				
Formula	C5H8O2	Molecular Weight	100.1	Flammable limits in Air (%)	1.4 ~ 14
Appearance	colorless			Solubility in Water	soluble
Specific Gravity	0.9405	Vapor Specific Gravity	3.5	Boiling Point()	99.3
Freezing Point ()	-71.2	Flash Point ()	10	Ignition Point ()	372
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 5ppmTWA 15ppmSTEL A4 LD50 1020mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable substance</p> <p>Noxiousness : Irritating to skin, eyes and throat.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. It is detrimental to an aquatic life living thing.</p> <p>Danger : Inflammability is high. It mixes with air, vapor becomes explosive gas. Vapor is heavier than air. Polymerization may be automatically carried out under the influence of heat or light.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

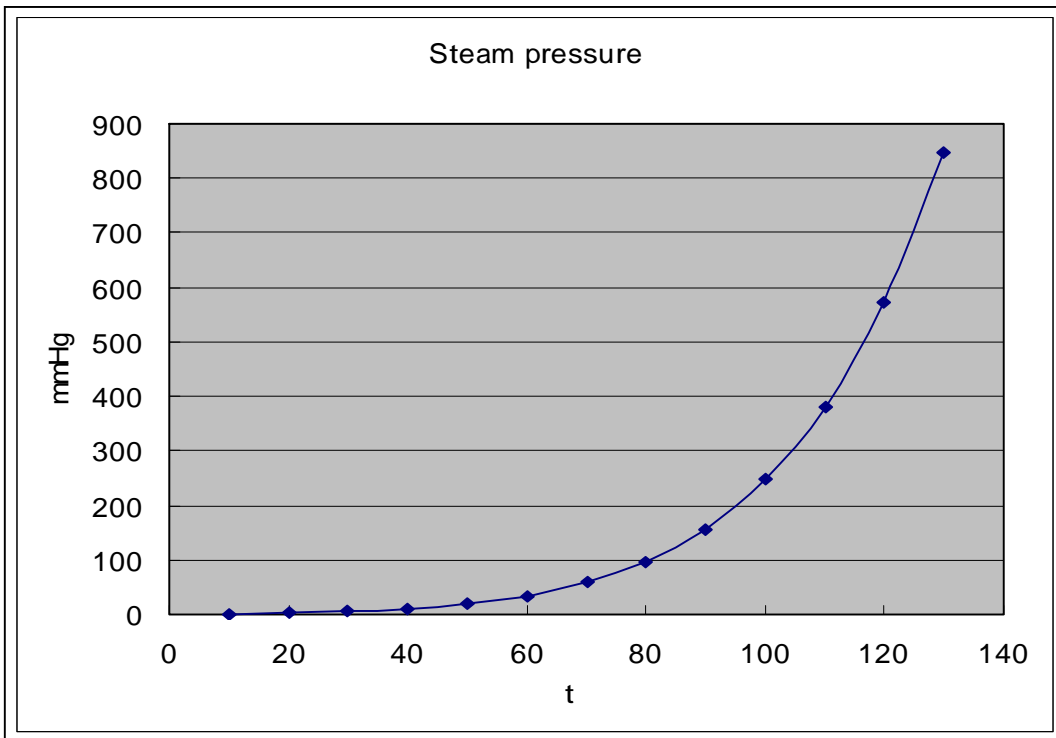


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

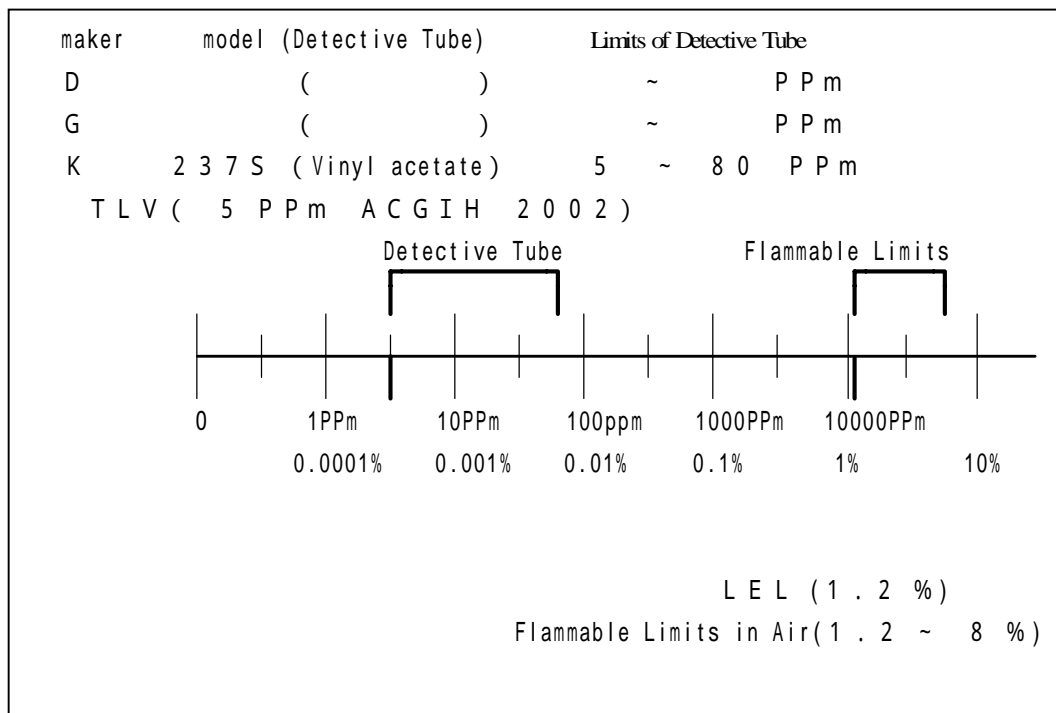
Material Name	Methyl butyl ketone				
Common synonyms	2-Hexanone				
UN Number	1245	CAS Number	591-78-6	IMDG CODE	Class3.2/P3257
IMO Pollution Category	D				
Formula	C ₅ H ₁₂ CO	Molecular Weight	100.2	Flammable limits in Air (%)	1.2 ~ 8.0
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.8301	Vapor Specific Gravity	3.5	Boiling Point()	127.2
Freezing Point ()	-56.9	Flash Point ()	35	Ignition Point ()	423
Steam Pressure	2.7mmHg(20)				
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 5ppm LD50 2590mg/kg (oral rat) ACGIH : 5ppmTWA 10ppmSTEL skin				
Hazard and Noxiousness	<p>Classification : Flammable substance, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : Inflammability is high. It mixes with air, vapor becomes explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

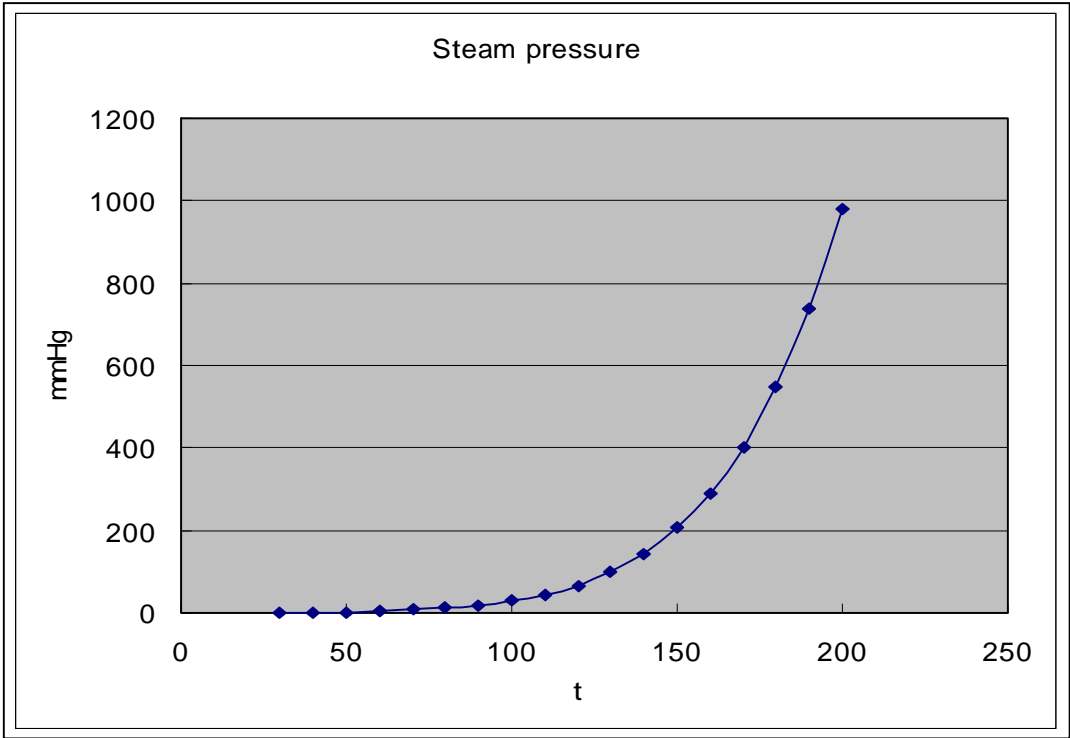


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

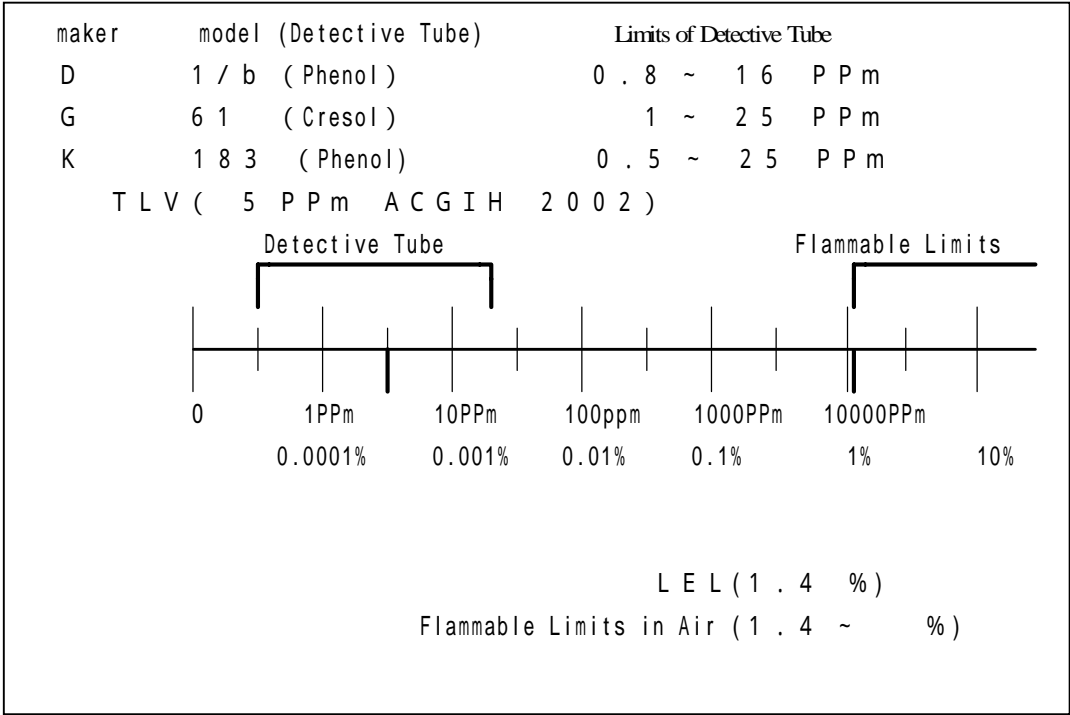
Material Name	Cresol				
Common synonyms	Cresylic acid, Methylphenol, Hydroxytoluene				
UN Number	2076	CAS Number	1319-77-3	IMDG CODE	Class6.1/P6114
IMO Pollution Category	A				
Formula	C7H8O	Molecular Weight	108.1	Flammable limits in Air (%)	1.4 ~
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.0465	Vapor Specific Gravity	3.8	Boiling Point()	191
Freezing Point ()	31	Flash Point ()	81	Ignition Point ()	599
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 5ppm LD50 121mg/kg (oral rat) ACGIH : 5ppmTWA skin				
Hazard and Noxiousness	<p>Classification : Corrosion substance, Acute toxicity substance</p> <p>Noxiousness : There are stimulative and corrosive to skin, eyes and throat. There is a central-nerves control action. There is danger of skin absorption.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. It is very detrimental to an aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

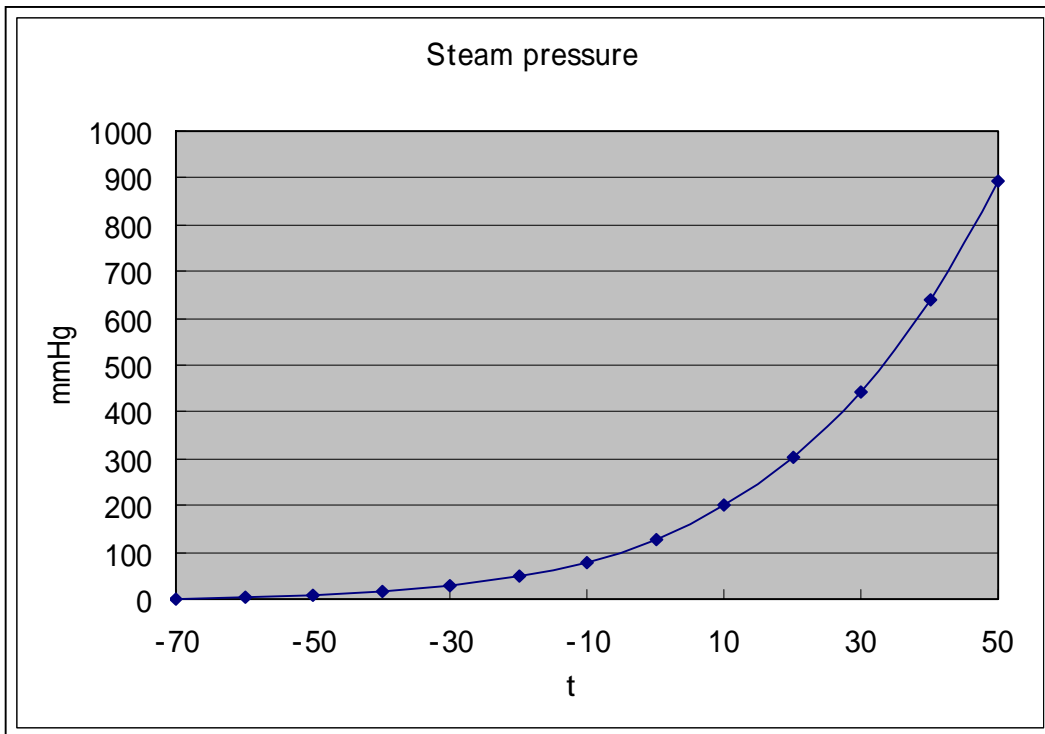


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

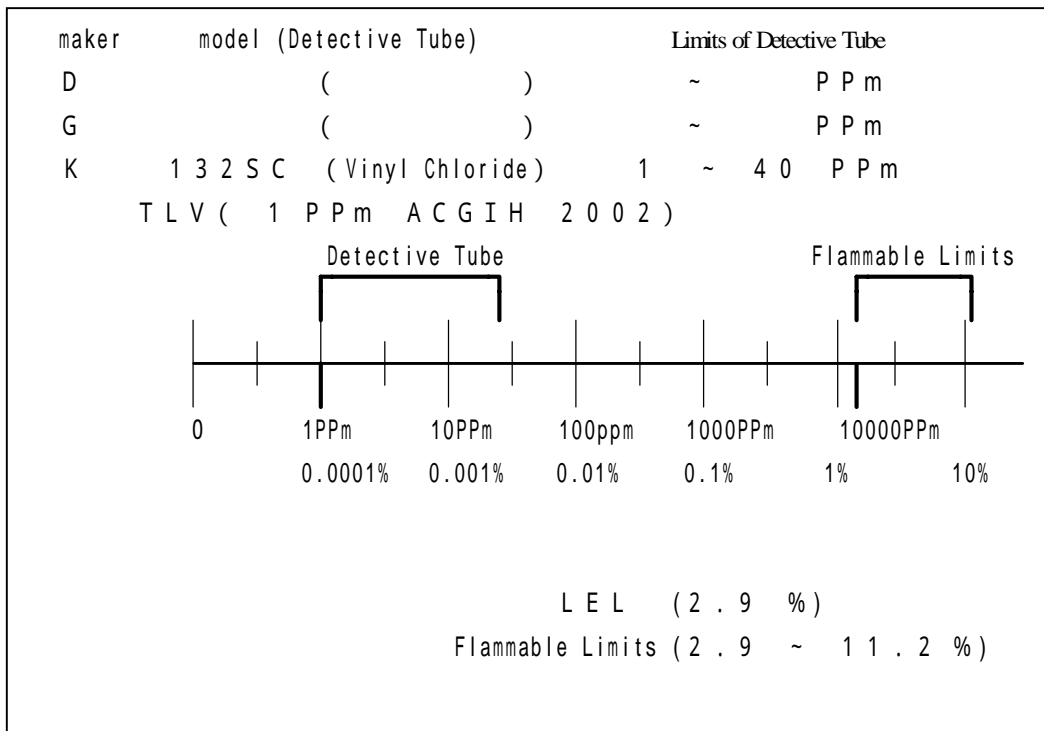
Material Name	Allyl chloride				
Common synonyms	3-Chloropropene, -Chloropropylene, AC				
UN Number	1100	CAS Number	107-05-1	IMDG CODE	Class3.1/P3105-1
IMO Pollution Category	B				
Formula	C3H5Cl	Molecular Weight	76.5	Flammable limits in Air (%)	2.9 ~ 11.1
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.9397	Vapor Specific Gravity	2.6	Boiling Point()	45.1
Freezing Point ()	-134.5	Flash Point ()	-32	Ignition Point ()	485
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 1ppmTWA 2ppmSTEL A3				
Hazard and Noxiousness	<p>Classification : Flammable substance, Acute toxicity substance, A stimulative substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. Carcinogenic is checked in the animal experiment. There is danger of skin absorption.</p> <p>Environmental influence : It hydrolyzes gradually underwater and the life decomposition occurs. It is very detrimental to an aquatic life living thing.</p> <p>Danger : Inflammability is high. It mixes with air, vapor becomes explosive gas. Vapor is heavier than air. It reacts violently with metal, such as aluminum and zinc, and generates heat. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
<p>The measure at the time of leak on the sea</p>	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

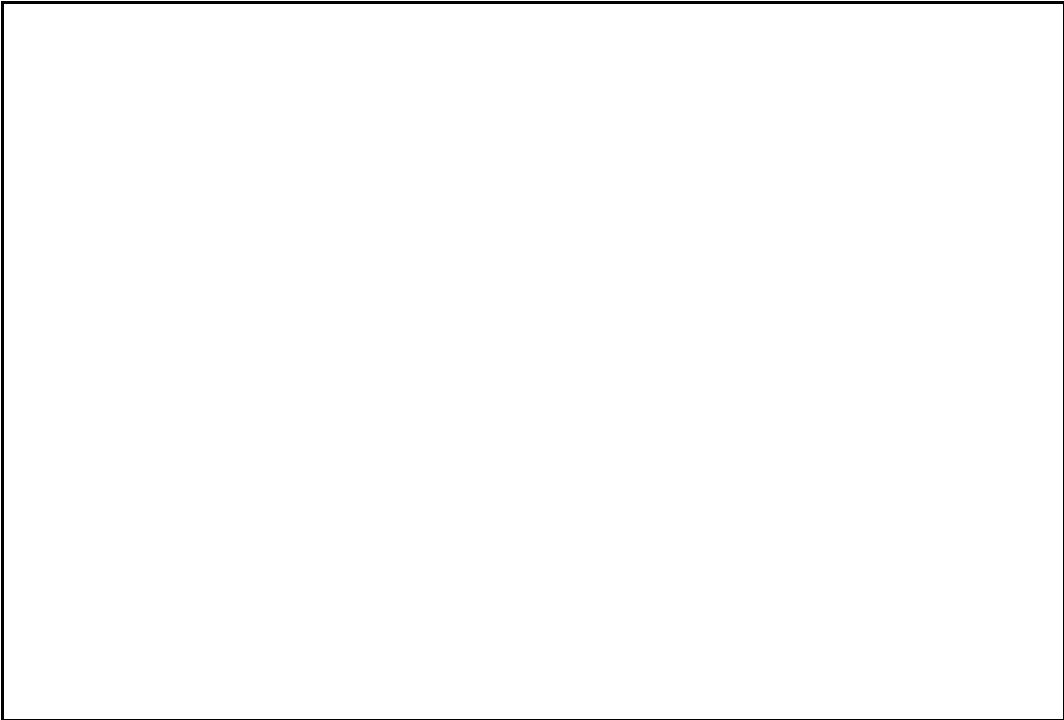


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

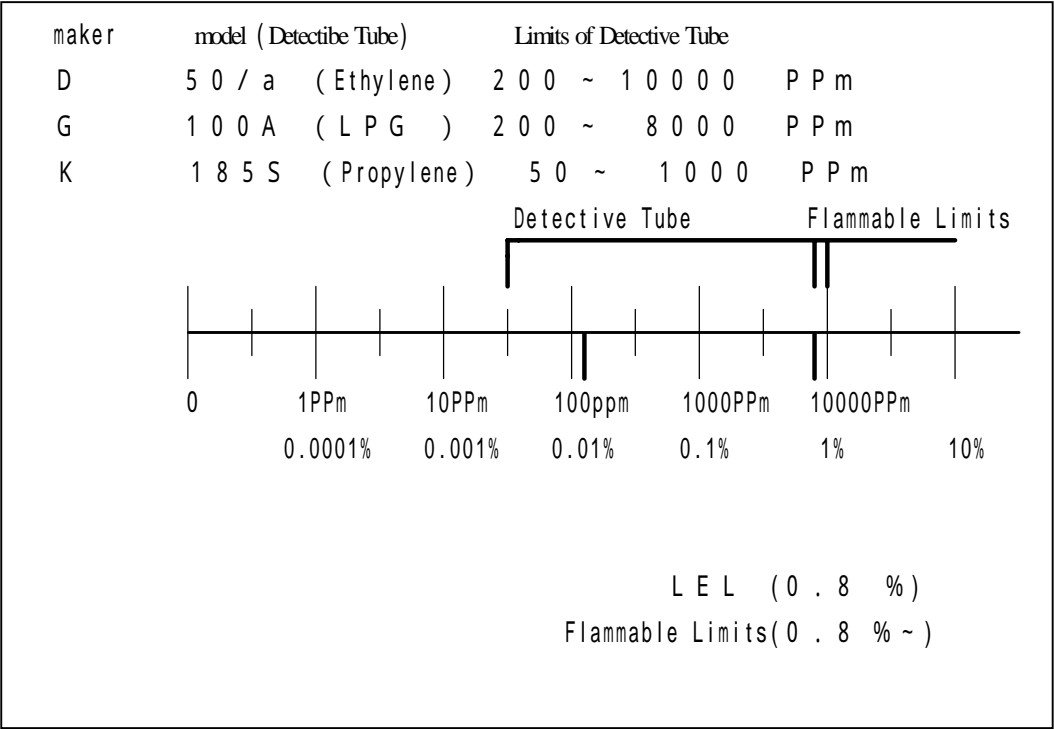
Material Name	Propylene tetramer				
Common synonyms	Tetrapropylene, Dodecene				
UN Number	2850	CAS Number		IMDG CODE	Class3.3/P3378
IMO Pollution Category	B				
Formula	(C3H6)4	Molecular Weight		Flammable limits in Air (%)	0.8 ~
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.77	Vapor Specific Gravity	5.8	Boiling Point()	183 ~ 202
Freezing Point ()	-35	Flash Point ()	60	Ignition Point ()	255
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion					
Hazard and Noxiousness	<p>Classification : Flammable substance Noxiousness : In normal temperature, it is hard to reach detrimental concentration. Environmental influence :</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

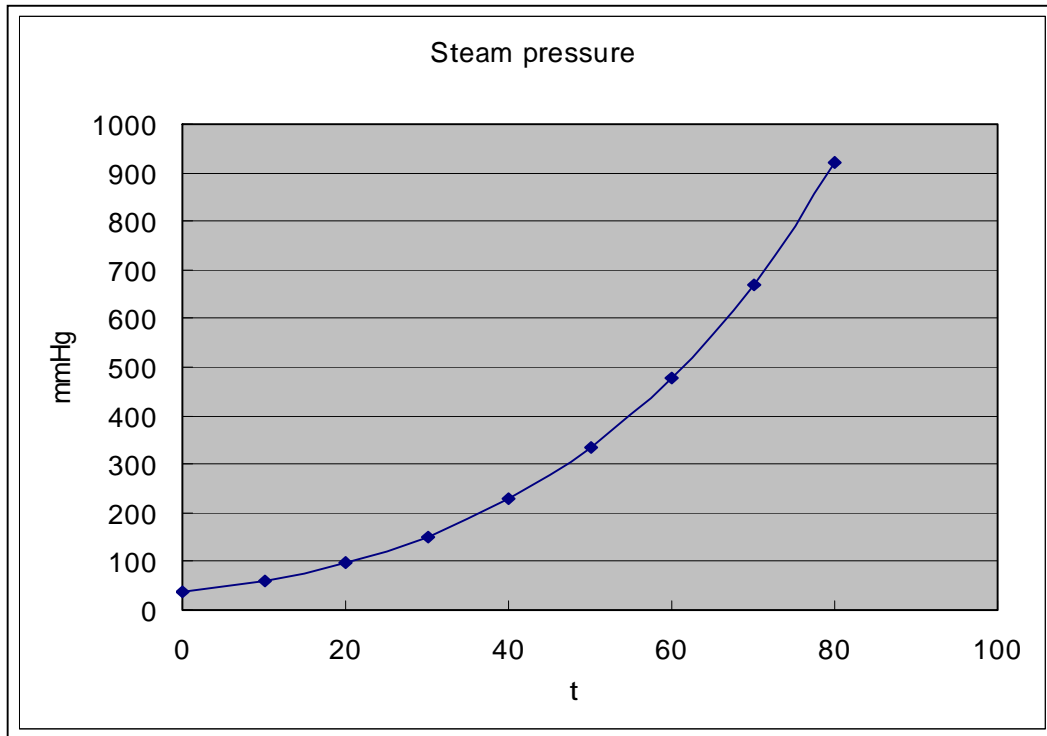


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

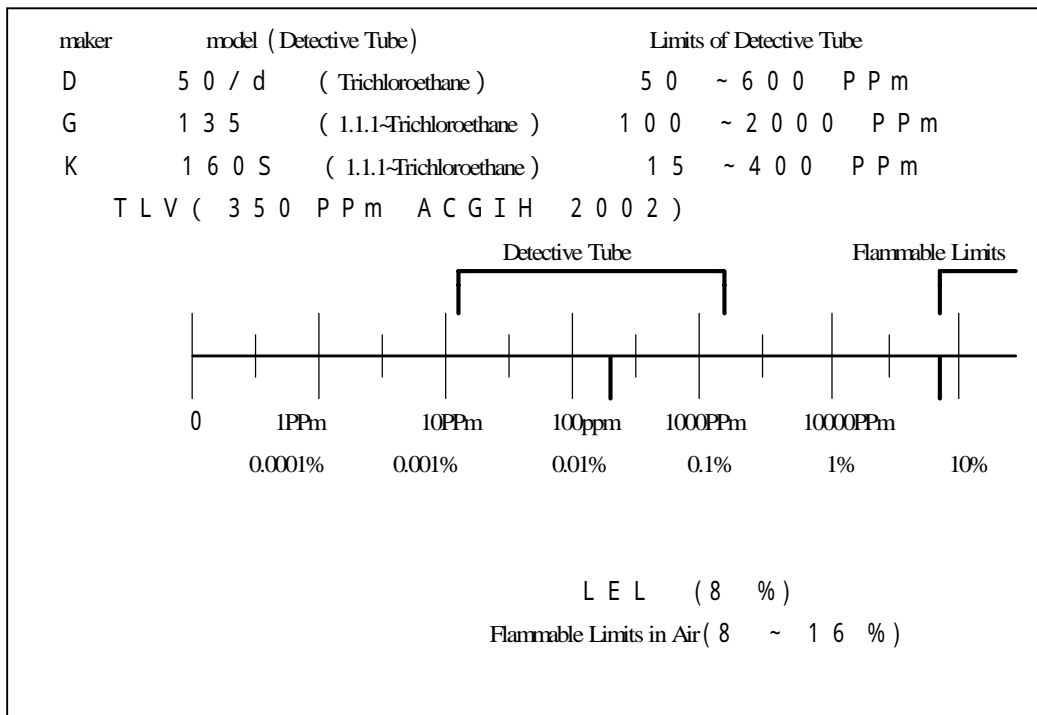
Material Name	1,1,1-Trichloroethane				
Common synonyms	Ethane trichloride				
UN Number	2831	CAS Number	71-55-6	IMDG CODE	Class6.1/P6272-1
IMO Pollution Category	C				
Formula	C ₂ H ₃ Cl ₃	Molecular Weight	133.4	Flammable limits in Air (%)	8 ~ 16
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	1.3376	Vapor Specific Gravity	4.6	Boiling Point()	73.9
Freezing Point ()	-32.96	Flash Point ()		Ignition Point ()	500
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 200ppm LD50 10300mg/kg (oral rat) ACGIH : 350ppmTWA 450ppmSTEL A4				
Hazard and Noxiousness	<p>Classification : Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. High concentration vapor has an anesthesia action. There is a central-nerves control action.</p> <p>Environmental influence : Speed is slow although there is biodegradation nature. The accumulation nature to an aquatic life living thing is low. It is detrimental to an aquatic life living thing.</p> <p>Danger : It may burn under specific conditions, such as high temperature. Vapor is heavier than air. Heating etc. decompose and poisonous phosgen is produced. Aluminum and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

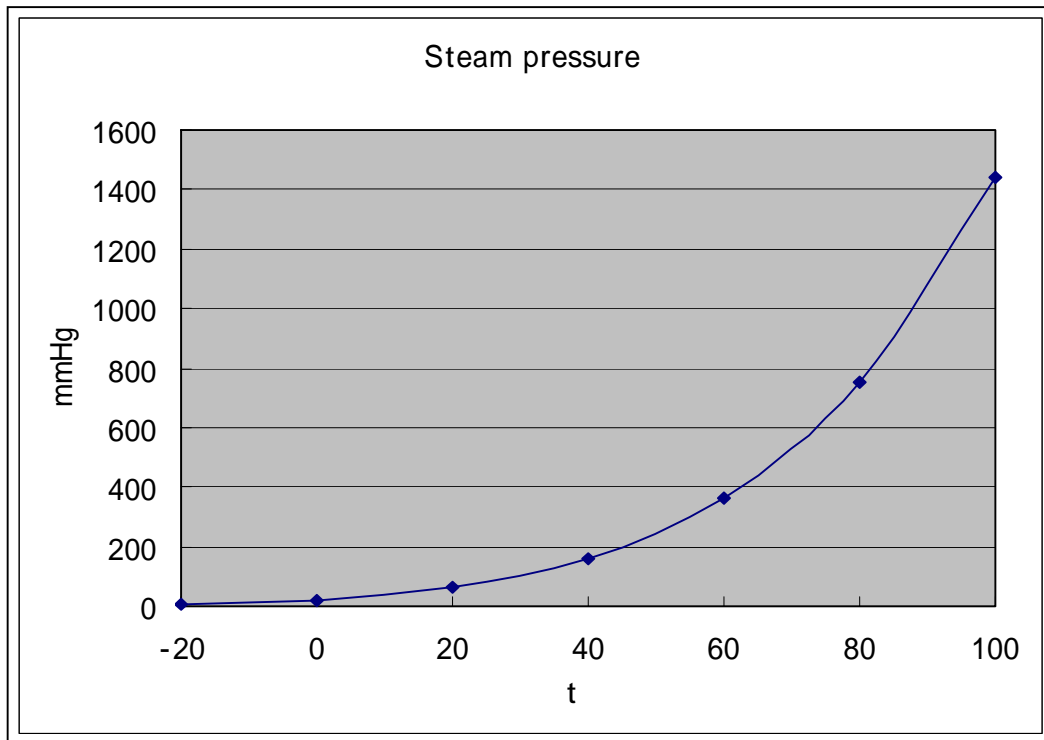


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

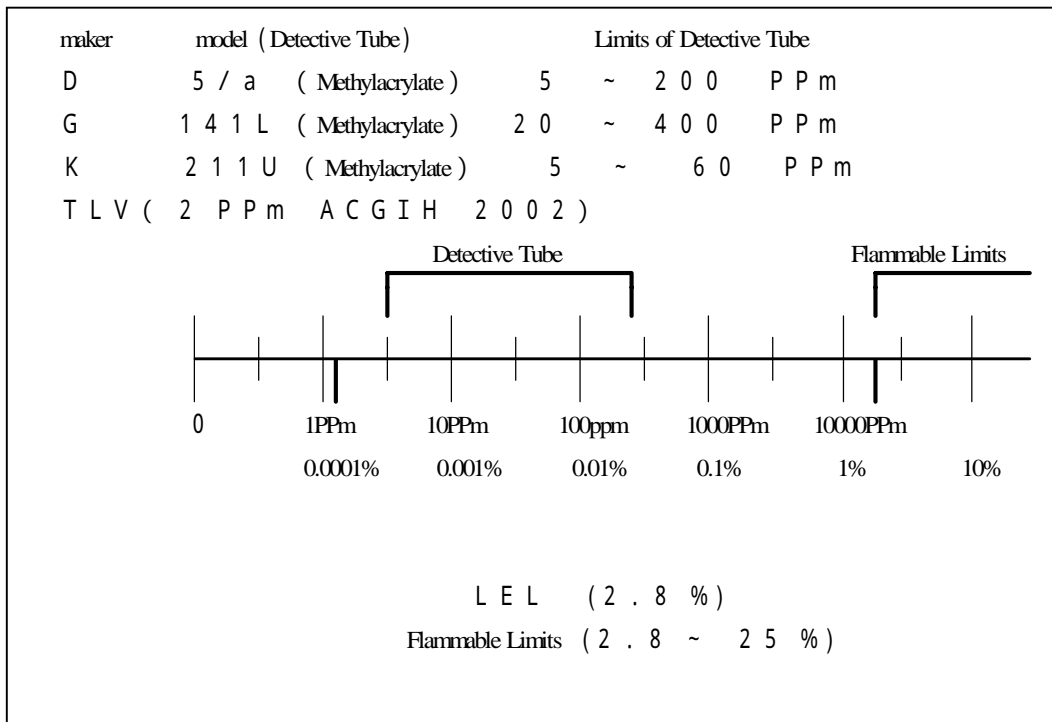
Material Name	Methyl acrylate				
Common synonyms	Methylpropenoate, Acrylic acid methyl ester				
UN Number	1919	CAS Number	96-33-3	IMDG CODE	Class3.2/P3252
IMO Pollution Category	B				
Formula	CH ₂ =CHCOOCH ₃	Molecular Weight	86.09	Flammable limits in Air (%)	2.8 ~ 25.0
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	0.9561	Vapor Specific Gravity	3	Boiling Point()	80
Freezing Point ()	-75	Flash Point()	-2.8	Ignition Point()	468
Steam Pressure	100mmHg(20)				
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH : 2ppmTWA A4 skin L D50 300mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is lachrymal. There is danger of skin absorption.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : Inflammability is high. It may mix with air and steam may produce explosive gas. Vapor is heavier than air. Intense polymerization may be caused by heating or contamination by other substances.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

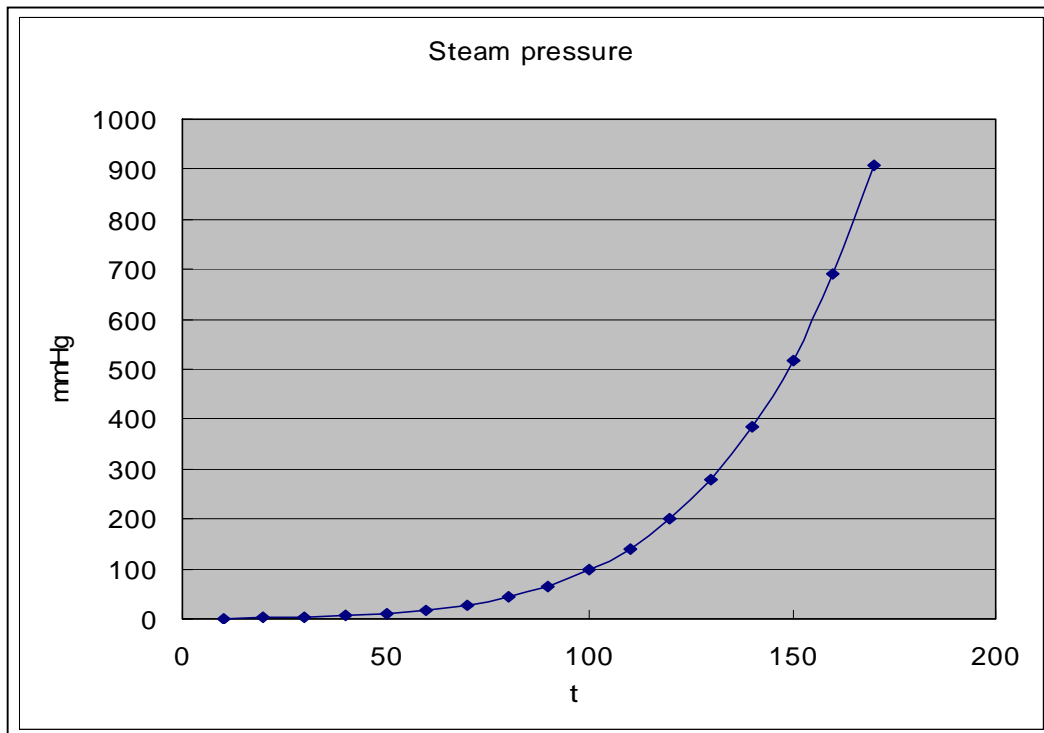


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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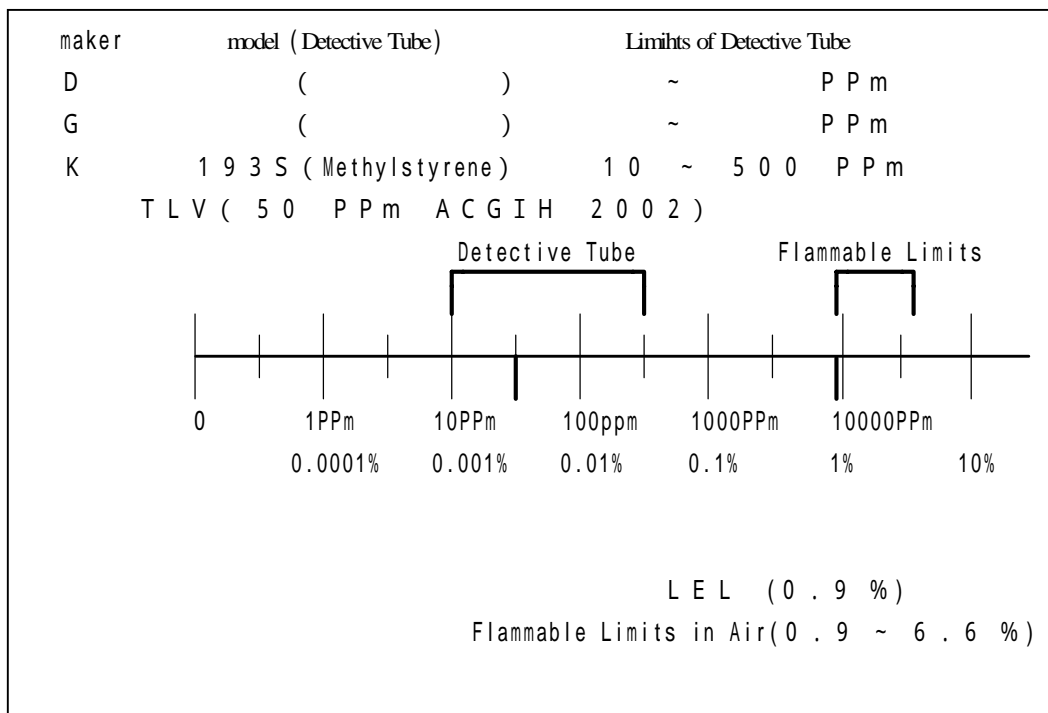
Material Name	-Methylstyrene				
Common synonyms	Vinyltoluene, Tolyethylene, Methylvinylbenzene				
UN Number	2303	CAS Number	98-83-9	IMDG CODE	Class3.3/P3357
IMO Pollution Category	A				
Formula	C9H10	Molecurar Weight	118.2	Flammable limits in Air (%)	0 . 9 ~ 6 . 6
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	0.9134	Vapor Specific Gravity	4.1	Boiling Point()	163.5
Freezing Point ()	-23.14	Flash Point ()	53.9	Ignition Point ()	574.4
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 50ppmTWA 100ppmSTEL L D50 4900mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action.</p> <p>Environmental influence : The accumulation nature to an aquatic life living thing is medium.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
<p>The measure at the time of leak on the sea</p>	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

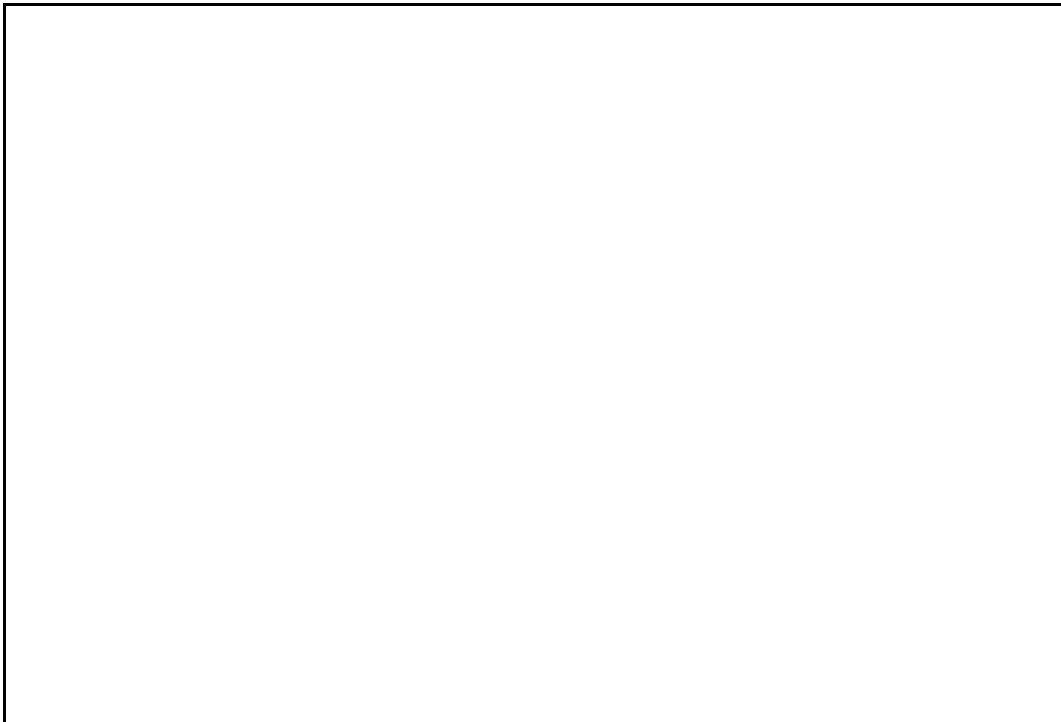


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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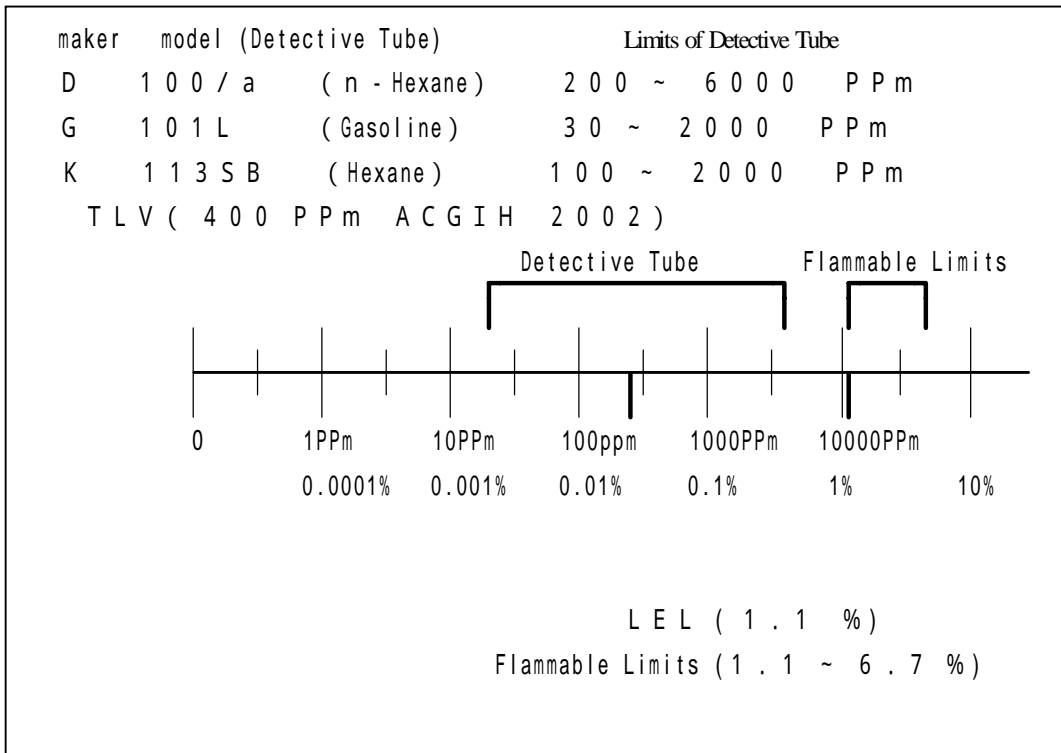
Material Name	Heptane				
Common synonyms	Heptyl hydride				
UN Number	1206	CAS Number	142-82-5	IMDG CODE	Class3.2/P3235
IMO Pollution Category	C				
Formula	C7H16	Molecular Weight	100.21	Flammable limits in Air (%)	1.1 ~ 6.7
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.68378	Vapor Specific Gravity	3.5	Boiling Point()	98.427
Freezing Point ()	-90.61	Flash Point ()	-4	Ignition Point ()	204
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 200ppm ACGIH : 400ppmTWA 500ppmSTEL				
Hazard and Noxiousness	<p>Classification : Flammable substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action.</p> <p>Environmental influence : There is biodegradation nature. Accumulation nature is in an aquatic life living thing. It is detrimental to an aquatic life living thing.</p> <p>Danger : Inflammability is high. It mixes with air, vapor become explosive gas. Vapor is heavier than air. A plastic is corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Syeam pressure curve



Limits of Detective Tube

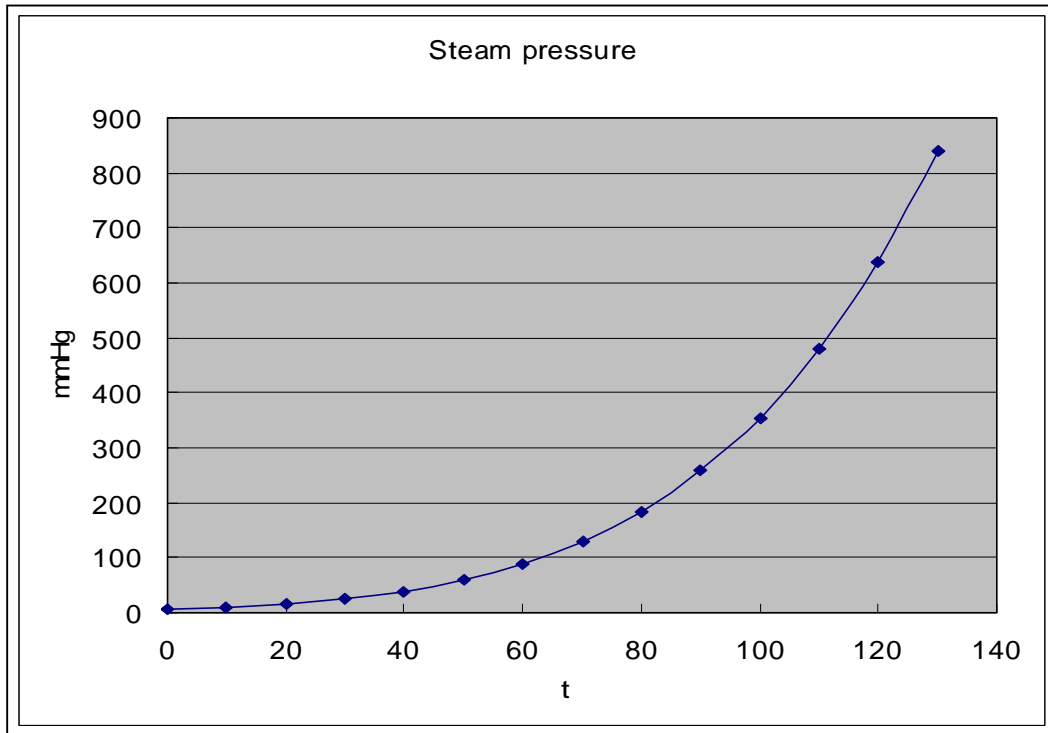


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

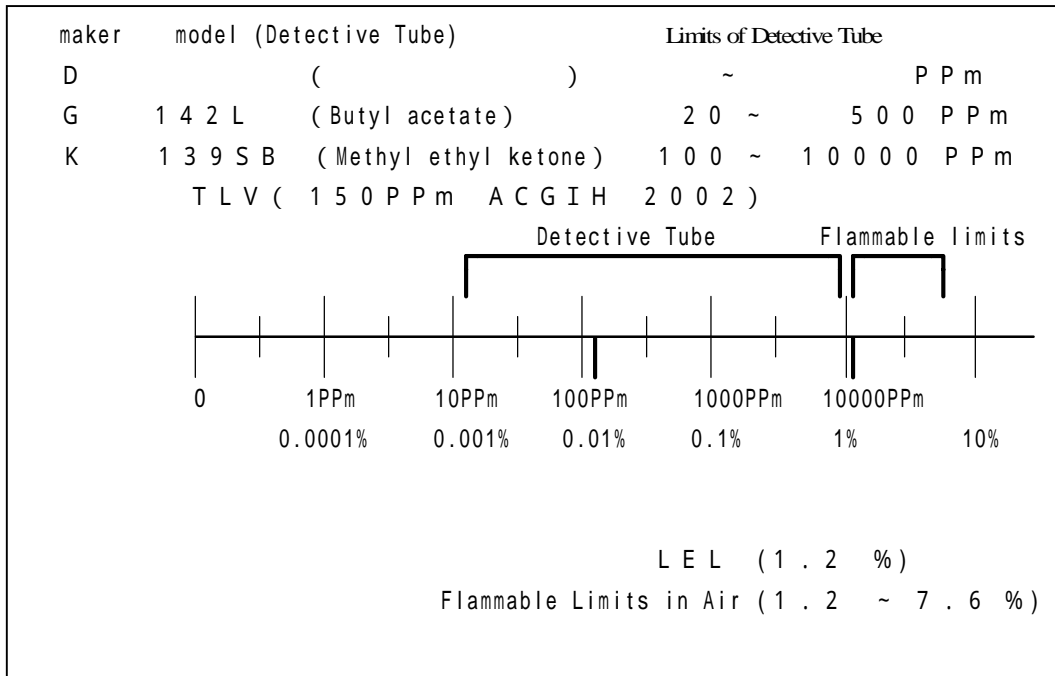
Material Name	Butyl acetate				
Common synonyms	Butyl ethanoate, Acetic butyl ether, Acetic acid butyl ester				
UN Number	1123	CAS Number	123-86-4	IMDG CODE	Class3.2/P3191
IMO Pollution Category	C				
Formula	C6H12O2	Molecular Weight	116.2	Flammable limits in Air (%)	1.2 ~ 7.6
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.8826	Vapor Specific Gravity	4	Boiling Point()	126.3
Freezing Point ()	-77	Flash Point ()	22	Ignition Point ()	425
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 100ppm LD50 13100mg/kg (oral rat) ACGIH: 150ppmTWA 200ppmSTEL				
Hazard and Noxiousness	<p>Classification : Flammable substance, Acute toxicity substance</p> <p>Noxiousness : Irritating to eyes and throat.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : Inflammability is high. It mixes with air, vapor become explosive gas. Vapor is heavier than air. A plastic is corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

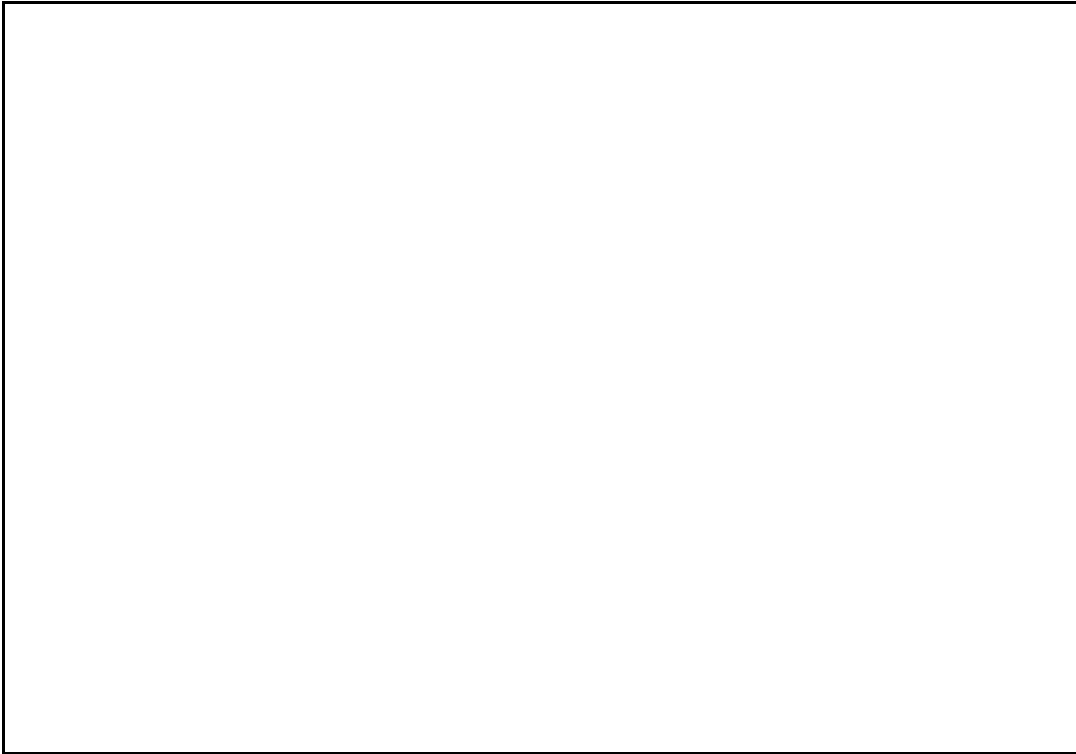


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

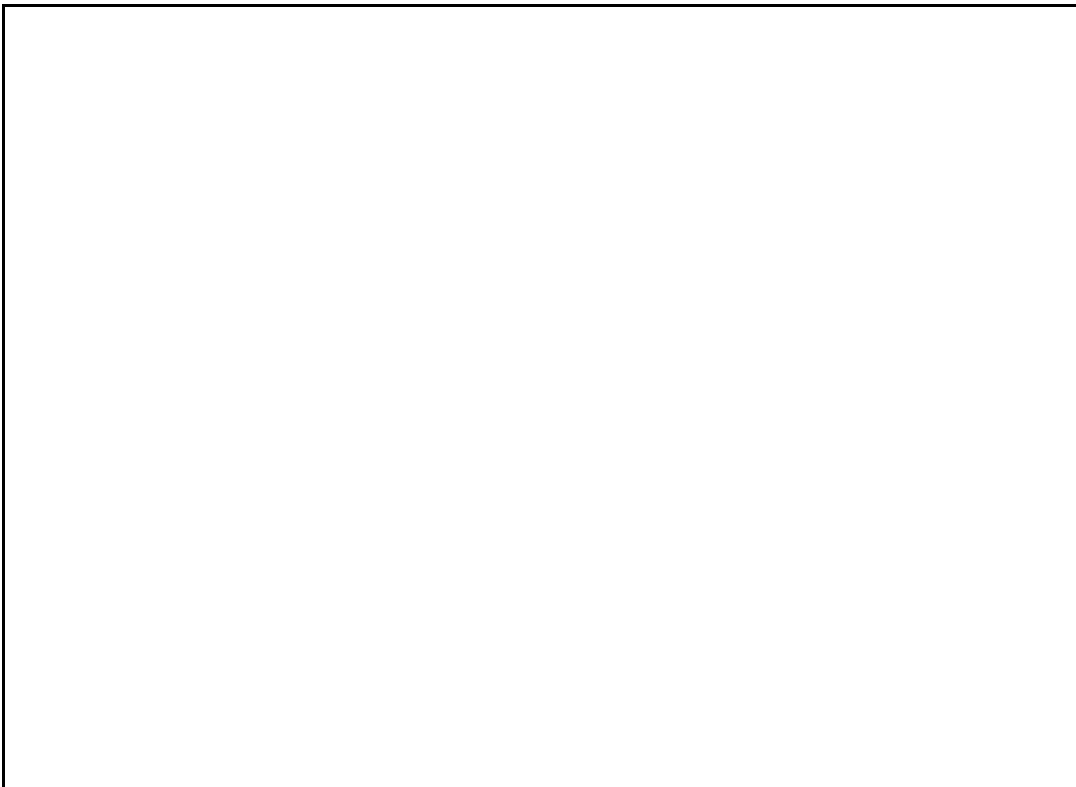
Material Name	Polysiloxane				
Common synonyms	Silicone, Dimethylhydrolizate				
UN Number	1993	CAS Number	9016-00-6	IMDG CODE	Class3.2/P3230
IMO Pollution Category					
Formula		Molecurar Weight		Flammable limits in Air (%)	
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	0.7636	Vapor Specific Gravity	5.6	Boiling Point()	99.5
Freezing Point ()	-67	Flash Point ()	-9	Ignition Point ()	
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion					
Hazard and Noxiousness	<p>Classification : Flammable substance Noxiousness : Stimulative and toxicity are weak. Environmental influence :</p> <p>Danger : Inflammability is high. It mixes with air, vapor become explosive gas. Vapor is heavier than air. Heating etc. decomposes and stimulative gas is generated.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



Limits of Detective Tube

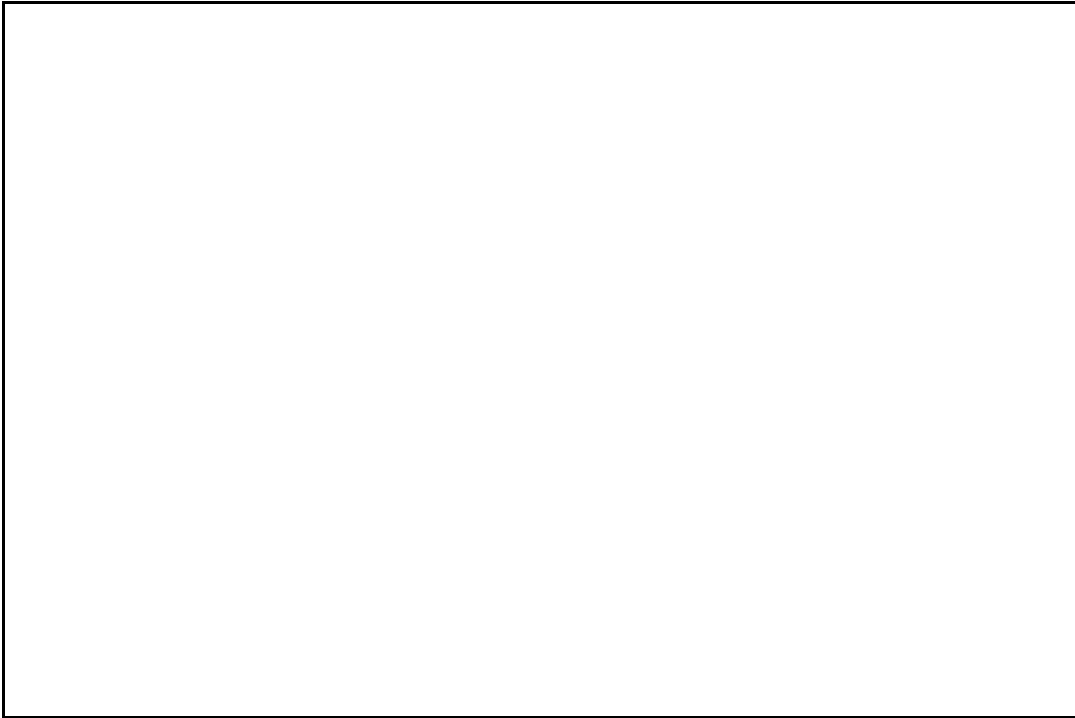


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

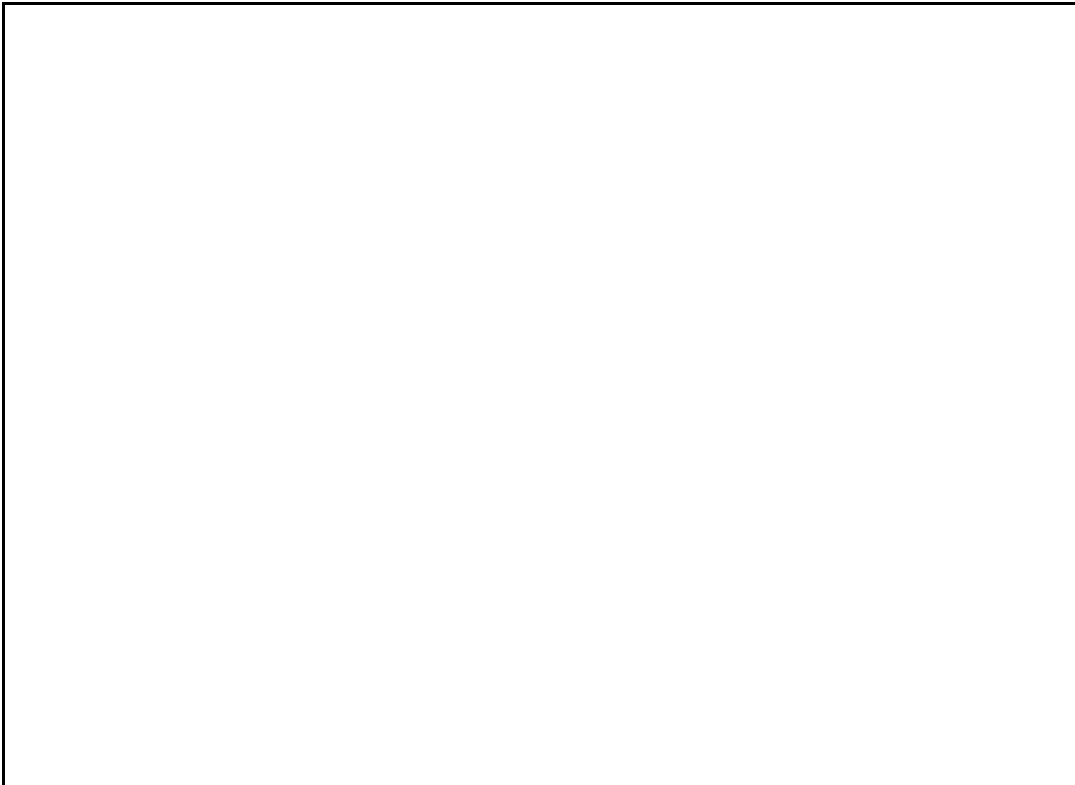
Material Name	o-Chloronitrobenzene				
Common synonyms	1-Chloro-2-nitrobenzene				
UN Number	1578	CAS Number	88-73-3	IMDG CODE	Class6.1/P6106
IMO Pollution Category	B				
Formula	C6H4Cl(NO2)	Molecular Weight	157.56	Flammable limits in Air (%)	
Appearance	yellow			Solubility in Water	insoluble
Specific Gravity	1.368	Vapor Specific Gravity	5.5	Boiling Point()	244.5
Freezing Point ()	33	Flash Point ()	123	Ignition Point ()	
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	yes	
TLV, Toxicity by Ingestion	L D50 288mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. Blood is affected and have an attack of methemoglobinemia. There is danger of skin absorption.</p> <p>Environmental influence : It is hard to biodegrade. Accumulation nature is in an aquatic life living thing. It is very detrimental to an aquatic life living thing.</p> <p>Danger : It is an inflammability. The explosion limit is not known. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO₂, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO₂, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



Limits of Detective Tube

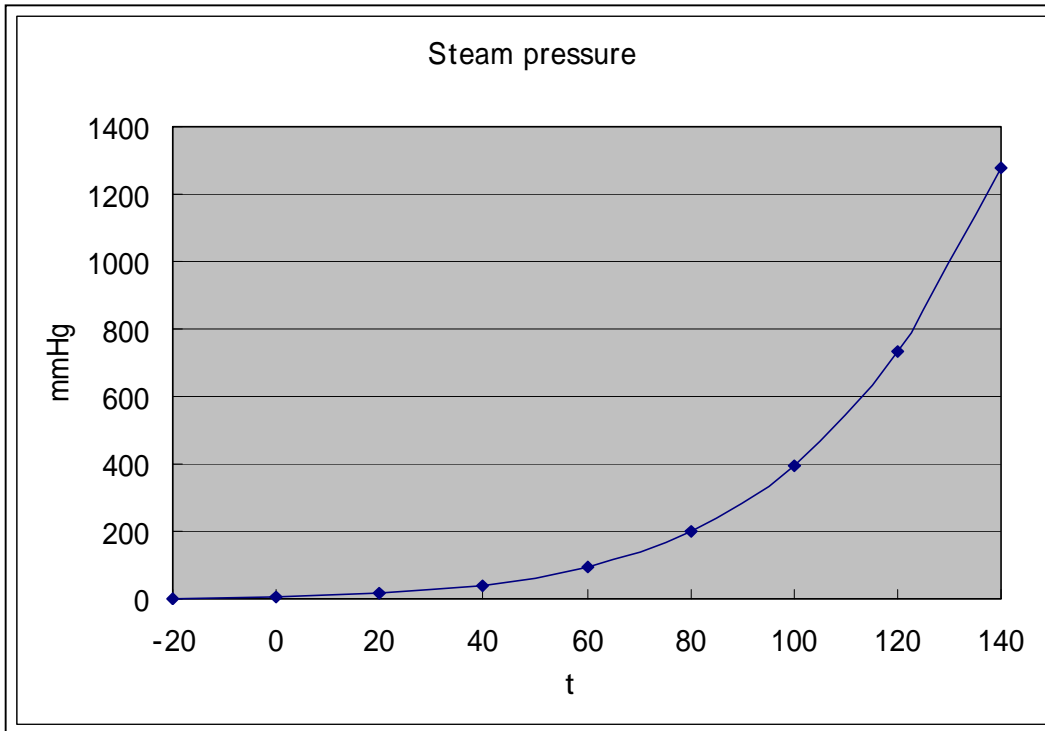


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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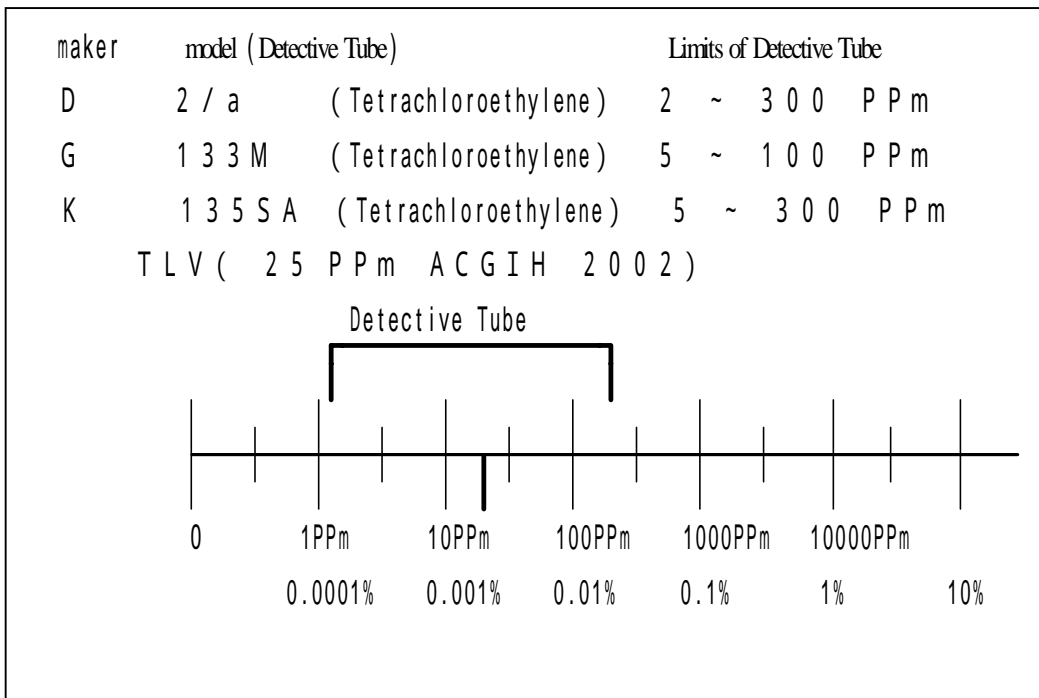
Material Name	Tetrachloroethylene				
Common synonyms	Perchloroethylene, Ethylene tetrachloride,				
UN Number	1897	CAS Number	127-18-4	IMDG CODE	Class6.1/P6264
IMO Pollution Category	B				
Formula	C2Cl4	Molecular Weight	165.8	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	1.60682	Vapor Specific Gravity	5.8	Boiling Point()	121.2
Freezing Point ()	-22.18	Flash Point ()	123	Ignition Point ()	
Steam Pressure	14.3mmHg (20)				
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	ACGIH: 25ppmTWA 100ppmSTEL A3 LD50 8100mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action.</p> <p>Environmental influence : There is not biodegradation nature. The accumulation nature to an aquatic life living thing is medium. It is detrimental to an aquatic life living thing.</p> <p>Danger : It is nonflammability. Vapor is heavier than air. Heating and combustion decompose and poisonous phosgen is produced. Aluminum is corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

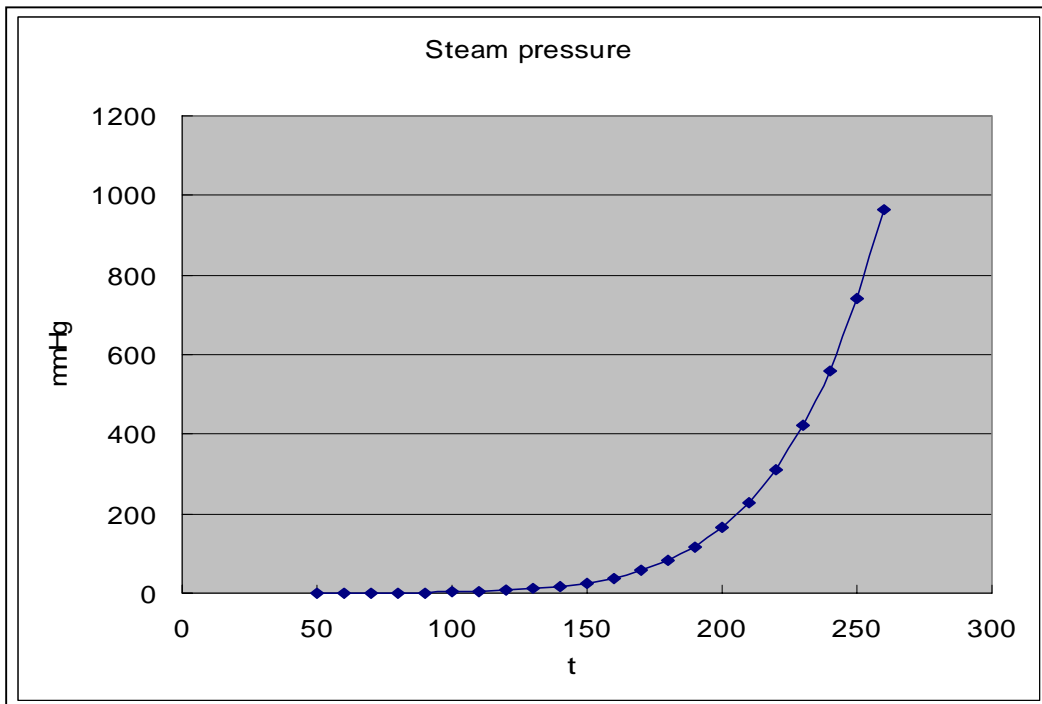


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

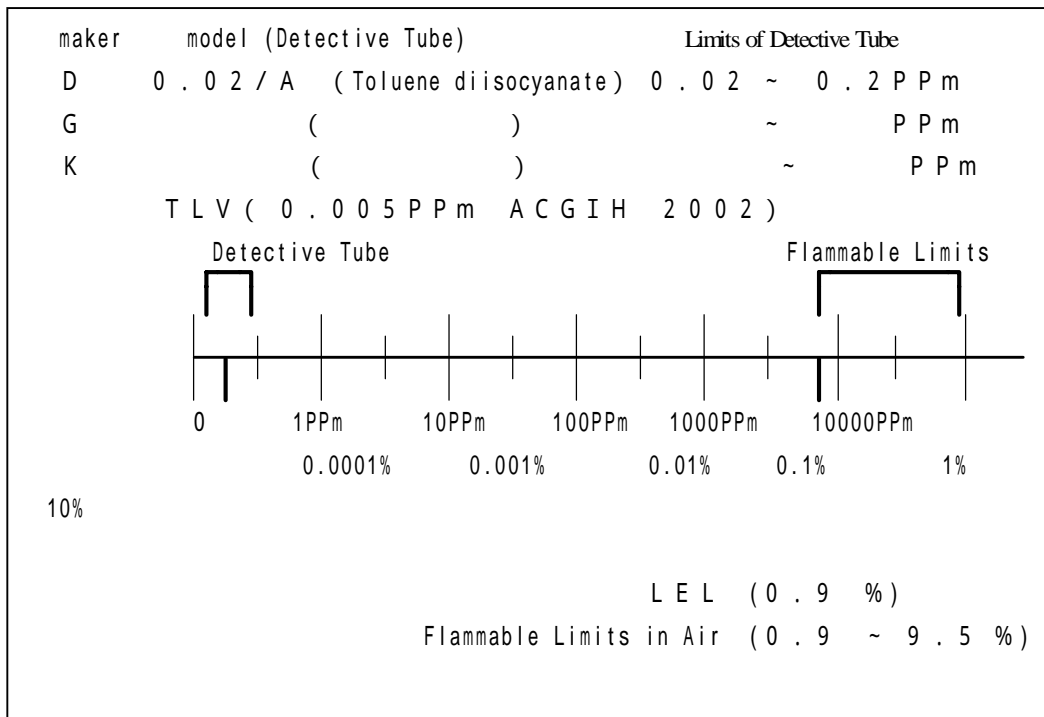
Material Name	Toluene diisocyanate				
Common synonyms	Diisocyanatotoluene, Tolyene diisocyanate, T.D.I				
UN Number	2078	CAS Number	584-84-9	IMDG CODE	Class6.1/P6269
IMO Pollution Category	C				
Formula	C9H6O2N2	Molecurar Weight	174.2	Flammable limits in Air (%)	0 . 9 ~ 9 . 5
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	1.2244	Vapor Specific Gravity	6	Boiling Point()	251
Freezing Point ()	19.5	Flash Point ()	132	Ignition Point ()	
Steam Pressure	0.01mmHg (2 0)				
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 0.005ppm L D50 6170mg/kg (oral rat)		ACGIH : 0.005ppmTWA 0.02ppmSTEL A4		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance Noxiousness : Irritating to skin, eyes and throat. Condition like asthma is caused. Condition may appear behind time. Even if it exceeds permission concentration, it does not feel as a bad smell. Below in permission concentration, condition may occur. Environmental influence : Biodegradation nature is low. The accumulation nature to an aquatic life living thing is low It is very detrimental to an aquatic life living thing. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. Polymerization is carried out reacting with water etc. and generating carbon dioxide.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



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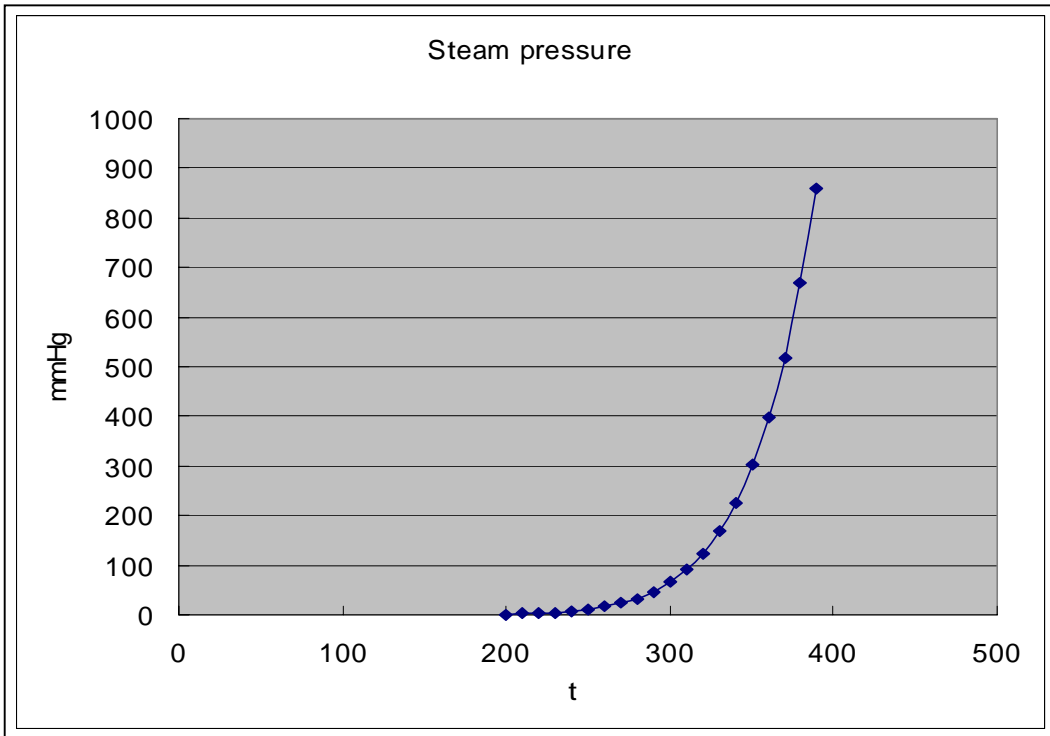


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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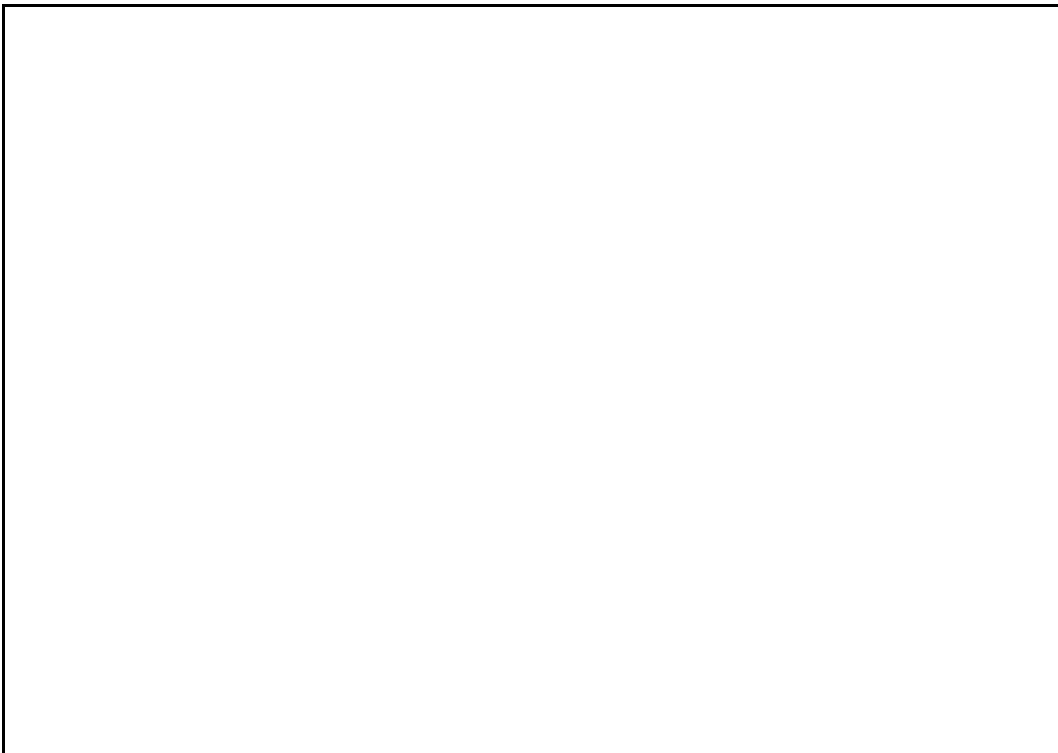
Material Name	Dioctyl phthalate				
Common synonyms	Di-phthalate, Di-sec-octyl phthalate				
UN Number		CAS Number	117-81-7	IMDG CODE	
IMO Pollution Category					
Formula	C24H38O4	Molecular Weight	390.56	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.9861	Vapor Specific Gravity	13.6	Boiling Point()	385
Freezing Point ()	-55	Flash Point ()	218	Ignition Point ()	410
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 5mg/m ³ ACGIH : 5mg/m ³ TWA A3 L D50 31000mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : There is almost no volatility. If not exposed to high temperature, steam detrimental to people's health is not generated.</p> <p>Environmental influence : Biodegradation nature is low. The accumulation nature to an aquatic life living thing is high.</p> <p>Danger : It is an inflammability. It is a stable substance and there is usually no danger of ignition explosion. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p>
<p>The measure at the time of leak on the sea</p>	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. A solidifying agent is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



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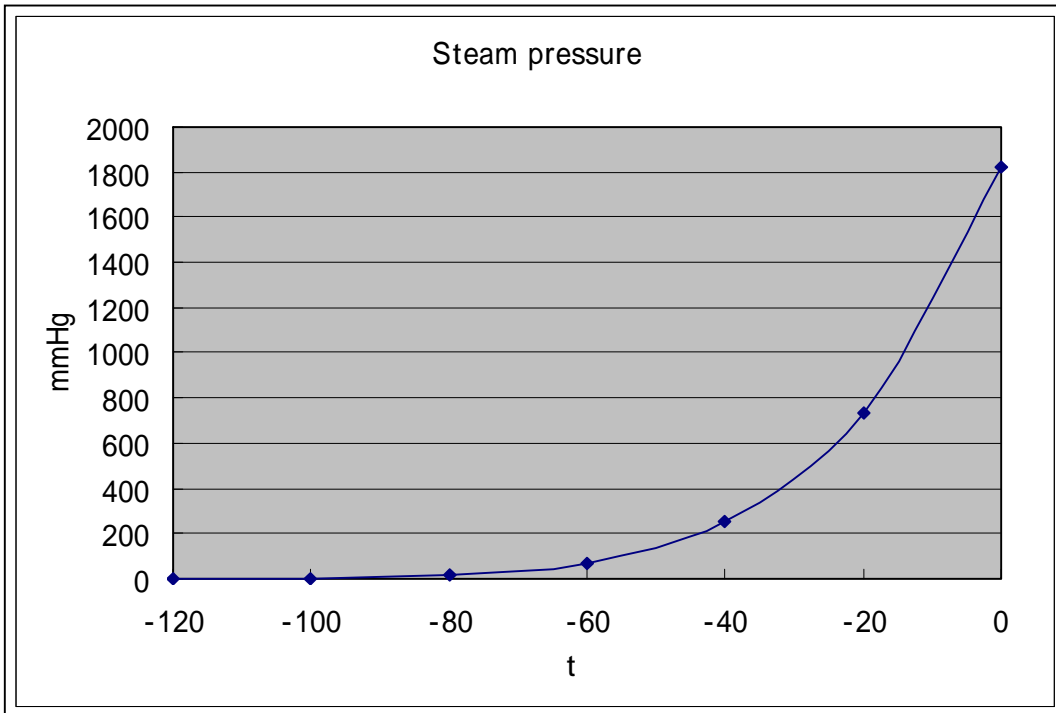


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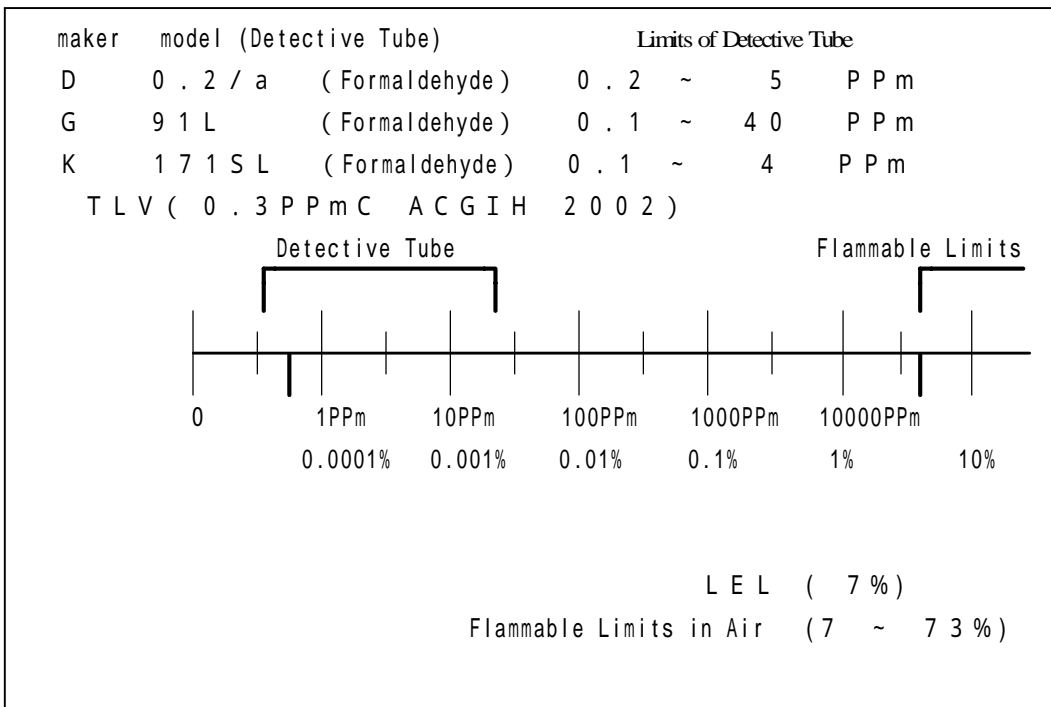
Material Name	Formaldehyde solution (45% or less)				
Common synonyms	Formalin, Formic aldehyde, Methanal				
UN Number	1198	CAS Number	50-00-0	IMDG CODE	class3.3/P3347
IMO Pollution Category	C				
Formula	HCHO	Molecular Weight	30	Flammable limits in Air (%)	7.0 ~ 73.0
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.085	Vapor Specific Gravity	1	Boiling Point()	
Freezing Point ()	-92	Flash Point ()	49	Ignition Point ()	420
Steam Pressure					
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 0.5ppm L D50 800mg/kg (oral rat) ACGIH : 0.3ppmC A2				
Hazard and Noxiousness	<p>Classification : Corrosion substance. Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. Condition may appear behind time. Carcinogenic [to a man] is suspected.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low Toxicity is strong to an aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



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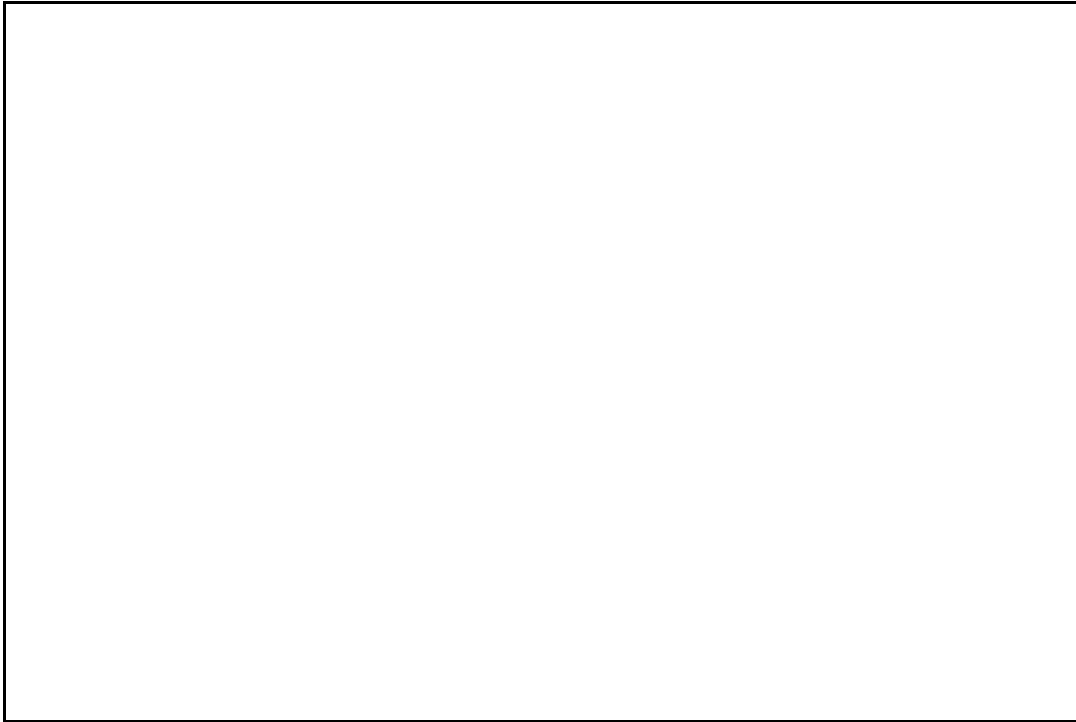


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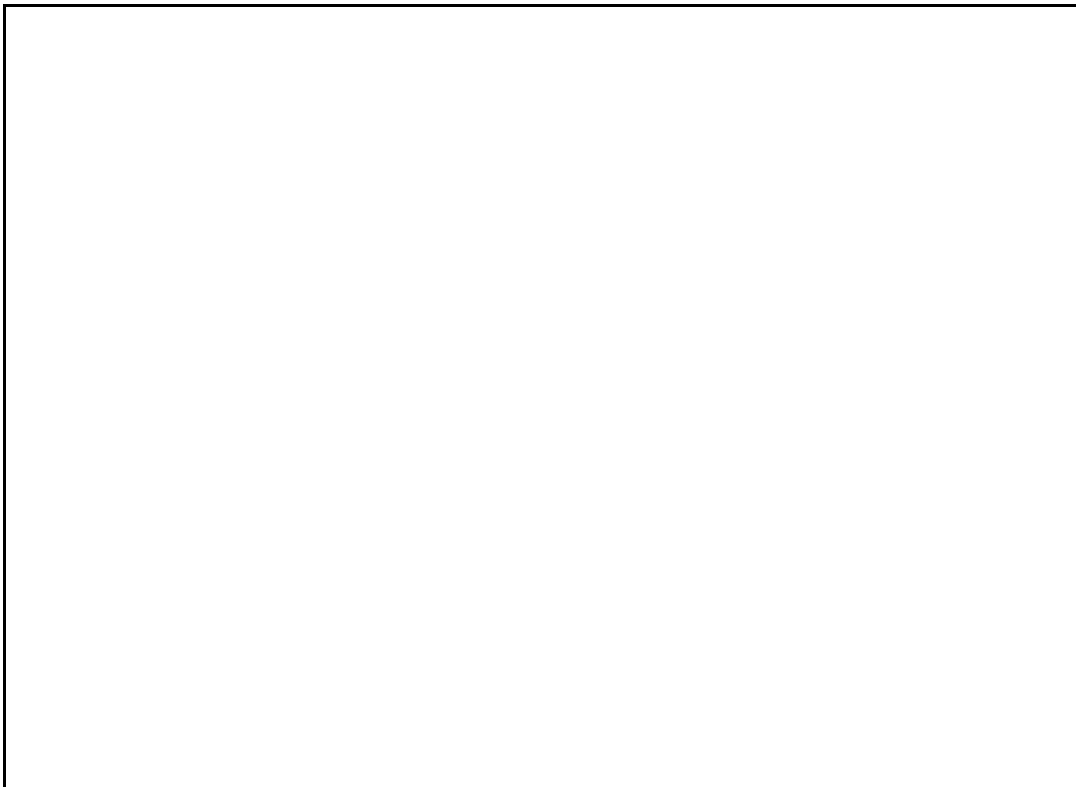
Material Name	Xylenol				
Common synonyms	Dimethylphenol, Hydroxydimethylbenzene				
UN Number	2261	CAS Number	1300-71-6	IMDG CODE	class6.1/P6280
IMO Pollution Category	B				
Formula	C8H10O	Molecular Weight	122.17	Flammable limits in Air (%)	1.4 ~
Appearance	white			Solubility in Water	insoluble
Specific Gravity	0.9680 ~ 1.036	Vapor Specific Gravity	4.2	Boiling Point()	203
Freezing Point ()	26 ~ 76	Flash Point ()	94	Ignition Point ()	599
Steam Pressure					
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : L D50 296mg/kg (oral rat)		ACGIH :		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance Noxiousness : There are stimulative and corrosive to the skin, eyes and the throat. It is easily absorbed from membrane and lungs. Condition may appear behind time. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is medium. Toxicity is strong to an aquatic life living thing. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

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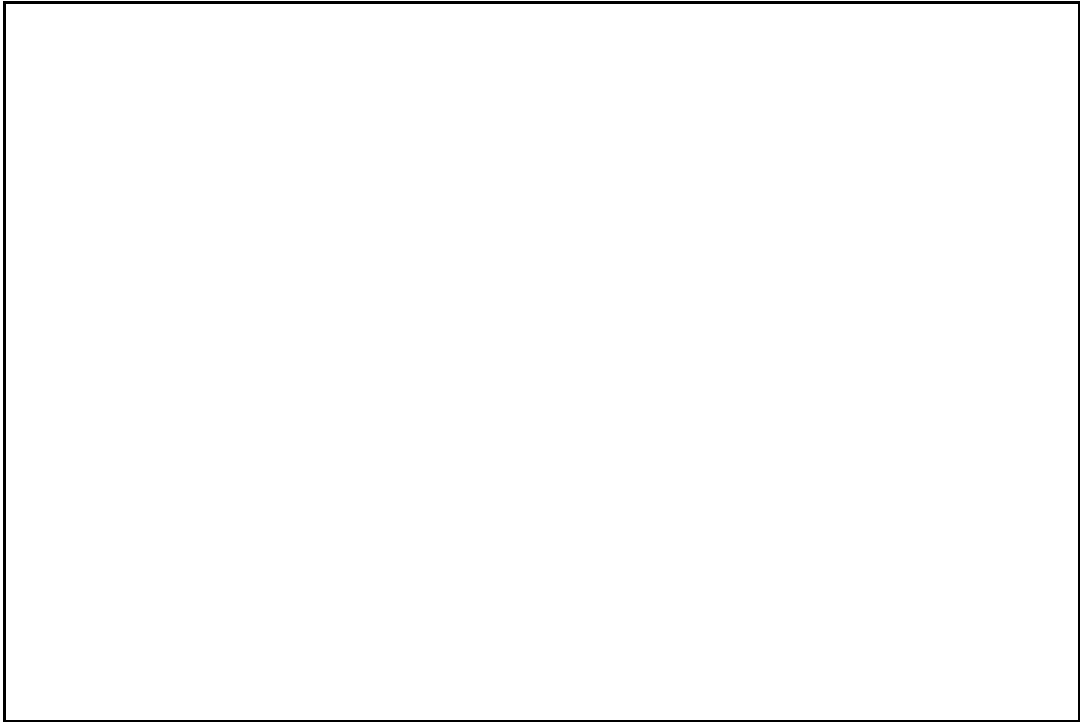


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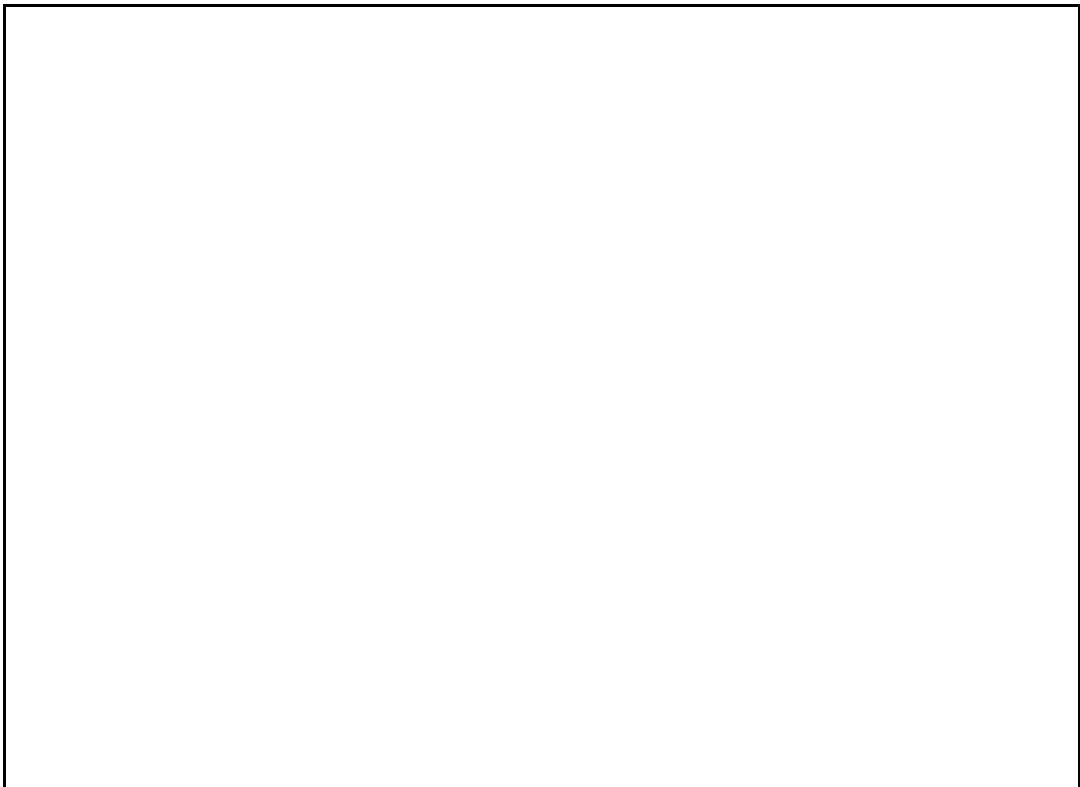
Material Name	Alkylbenzenesulfonic acid				
Common synonyms					
UN Number	2584 2586	CAS Number	27176-87-0	IMDG CODE	class8/P8105
IMO Pollution Category	C				
Formula	C18H30S	Molecular Weight	326.5	Flammable limits in Air (%)	
Appearance	brown			Solubility in Water	easily soluble
Specific Gravity	1	Vapor Specific Gravity		Boiling Point()	300
Freezing Point ()		Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan: L D50 650mg/kg (oral rat)		ACGIH:		
Hazard and Noxiousness	<p>Classification:</p> <p>Noxiousness: Most detrimental nature cannot be found.</p> <p>Environmental influence: There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger: It is nonflammability.</p>				
First Aid	<p>If inhaled Since there is no volatility, there is no danger of inhalation.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

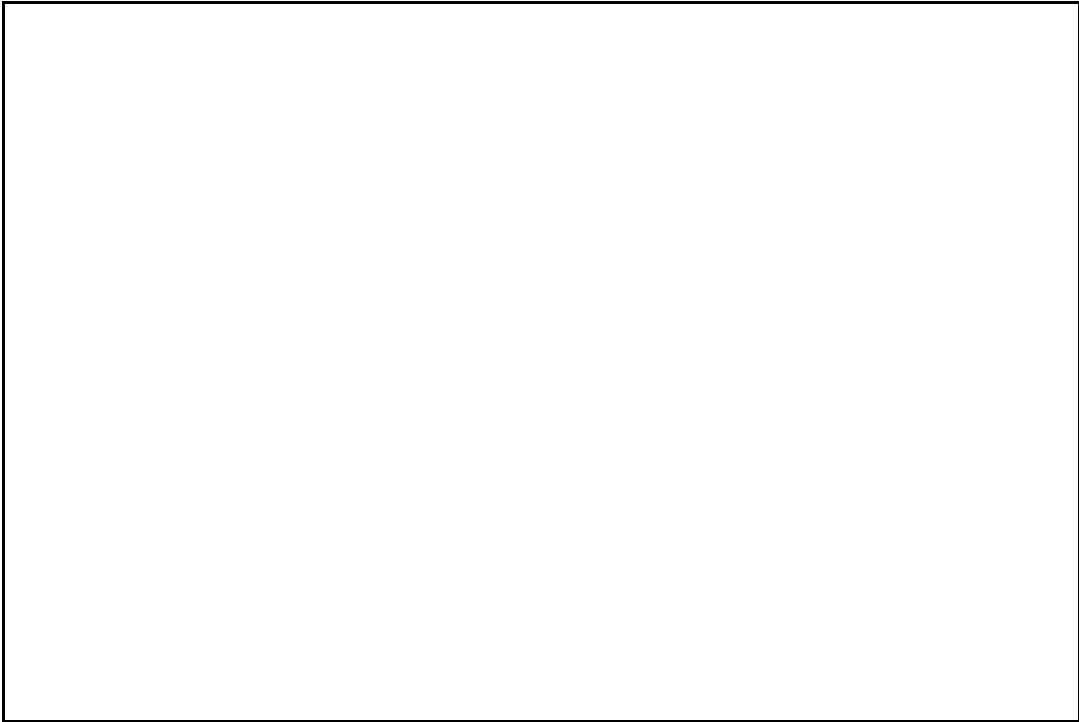


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

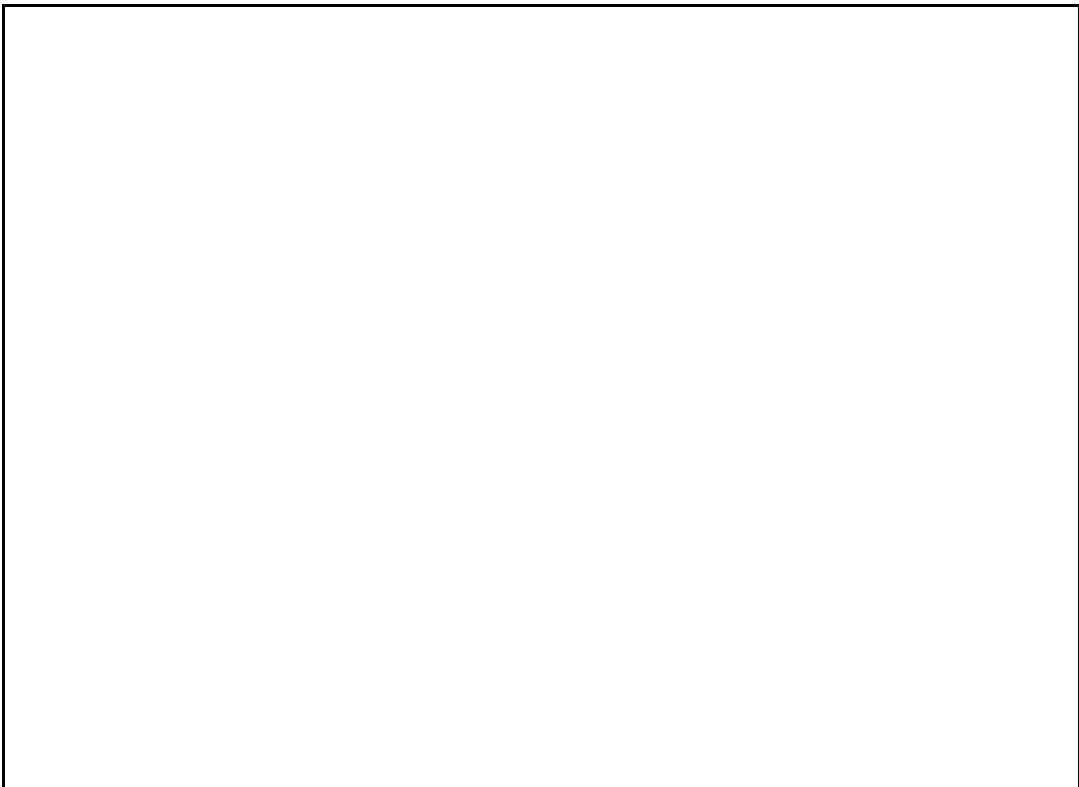
Material Name	Hexamethylenediamine				
Common synonyms	1,6-Diaminohexane, Nylon-diamine				
UN Number	1783	CAS Number	124-09-4	IMDG CODE	class8/P8180
IMO Pollution Category	C				
Formula	NH ₂ (CH ₂) ₆ NH ₂	Molecular Weight	116.21	Flammable limits in Air (%)	0.9 ~ 7.6
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	0.93	Vapor Specific Gravity	4	Boiling Point()	205
Freezing Point ()	45	Flash Point ()	85	Ignition Point ()	305
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : ACGIH : 0.5ppmTWA L D50 750mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Corrosion substance Noxiousness : There are stimulative and corrosive to the skin, eyes and throat. Condition may appear behind time. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

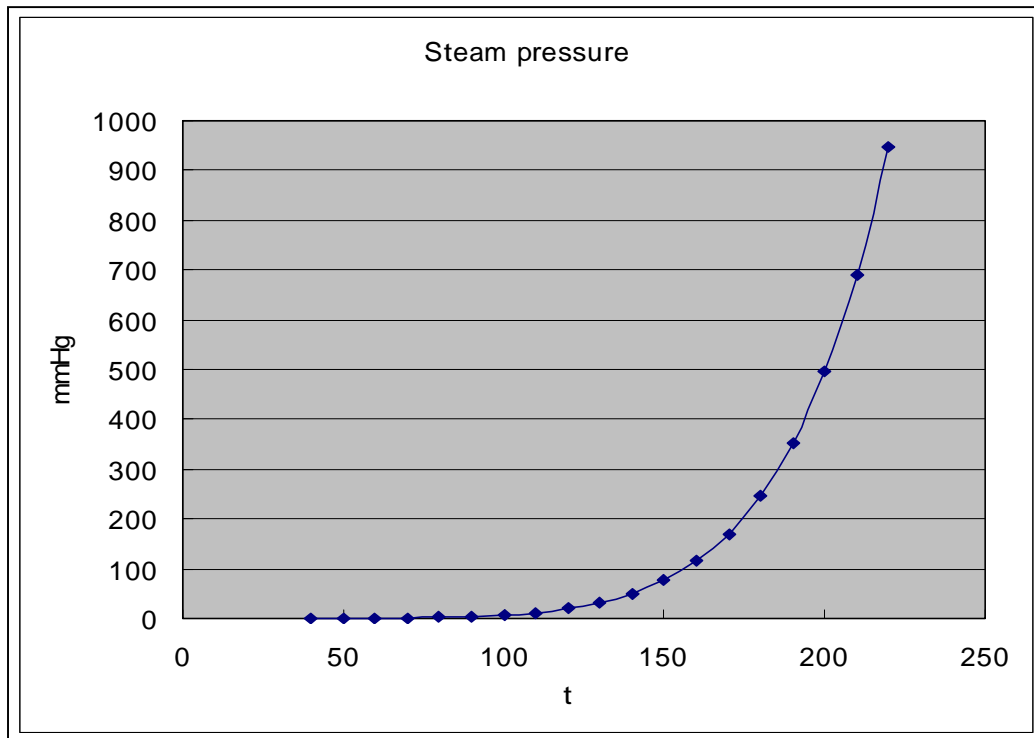


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Phosphoric acid				
Common synonyms	Orthophosphoric acid				
UN Number	1805	CAS Number	7664-38-2	IMDG CODE	class8/P8204
IMO Pollution Category	D				
Formula	H3PO4	Molecular Weight	98	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.8741	Vapor Specific Gravity		Boiling Point()	213
Freezing Point ()	42.35	Flash Point ()		Ignition Point ()	
Steam Pressure	0.03mmHg (20)				
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 1mg/m3 L D50 1530mg/kg (oral rat)		ACGIH : 1mg/m3TWA 3mg/m3STEL		
Hazard and Noxiousness	<p>Classification : Corrosion substance Noxiousness : Usually, detrimental steam is not produced. Contact corrodes the skin, eyes and the throat.. Condition may appear behind time. Environmental influence : It is detrimental to an aquatic life living thing. Danger : It is nonflammability. Heat will be generated if water is contacted. Metal is invaded and hydrogen gas with explosion danger is generated.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water. It is cautious of generating of the hydrogen gas by contact to metal in especially a blockade place.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

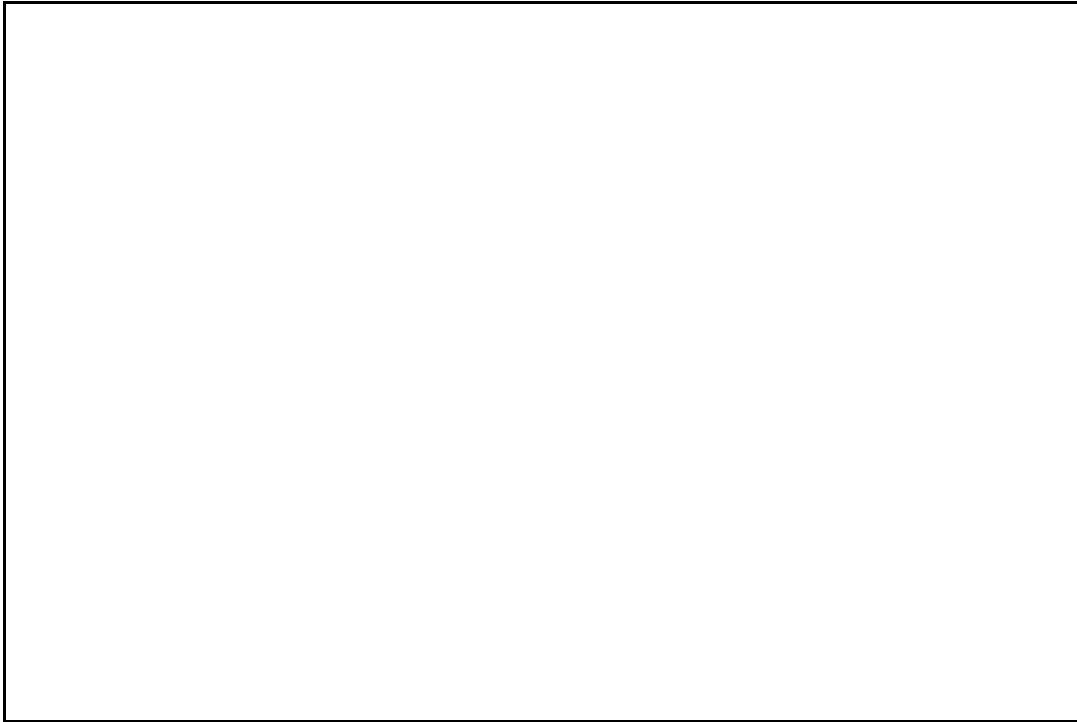


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

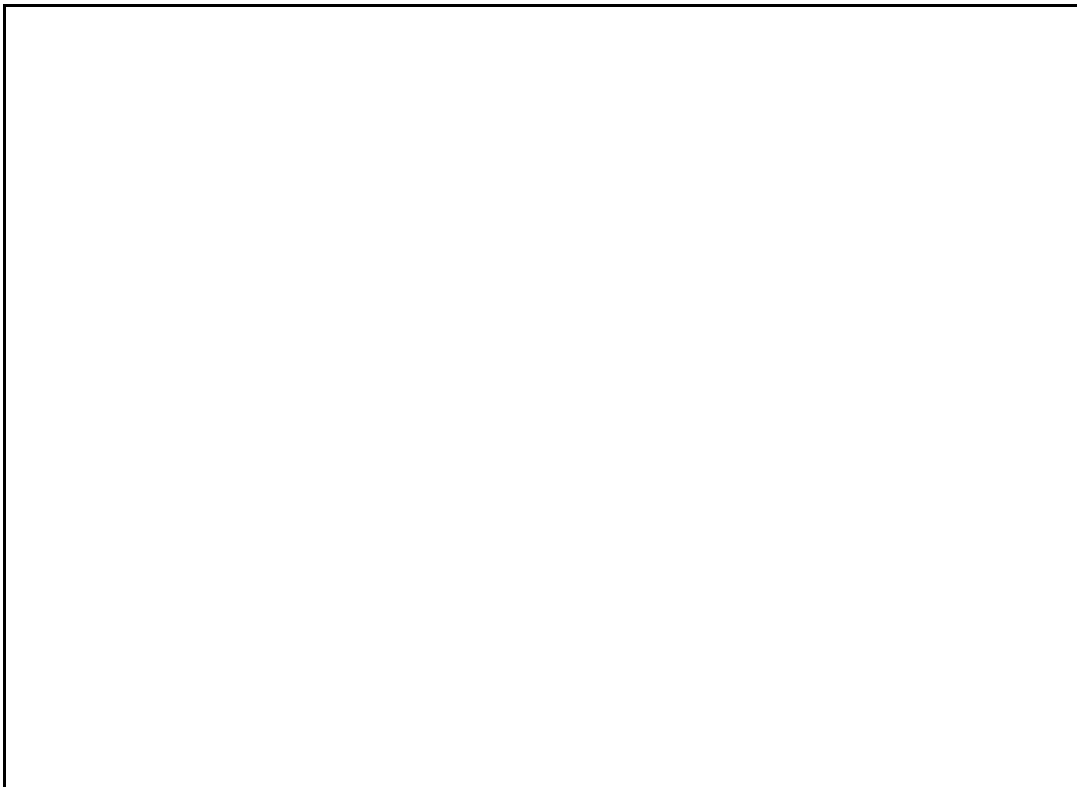
Material Name	Sorbitol				
Common synonyms	Sorbit, Sorbol				
UN Number		CAS Number	50-70-4	IMDG CODE	
IMO Pollution Category					
Formula	C5H14O6	Molecular Weight	182.17	Flammable limits in Air (%)	
Appearance	white			Solubility in Water	easily soluble
Specific Gravity	1.47	Vapor Specific Gravity		Boiling Point()	
Freezing Point ()	110	Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : ACGIH : L D50 15900mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Most detrimental nature cannot be found.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability.</p>				
First Aid	<p>If inhaled Most detrimental nature cannot be found.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

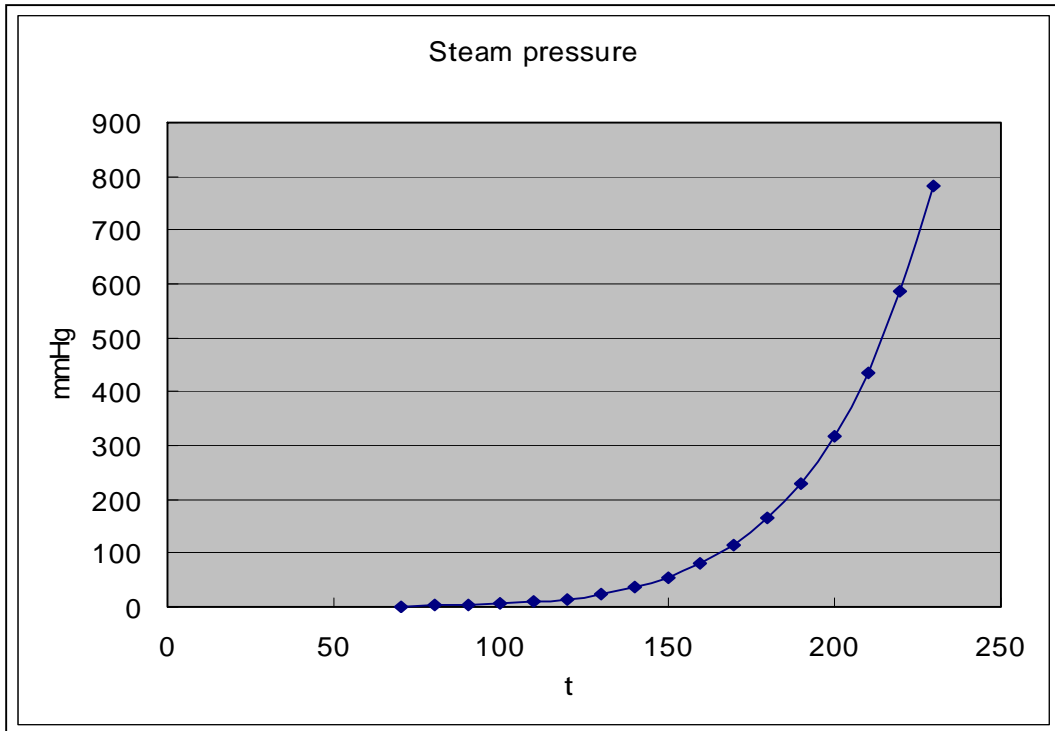


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Decanol				
Common synonyms					
UN Number	3082	CAS Number	112-30-1	IMDG CODE	Class9/P9028
IMO Pollution Category	B				
Formula		Molecular Weight		Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity		Vapor Specific Gravity		Boiling Point()	
Freezing Point ()		Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan: LD50 28000mg/kg (oral rat)		ACGIH:		
Hazard and Noxiousness	<p>Classification:</p> <p>Noxiousness: There is almost no volatility, and if not exposed to high temperature, steam detrimental to people's health is not generated.</p> <p>Environmental influence: There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respires artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p>
<p>The measure at the time of leak on the sea</p>	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



Limits of Detective Tube

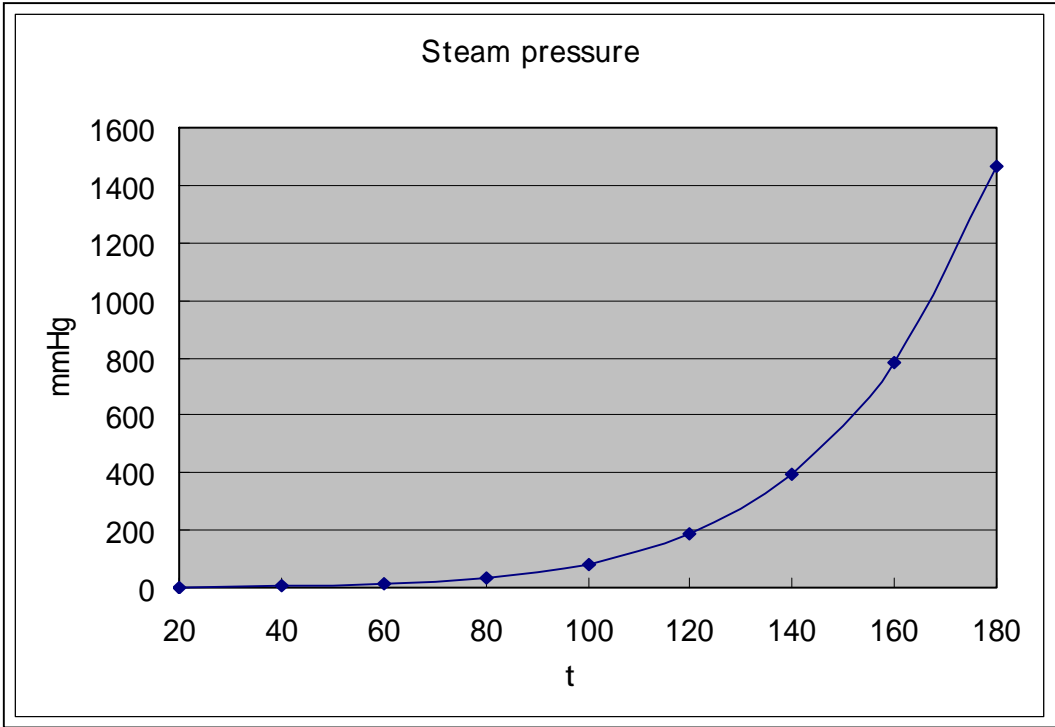


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

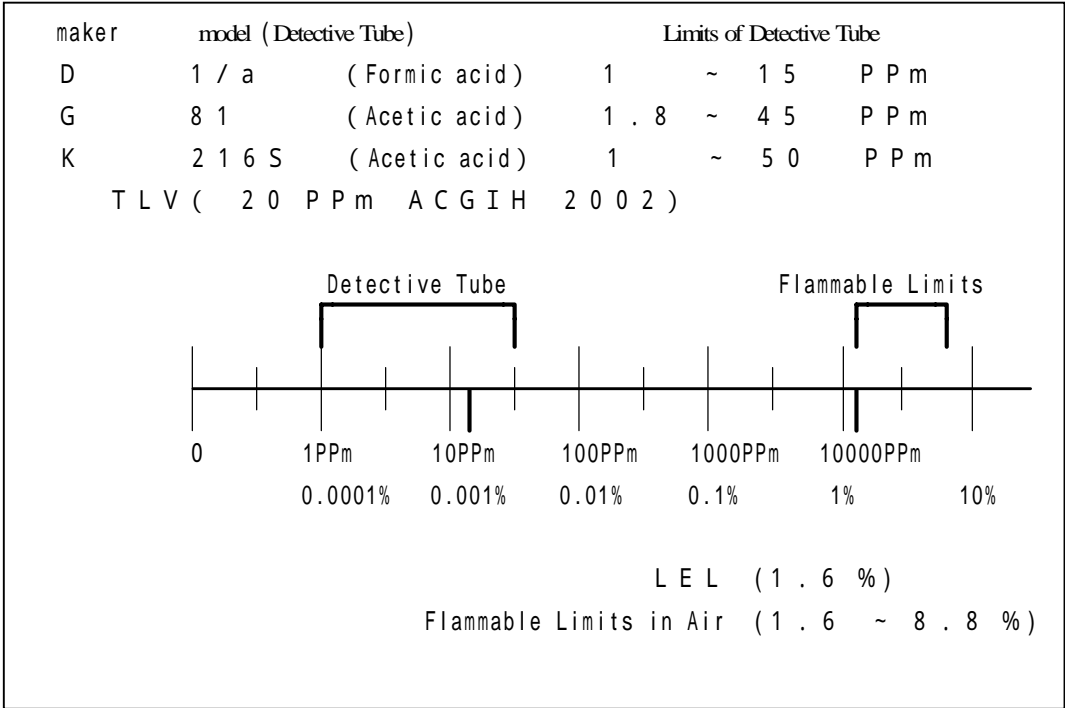
Material Name	Methacrylic acid				
Common synonyms	Methylacrylic acid				
UN Number	2531	CAS Number	79-41-4	IMDG CODE	Class8/P8192
IMO Pollution Category	D				
Formula	C4H6O2	Molecular Weight	86	Flammable limits in Air (%)	1.6 ~ 8.8
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.0128	Vapor Specific Gravity	3	Boiling Point()	161
Freezing Point ()	16	Flash Point ()	77.2	Ignition Point ()	
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : ACGIH : 20ppmTWA L D50 1000mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Acute toxicity substance. Corrosion substance.</p> <p>Noxiousness : There is stimulative to the skin, eyes and the throat. Condition may appear behind time.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits Detective Tube

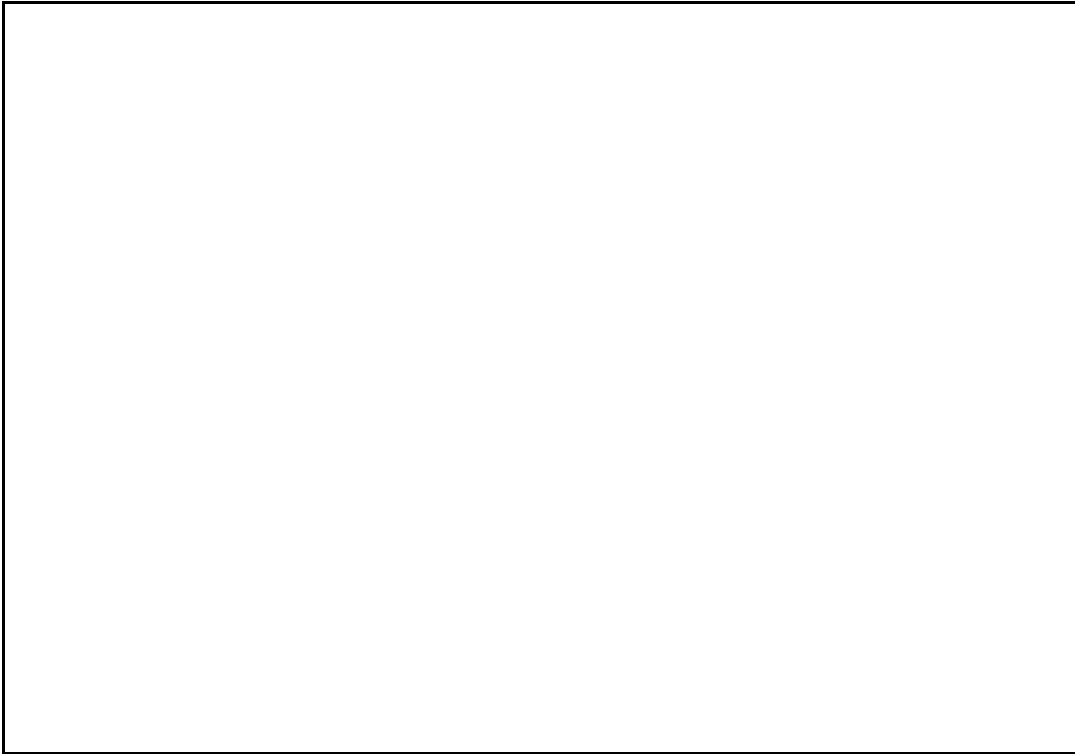


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

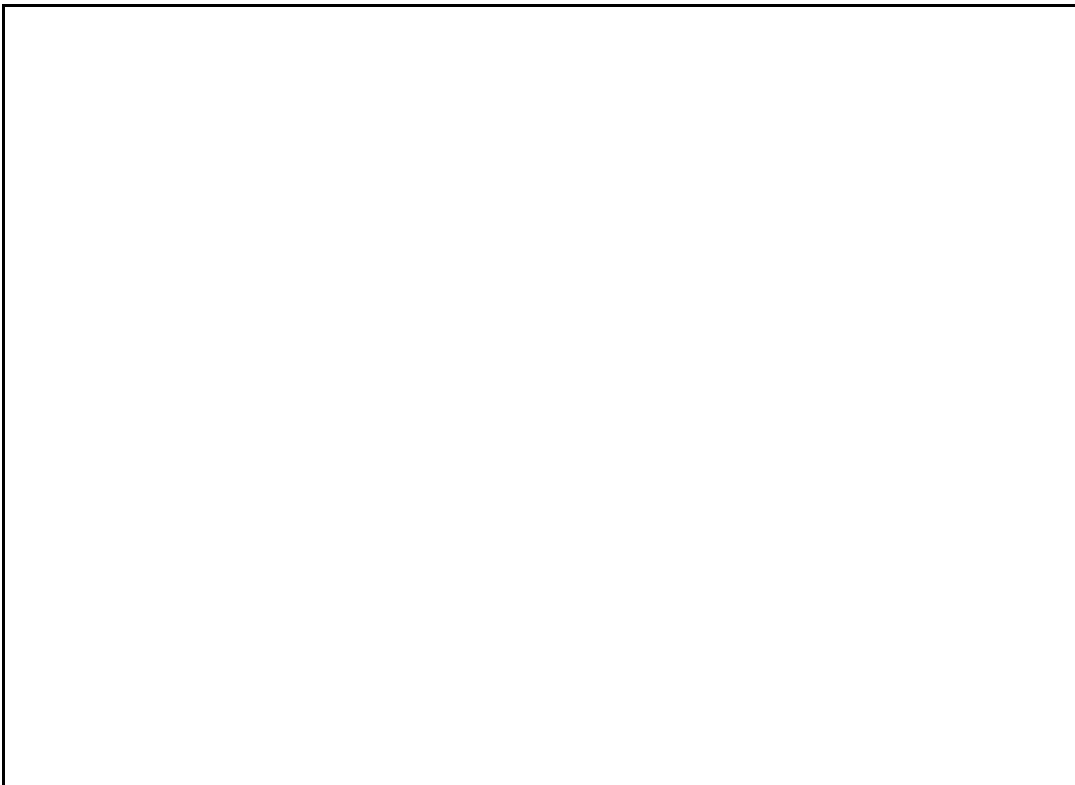
Material Name	Potassium hydroxide				
Common synonyms	Caustic potash, Potassium hydrate				
UN Number	1814	CAS Number	1310-58-3	IMDG CODE	Class8/P8214
IMO Pollution Category	C				
Formula	KOH	Molecular Weight	56.1	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	2.05	Vapor Specific Gravity		Boiling Point()	1320
Freezing Point ()	360.4	Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 2mg/m ³ L D50 3015mg/kg (oral rabbit)		ACGIH : 2mg/m ³ C		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance. Corrosion substance.</p> <p>Noxiousness : Irritating to the skin, eyes and the throat. There is corrosive [strong] to a living body. Condition may appear behind time.</p> <p>Environmental influence : It is detrimental to an aquatic life living thing.</p> <p>Danger : It is nonflammability. It will generate heat, if moisture and water are contacted. A plastic and rubber are corroded. Strong alkalinity is shown. Zinc and aluminum are invaded and hydrogen gas is generated.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water. It is cautious of generating of the hydrogen gas by contact with zinc, aluminum, etc. in a blockade place.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

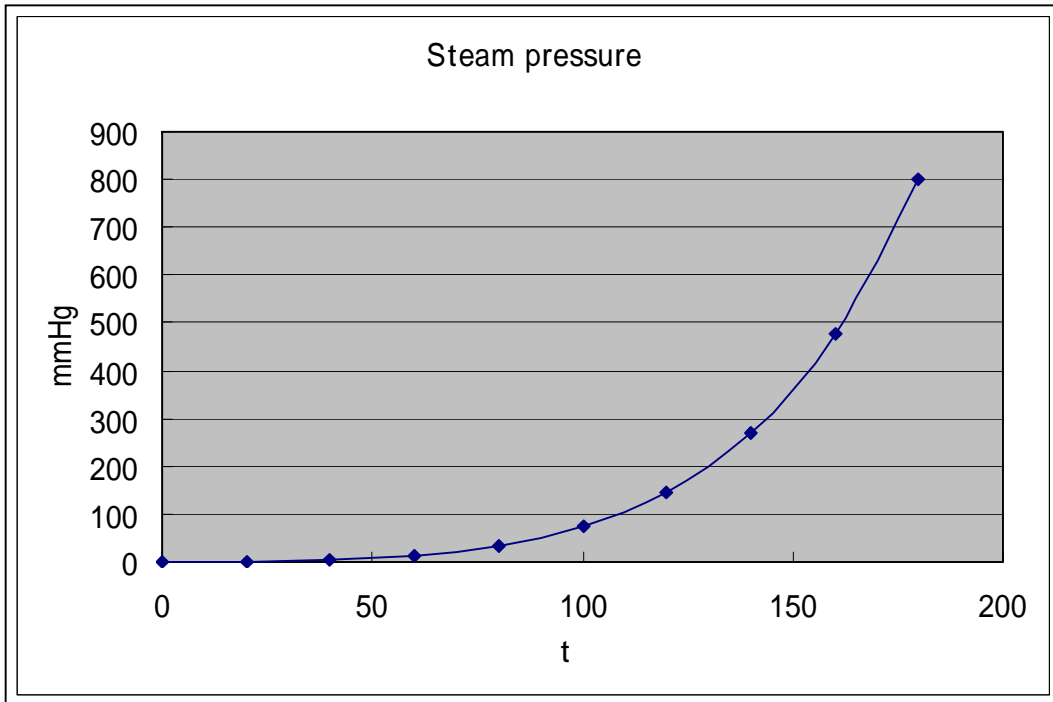


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

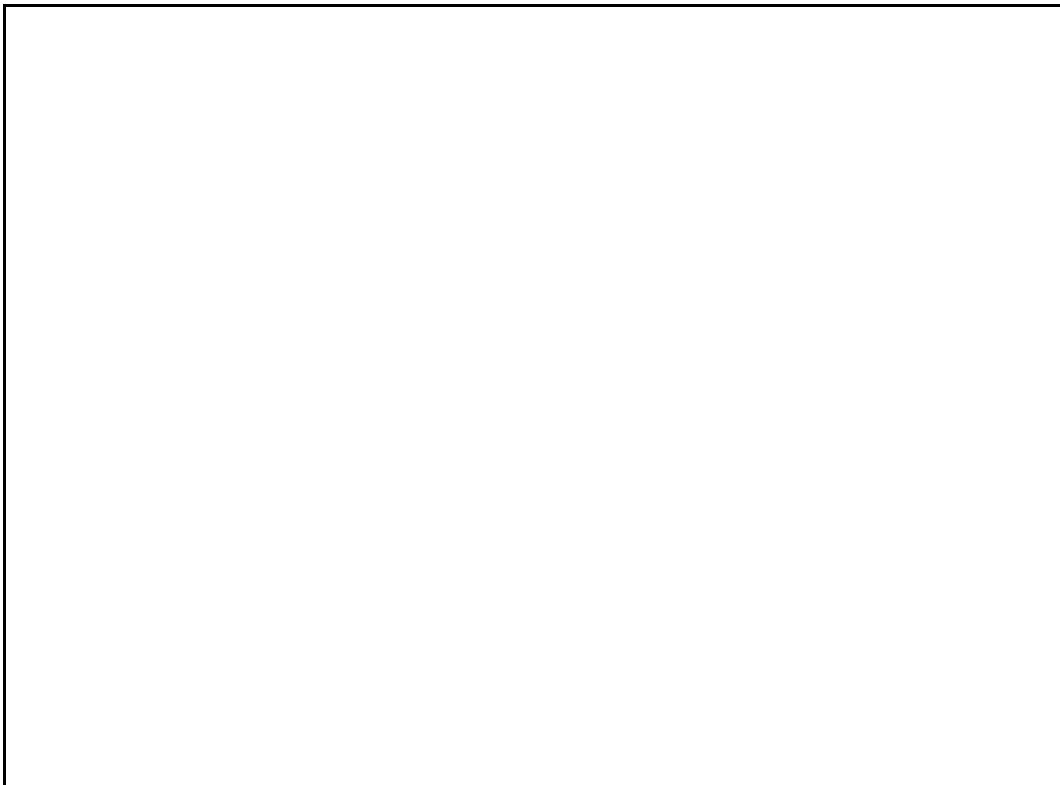
Material Name	Dipentene				
Common synonyms	Limonene, Cinene				
UN Number	2052	CAS Number	5989-54-8	IMDG CODE	Class3.3/P3326
IMO Pollution Category	C				
Formula	C10H16	Molecular Weight	136.24	Flammable limits in Air (%)	0.75 ~ 6.1
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.8405	Vapor Specific Gravity	4.7	Boiling Point()	178
Freezing Point ()	-95.5	Flash Point ()	45	Ignition Point ()	237
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : L D50 5000mg/kg (oral rat)		ACGIH :		
Hazard and Noxiousness	<p>Classification : Flammable liquids Noxiousness : In normal temperature, it is hard to reach detrimental concentration. Irritating to skin, eyes and throat. Toxicity is weak. Environmental influence : There is not biodegradation nature. The accumulation nature to an aquatic life living thing is high. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

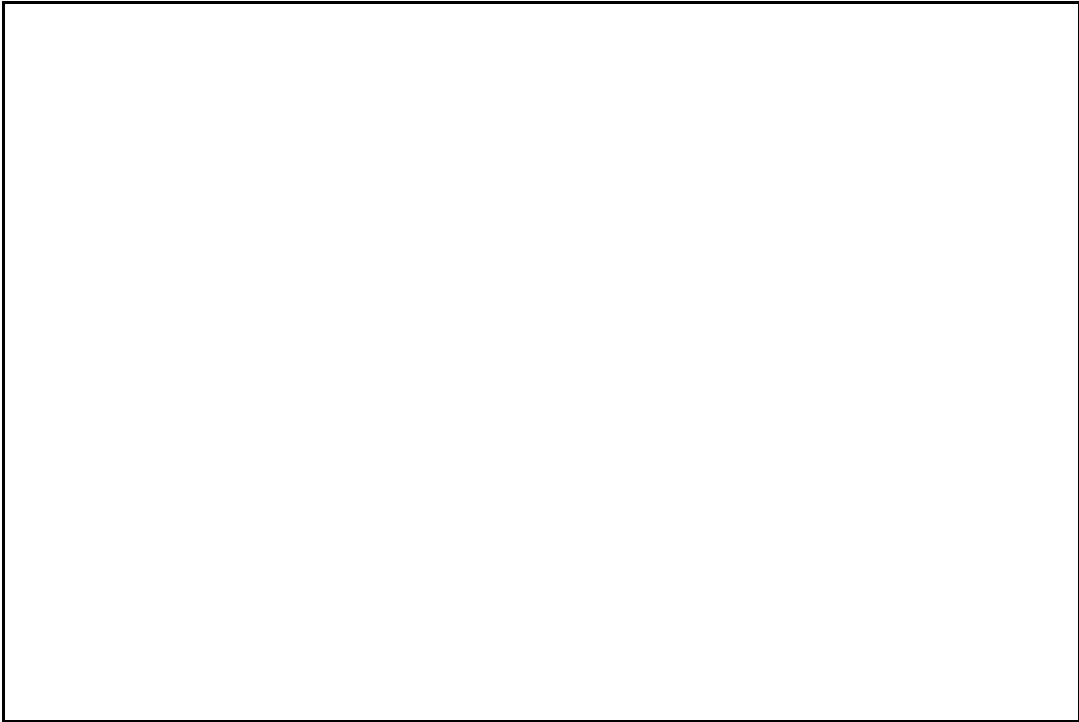


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

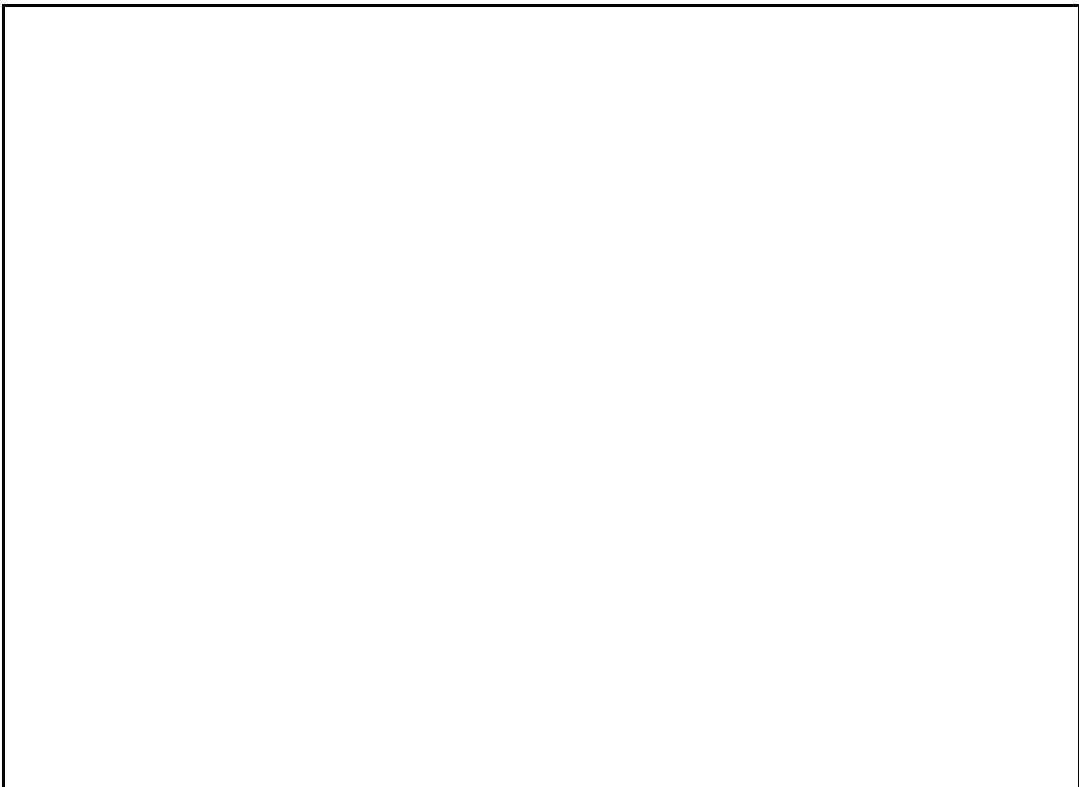
Material Name	Sodium hydrogen sulfide				
Common synonyms	Sodium bisulfide, Sodium hydrosulphide,				
UN Number	2949	CAS Number	16721-80-5	IMDG CODE	Class8/P8225
IMO Pollution Category	B				
Formula	NaHS	Molecular Weight	56.1	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.79	Vapor Specific Gravity		Boiling Point()	
Freezing Point ()	350	Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : LD50 30mg/kg (abdominal cavity rat) ACGIH :				
Hazard and Noxiousness	<p>Classification : Corrosion substance. Noxiousness : Little hydrogen sulfide gas has occurred. There is corrosive to a living body. Condition may appear behind time. Environmental influence : It is detrimental to an aquatic life living thing. Danger : It is nonflammability. Since hydrogen sulfide gas has the danger of ignition and explosion, a sealing place takes cautions. It melts into water and weak alkalinity is shown.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water. It is cautious of generating of the hydrogen gas by contact with zinc, aluminum, etc. in a blockade place.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

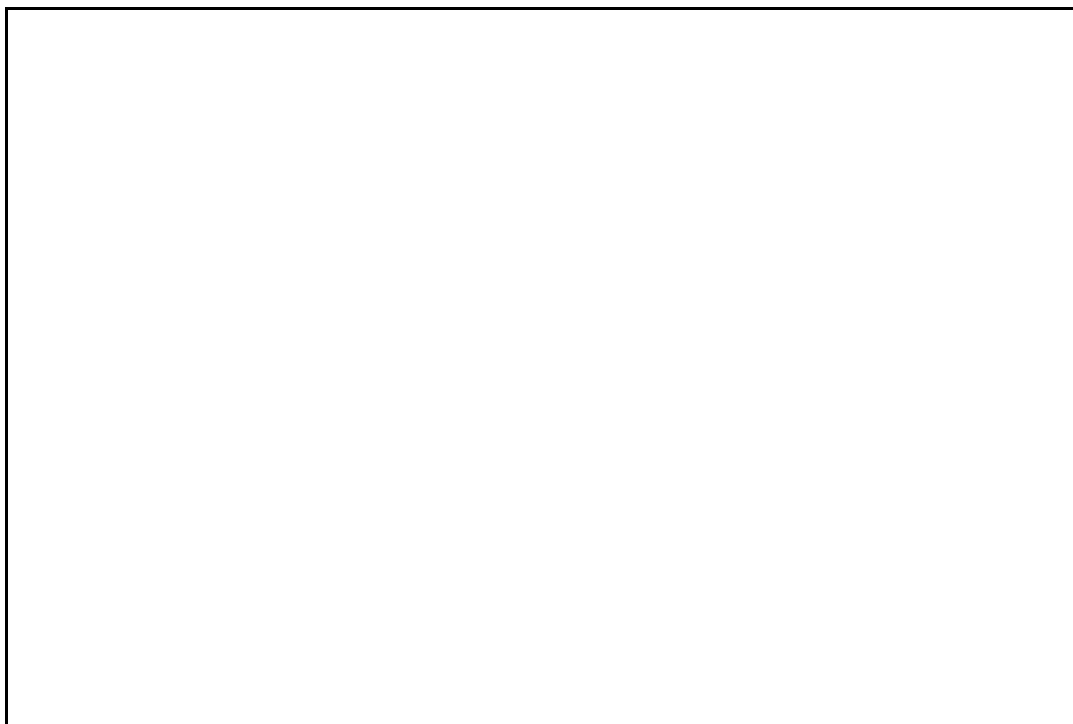


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Diphenylmethane-4,4-diisocyanate				
Common synonyms	MDI, Methylene bis				
UN Number	2489	CAS Number	101-68-8	IMDG CODE	Class6.1/P6140
IMO Pollution Category	B				
Formula	C15H10O2N2	Molecular Weight	250.26	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	1.19	Vapor Specific Gravity		Boiling Point()	194 ~ 199
Freezing Point ()	37.2	Flash Point ()	202	Ignition Point ()	232
Steam Pressure					
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 0.05mg/m3 LD50		ACGIH : 0.005ppmTWA		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance.</p> <p>Noxiousness : Irritating to the skin, eyes and the throat. Condition like asthma is caused. Condition may appear behind time. A bad smell is not felt even if it exceeds permission concentration. Below in permission concentration, condition may occur.</p> <p>Environmental influence : Since it decomposes underwater, the accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability. Polymerization is carried out reacting gradually with water etc. and generating carbon dioxide.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO₂, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO₂, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



Limits of Detective Tube

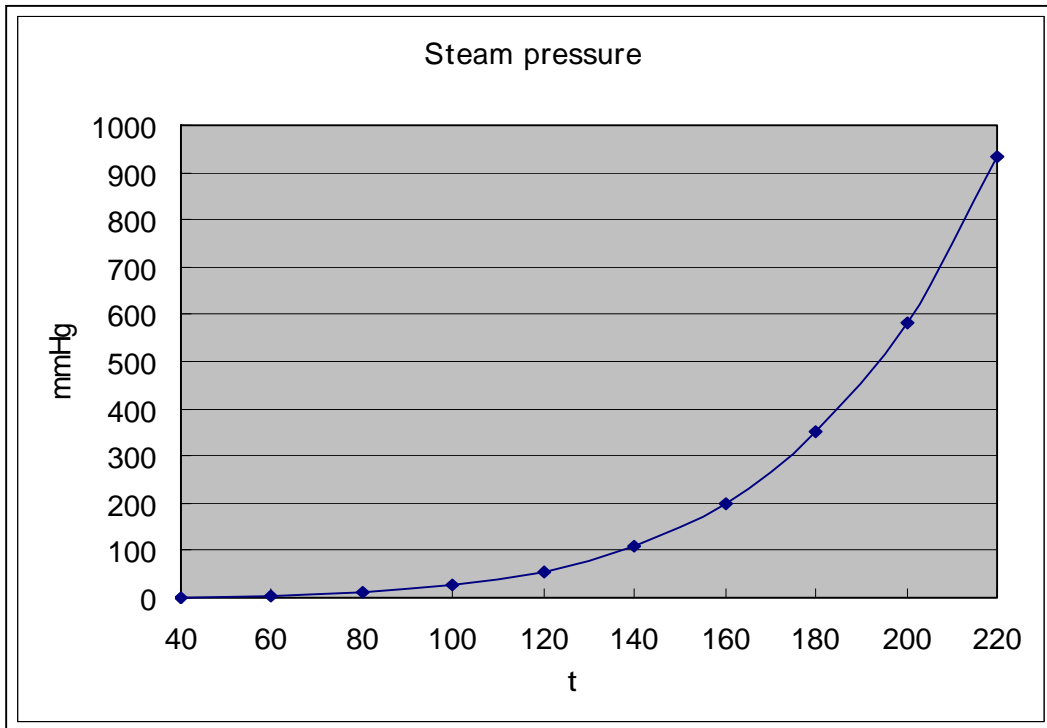


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

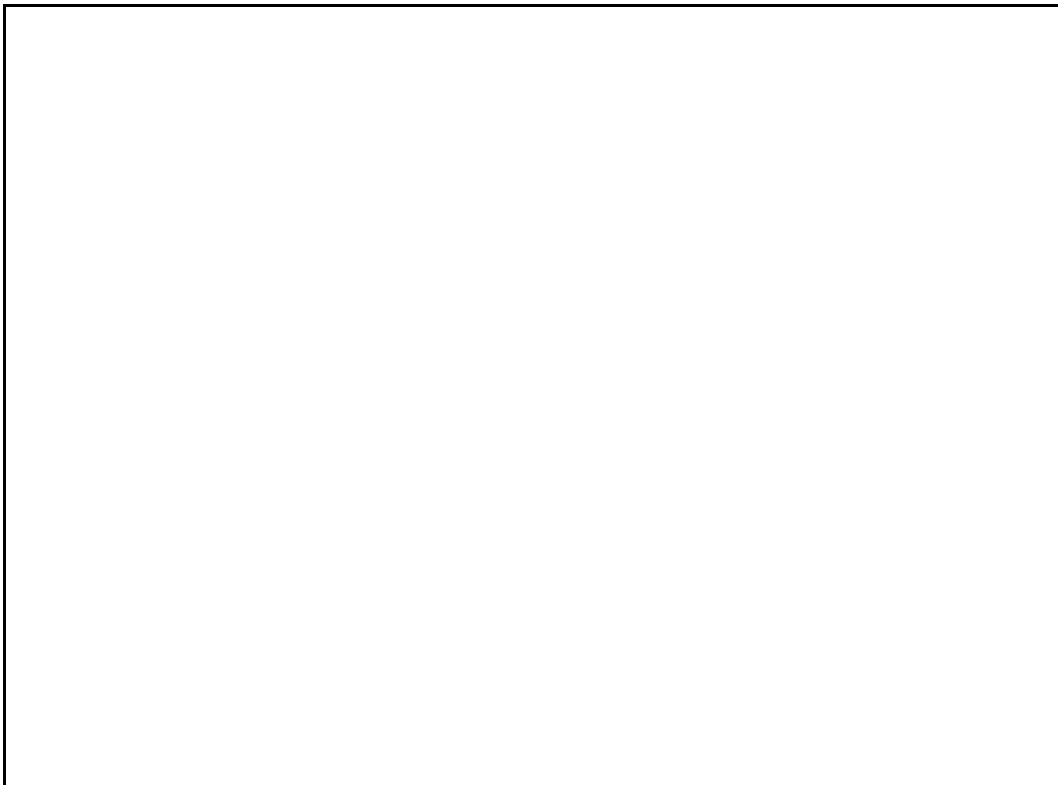
Material Name	Nitrobenzene				
Common synonyms	Nitrobenzol, Oil of mirbane				
UN Number	1662	CAS Number	98-95-3	IMDG CODE	Class6.1/P6208
IMO Pollution Category	B				
Formula	C6H5NO2	Molecurar Weight	123.1	Flammable limits in Air (%)	1 . 8 ~ 4 0
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	1.2037	Vapor Specific Gravity	4.3	Boiling Point()	211.03
Freezing Point ()	5.85	Flash Point ()	88	Ignition Point ()	482
Steam Pressure	1mmHg(2 0)				
Corrosion	human : no	metal : no	Oxidation	yes	
TLV, Toxicity by Ingestion	Japan : 1ppm L D50 640mg/kg (oral rat)		ACGIH : 1ppmTWA A3 skin		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance Noxiousness : Irritating to skin, eyes and throat. Blood is affected and have an attack of methemoglobinemia. There is danger of skin absorption. Carcinogenic is checked in the animal experiment. Poisoning condition may appear behind time. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. A solidifying agent is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

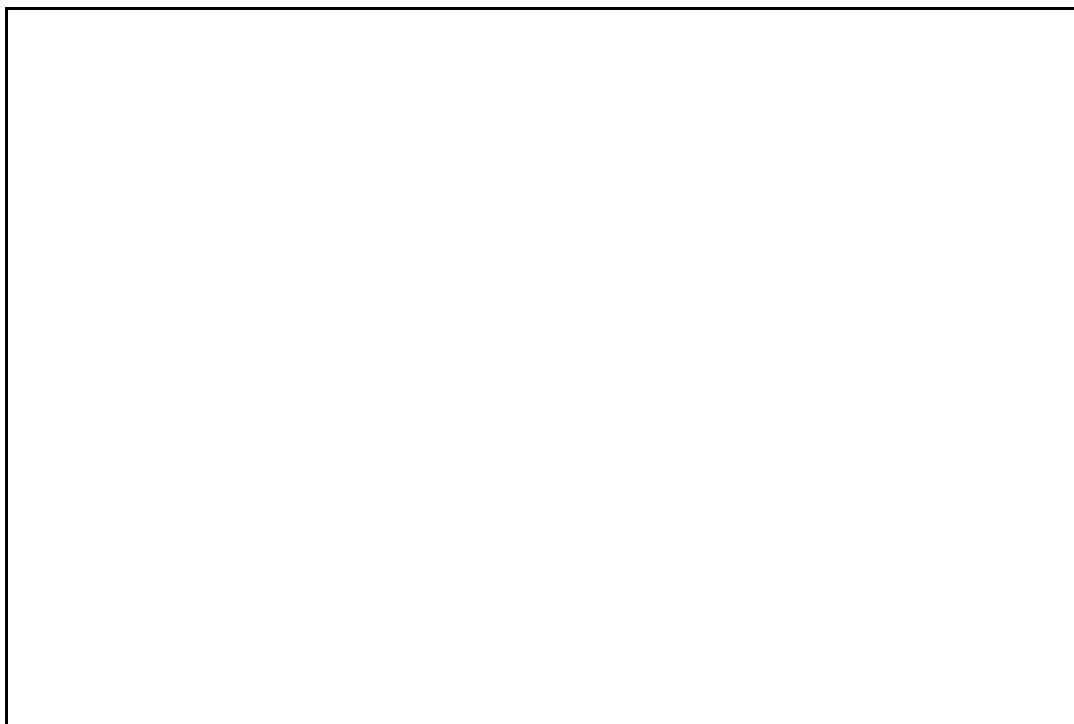


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

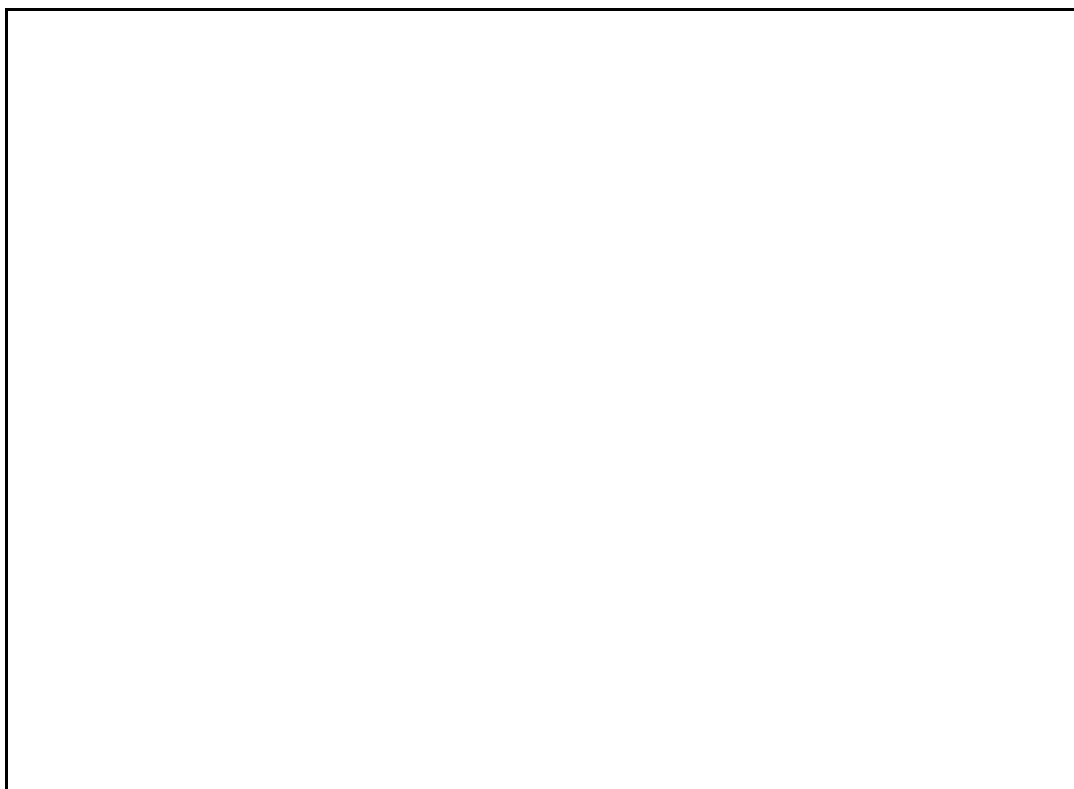
Material Name	Dibutyl phthalate				
Common synonyms					
UN Number	3082	CAS Number	84-74-2	IMDG CODE	Class9/P9028
IMO Pollution Category	A				
Formula	C6H4(COOC4H9)2	Molecular Weight	278.35	Flammable limits in Air (%)	0.5 ~ 2.5
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	1.048	Vapor Specific Gravity		Boiling Point()	339
Freezing Point ()	-35	Flash Point ()	187	Ignition Point ()	402
Steam Pressure					
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan : 5mg/m ³ ACGIH : 5mg/m ³ TWA L D50 8000mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : There is almost no volatility, and detrimental steam is not generated if not exposed to high temperature. It is known for the animal experiment that it may have toxic influence on a man's reproduction.</p> <p>Environmental influence : Biodegradation nature is low. The accumulation nature to an aquatic life living thing is high. Toxicity is strong to an aquatic life living thing.</p> <p>Danger : It is inflammability. It is a stable substance and there is usually no danger of ignition and explosion. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. A solidifying agent is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective tube

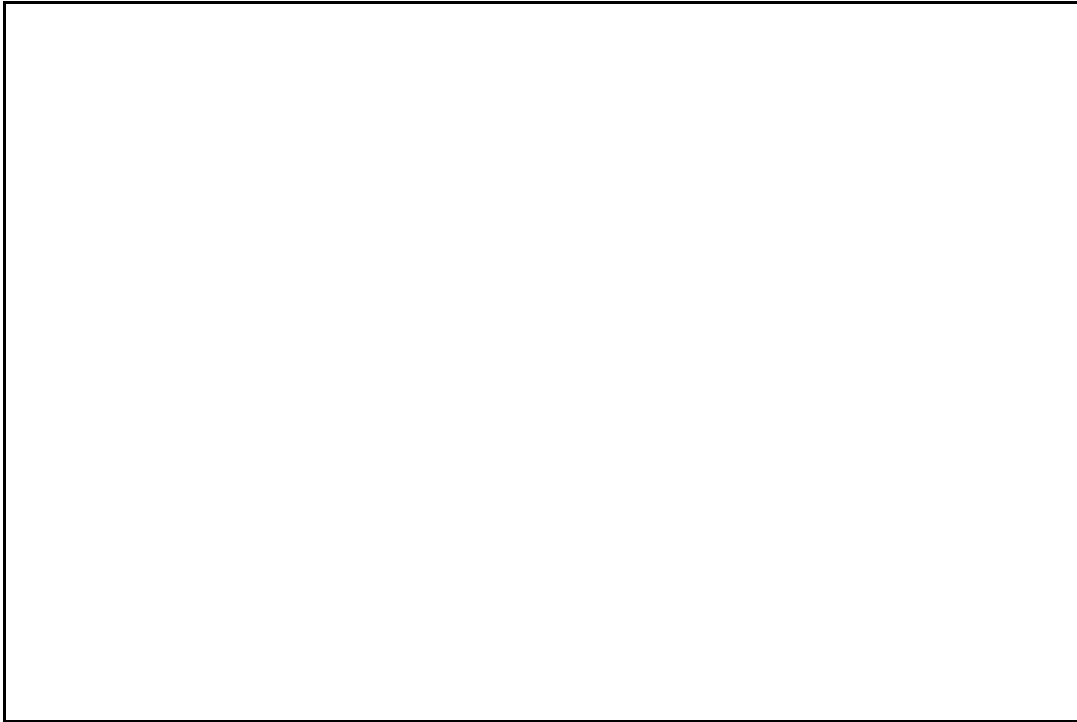


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

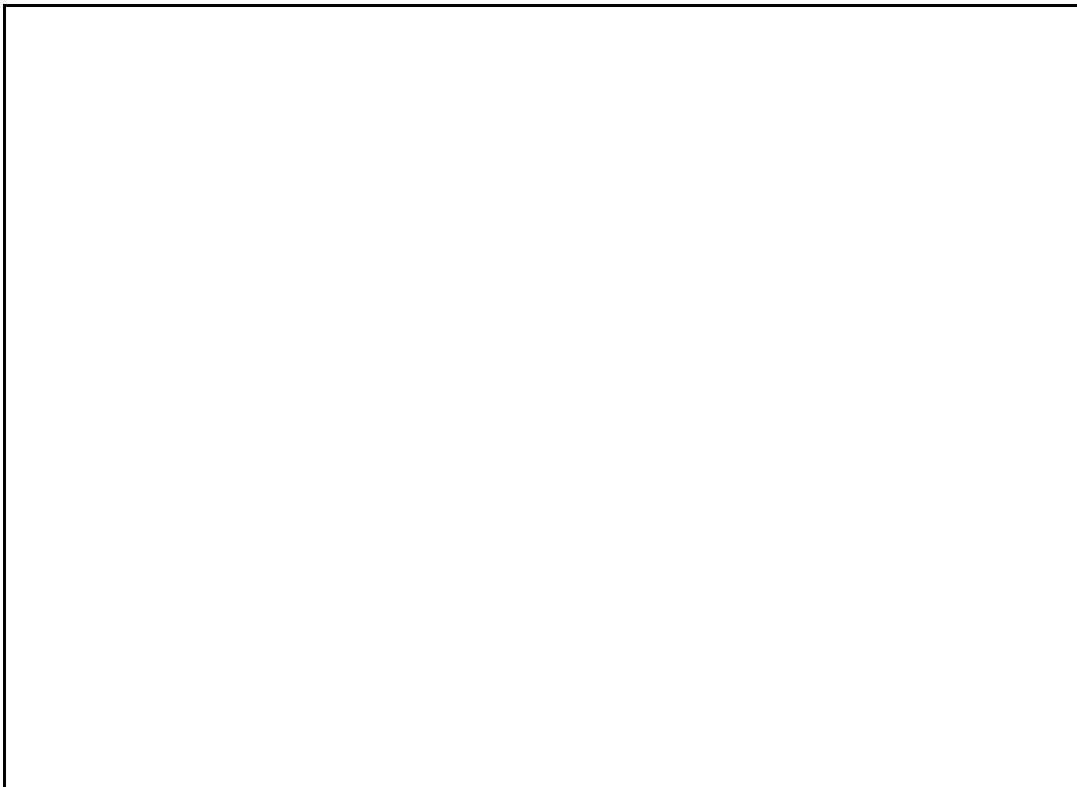
Material Name	Triethanolamine				
Common synonyms	Triethylolamine,				
UN Number	2491	CAS Number	102-71-6	IMDG CODE	Class8/P8169
IMO Pollution Category	D				
Formula	N(CH ₂ CH ₂ OH) ₃	Molecular Weight	149.2	Flammable limits in Air (%)	1.3 ~ 8.5
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.1242	Vapor Specific Gravity	5.2	Boiling Point()	206.7
Freezing Point ()	18	Flash Point ()	179	Ignition Point ()	324
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : ACGIH : 5mg/m ³ TWA L D50 8680mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Corrosion substance, Acute toxicity substance, Flammable liquids</p> <p>Noxiousness : In normal temperature, it is hard to reach detrimental concentration. Acute toxicity is low. Irritating to skin, eyes and throat.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



Limits of Detective Tube

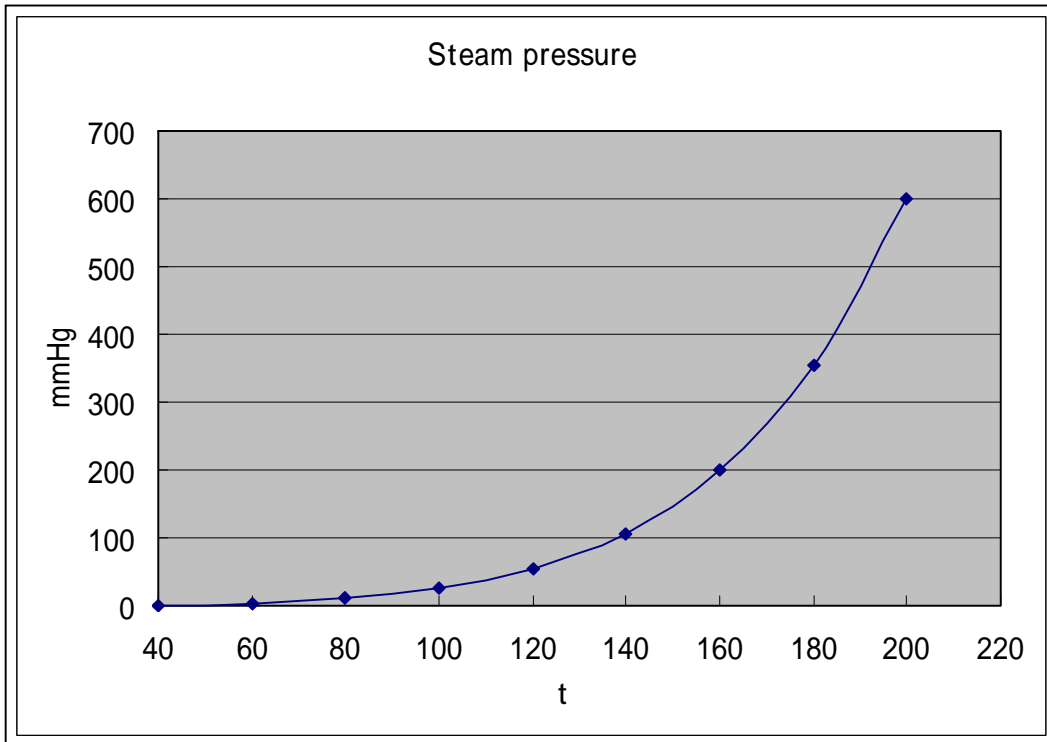


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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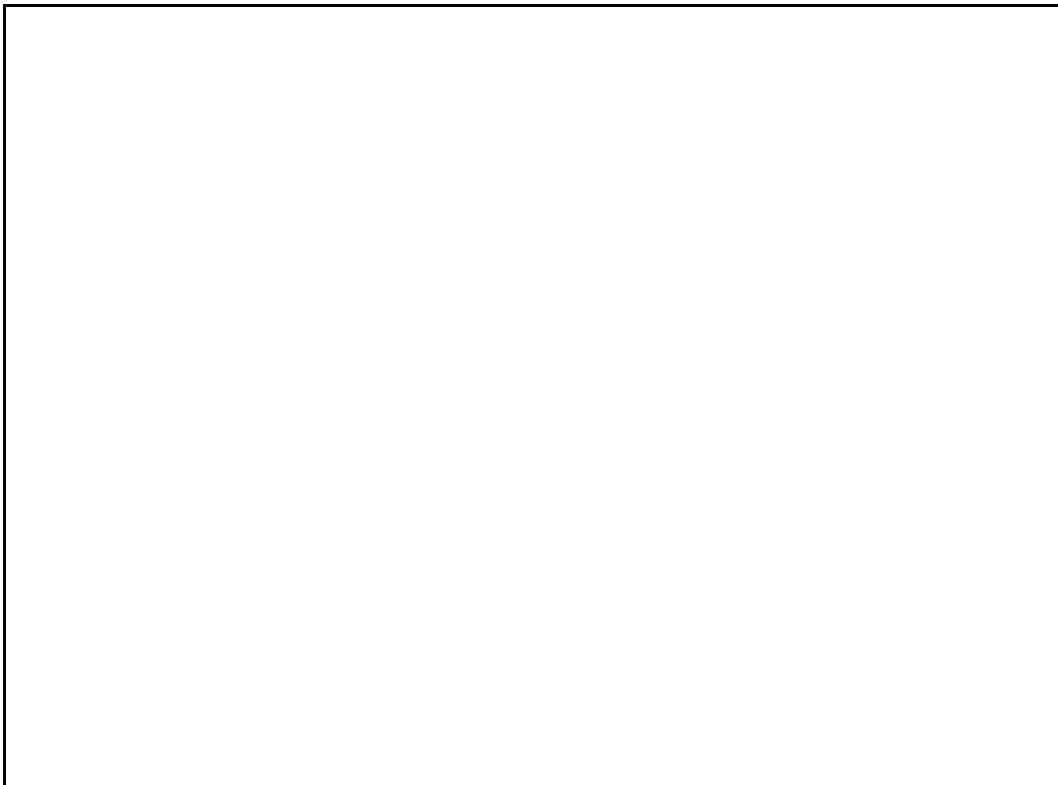
Material Name	Diethyl sulphate				
Common synonyms	Ethyl sulphate, Sulfuric acid diethyl ester				
UN Number	1594	CAS Number	64-67-5	IMDG CODE	Class6.1/P6130
IMO Pollution Category	B				
Formula	(C ₂ H ₅) ₂ SO ₄	Molecular Weight	154.18	Flammable limits in Air (%)	4 . 1 ~
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	1.1774	Vapor Specific Gravity	5.3	Boiling Point()	208
Freezing Point ()	25.2	Flash Point ()	104	Ignition Point ()	436.1
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : L D50 880mg/kg (oral rat)		ACGIH :		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance Noxiousness : Irritating to skin, eyes and throat. Environmental influence : Decomposes gradually by water. Danger : It is inflammability. Vapor is heavier than air. It reacts violently with water. The mixture with water invades metal and generates ignition and explosive hydrogen gas.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



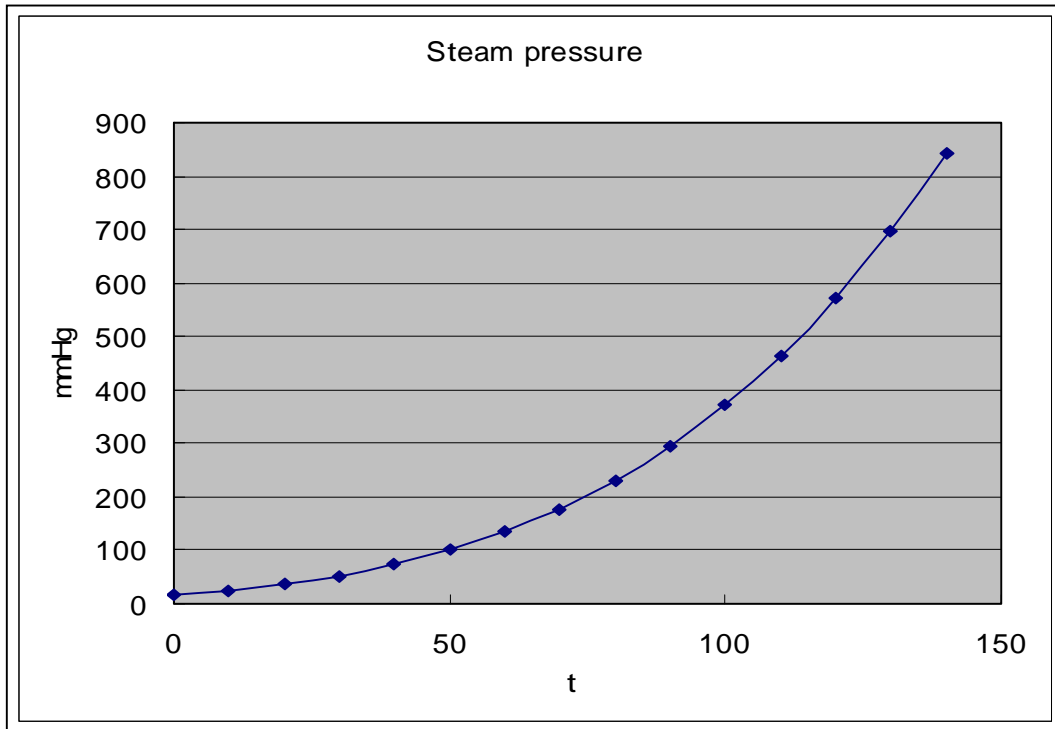
Limits of Detective Tube



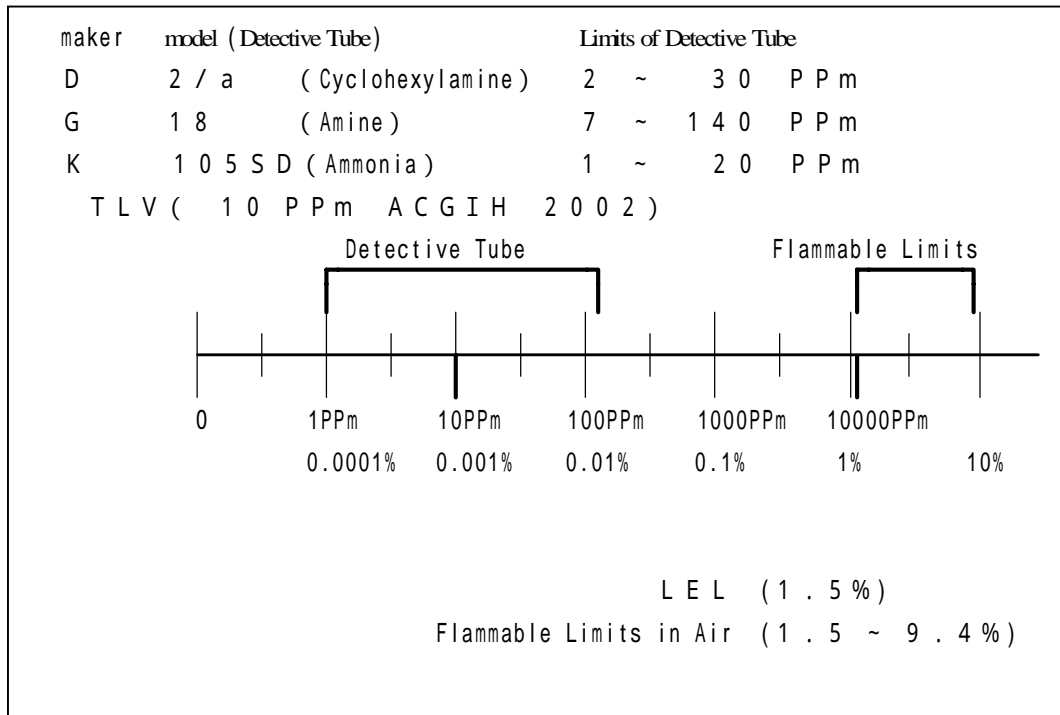
<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

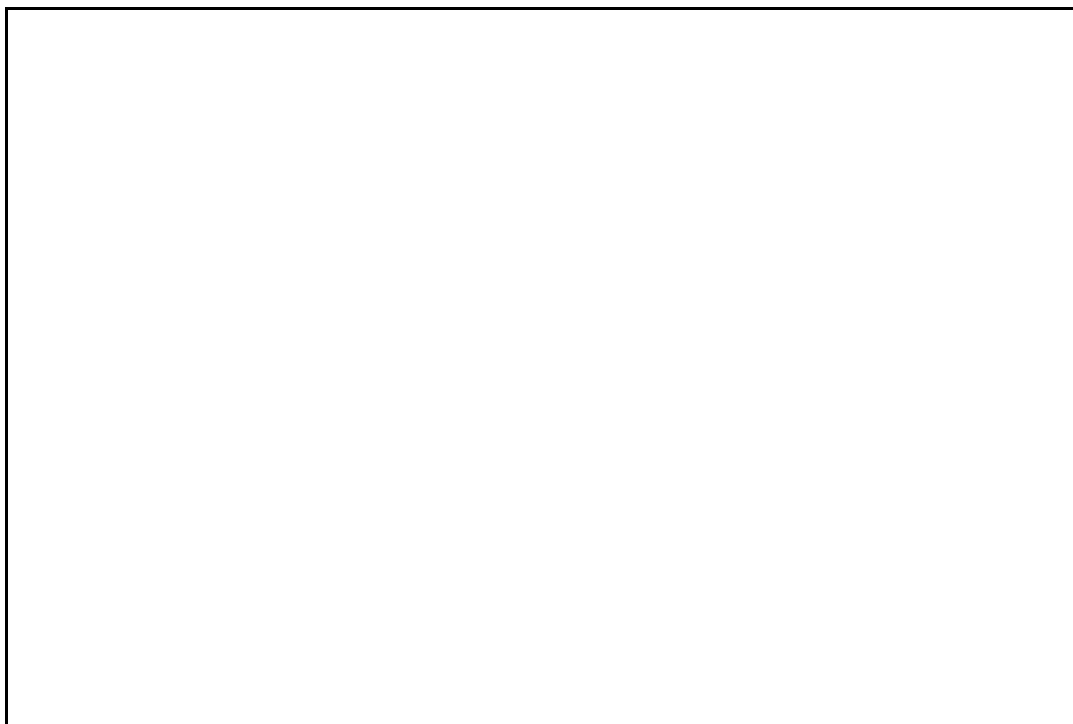


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Ethyl-3-ethoxy propionate				
Common synonyms	Ethyl- -ethoxy propionate				
UN Number		CAS Number		IMDG CODE	Class3.3
IMO Pollution Category	C				
Formula	C7H14O3	Molecular Weight		Flammable limits in Air (%)	1.05 ~
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.949	Vapor Specific Gravity	5	Boiling Point()	170.1
Freezing Point ()	-100	Flash Point ()	82.2	Ignition Point ()	377
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : L D50 5000mg/kg (oral rat)		ACGIH :		
Hazard and Noxiousness	<p>Classification : Flammable liquids, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is a central-nerves control action.</p> <p>Environmental influence : The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

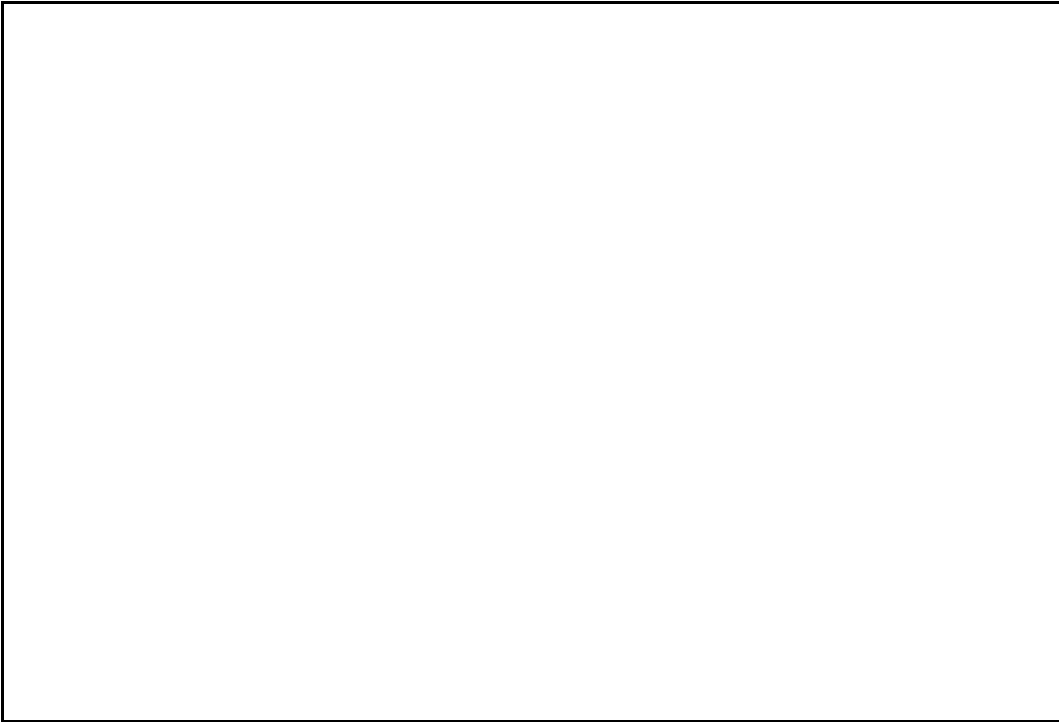


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

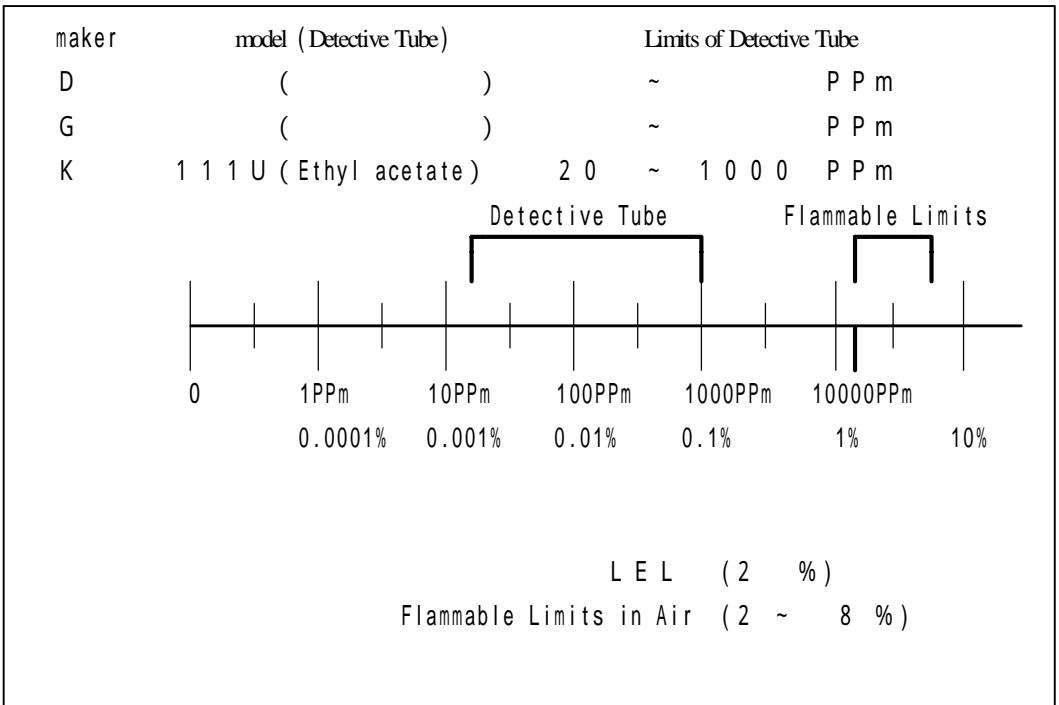
Material Name	n-Butyl methacrylate				
Common synonyms					
UN Number	2227	CAS Number	97-88-1	IMDG CODE	Class3.3/P3316
IMO Pollution Category	D				
Formula	C8H14O2	Molecular Weight	142.2	Flammable limits in Air (%)	2 ~ 8
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.894	Vapor Specific Gravity	4.9	Boiling Point()	163
Freezing Point ()	-25	Flash Point ()	52.2	Ignition Point ()	294
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : L D50 22600mg/kg (oral rat)		ACGIH :		
Hazard and Noxiousness	<p>Classification : Flammable liquids Noxiousness : Irritating to eyes. There is danger of skin absorption. Poisoning condition may appear behind time. Environmental influence : It hydrolyzes underwater. The accumulation nature to an aquatic life living thing is medium. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer is sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

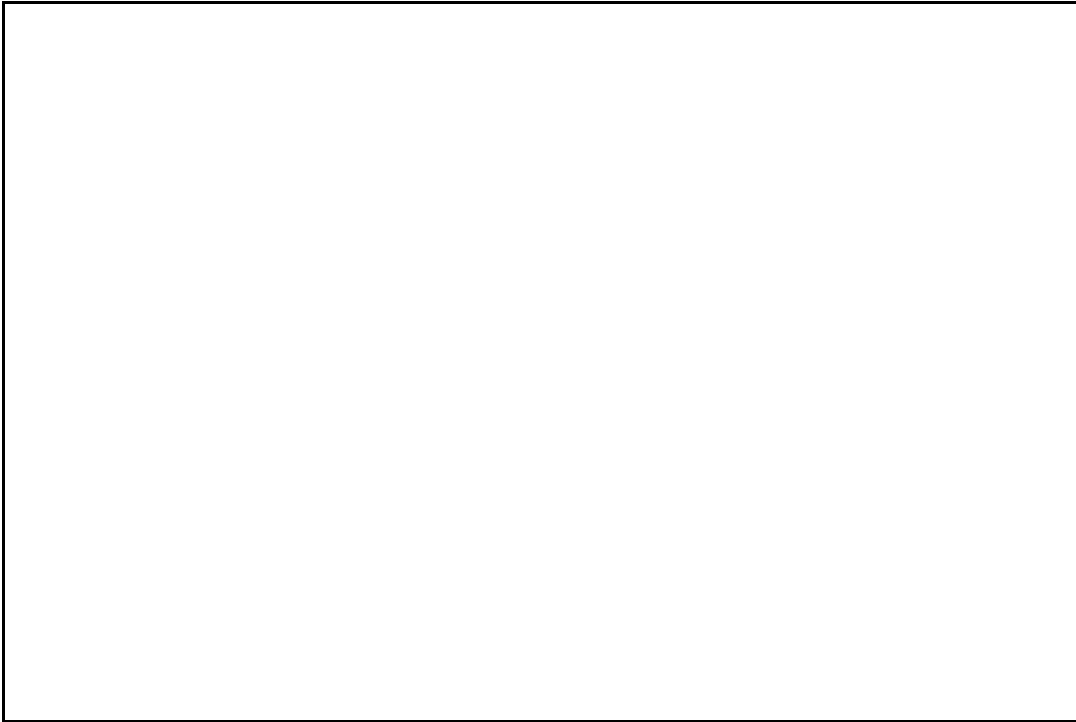


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

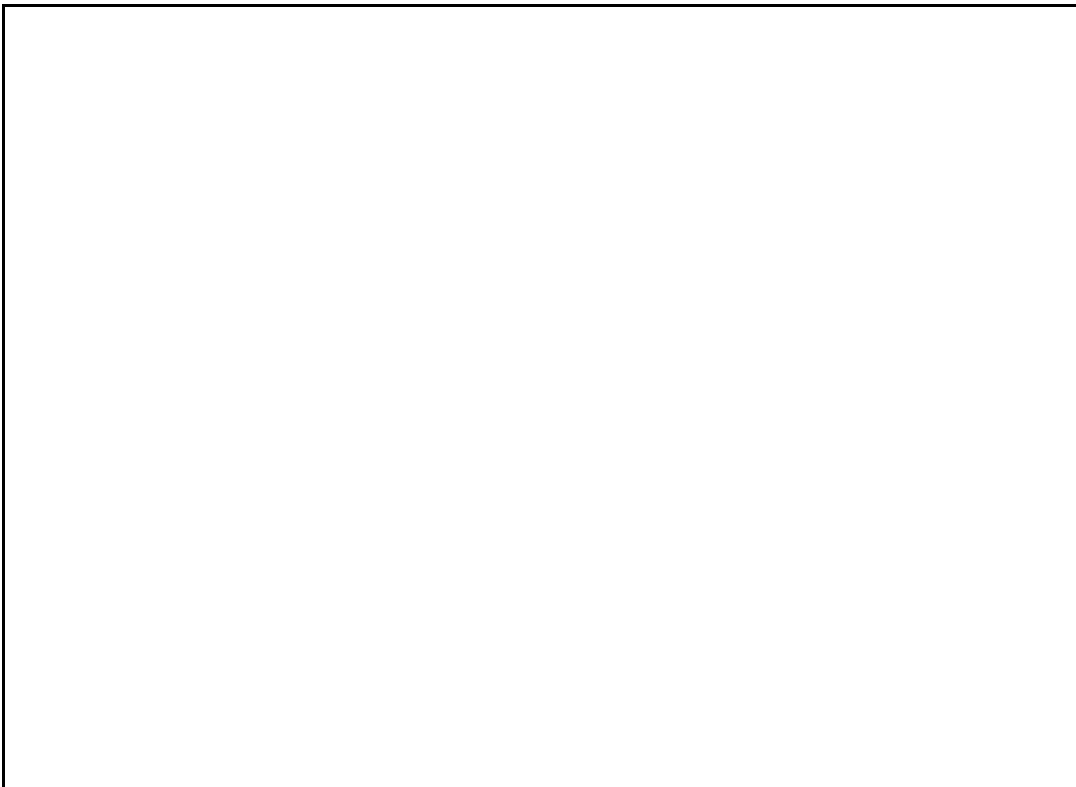
Material Name	Calcium hypochlorite				
Common synonyms	Calcium oxychloride, Bleaching powder				
UN Number	2880	CAS Number	7778-54-3	IMDG CODE	Class5.1/P5138
IMO Pollution Category	C				
Formula	Ca(OCl)2	Molecular Weight	187.07	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.15	Vapor Specific Gravity		Boiling Point()	
Freezing Point ()		Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	yes	
TLV, Toxicity by Ingestion	Japan : L D50		ACGIH :		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance, Corrosion substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is corrosive strong to a living body.</p> <p>Environmental influence : It is detrimental to an aquatic life living thing.</p> <p>Danger : When there is a strong oxidizing quality and an inflammable substance is contacted, it may be made to ignite, although it is nonflammability. Combustion is accelerated in case of a fire.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Only water must not be used in case of a surrounding fire, and dry chemical, alcohol-resistant foam, etc. must not use it. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Syeam pressure curve



Limits of Detective Tube

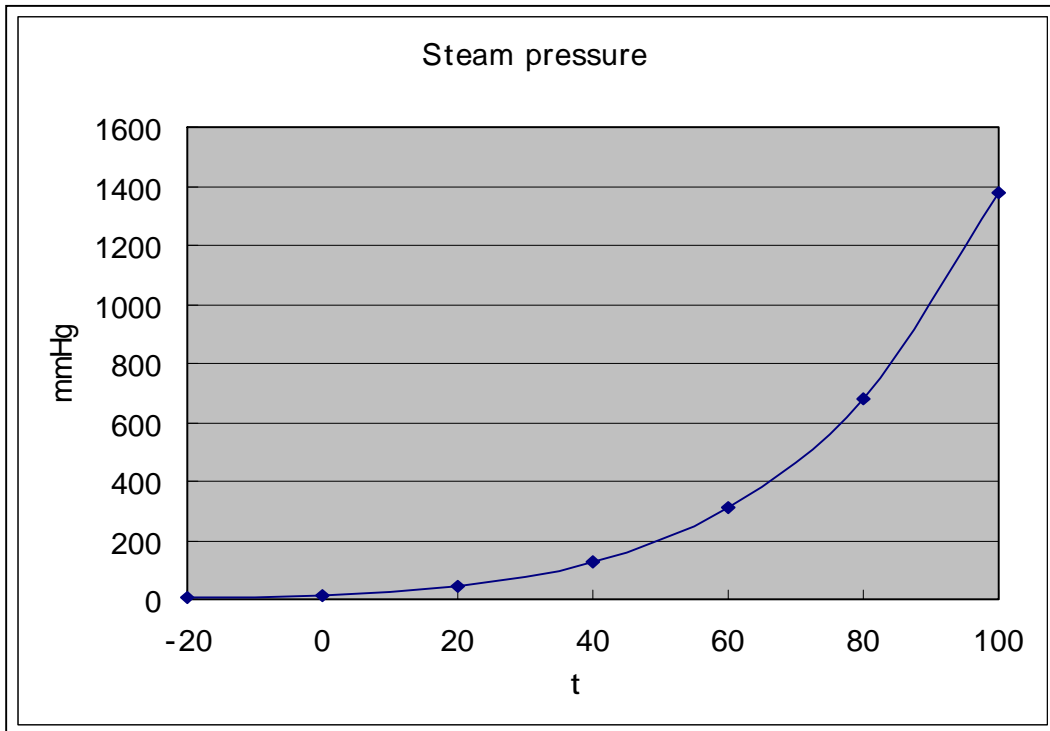


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

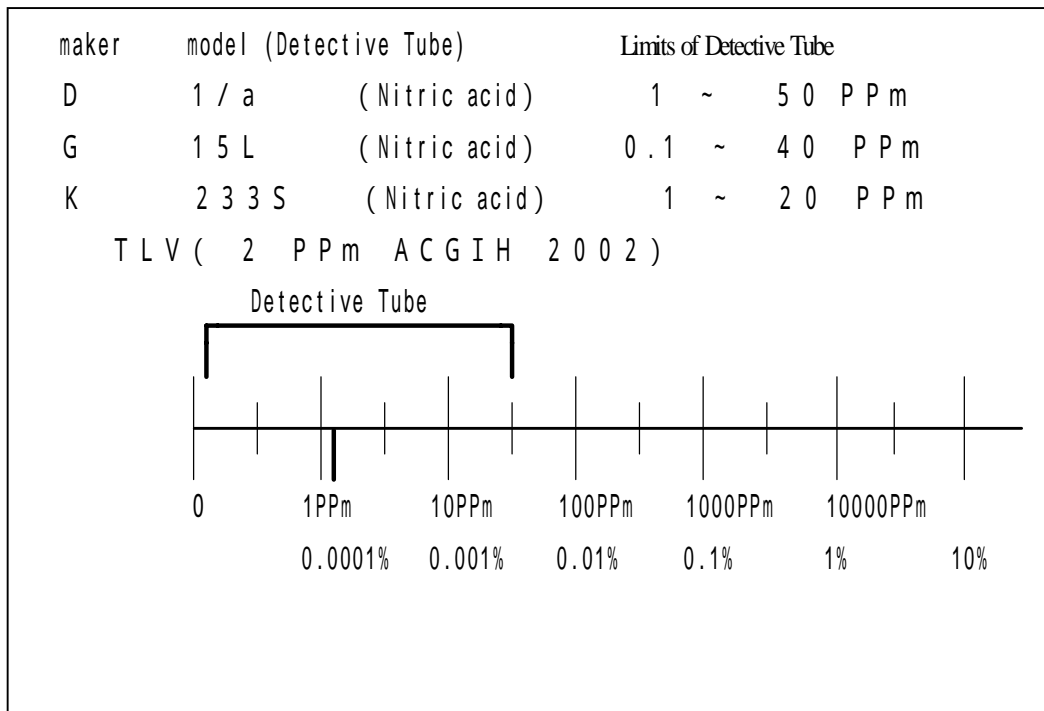
Material Name	Nitric acid				
Common synonyms	Aquafortis, Azotic acid, Hydrogen nitrate				
UN Number	2031	CAS Number	7697-37-2	IMDG CODE	Class8/P8195
IMO Pollution Category	C				
Formula	HNO ₃	Molecular Weight	63	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.5	Vapor Specific Gravity		Boiling Point()	86
Freezing Point ()	-42	Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	yes	
TLV, Toxicity by Ingestion	Japan : 2ppm L D 50		ACGIH : 2ppmTWA 4ppmSTEL		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance, Corrosion substance.</p> <p>Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time.</p> <p>Environmental influence : It is detrimental to an aquatic life living thing.</p> <p>Danger : It is nonflammability. If water is contacted, heat will be generated and the amount of generating of corrosive steam will increase. Metal is invaded and hydrogen gas with explosion danger is generated. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water. It is cautious of generating of the hydrogen gas by contact with metal in a blockade place.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

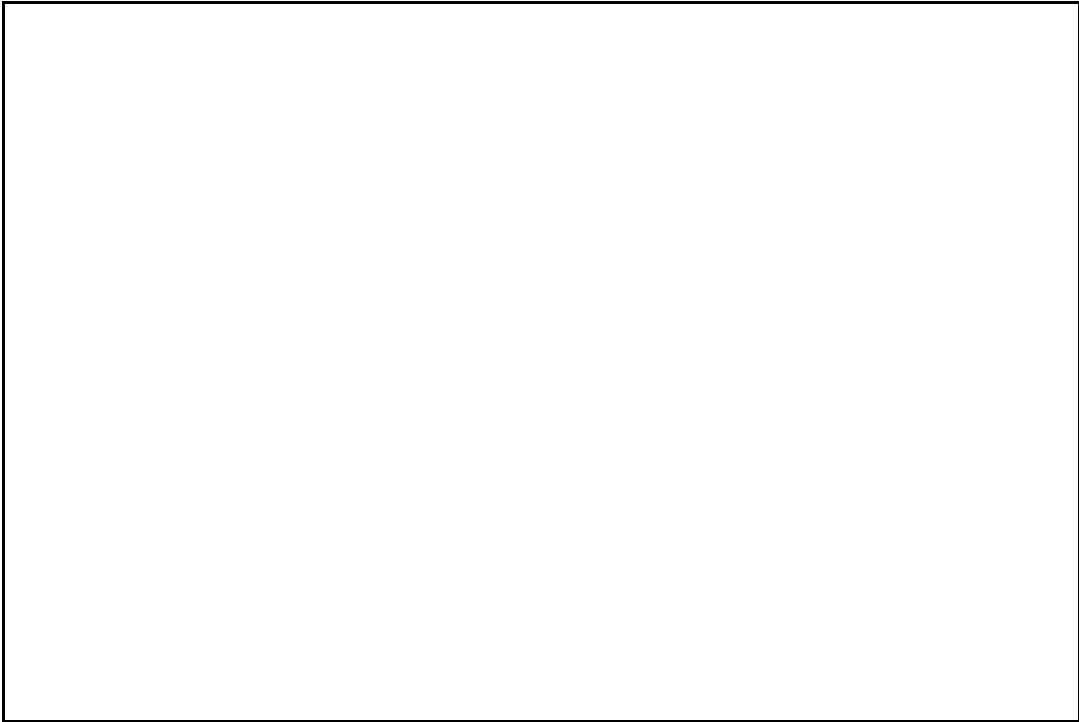


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

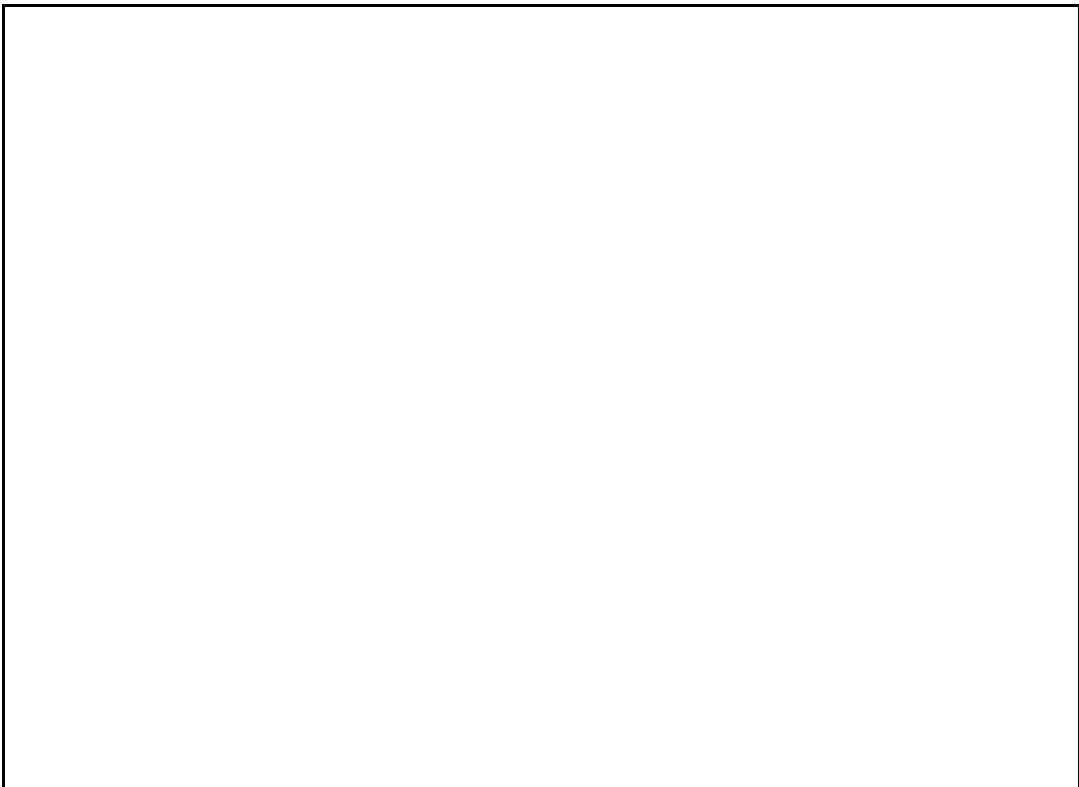
Material Name	Butyl benzyl phthalate				
Common synonyms	1,2-Benzenedicarboxylic acid butyl phenylmethyl ester, BBP				
UN Number	3082	CAS Number	85-68-7	IMDG CODE	Class9/P9028
IMO Pollution Category	A				
Formula	C19H20O4	Molecular Weight	312.37	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	1.117	Vapor Specific Gravity	10.8	Boiling Point()	370
Freezing Point ()	-40	Flash Point ()	199	Ignition Point ()	
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	yes	
TLV, Toxicity by Ingestion	Japan : L D50 3160mg/kg (abdominal cavity mouse) ACGIH :				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : There is almost no volatility, and detrimental steam is not generated if not exposed to high temperature.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is high.</p> <p>Danger : It is inflammability.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



Limits of Detective Tube

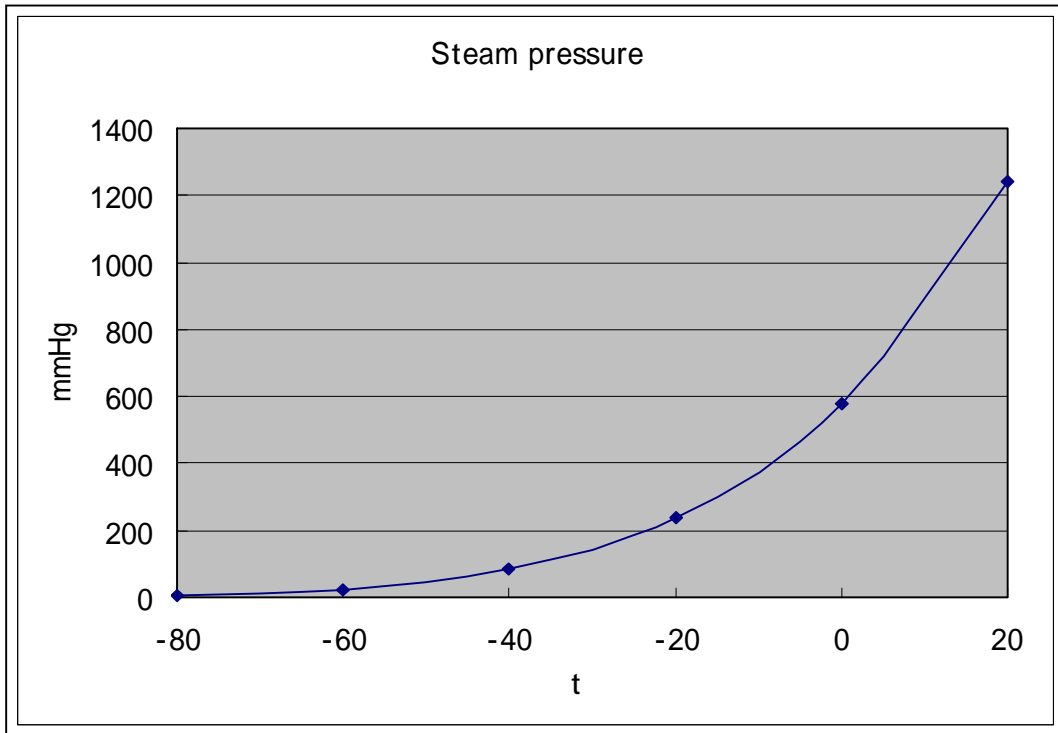


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

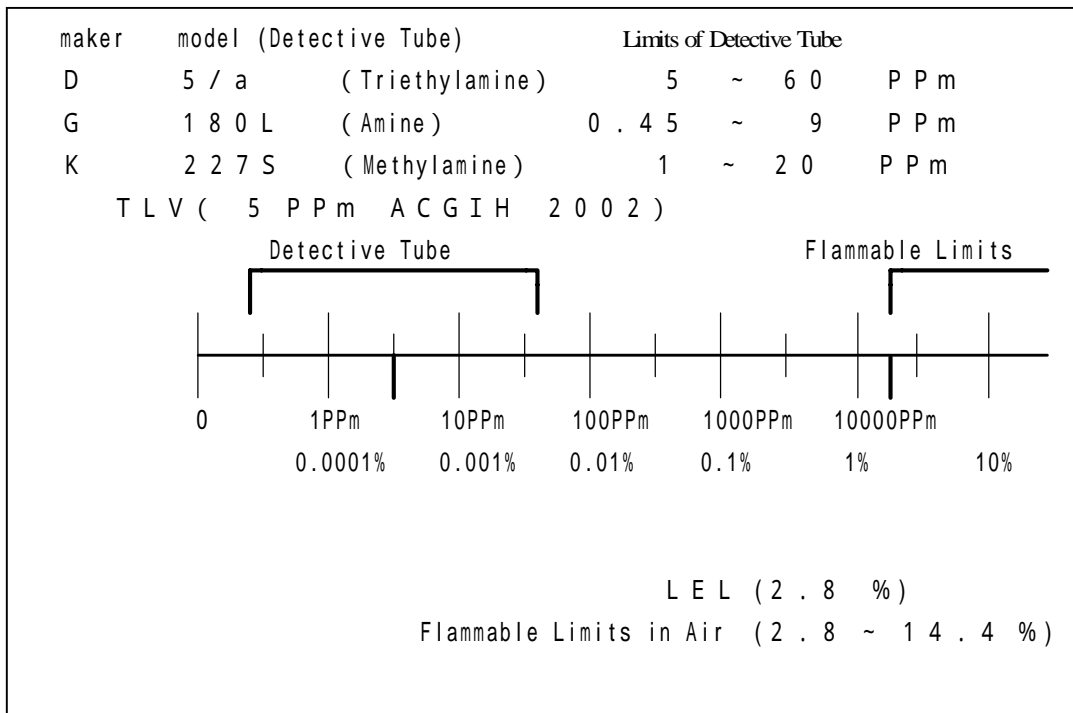
Material Name	Dimethylamine				
Common synonyms	N-Methylmethanamine, DMA				
UN Number	1160	CAS Number	124-40-3	IMDG CODE	Class3.1/P3118 3.2/P3212
IMO Pollution Category	C				
Formula	(CH ₃) ₂ NH	Molecular Weight	45.1	Flammable limits in Air (%)	2.8 ~ 14.4
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.6804	Vapor Specific Gravity	1.6	Boiling Point()	6.88
Freezing Point ()	-93	Flash Point ()	-17.8	Ignition Point ()	400
Steam Pressure	400mmHg(20)				
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 10ppm LD50 698mg/kg (oral rat) ACGIH : 5ppmTWA 15ppmSTEL A4				
Hazard and Noxiousness	<p>Classification : Flammable liquids, Acute toxicity substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

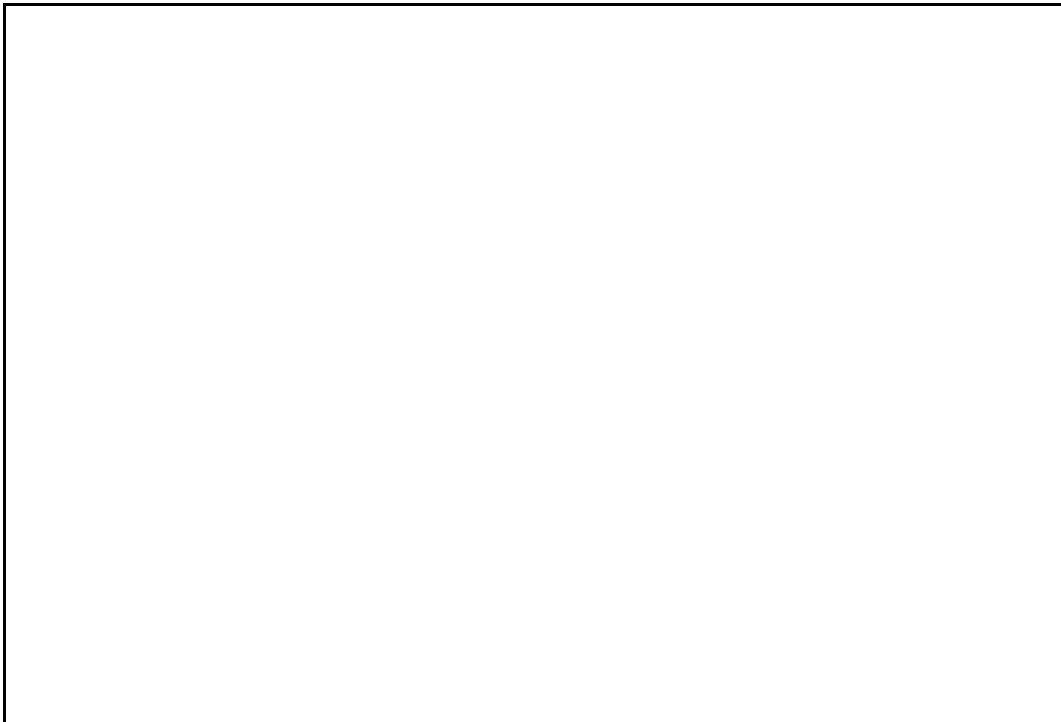


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

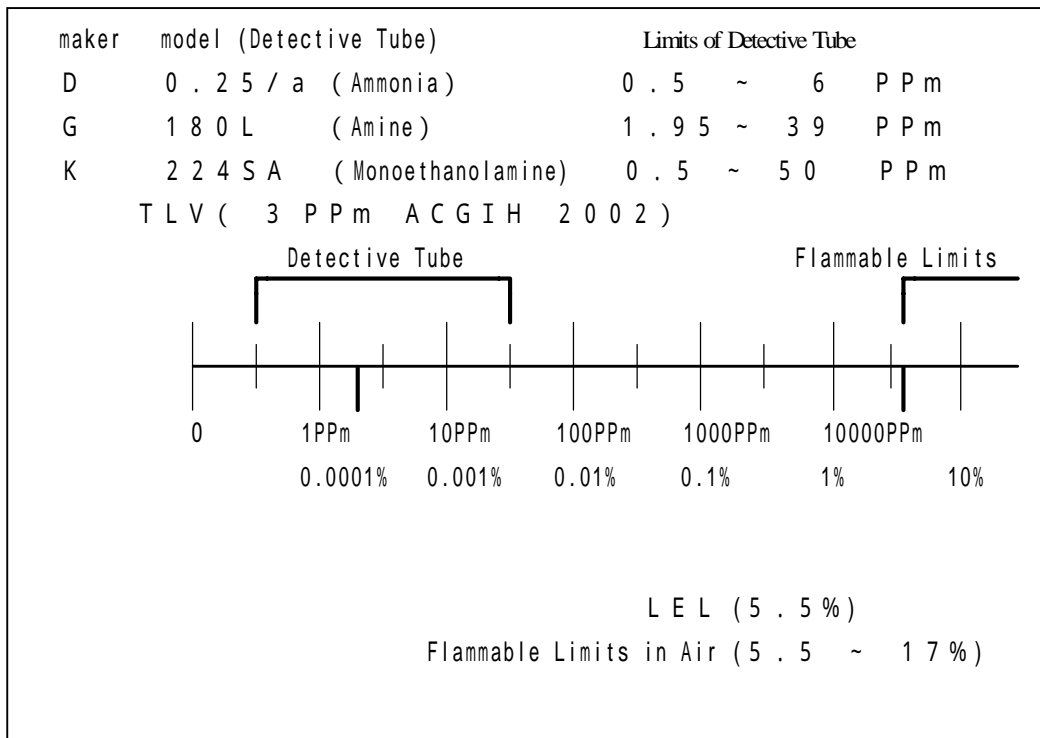
Material Name	Ethanolamine				
Common synonyms	Aminoethanol, Hydroxyethylamine				
UN Number	2491	CAS Number	141-43-5	IMDG CODE	Class8/P8169
IMO Pollution Category	D				
Formula	H ₂ NCH ₂ CH ₂ OH	Molecular Weight	149.2	Flammable limits in Air (%)	5.5 ~ 17
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.0117	Vapor Specific Gravity	2.1	Boiling Point()	171.1
Freezing Point ()	10.5	Flash Point()	85	Ignition Point()	410
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : ACGIH : 3ppmTWA 6ppmSTEL L D50 2100mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Acute toxicity substance, Corrosion substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

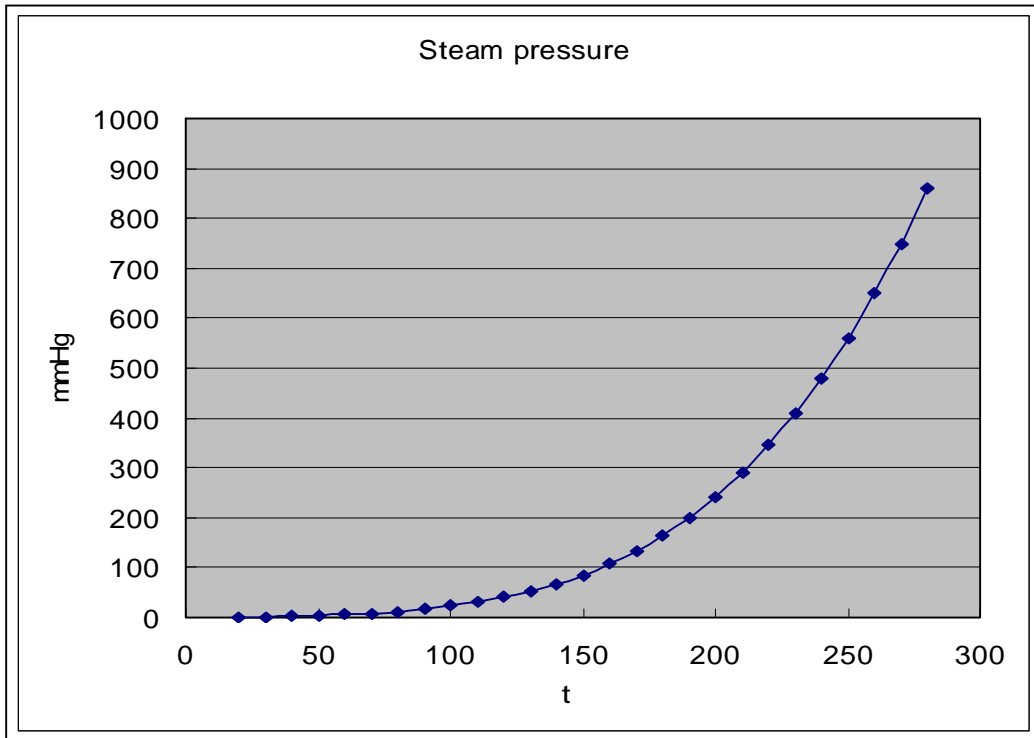


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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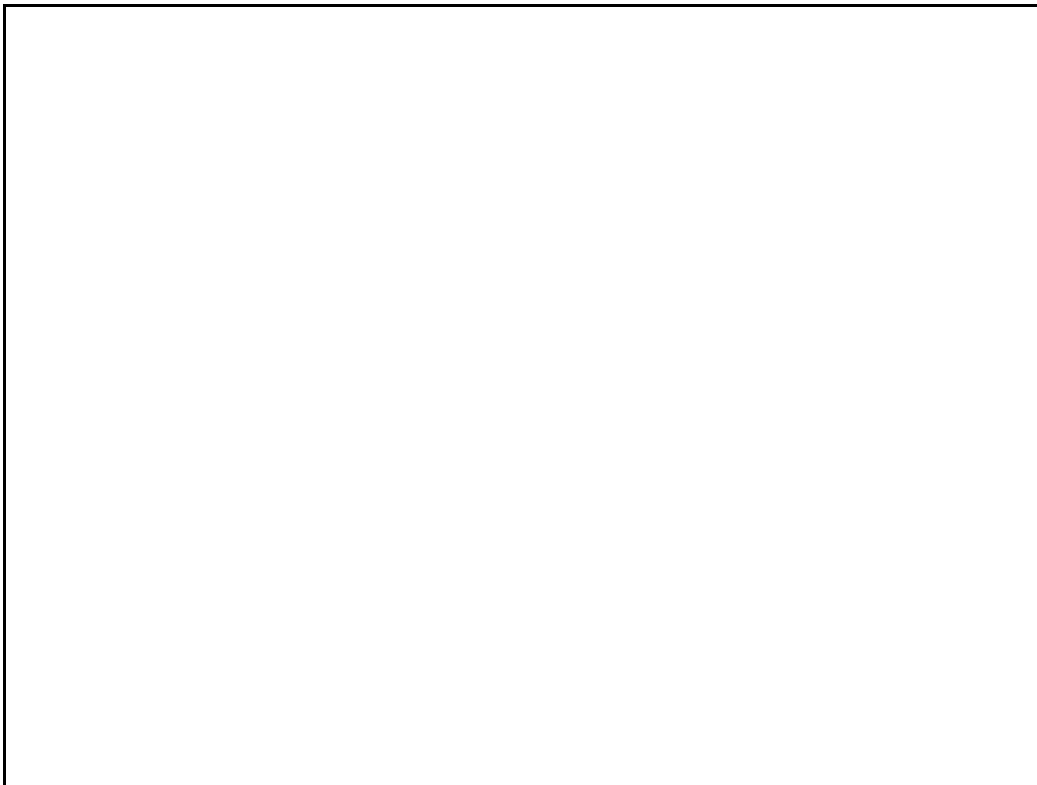
Material Name	Diethanolamine				
Common synonyms	Diethylolamine, 2,2-Iminodiethanol				
UN Number	1760	CAS Number	111-42-2	IMDG CODE	Class8/P8147
IMO Pollution Category	D				
Formula	HN(CH ₂ CH ₂ OH) ₂	Molecular Weight	105.1	Flammable limits in Air (%)	1.6 ~ 9.8
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	1.0881	Vapor Specific Gravity	3.6	Boiling Point()	271
Freezing Point ()	28	Flash Point ()	138	Ignition Point ()	662.2
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : ACGIH : 2mg/m ³ TWA skin L D50 710mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is danger of skin absorption. Poisoning condition may appear behind time.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

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Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

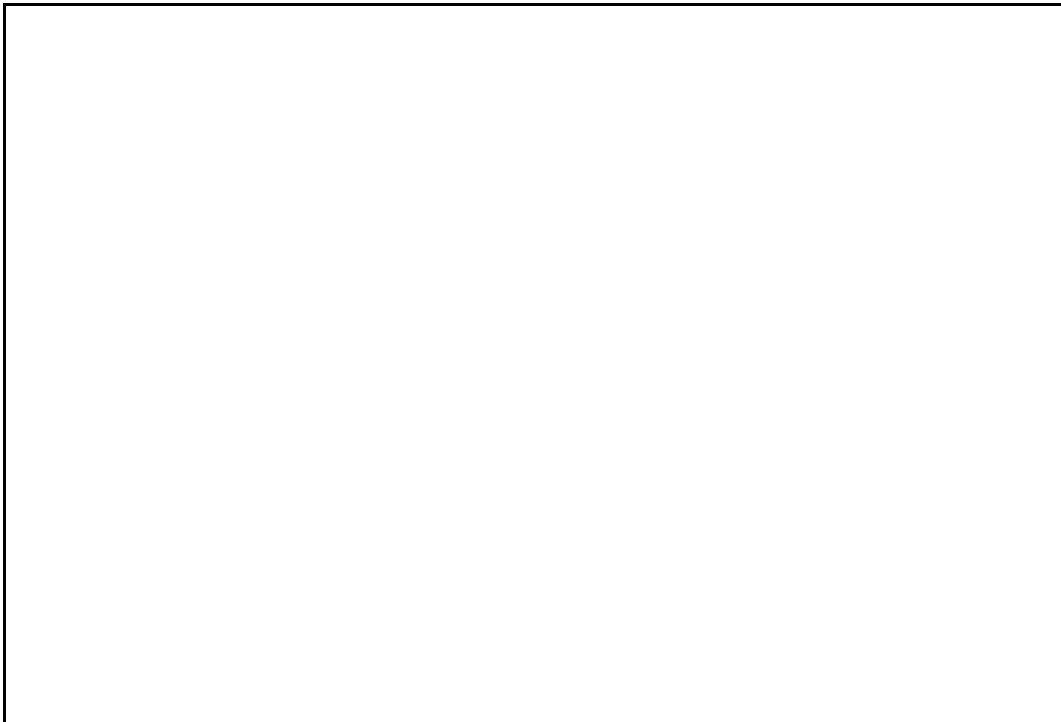


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

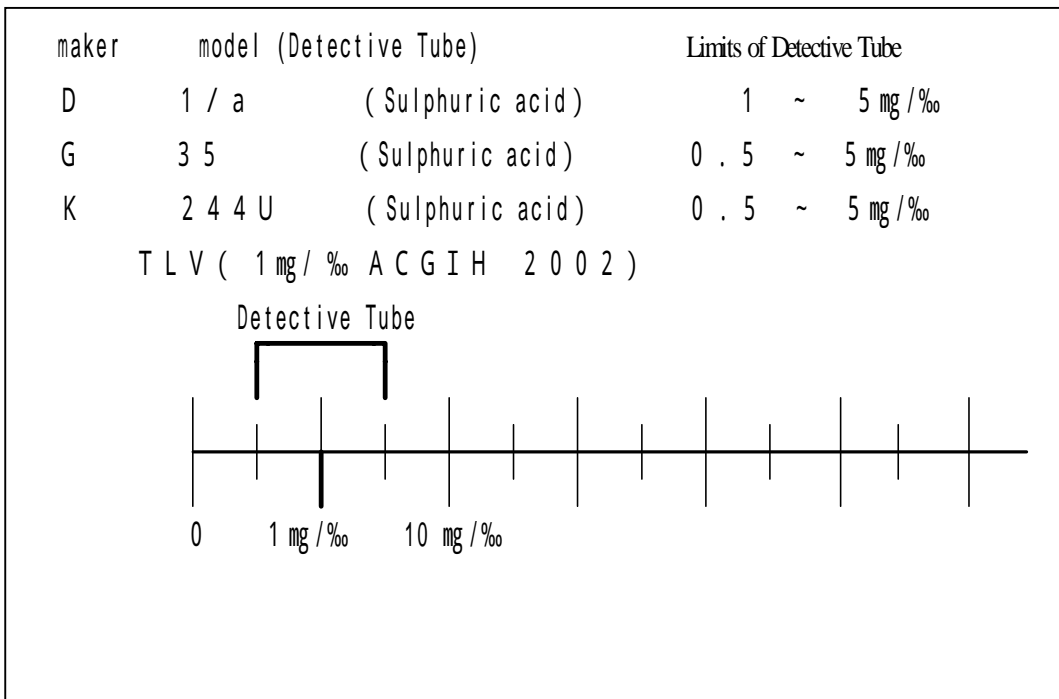
Material Name	Sulphuric acid				
Common synonyms	Sulfuric acid, Oil of vitriol				
UN Number	1830	CAS Number	7664-93-9	IMDG CODE	Class8/P8230
IMO Pollution Category	C				
Formula	H2SO4	Molecular Weight	98.1	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.834	Vapor Specific Gravity		Boiling Point()	340
Freezing Point ()	10.36	Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human : yes	metal : yes	Oxidation	yes	
TLV, Toxicity by Ingestion	Japan : 1mg/m ³ ACGIH: 1mg/m ³ TWA 3mg/m ³ STEL A2 L D50 2140mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Acute toxicity substance, Corrosion substance</p> <p>Noxiousness : Irritating to skin, eyes and throat. Carcinogenic is suspected to a man. Poisoning condition may appear behind time.</p> <p>Environmental influence : It is detrimental to an aquatic life living thing.</p> <p>Danger : It reacts with water and generates heat violently. Although concentrated sulfuric acid makes nonconductor and does not invade iron, if it dilutes, it will invade much metal and will generate ignition and explosive hydrogen gas.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In order to react violently with water, don't drain water off directly. In case of large fire, use much water spray. Cool containers with flooding quantities of water. It is cautious of hydrogen gas generating by contact to metal in especially a closing place.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



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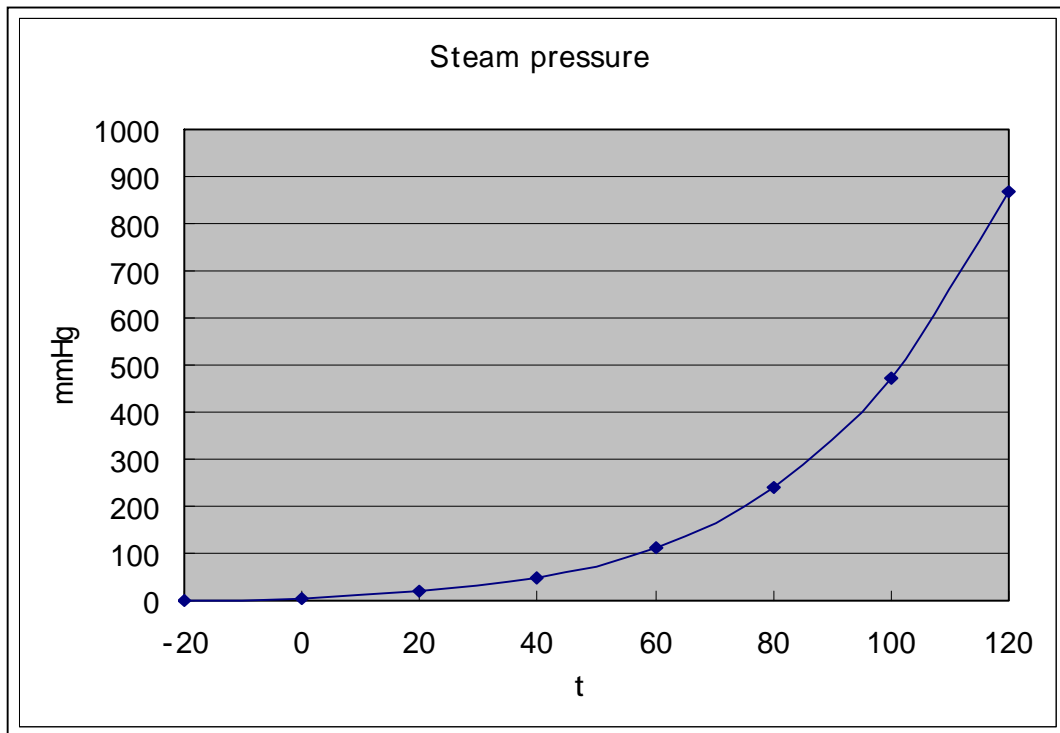


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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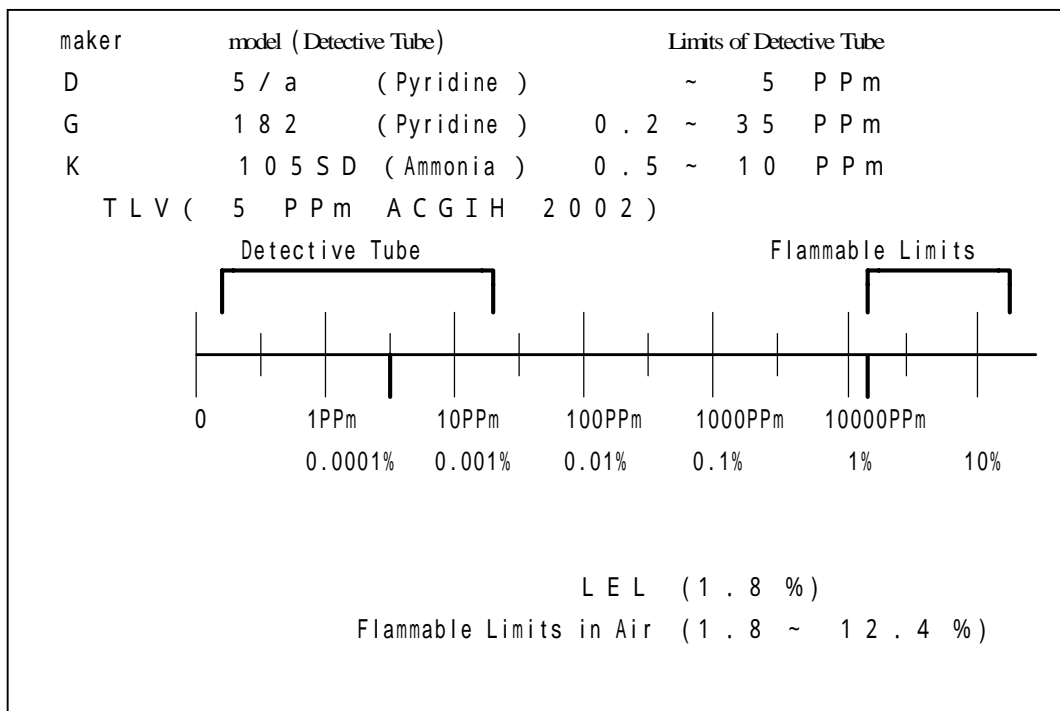
Material Name	Pyridine				
Common synonyms	Azabenzene				
UN Number	1282	CAS Number	110-86-1	IMDG CODE	Class3.2/P3277
IMO Pollution Category	D				
Formula	C5H5N	Molecular Weight	79.1	Flammable limits in Air (%)	1.8 ~ 12.4
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.977	Vapor Specific Gravity	2.7	Boiling Point()	115.5
Freezing Point ()	-41.8	Flash Point ()	20	Ignition Point ()	482
Steam Pressure					
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : ACGIH : 5ppmTWA L D50 891mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable liquids Noxiousness : Irritating to skin, eyes and throat. Poisoning condition may appear behind time. Environmental influence : The accumulation nature to an aquatic life living thing is medium. Danger : Inflammability is high. It mixes with air, vapor becomes explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



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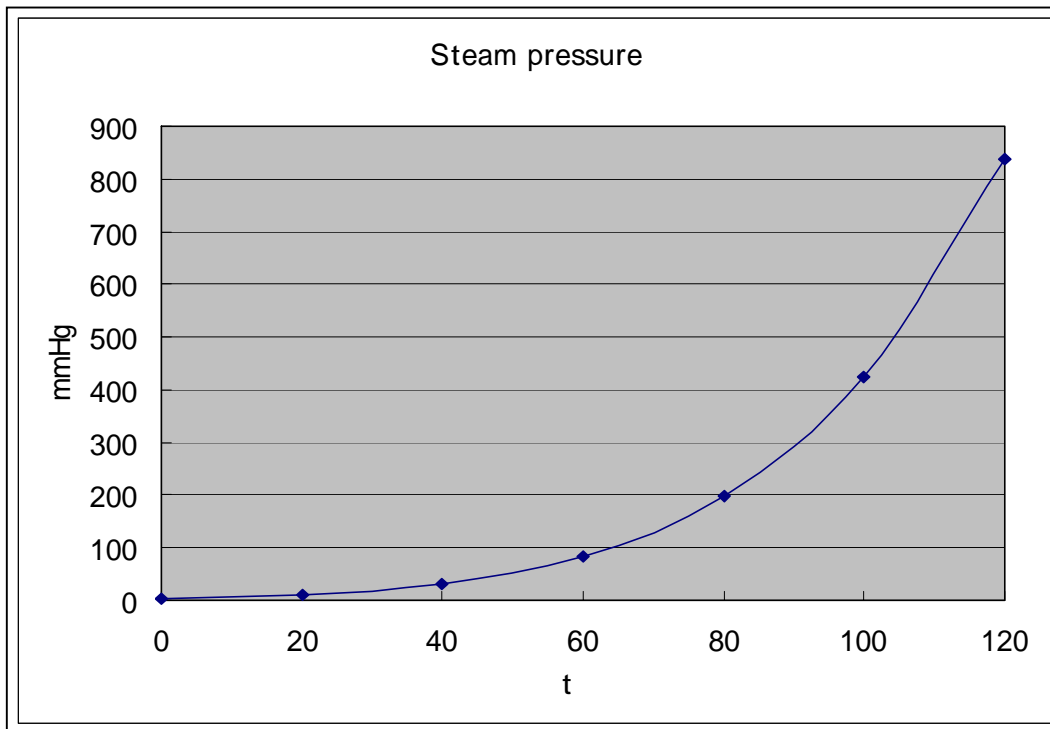


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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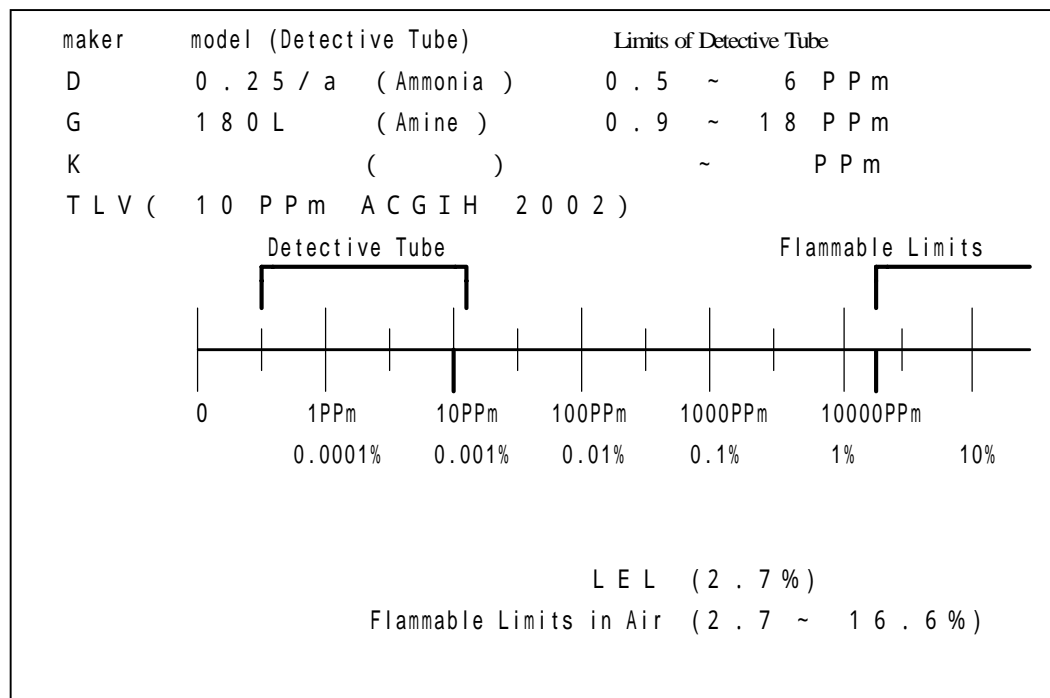
Material Name	Ethylenediamine				
Common synonyms					
UN Number	1604	CAS Number	107-15-3	IMDG CODE	Class8/P8170
IMO Pollution Category	C				
Formula	NH ₂ CH ₂ CH ₂ NH ₂	Molecular Weight	60.1	Flammable limits in Air (%)	2.7 ~ 16.6
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	0.8994	Vapor Specific Gravity	2.1	Boiling Point()	117
Freezing Point ()	8.5	Flash Point ()	33.9	Ignition Point ()	385
Steam Pressure					
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 10ppm L D50 760mg/kg (oral rat)		ACGIH : 10ppmTWA A4 skin		
Hazard and Noxiousness	<p>Classification : Corrosion substance, Flammable liquids</p> <p>Noxiousness : Irritating to skin, eyes and throat. There is danger of skin absorption. Poisoning condition may appear behind time.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. It is detrimental to an aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



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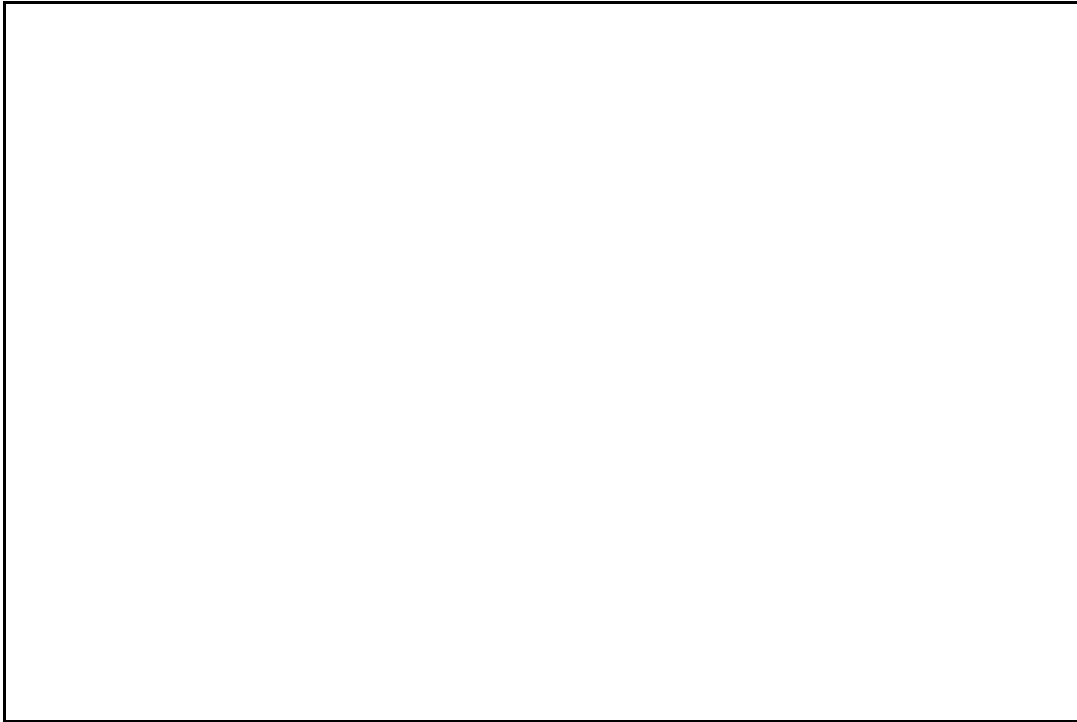


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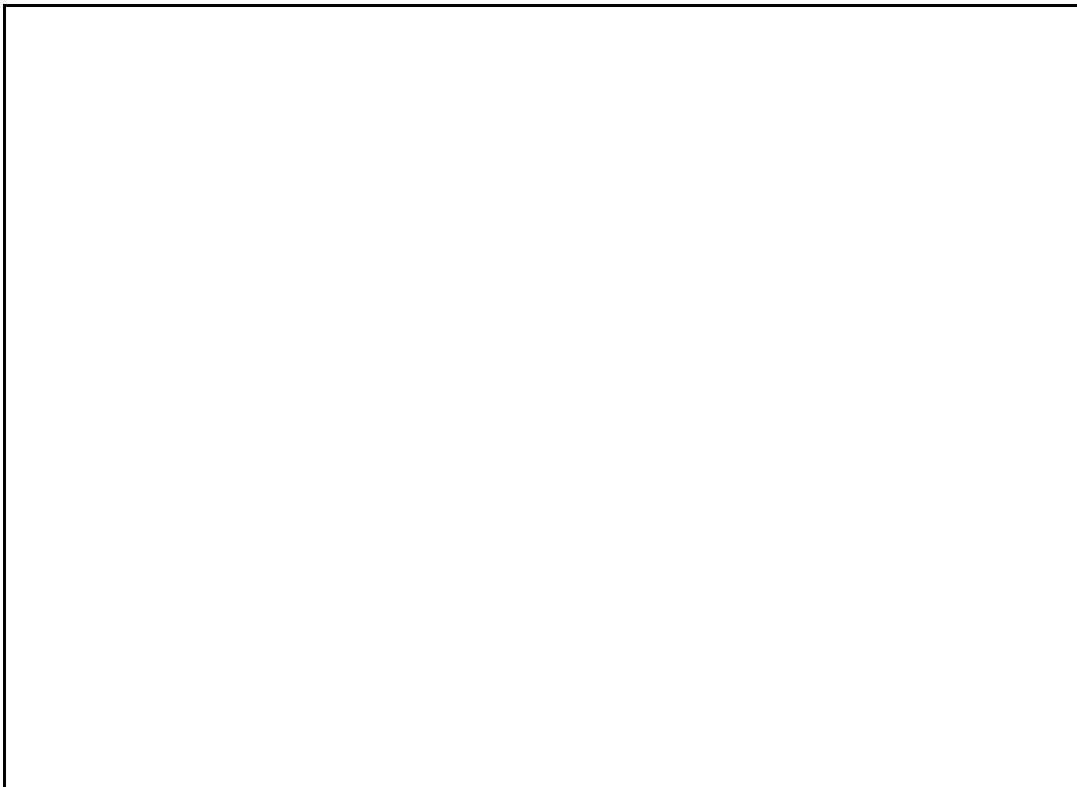
Material Name	Ammonium sulfate				
Common synonyms					
UN Number		CAS Number	7783-20-2	IMDG CODE	
IMO Pollution Category	D				
Formula	(NH ₄) ₂ SO ₄	Molecular Weight	132.13	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.76	Vapor Specific Gravity		Boiling Point()	
Freezing Point ()	513	Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan : L D50 2840mg/kg (oral rat)		ACGIH:		
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : In the usual handling, there is almost no detrimental nature in a human body. Environmental influence :</p> <p>Danger : It is nonflammability. When involved in a fire, there is a possibility of generating strong stimulative sulfurous acid gas, nitrogen oxide, and ammonia gas, by heat decomposition.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
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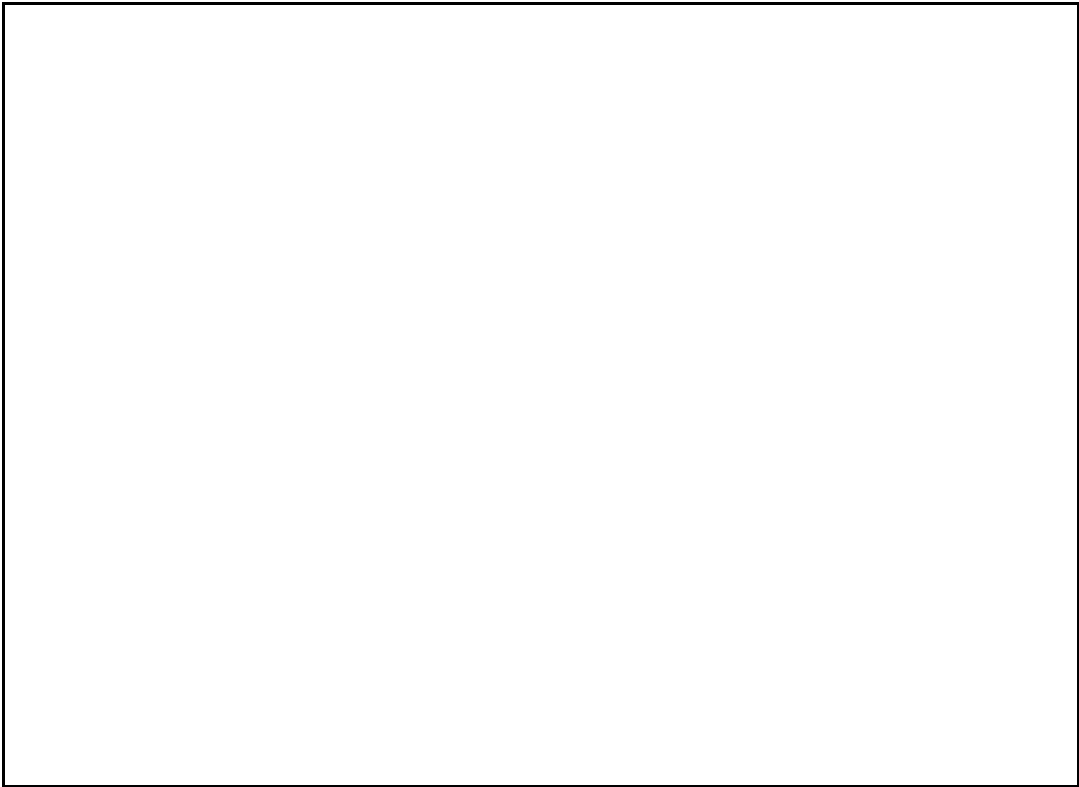
Material Name	Ethyleneglycol diacetate				
Common synonyms					
UN Number		CAS Number	111-55-9	IMDG CODE	
IMO Pollution Category	C				
Formula	C ₂ H ₄ (CH ₃ COO) ₂	Molecular Weight	146.1	Flammable limits in Air (%)	1.6 ~ 8.4
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.1	Vapor Specific Gravity	5	Boiling Point()	191
Freezing Point ()	-31	Flash Point ()	96	Ignition Point ()	
Steam Pressure					
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan: L D50 6850mg/kg (oral rat)		ACGIH:		
Hazard and Noxiousness	<p>Classification:</p> <p>Noxiousness: Since volatility is low, detrimental concentration is not reached in normal temperature. Stimulative to skin, eyes and throat is weak.</p> <p>Environmental influence: There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger: It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

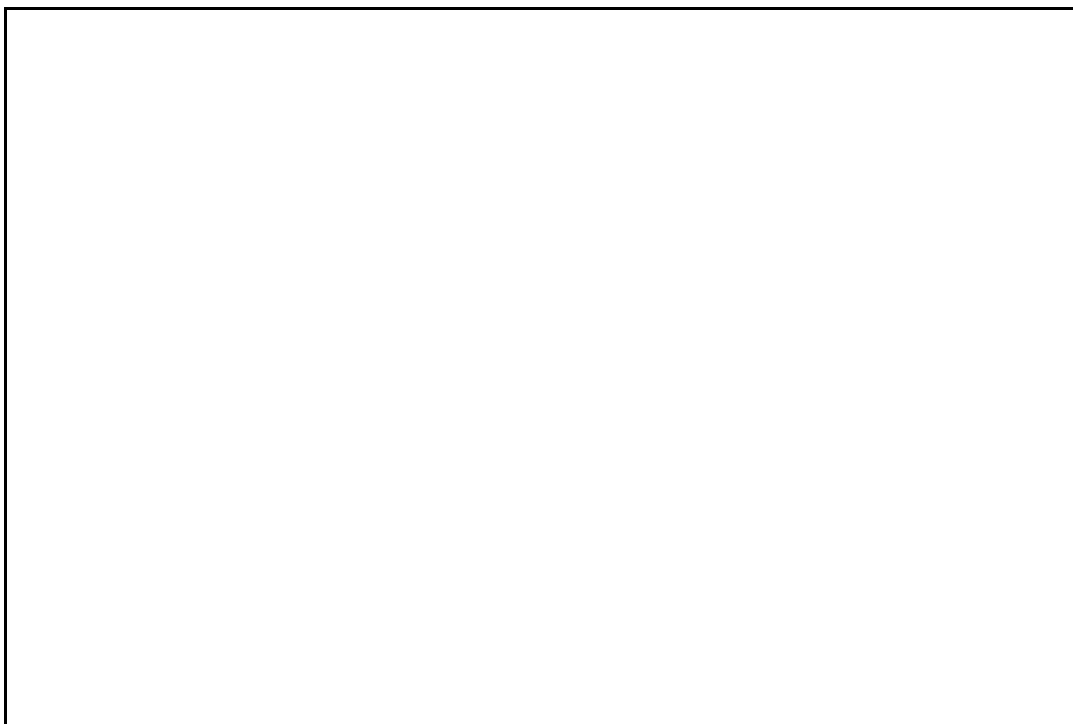


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Butyraldehyde				
Common synonyms					
UN Number	1129	CAS Number	123-72-8	IMDG CODE	Class3.2/P3196
IMO Pollution Category	C				
Formula	CH ₃ CH ₂ CH ₂ CHO	Molecular Weight	72.1	Flammable limits in Air (%)	1.9 ~ 12.5
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.8048	Vapor Specific Gravity		Boiling Point()	74.7
Freezing Point ()	-99	Flash Point ()	-9	Ignition Point ()	
Steam Pressure					
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan: L D50 5890mg/kg (oral rat)		ACGIH:		
Hazard and Noxiousness	<p>Classification: Flammable liquids, Acute toxicity substance</p> <p>Noxiousness: Irritating to skin, eyes and throat. Poisoning condition may appear behind time.</p> <p>Environmental influence: There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. There is toxicity to an aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. Polymerization may be caused by heating.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Don't make the inside of a mouth wash well with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

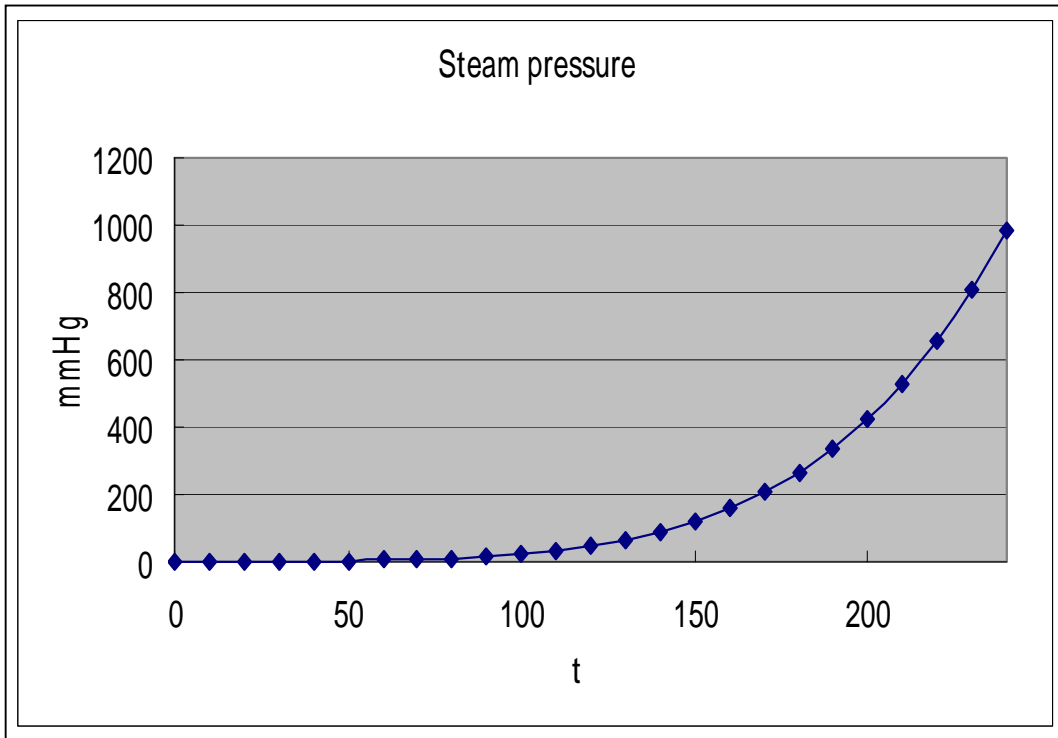


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

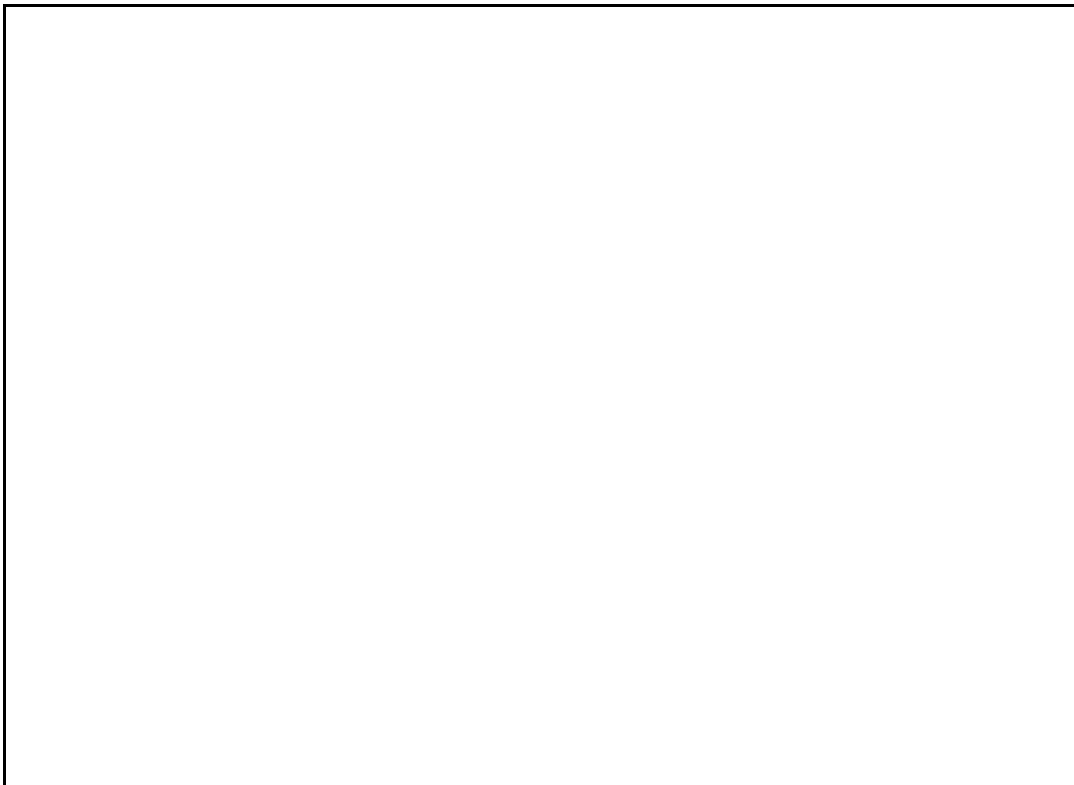
Material Name	Octanoic acid				
Common synonyms	2-Ethylhexanoic acid				
UN Number		CAS Number	149-57-5	IMDG CODE	Class8
IMO Pollution Category	D				
Formula	C ₄ H ₉ CH(C ₂ H ₅)COOH	Molecular Weight	144.22	Flammable limits in Air (%)	0.8 ~ 6.0
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.9077	Vapor Specific Gravity	5	Boiling Point()	226.9
Freezing Point ()	-83	Flash Point ()	126.7	Ignition Point ()	371
Steam Pressure	0.03mmHg (20)				
Corrosion	human : yes	metal : yes	Oxidation	yes	
TLV, Toxicity by Ingestion	Japan : L D50 3000mg/kg (oral rat)		ACGIH :		
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : It is stimulative and corrosive to skin, eyes and throat. It is made to eat metal.</p> <p>Environmental influence :</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. Reduction is strong.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube



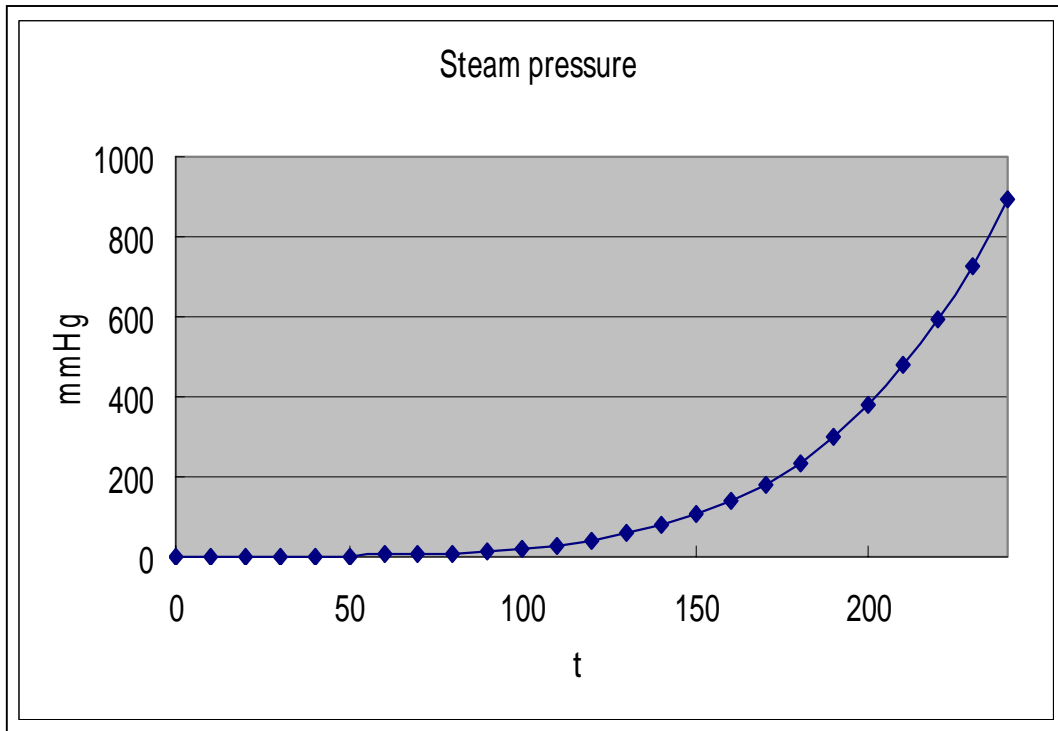
<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Polymethylene polyphenyl polyisocyanate				
Common synonyms	Papi, Polymeric MDI, Crude MDI, Polymethylene polyphenyl isocyanate				
UN Number	2810	CAS Number	9016-87-9	IMDG CODE	
IMO Pollution Category	D				
Formula		Molecular Weight		Flammable limits in Air (%)	
Appearance	Tea brown			Solubility in Water	
Specific Gravity	1.24	Vapor Specific Gravity	14	Boiling Point()	232
Freezing Point ()		Flash Point ()	218	Ignition Point ()	
Steam Pressure	0.005mmHg(20)				
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan : L D50 10000mg/kg (oral rat)		ACGIH :		
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Irritating to skin, eyes and throat The asthma externals symptom is caused. It is likely to appear delaying the symptom. Even if a permissible density is exceeded, it doesn't feel it as a stench. The symptom might occur to the density below a permissible density.</p> <p>Environmental influence : The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. Polymerization is carried out reacting with water etc. and generating carbon dioxide.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

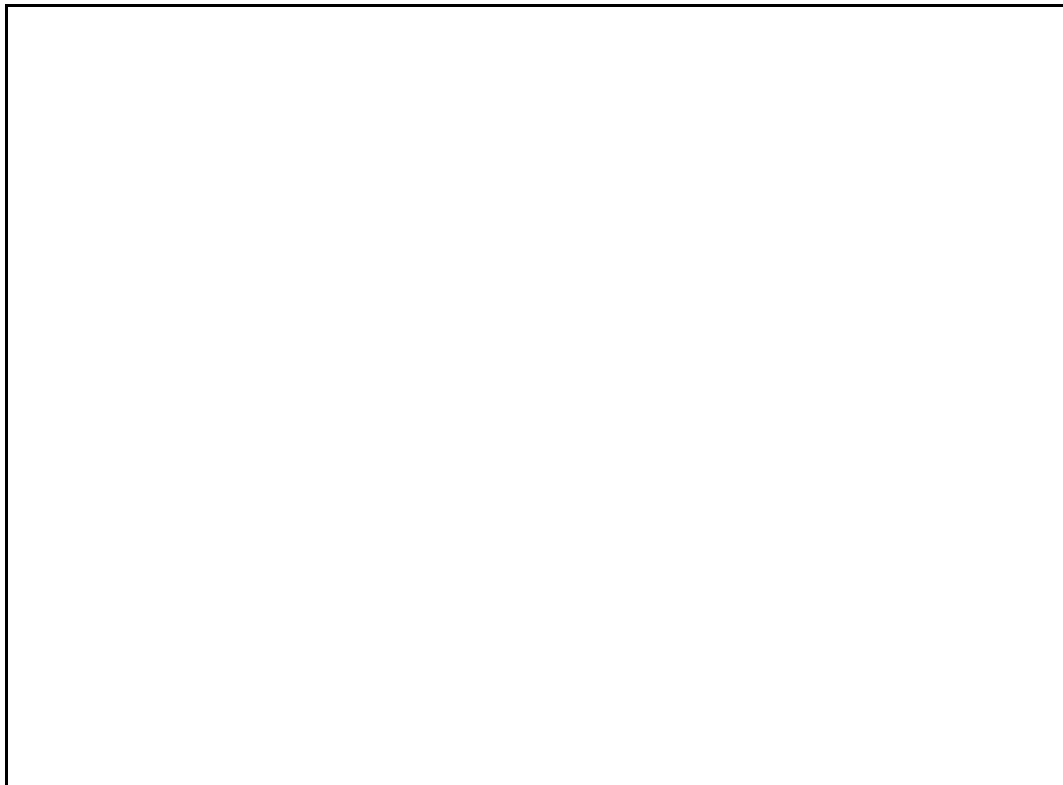
Polymethylene polyphenyl polyisocyanate - 2

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
<p>The measure at the time of leak on the sea</p>	

Syeam pressure curve



Limits of Detective Tube



Polymethylene polyphenyl polyisocyanate - 4

<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

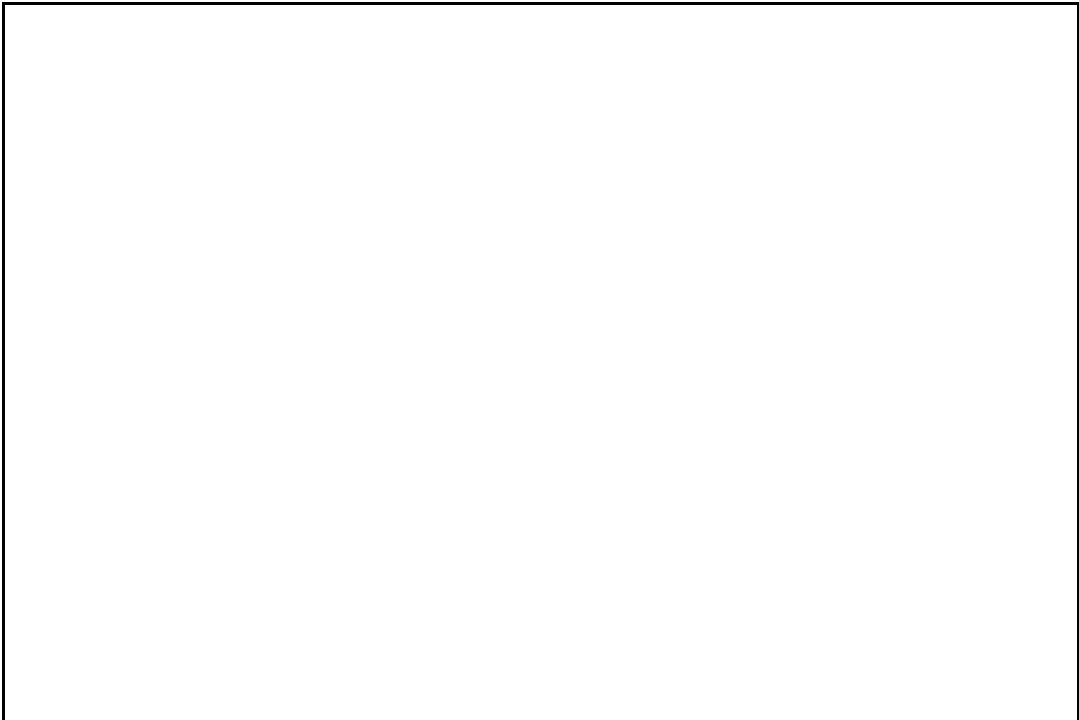
Material Name	Polybutene				
Common synonyms	Polybutylene, Polyisobutylene				
UN Number		CAS Number	9003-28-5	IMDG CODE	
IMO Pollution Category					
Formula		Molecular Weight	250 ~ 2500	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.83 ~ 0.912	Vapor Specific Gravity		Boiling Point()	
Freezing Point ()	-50 ~ 20	Flash Point ()	115 ~ 230	Ignition Point ()	
Steam Pressure					
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan : L D50 5890mg/kg (oral rat)		ACGIH:		
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Toxicity is low. A high density gas acts as suffocated gas.</p> <p>Environmental influence : There is little data about biodegradation nature to carry out. There is accumulation in the aquatic life living thing.</p> <p>Danger : It is an inflammability. The explosion limit is not known. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



Limits of Detective Tube

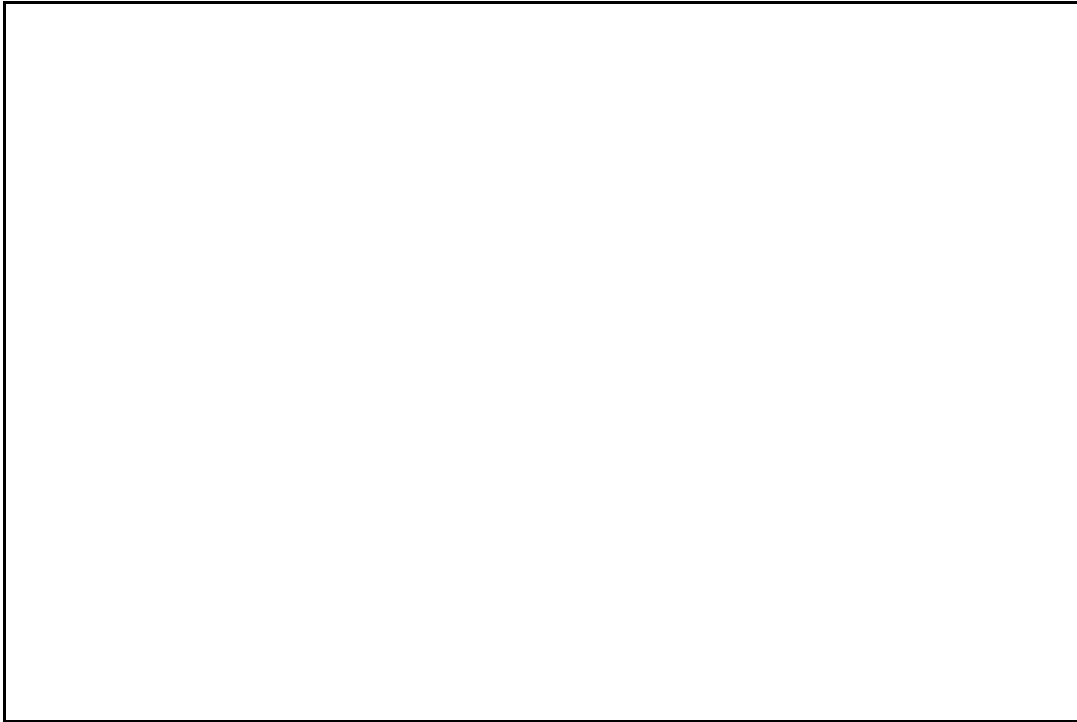


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

Material Name	Olefin mixtures(C5-C15)				
Common synonyms					
UN Number		CAS Number		IMDG CODE	
IMO Pollution Category					
Formula		Molecular Weight		Flammable limits in Air (%)	
Appearance				Solubility in Water	
Specific Gravity		Vapor Specific Gravity		Boiling Point()	
Freezing Point ()		Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human :	metal :	Oxidation		
TLV, Toxicity by Ingestion	Japan :		ACGIH :		
Hazard and Noxiousness	Classification : Noxiousness : Environmental influence : Danger :				
First Aid	If inhaled In case of contact When it goes into an eye If swallowed				

The measure in case of a fire	<p>Fire extinguisher</p> <p>The fire-extinguishing method</p> <p>Firefighters protection</p>
The measure at the time of leak	<p>Notes to a human body</p> <p>Notes to environment</p> <p>A method of removing</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment</p> <p>Detector</p>
The measure at the time of leak on the sea	<p>Leak on board</p> <p>Leak on the sea</p>

Steam pressure curve



Limits of Detective Tube

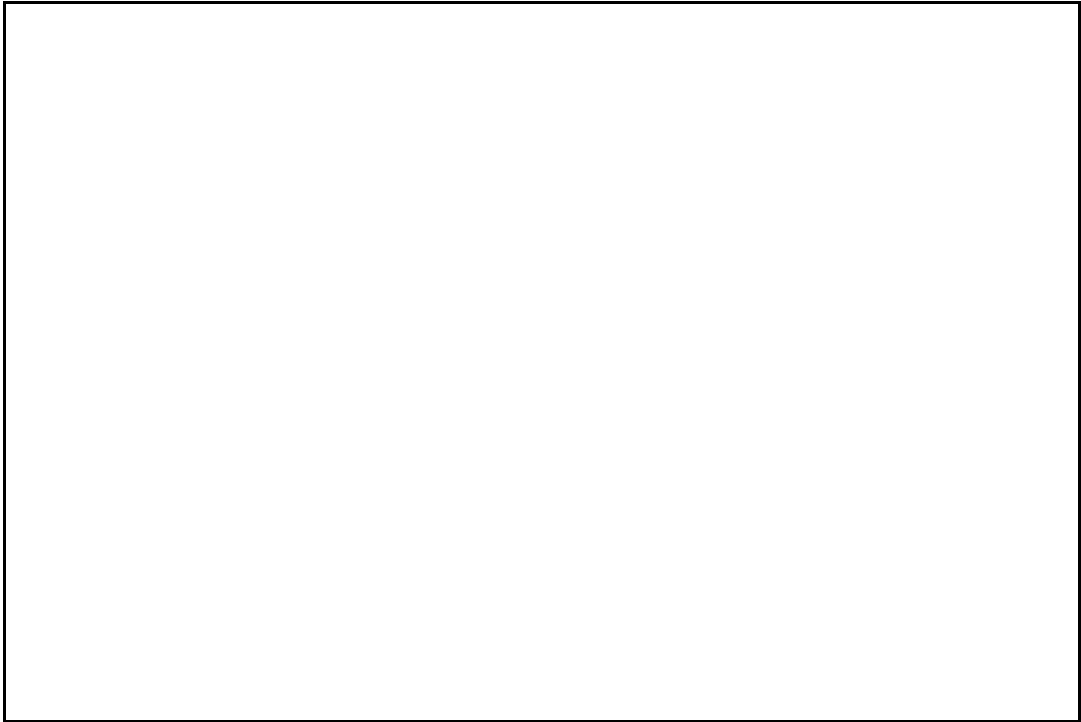


The cautions on handling, and transportation / storage	Handling Container handling Storage Transport
The cautions on abandonment	The cautions on abandonment

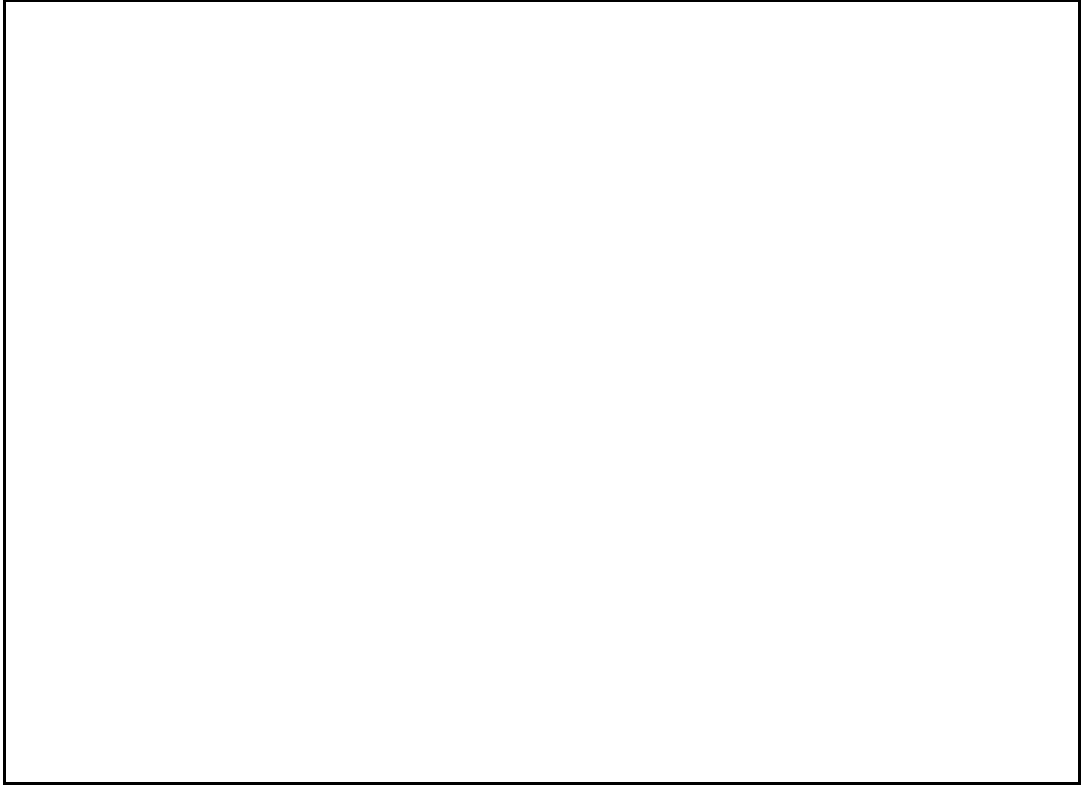
Material Name	Acrylamide				
Common synonyms	Propeneamide				
UN Number	2074	CAS Number	79-06-1	IMDG CODE	Class6.1/P6054
IMO Pollution Category	D				
Formula	CH ₂ =CHCONH ₂	Molecular Weight	71.08	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.122	Vapor Specific Gravity		Boiling Point()	
Freezing Point ()		Flash Point ()		Ignition Point ()	
Steam Pressure					
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 0.3mg/m ³ L D 50 170mg/kg (oral rat)		ACGIH : 0.03mg/m ³ TWA A2 skin		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance, Other noxiousness substance</p> <p>Noxiousness : There are stimulation and a causticity for the skin, eyes, and airways. It is likely to appear delaying the poisoning symptom. Carcinogenesis is confirmed in the animal experiment. There is a skin absorption.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It doesn't burn easily though it is combustion. The explosive gas might be caused in steam mixing it with air if heated. The polymerization is caused by heating. Steam is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



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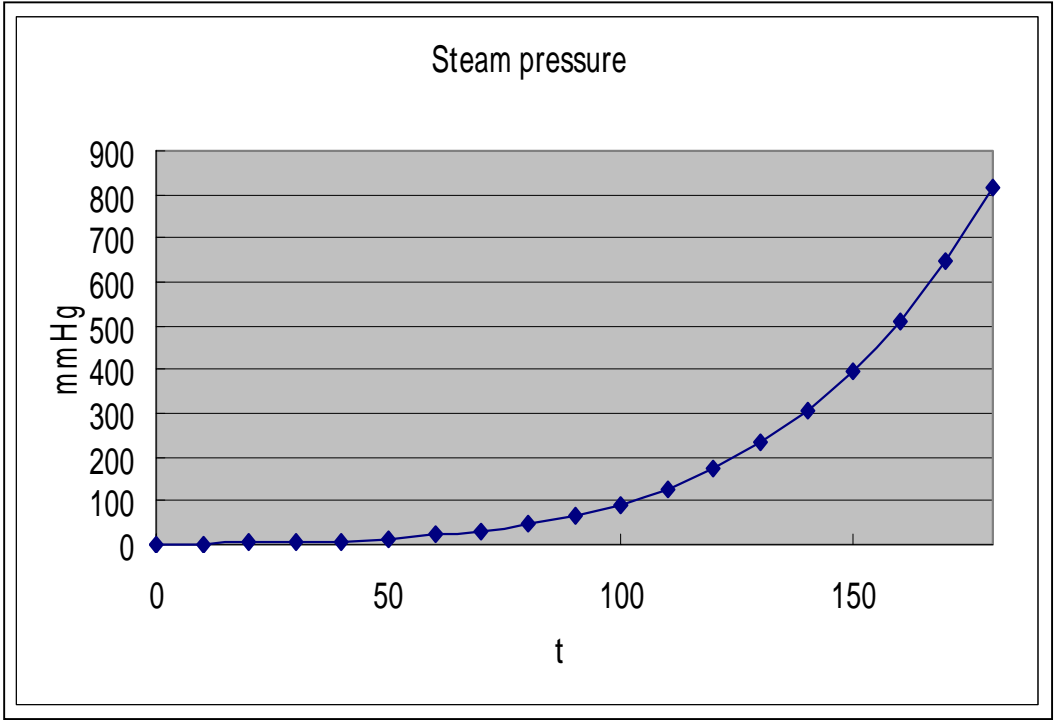


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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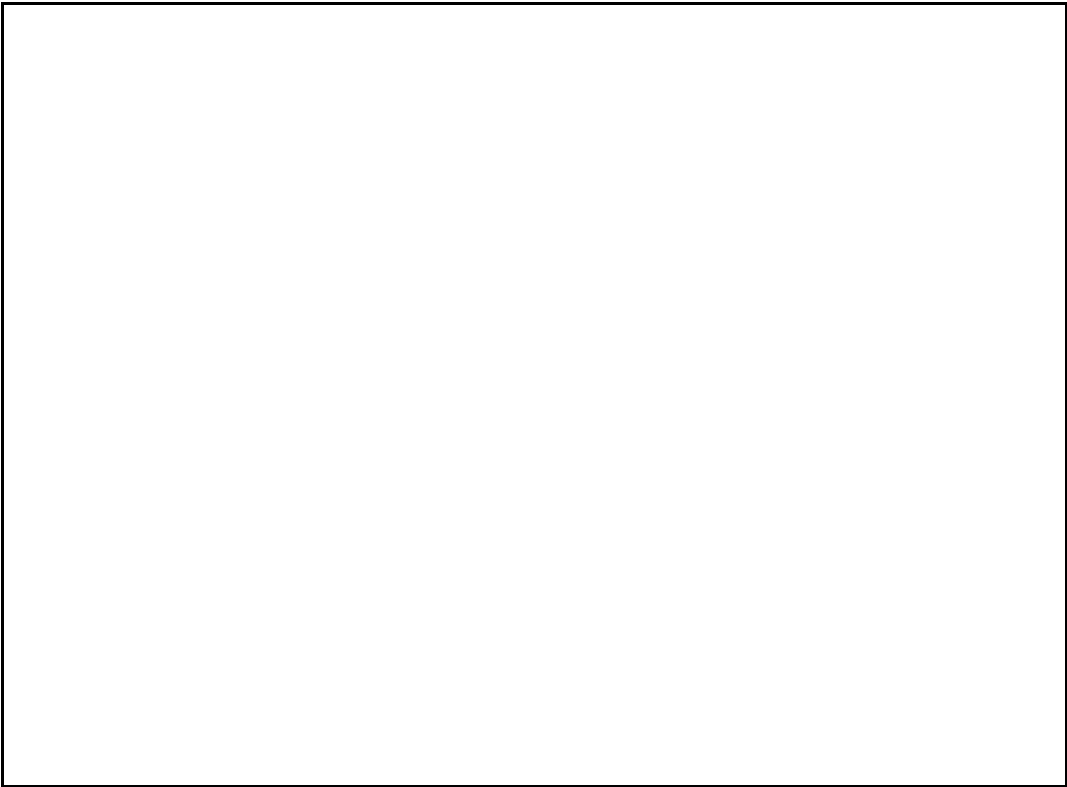
Material Name	Heptanol				
Common synonyms	Heptyl alcohol				
UN Number		CAS Number	70995-11-2	IMDG CODE	
IMO Pollution Category	C				
Formula	CH ₃ (CH ₂) ₆ OH	Molecular Weight	116.21	Flammable limits in Air (%)	1.2 ~ 10.0
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.882	Vapor Specific Gravity	4.04	Boiling Point()	176.81
Freezing Point ()	-34.03	Flash Point()	74	Ignition Point()	300
Steam Pressure	0.9mmHg(20)				
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan : L D50 500mg/kg (oral rat)		ACGIH:		
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Toxicity is low. Environmental influence : There is biodegradation nature. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
<p>The measure at the time of leak on the sea</p>	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

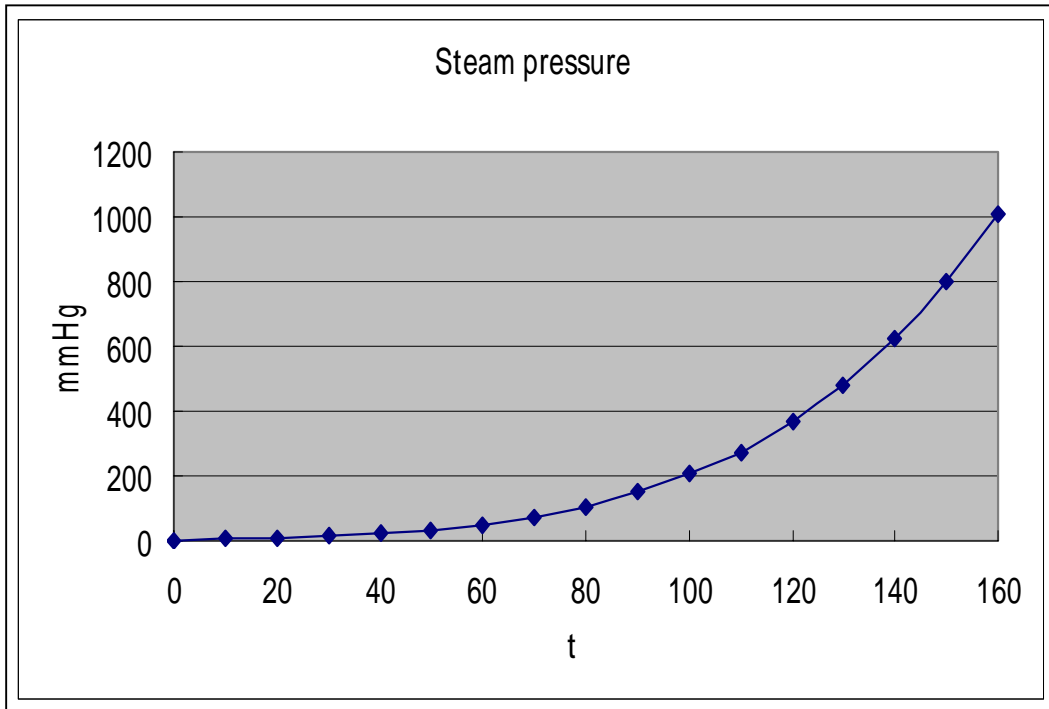


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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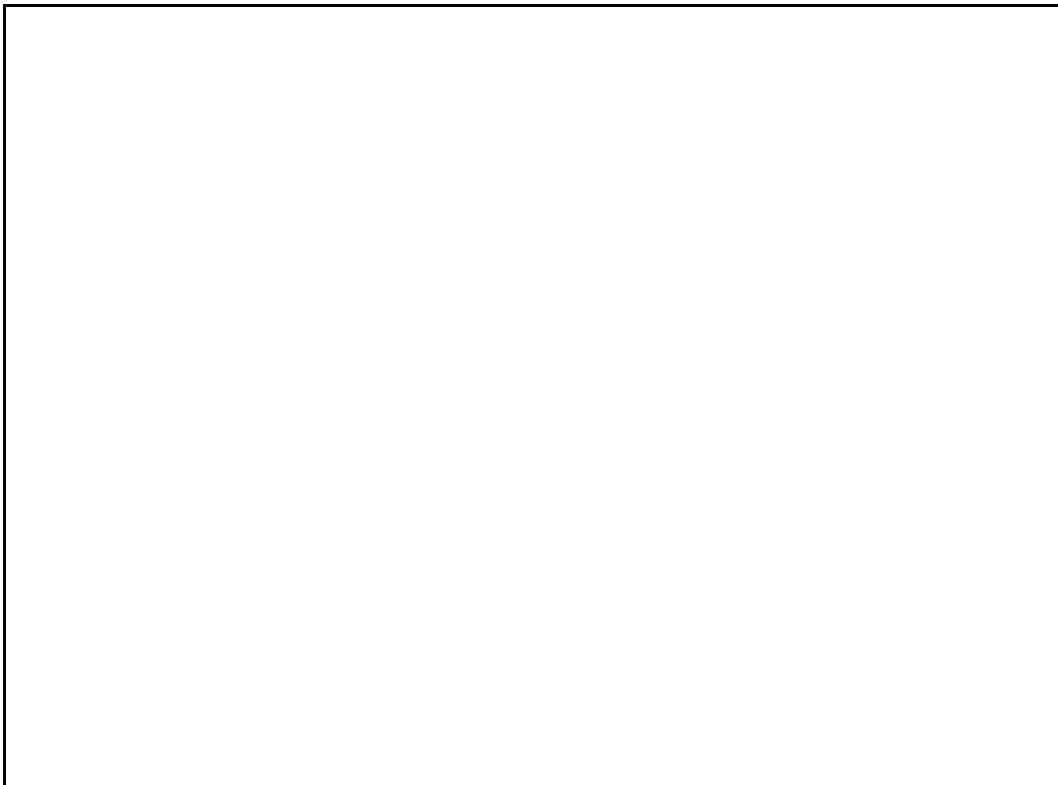
Material Name	Palm oil fatty acid methyl ester				
Common synonyms	Coconut methyl ester				
UN Number		CAS Number		IMDG CODE	
IMO Pollution Category	D				
Formula		Molecular Weight		Flammable limits in Air (%)	
Appearance	Straw			Solubility in Water	
Specific Gravity	0.85	Vapor Specific Gravity		Boiling Point()	148
Freezing Point ()		Flash Point()	65	Ignition Point()	
Steam Pressure					
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan: L D 50	ACGIH:			
Hazard and Noxiousness	<p>Classification:</p> <p>Noxiousness: It is the one used for food and there is substantially no influence on the human body.</p> <p>Environmental influence: There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger: It doesn't burn easily and it is necessary heating.</p>				
First Aid	<p>If inhaled</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
<p>The measure at the time of leak on the sea</p>	

Steam pressure curve



Limits of Detective Tube

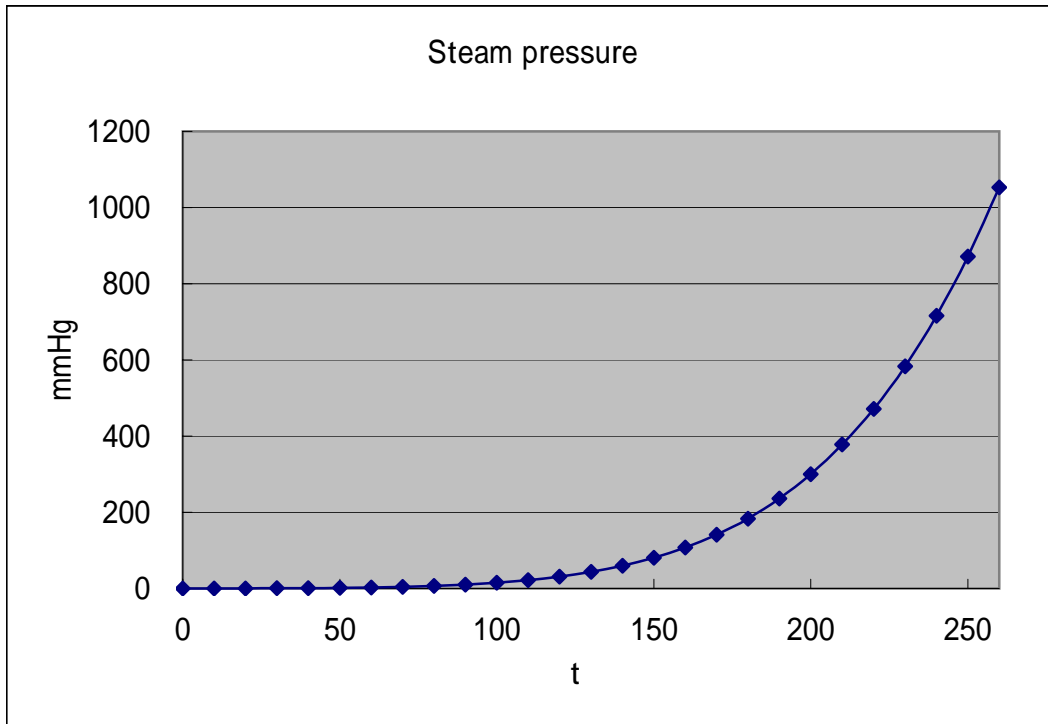


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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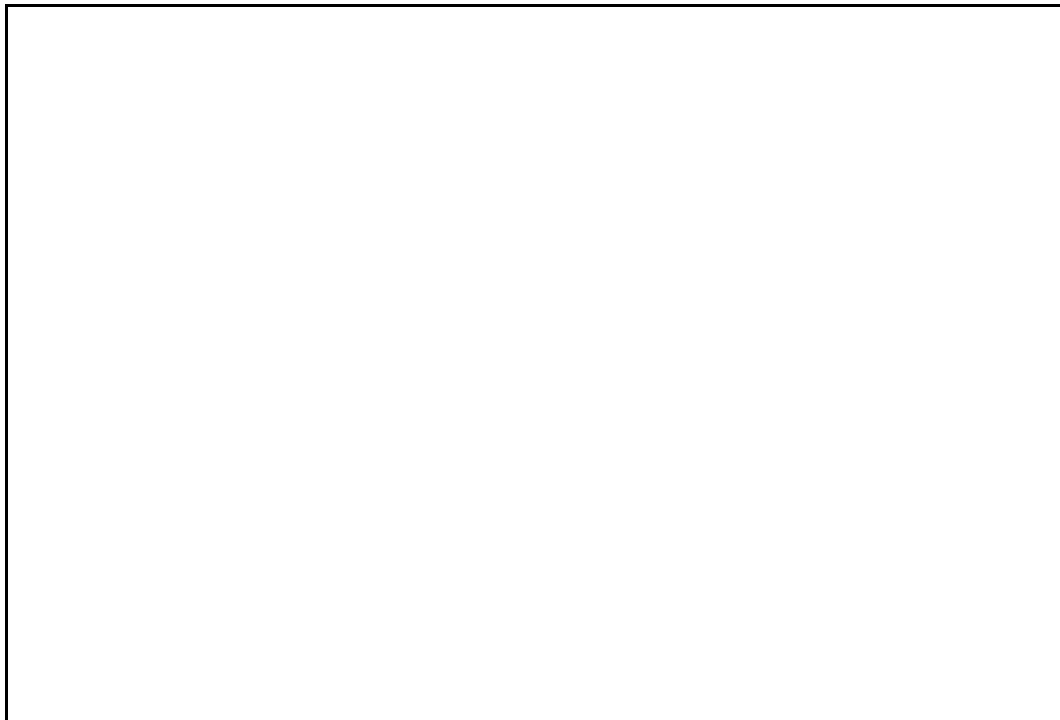
Material Name	Undecanol				
Common synonyms	Undecyl alcohol, DIADOL 11				
UN Number	3082	CAS Number	112-42-5	IMDG CODE	
IMO Pollution Category	B				
Formula	CH ₃ (CH ₂) ₉ CH ₂ OH	Molecular Weight	172	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.822	Vapor Specific Gravity	6	Boiling Point()	243
Freezing Point ()	19	Flash Point ()	117	Ignition Point ()	
Steam Pressure	6 ~ 15.0mmHg				
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan: L D 50	ACGIH:			
Hazard and Noxiousness	<p>Classification:</p> <p>Noxiousness: Toxicity is low.</p> <p>Environmental influence: There is biodegradation nature. There is accumulation in the aquatic life living thing.</p> <p>Danger: It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
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Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



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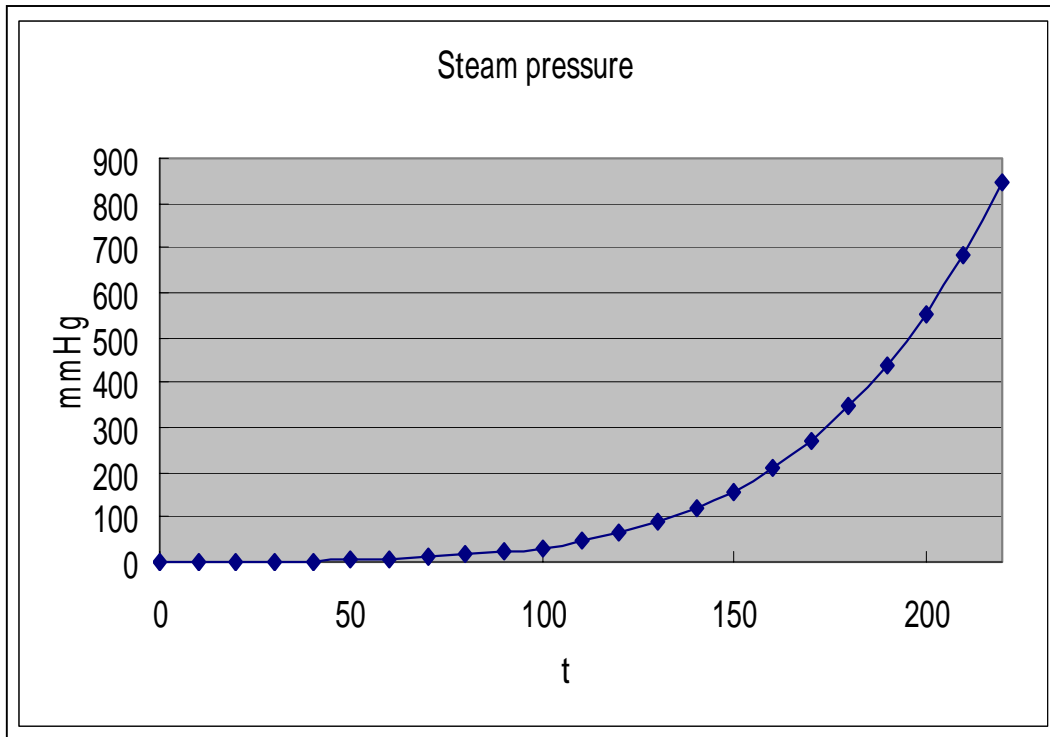


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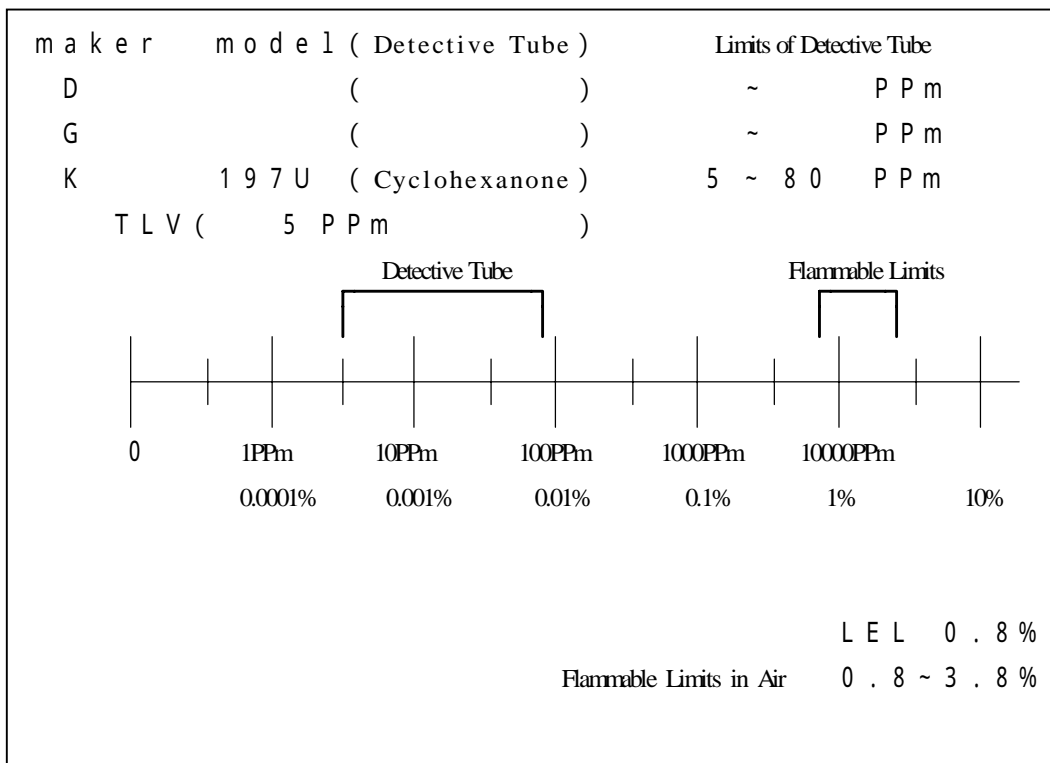
Material Name	Isophorone				
Common synonyms	3,3,5-Trimethyl-2-cyclohexen-1-one				
UN Number		CAS Number	78-59-1	IMDG CODE	
IMO Pollution Category	D				
Formula	C8H14O	Molecular Weight	138.21	Flammable limits in Air (%)	0.8 ~ 3.8
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.9929	Vapor Specific Gravity	4.8	Boiling Point()	215
Freezing Point ()	-8.1	Flash Point ()	84	Ignition Point ()	460
Steam Pressure	0.2mmHg(20)				
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : L D50 2330mg/kg (oral rat)		ACGIH : 5ppm TLV-C A3		
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : There is stimulation for the skin, eyes, and airways. Carcinogenic is confirmed in the animal experiment.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube



<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

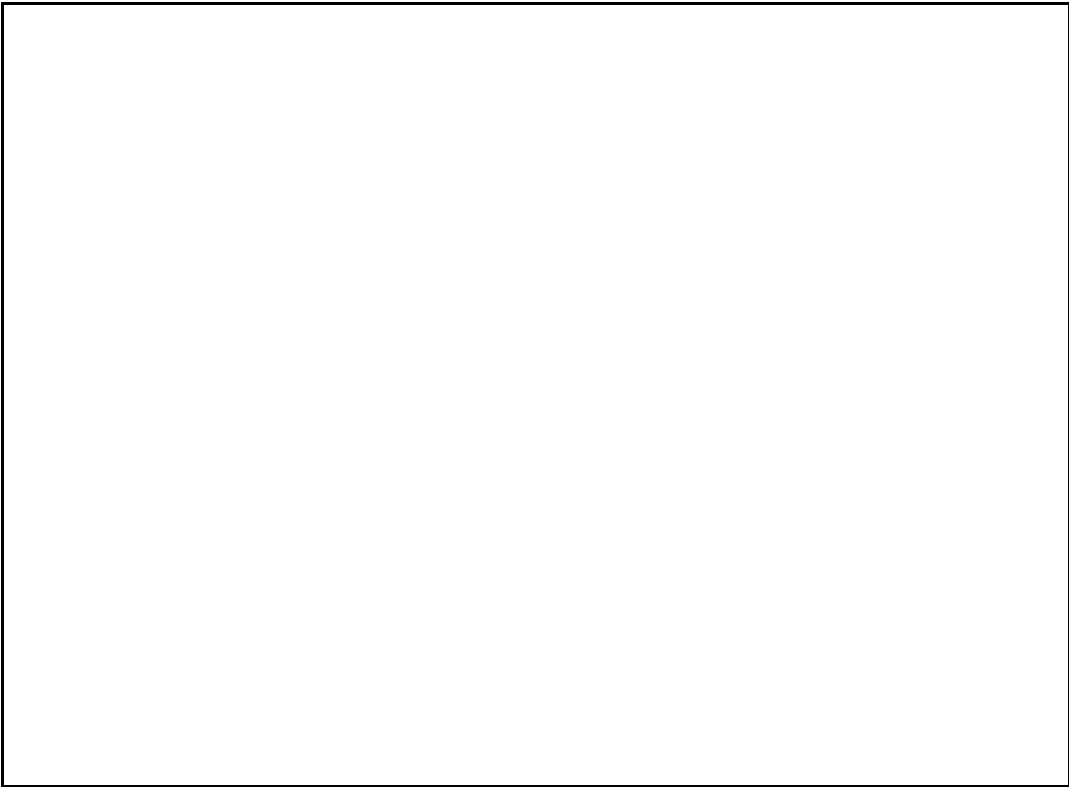
Material Name	Olefin mixtures(C5-C7)				
Common synonyms					
UN Number		CAS Number		IMDG CODE	
IMO Pollution Category					
Formula		Molecular Weight		Flammable limits in Air (%)	
Appearance				Solubility in Water	
Specific Gravity		Vapor Specific Gravity		Boiling Point()	
Freezing Point ()		Flash Point()		Ignition Point()	
Steam Pressure					
Corrosion			Oxidation		
TLV, Toxicity by Ingestion	Japan :		ACGIH :		
Hazard and Noxiousness	Classification : Noxiousness : Environmental influence : Danger :				
First Aid	If inhaled In case of contact When it goes into an eye If swallowed				

The measure in case of a fire	Fire extinguisher The fire-extinguishing method Firefighters protection
The measure at the time of leak	Notes to a human body Notes to environment A method of removing
Personal Protective Equipment and Detector	Personal Protective Equipment Detector
The measure at the time of leak on the sea	Leak on board Leak on the sea

Steam pressure curve



Limits of Detective Tube

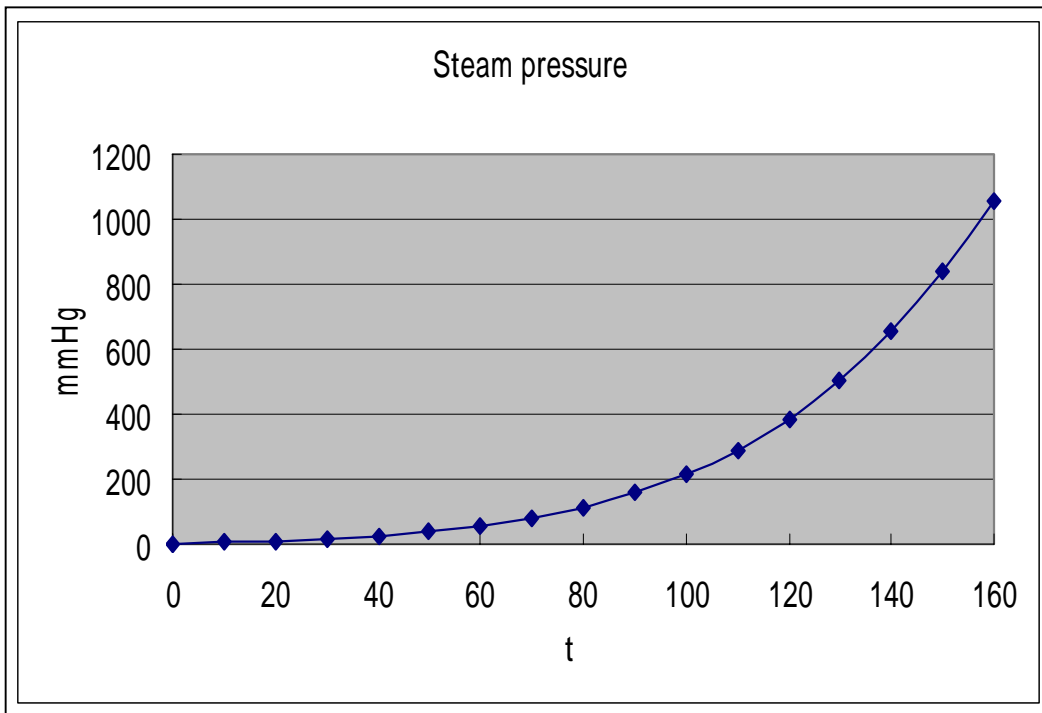


The cautions on handling, and transportation / storage	Handling Container handling Storage Transport
The cautions on abandonment	The cautions on abandonment

Material Name	Propylene glycol monomethylether acetate				
Common synonyms	Methoxypropyl acetate				
UN Number	1993	CAS Number	108-65-6	IMDG CODE	Class3.3/P3345
IMO Pollution Category	D				
Formula		Molecular Weight	132.1	Flammable limits in Air (%)	1.5 ~ 7.0
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	0.97	Vapor Specific Gravity	4.6	Boiling Point()	146
Freezing Point ()	-55	Flash Point ()	47.7	Ignition Point ()	
Steam Pressure	3.45mmHg(20)				
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan : 5ppm L D50 8532mg/kg (oral rat)		ACGIH : 5ppm TWA skin		
Hazard and Noxiousness	<p>Classification : Flammable liquids Noxiousness : There is stimulation for eyes and airways. The liquid removes the skin. Environmental influence :</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respies artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
<p>The measure at the time of leak on the sea</p>	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

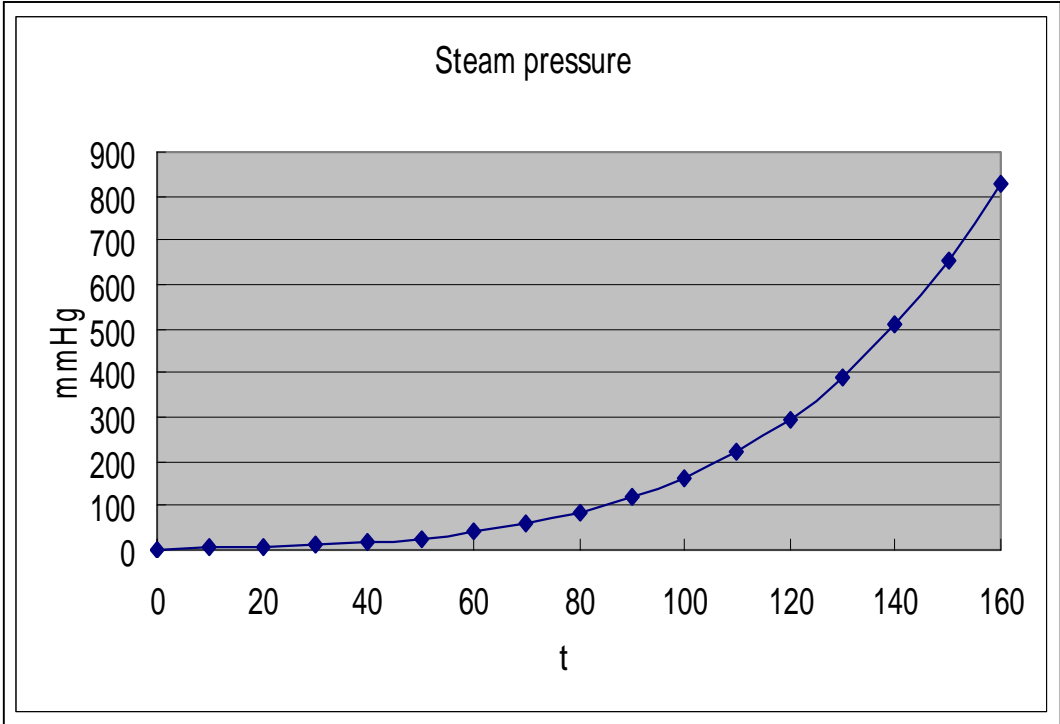


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

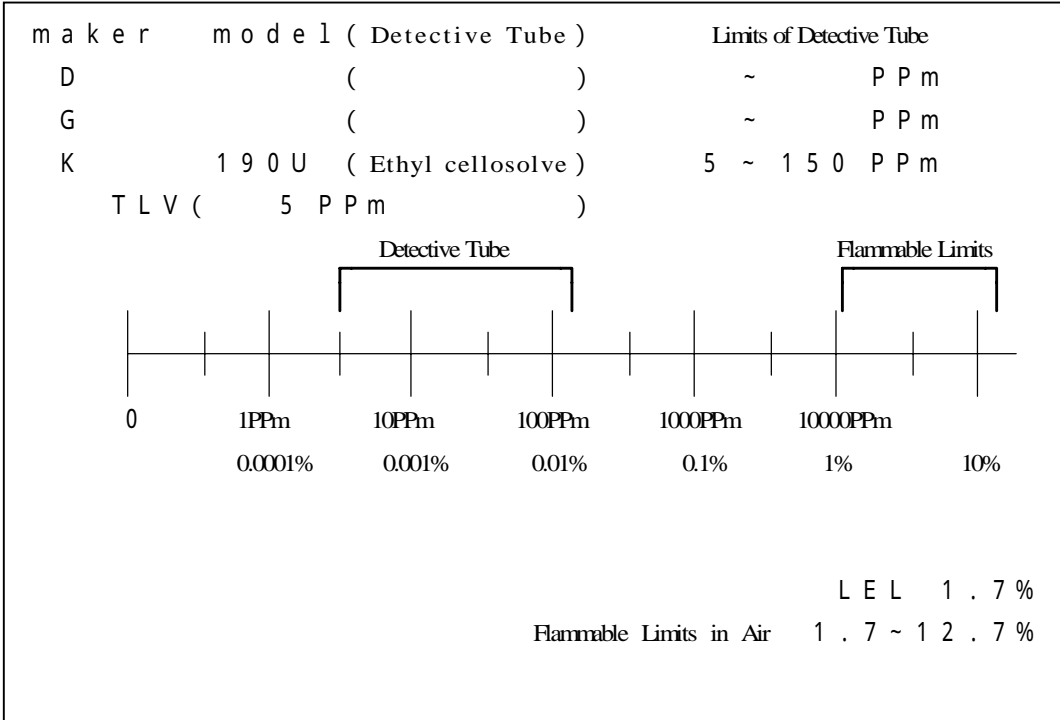
Material Name	Ethylglycol acetate				
Common synonyms	Ethylenegrycol monoethyl ether acetate				
UN Number	1172	CAS Number	111-15-9	IMDG CODE	Class3.3/P3341
IMO Pollution Category	C				
Formula	CH ₃ COOCH ₂ CH ₂ OC ₂ H ₅	Molecurar Weight	132.2	Flammable limits in Air (%)	1.7 ~ 12.7
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	0.9748	Vapor Specific Gravity	4.7	Boiling Point()	156.3
Freezing Point ()	-61.7	Flash Point ()	52	Ignition Point ()	379
Steam Pressure	1.2mmHg(20)				
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 5ppm L D50 3000mg/kg (oral rat)		ACGIH : 5ppm TWA skin		
Hazard and Noxiousness	<p>Classification : Flammable liquids, Acute toxicity substance</p> <p>Noxiousness : There is stimulation for the skin, eyes, and airways. There is a skin absorption.</p> <p>Environmental influence : The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

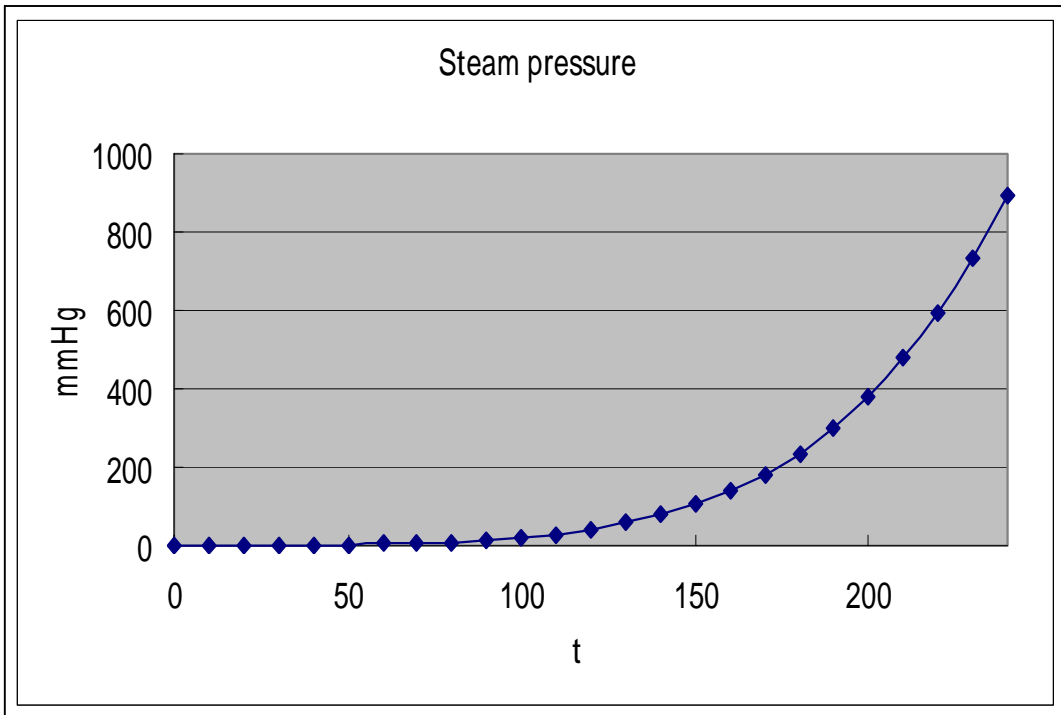


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

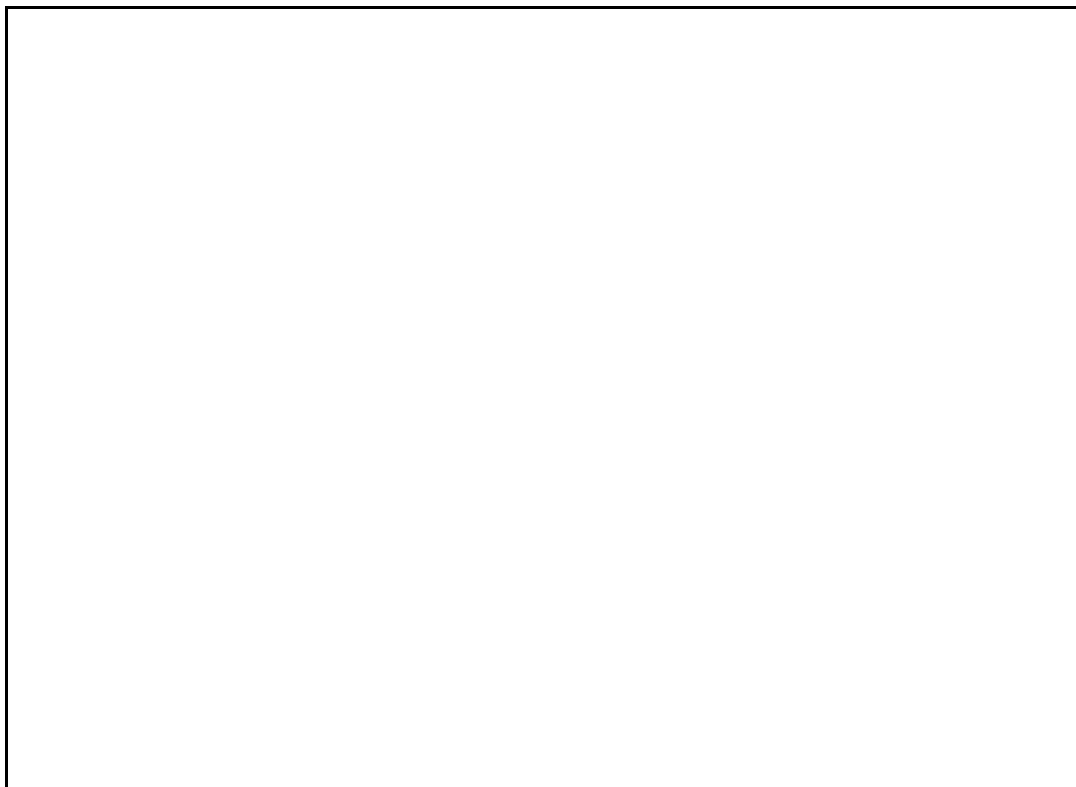
Material Name	Dipropylene glycol				
Common synonyms	1,1'-Oxy-dipropanol				
UN Number		CAS Number	25265-71-8	IMDG CODE	
IMO Pollution Category					
Formula	CH3CHOHCH2OCH2CHOHCH3	Molecular Weight	134.2	Flammable limits in Air (%)	2.9 ~ 12.6
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.02	Vapor Specific Gravity	4.63	Boiling Point()	231.8
Freezing Point ()	-40	Flash Point ()	138	Ignition Point ()	350
Steam Pressure	0.008mmHg(20)				
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan: ACGIH: LD50 14850mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification:</p> <p>Noxiousness: Because volatility is low, it doesn't reach a harmful density at the normal temperature. Stimulation to the skin, eyes, and airways is low.</p> <p>Environmental influence: There is biodegradation nature. There is not accumulation in the aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube



<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

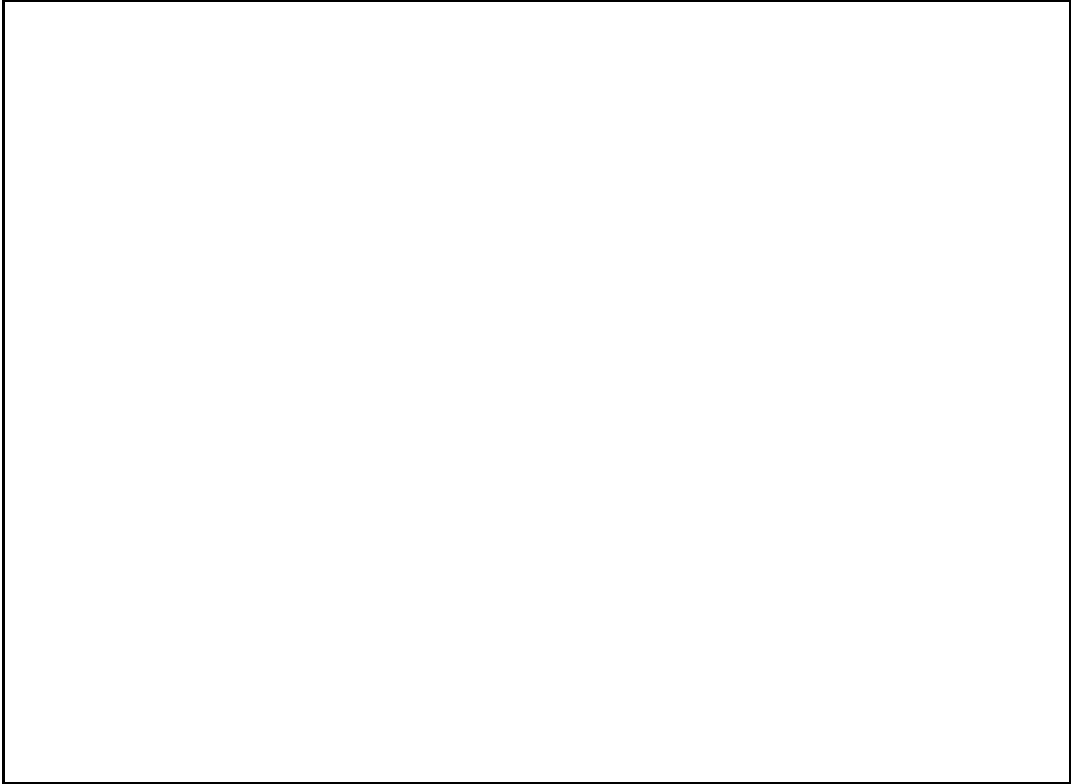
Material Name	Diheptyl phthalate				
Common synonyms	Diheptylphthalate				
UN Number		CAS Number	78-59-1	IMDG CODE	
IMO Pollution Category					
Formula	C ₆ H ₄ (CO ₂ C ₇ H ₁₅) ₂	Molecular Weight	362.51	Flammable limits in Air (%)	
Appearance	colorless			Solubility in Water	insoluble
Specific Gravity	0.992	Vapor Specific Gravity	12.5	Boiling Point()	235 ~ 245
Freezing Point ()	-46	Flash Point()	193	Ignition Point()	
Steam Pressure					
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan : L D 50	ACGIH :			
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Because volatility is low, it doesn't reach a harmful density at the normal temperature. Stimulation to the skin, eyes, and airways is low.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tuve

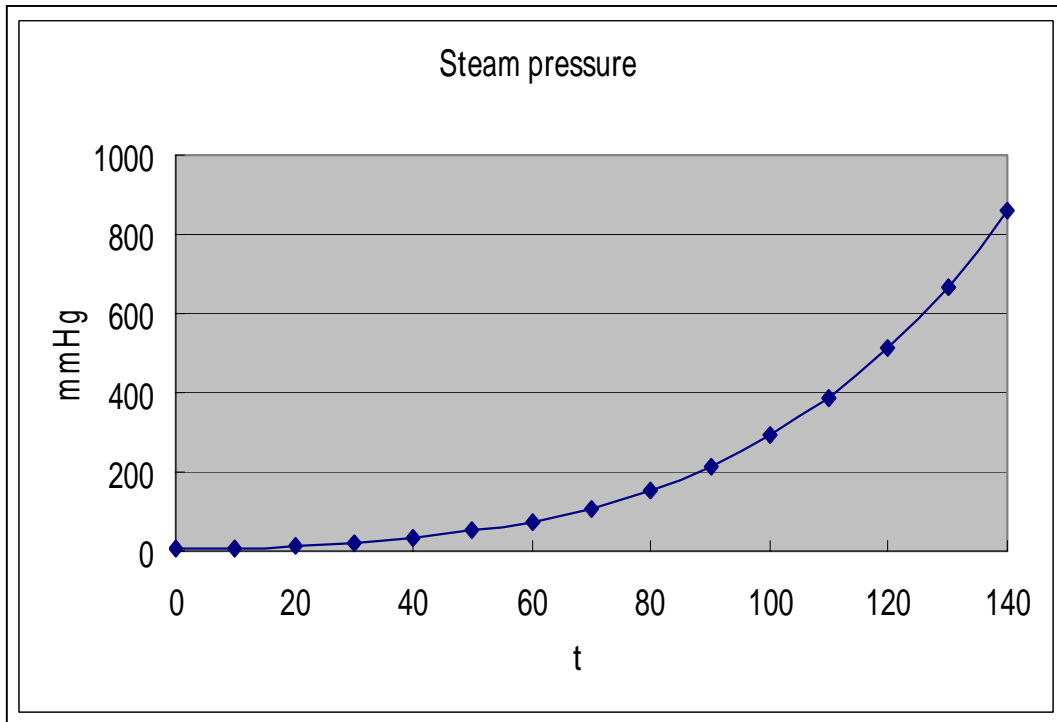


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

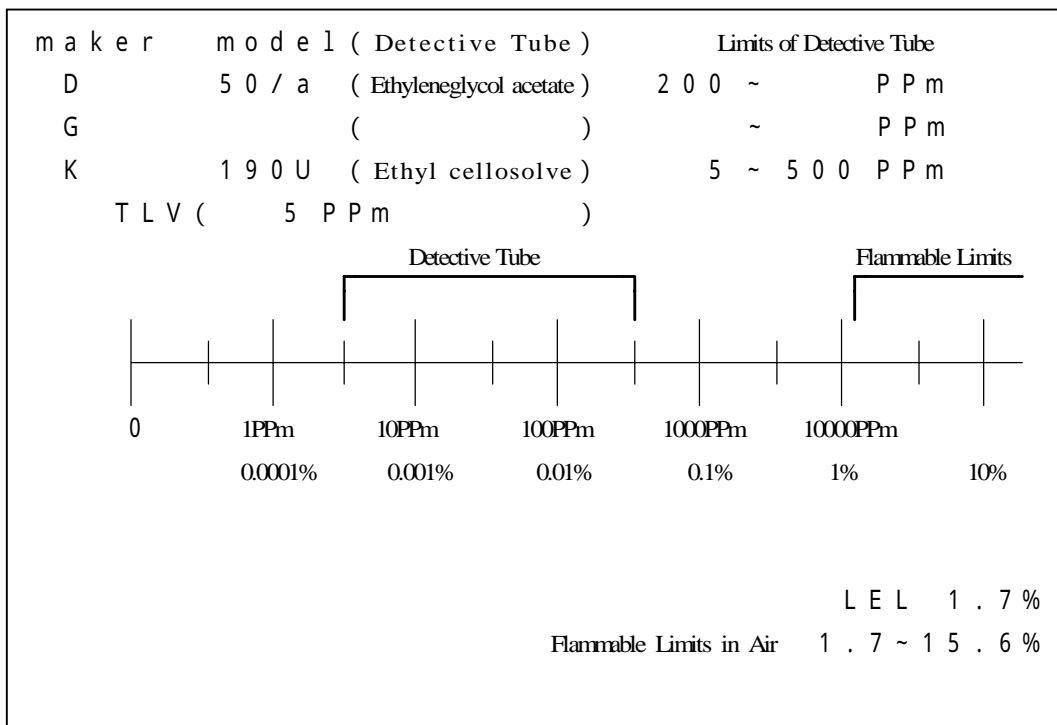
Material Name	2-Ethoxyethanol				
Common synonyms	Ethylene glycol monoethyl ether,ethyl glycol,ethyl cellosolve				
UN Number	1171	CAS Number	110-80-5	IMDG CODE	Class3.3/P3341
IMO Pollution Category	D				
Formula	C2H5OCH2CH2OH	Molecular Weight	90.12	Flammable limits in Air (%)	1.7 ~ 15.6
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.9275	Vapor Specific Gravity	3.1	Boiling Point()	135.1
Freezing Point ()	-70	Flash Point ()	43	Ignition Point ()	235
Steam Pressure	3.75mmHg				
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 5ppm L D50 3000mg/kg (oral rat) ACGIH : 5ppm(18mg/m3) TWA skin				
Hazard and Noxiousness	<p>Classification : Flammable liquids, Acute toxicity substance</p> <p>Noxiousness : Stimulation to the skin, eyes, and airways is low. There is a skin absorption. Genital toxicity might be caused for people.</p> <p>Environmental influence : There is biodegradation nature. There is not accumulation in the aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of detective Tuve

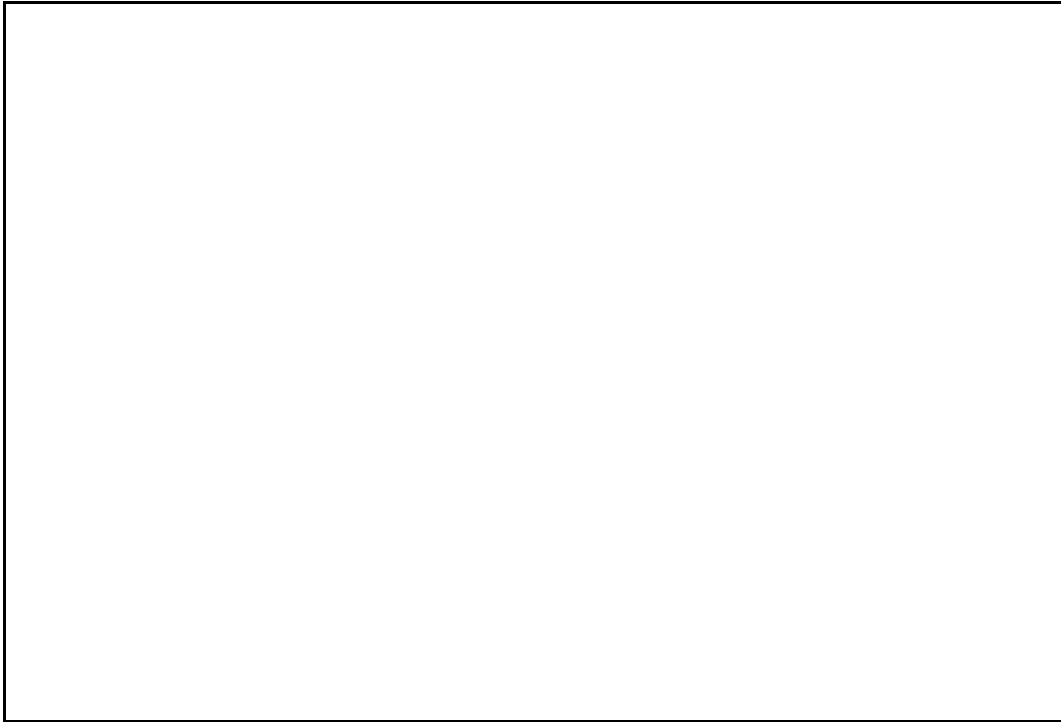


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

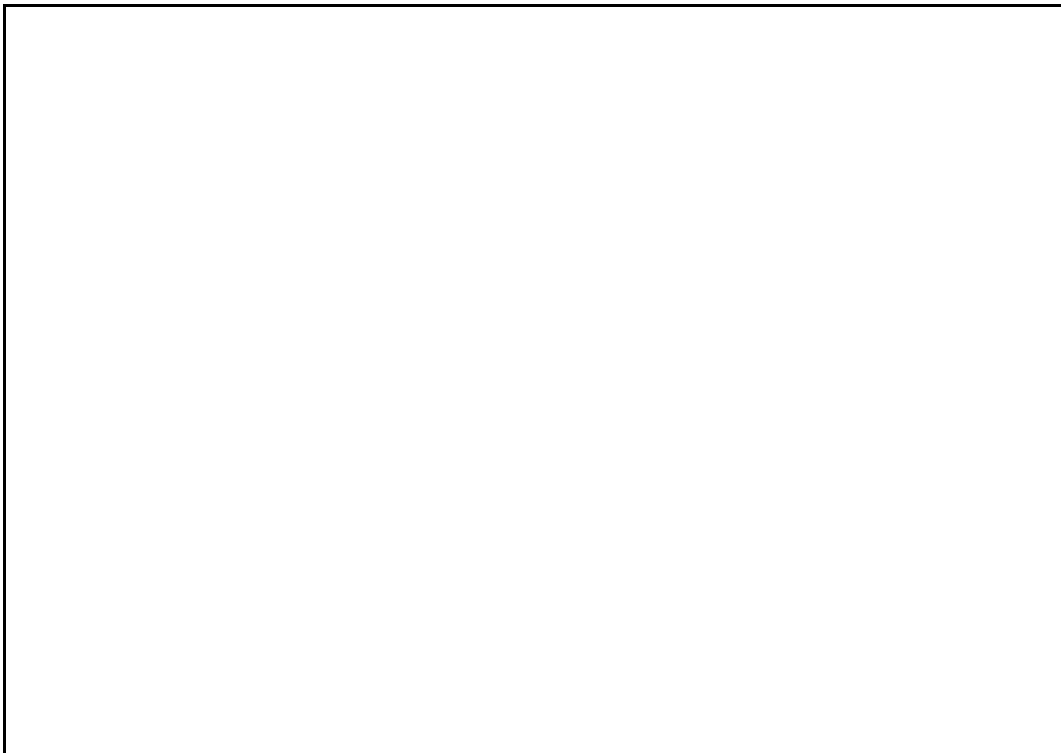
Material Name	Turpentine oil				
Common synonyms	Oil of turpentine,Gum thus,Spirits of turpentine				
UN Number	1299	CAS Number	8006-64-2	IMDG CODE	Class3.3/P3391
IMO Pollution Category	B				
Formula	C10H16	Molecurar Weight	136	Flammable limits in Air (%)	0.8 ~
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	0.860 ~ 0.875	Vapor Specific Gravity	4.8	Boiling Point()	150 ~ 170
Freezing Point ()	-50 ~ -60	Flash Point ()	35	Ignition Point ()	253.5
Steam Pressure	10mmHg(37.3)				
Corrosion	human : no	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : 50ppm L D50 5760mg/kg (oral rat)		ACGIH : 100ppm TWA		
Hazard and Noxiousness	<p>Classification : Flammable liquids, Acute toxicity substance</p> <p>Noxiousness : There is stimulation for the skin, eyes, and airways. There is an effect of controlling the center nerve.</p> <p>Environmental influence : There is toxicity to an aquatic life living thing. The influence that extends over a long period of time in an aquatic environment might be exerted.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

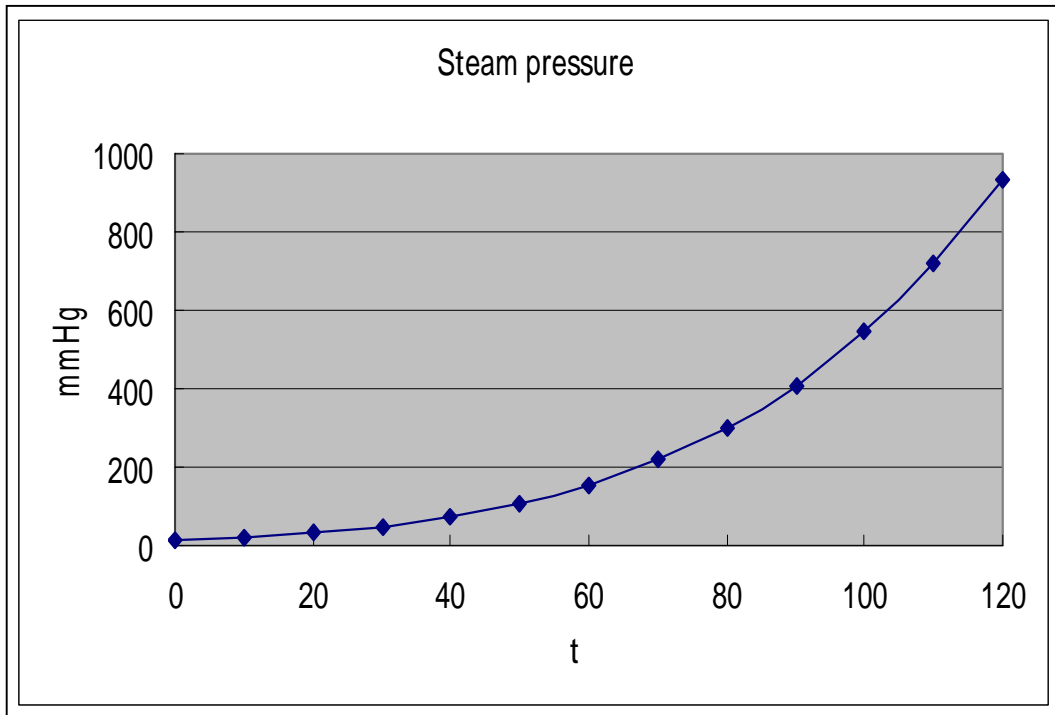


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

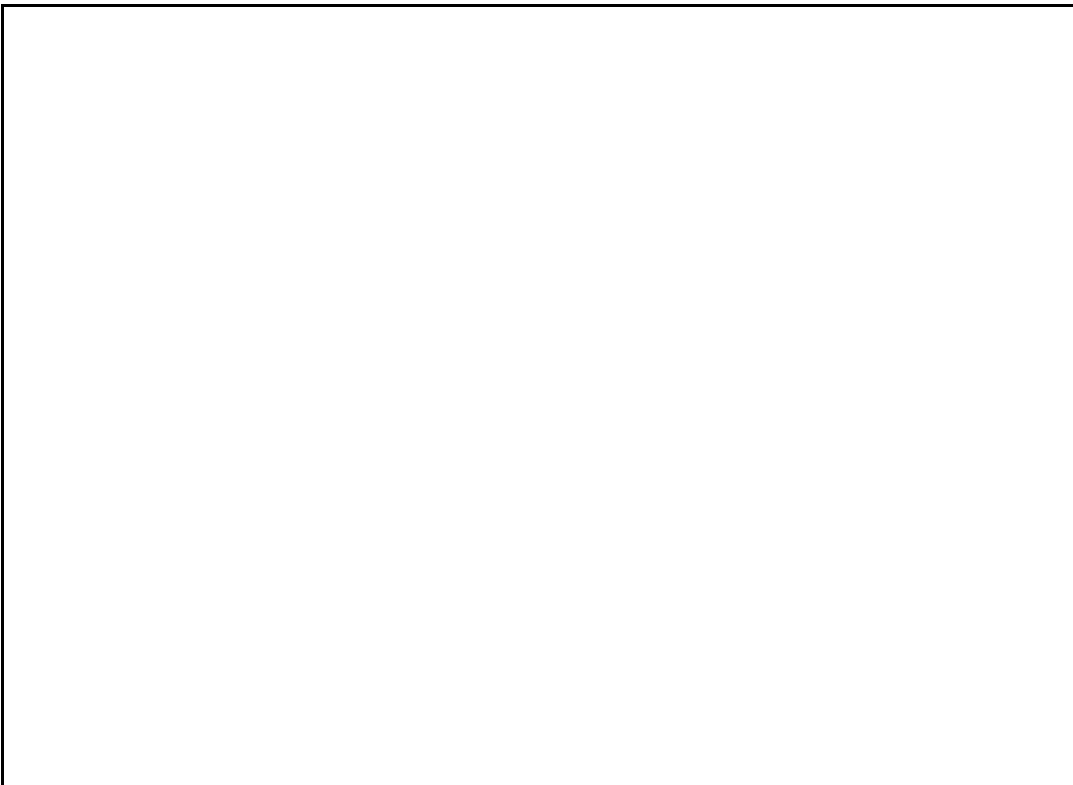
Material Name	1,3-Dichloropropene				
Common synonyms	Dichloropropene,Dichloropropylene,Propylene dichloride,TELONE-				
UN Number	2047	CAS Number	8003-19-8	IMDG CODE	Class3.3/P3330
IMO Pollution Category	B				
Formula	CH ₂ ClCH=CHCl	Molecular Weight	112.99	Flammable limits in Air (%)	5.3 ~ 14.5
Appearance	colorless			Sollubility in Water	insoluble
Specific Gravity	1.224	Vapor Specific Gravity	3.9	Boiling Point()	112.2
Freezing Point ()	-80	Flash Point ()	35	Ignition Point ()	557
Steam Pressure	30mmHg(20)				
Corrosion	human : no	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : ACGIH : 1ppm TWA skin A4 L D50 250mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable liquids,Other noxiousness substance</p> <p>Noxiousness : The skin, eyes, and airways are violently stimulated. It is likely to appear delaying the poisoning symptom. There is a possibility of absorbing it from the skin. Carcinogenic to man cannot be classified.</p> <p>Environmental influence : Perhaps, the accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO₂, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO₂, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward. Absorbing polymer and a solidifying agent are sprinkled from the windward, and it solidifies. After checking that generating of gas has been lost, it collects in a recovery net etc.</p>

Steam pressure curve



Limits of Detective Tube

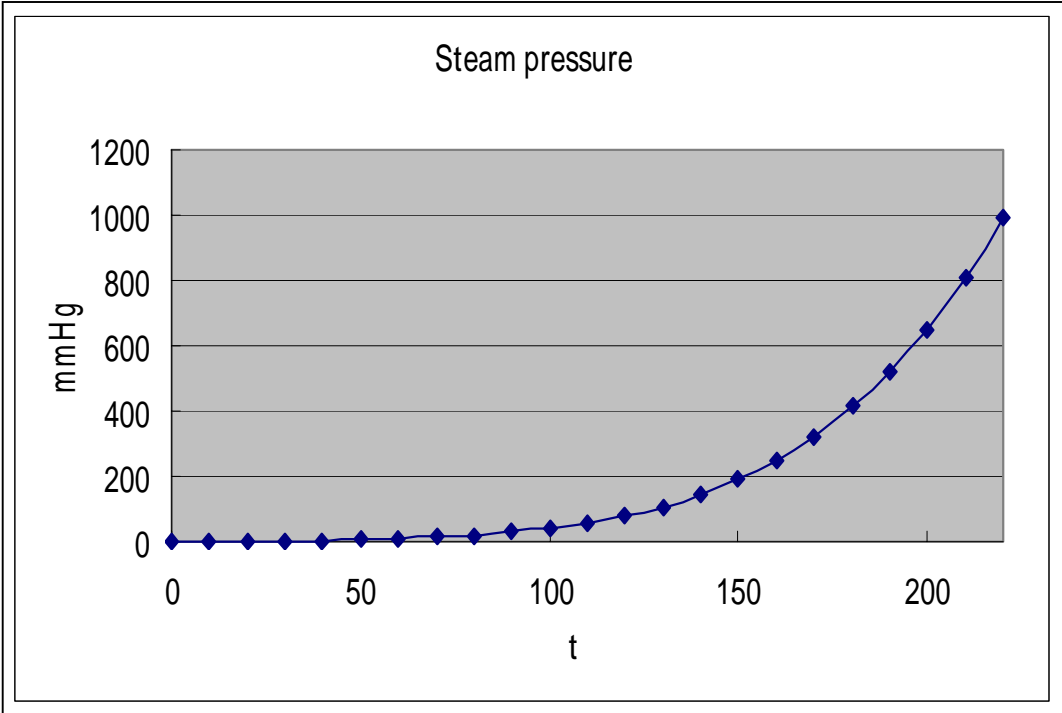


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

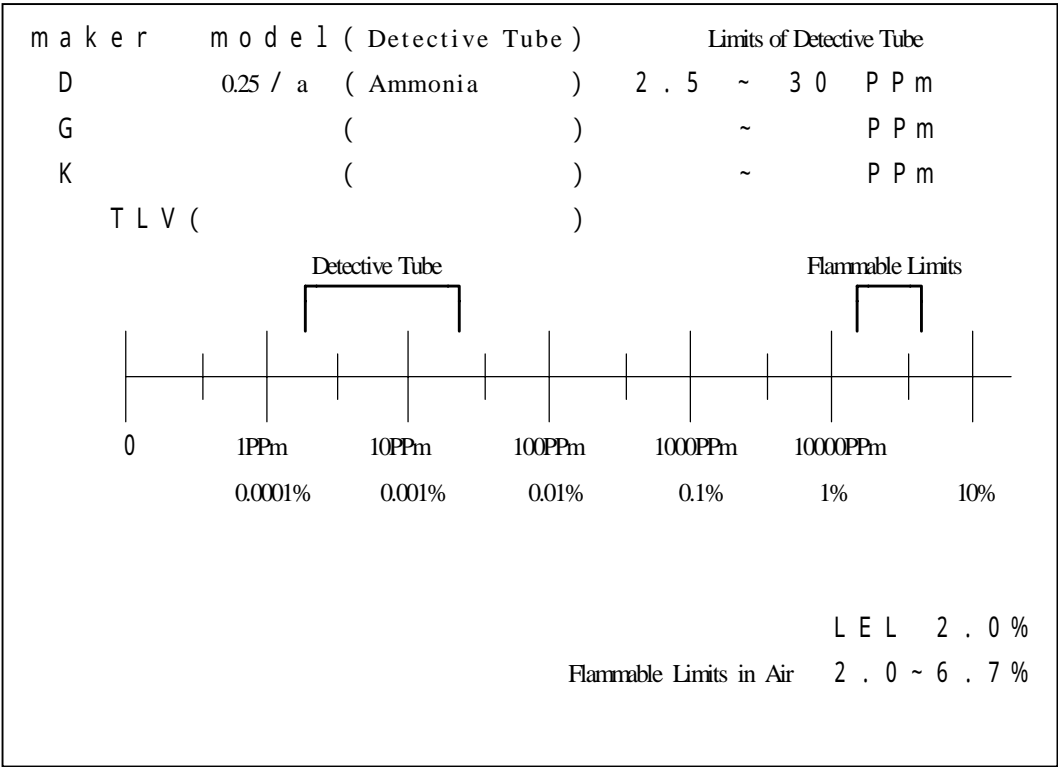
Material Name	Diethylenetriamine				
Common synonyms	DETA,2,2-Diamino diethylamine				
UN Number	2079	CAS Number	111-40-0	IMDG CODE	Class8/P8161
IMO Pollution Category	D				
Formula	NH ₂ C ₂ H ₄ NHC ₂ H ₄ NH ₂	Molecular Weight	103.17	Flammable limits in Air (%)	2 ~ 6.7
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.9586	Vapor Specific Gravity	3.6	Boiling Point()	207.1
Freezing Point ()	-39	Flash Point()	101.7	Ignition Point()	389
Steam Pressure	0.37mmHg(20)				
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : LD ₅₀ 1080mg/kg (oral rat)		ACGIH : 1ppm TWA skin		
Hazard and Noxiousness	<p>Classification : Corrosion substance</p> <p>Noxiousness : There is a causticity for the skin, eyes, and airways. It is likely to appear delaying the poisoning symptom. It is likely to absorb it from the skin.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. There is toxicity to an aquatic life living thing.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Solution is a strong base, and the metals such as copper and zinc are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

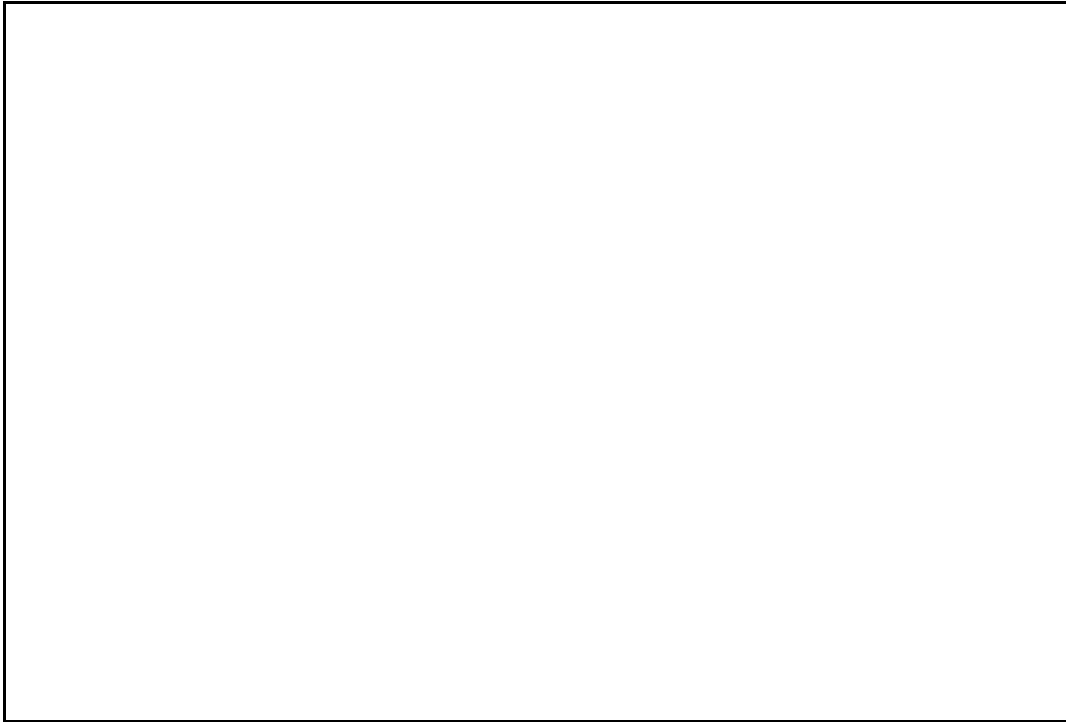


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. It separates from food, fodder, and the mixture dangerous substance.</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

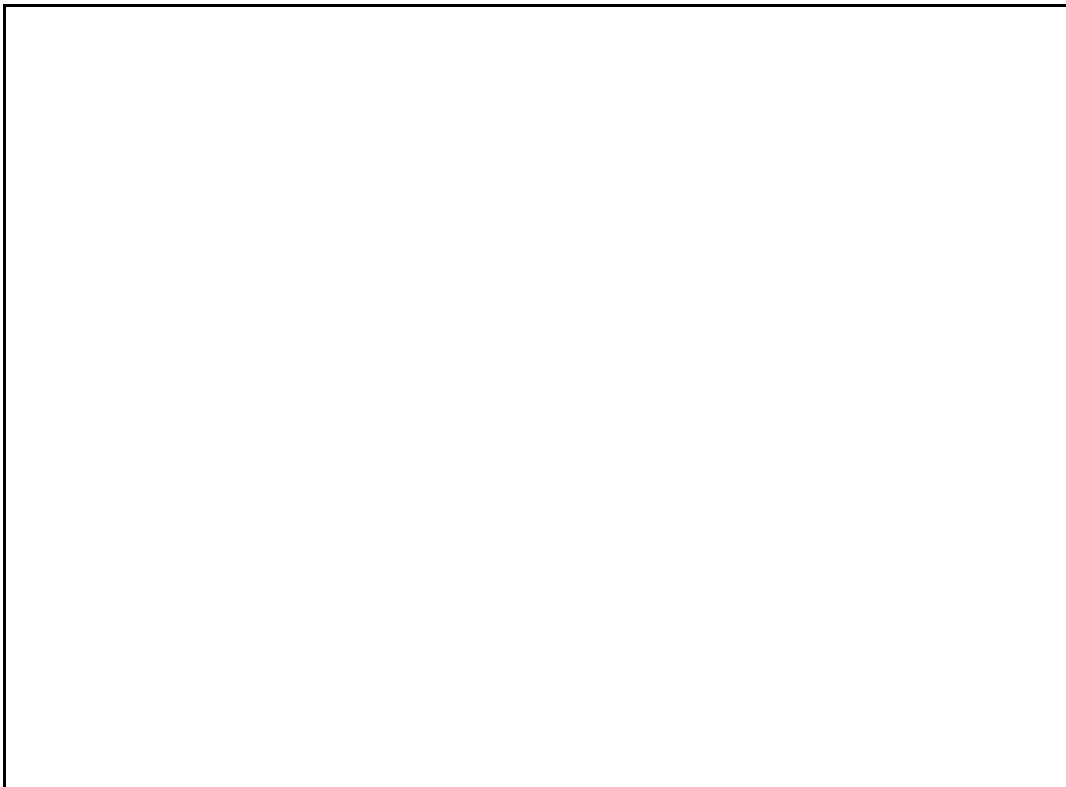
Material Name	Aqueous ammonia				
Common synonyms	Aqua ammonia, Ammonia water				
UN Number	2672	CAS Number	1336-21-6	IMDG CODE	Class8/P8111
IMO Pollution Category	C				
Formula	NH4OH	Molecular Weight	35.05	Flammable limits in Air (%)	16 ~ 25
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	0.877	Vapor Specific Gravity	0.6	Boiling Point()	-33.4
Freezing Point ()	-77.7	Flash Point ()		Ignition Point ()	651
Steam Pressure	0.01mmHg(20)				
Corrosion	human : yes	metal : yes	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : L D50 350mg/kg (oral rat)		ACGIH : 25ppm TWA 35ppm STEL		
Hazard and Noxiousness	<p>Classification : Acute toxicity substance, Corrosion substance</p> <p>Noxiousness : There is stimulation to the skin, eyes, and airways. There is a causticity to the living body. It is likely to appear delaying the poisoning symptom.</p> <p>Environmental influence : It is detrimental to an aquatic life living thing.. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is nonflammability. Solution is a strong base, and the metals such as copper and zinc are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher It is nonflammability.</p> <p>The fire-extinguishing method All the extinction medicines can be used. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Stop leak if you can do it without risk. Saved people from the circumference of the revealed place.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask,Self-contained breathing apparats. Gloves : Solvent-proof nature protection glove,Rubber gloves. Eye : Goggles,Face shields,Eye protectors. Body : Rubber boots,Protective clothing</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Syeam pressure curve



Limits of Detective Tube

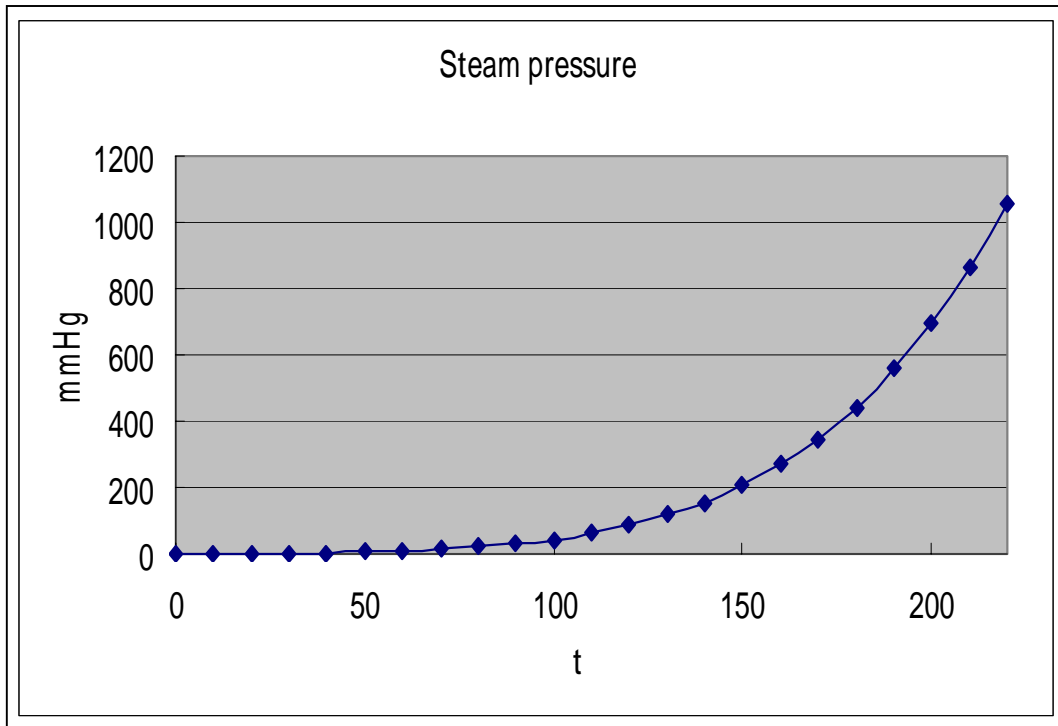


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. It separates from food, fodder, and the mixture dangerous substance.</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

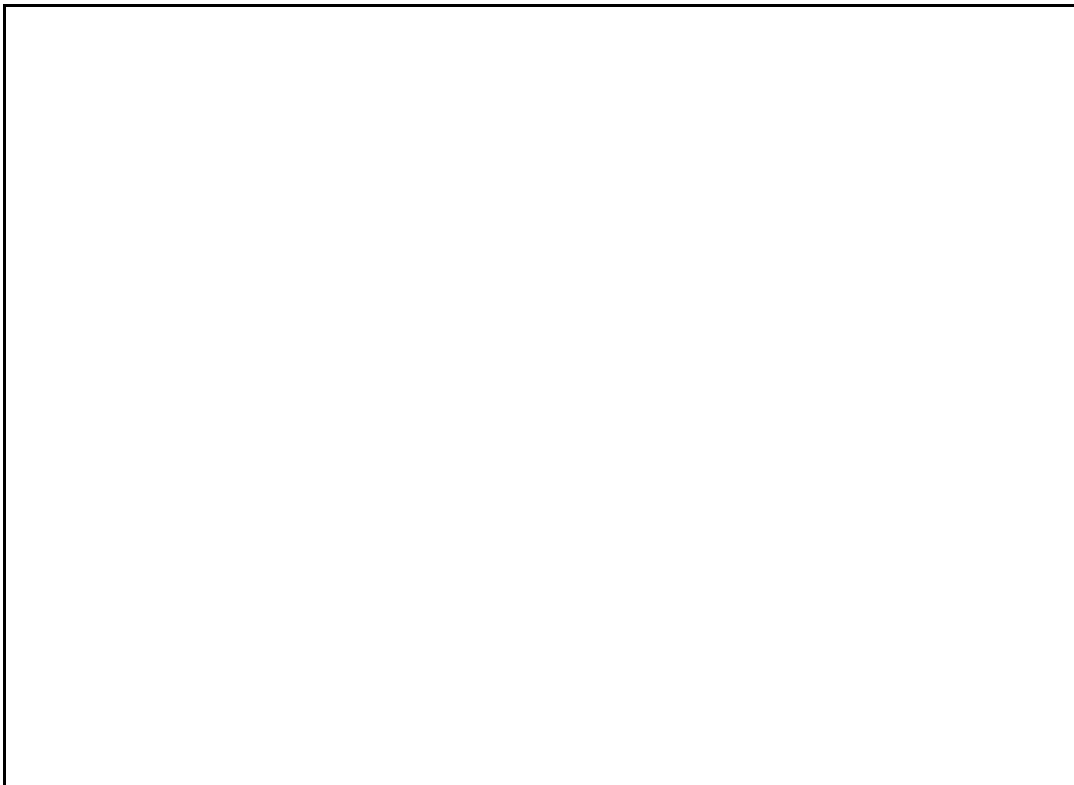
Material Name	-Butyrolactone				
Common synonyms	Butyrolactone,4-Hydroxybutyric acid lactone				
UN Number		CAS Number	96-48-0	IMDG CODE	
IMO Pollution Category	D				
Formula	C4H6O2	Molecular Weight	86.1	Flammable limits in Air (%)	0.3 ~ 16.0
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.1	Vapor Specific Gravity	3	Boiling Point()	204
Freezing Point ()	-44	Flash Point ()	98	Ignition Point ()	455
Steam Pressure	1.125mmHg				
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan : L D50 1540mg/kg (oral rat)		ACGIH:		
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Eyes are stimulated. It influences the central nervous system. The respiratory failure might be caused when taking it.</p> <p>Environmental influence : The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas.Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
<p>The measure at the time of leak on the sea</p>	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

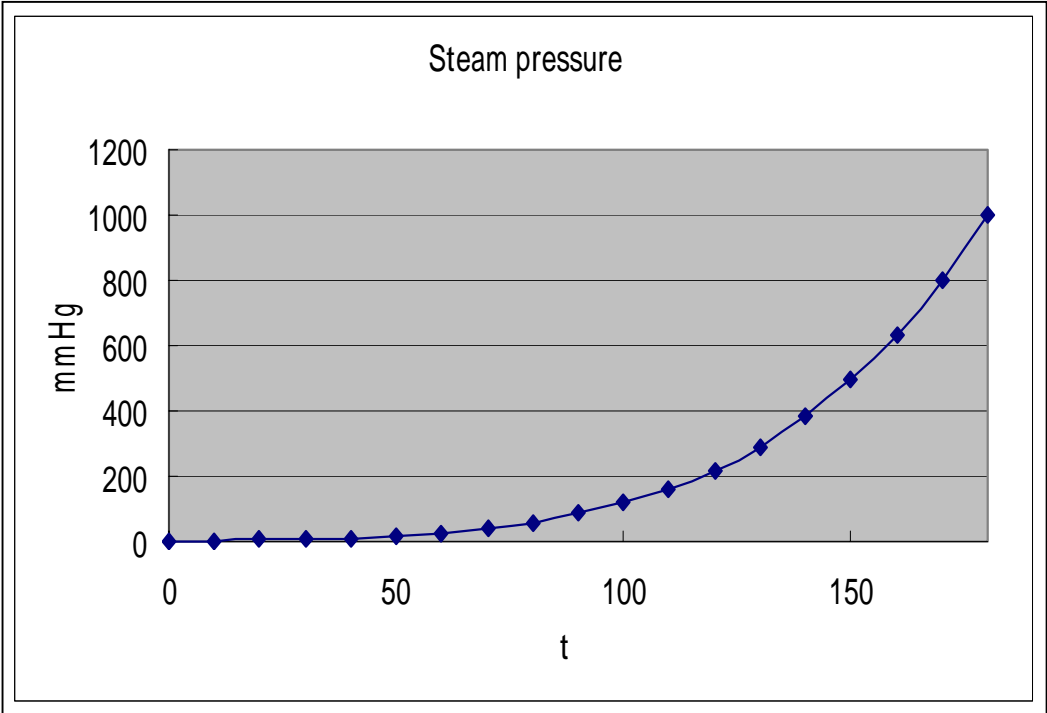


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

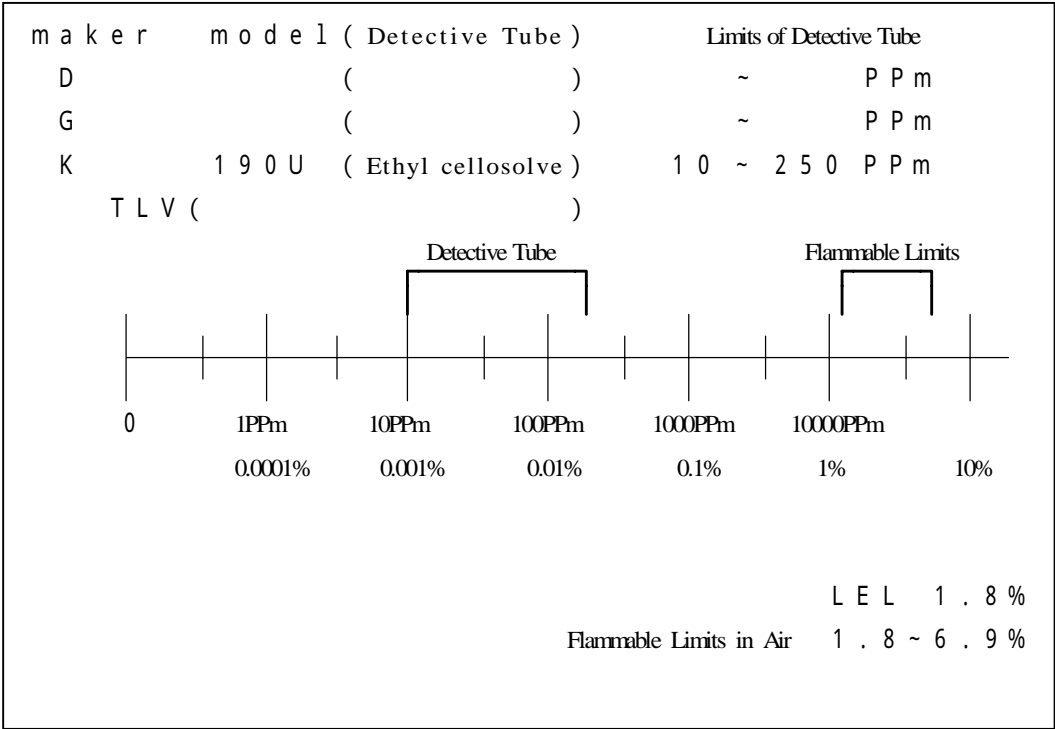
Material Name	Diacetone alcohol				
Common synonyms	4-Hydroxy-4-methyl-2-pentanone,Diacetone,DAA				
UN Number	1148	CAS Number	123-42-2	IMDG CODE	Class3.3/P3327
IMO Pollution Category	D				
Formula	(CH ₃) ₂ C(OH)CH ₂ COCH ₃	Molecular Weight	116.2	Flammable limits in Air (%)	1.8 ~ 6.9
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	0.9303	Vapor Specific Gravity	4	Boiling Point()	167.9
Freezing Point ()	-44	Flash Point ()	58	Ignition Point ()	643
Steam Pressure					
Corrosion	human : no	metal : no	Oxidation	no	
TLV,Toxicity by Ingestion	Japan : ACGIH : 50ppm TWA L D 50 4000mg/kg (oral rat)				
Hazard and Noxiousness	<p>Classification : Flammable liquids Noxiousness : Eyes and airways are stimulated. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

<p>The measure in case of a fire</p>	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
<p>The measure at the time of leak</p>	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
<p>Personal Protective Equipment and Detector</p>	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
<p>The measure at the time of leak on the sea</p>	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

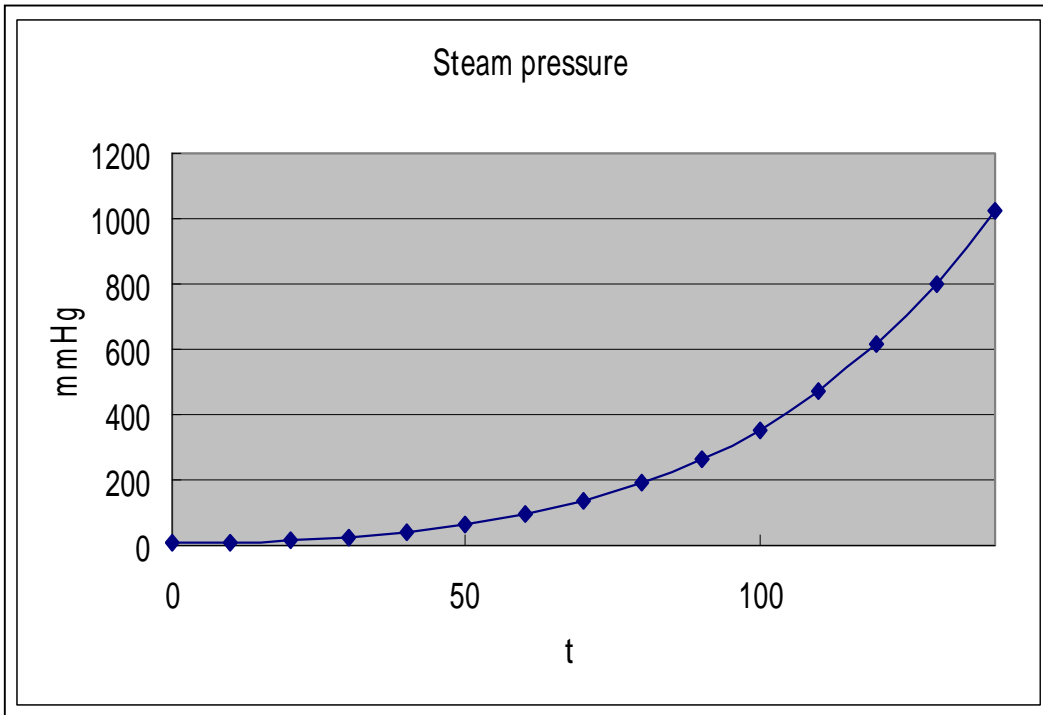


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
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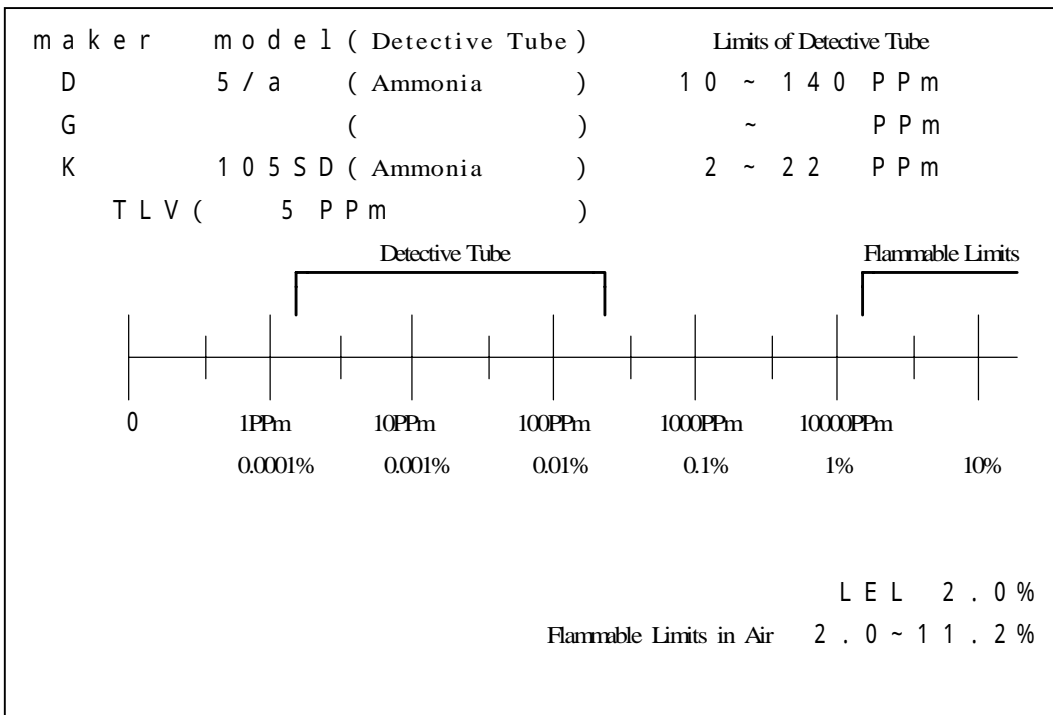
Material Name	Morpholine				
Common synonyms	Tetrahydro-1,4-oxazine,Diethyleneimide oxide				
UN Number	2054	CAS Number	110-91-8	IMDG CODE	Class3.3/P3367
IMO Pollution Category	D				
Formula	C4H9ON	Molecular Weight	87.12	Flammable limits in Air (%)	2.0 ~ 11.2
Appearance	colorless			Solubility in Water	easily soluble
Specific Gravity	1.007	Vapor Specific Gravity	3	Boiling Point()	128
Freezing Point ()	-4.9	Flash Point ()	37.8	Ignition Point ()	310
Steam Pressure	0.88Kpa/6.601mmHg(38)				
Corrosion	human : yes	metal : no	Oxidation	no	
TLV, Toxicity by Ingestion	Japan : L D50 1050mg/kg (oral rat)		ACGIH : 20ppm TWA A4 skin		
Hazard and Noxiousness	<p>Classification : Flammable liquids Noxiousness : The skin, eyes, and airways are stimulated. There is a causticity for the living body. It is likely to appear delaying the poisoning symptom. There is a possibility of absorbing it from the skin. Carcinogenic to man cannot be classified. Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is very low. Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air. A plastic and rubber are corroded.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. Do not use mouth-to-mouth method if victim ingested or inhaled the substance. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Detective Tube Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. It is made to dissolve in vapor using a spray nozzle, and gas is removed. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

Steam pressure curve



Limits of Detective Tube

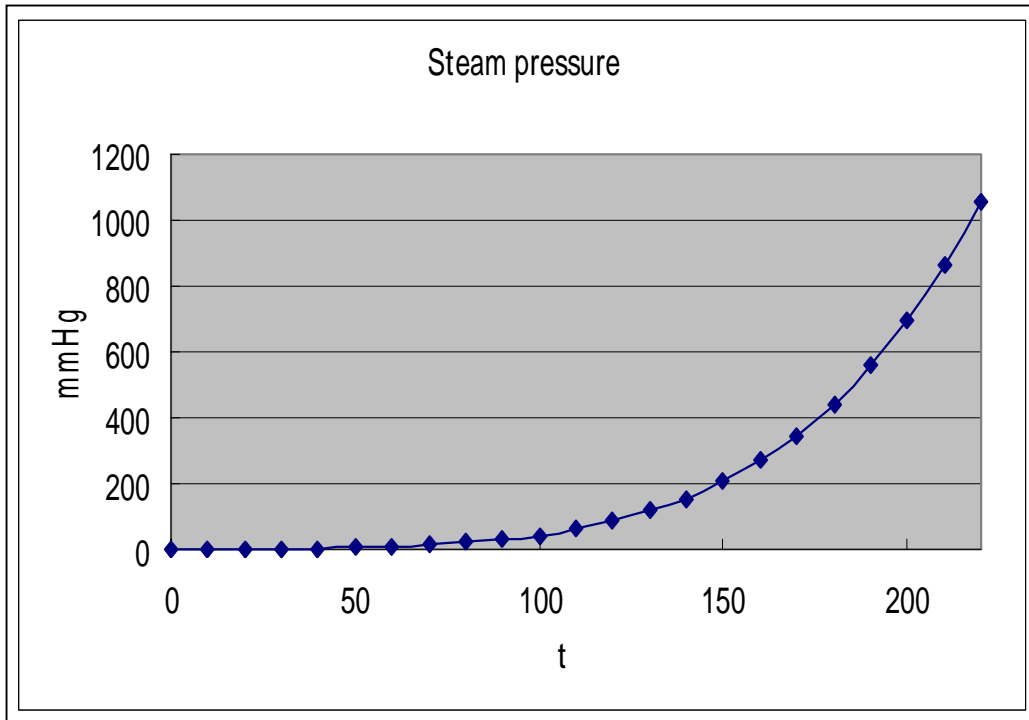


<p>The cautions on handling, and transportation / storage</p>	<p>Handling Inhalation is prevented and contact on an eye, membrane, and the skin is avoided. A suitable protection implement is worn if needed and work is done from the windward. Work environment is maintained below at permission concentration. When dealing with it indoors, the equipment which seals the steamy source of emission, or the partial exhaust is prepared. Their clothes are changed, when restroom, eyewashing, washing their face, etc. are fully performed after handling and it adheres to clothes. A leak, overflow, and scattering are prevented and steam is not made to emit. Since it is easy to ignite, fire, sparks, the thing that generates an arc, or the source of high temperature ignition is not used near. The electric apparatus used in a handling place is made into explosion prevention structure, and apparatus takes the measure against static electricity.</p> <p>Container handling A container uses a thing without breakage, corrosion, a crack, etc. It is made to fall indiscriminately and a container does not carry out the violent handling of adding or dragging a shock etc. Since static electricity may be generated by flow, a ground is taken in the container of receipts and payments</p> <p>Storage A container avoids direct rays and keeps them in the good cool place of ventilation. A storage place is considered as fire strict prohibition. It is desirable to place a watchman when engaged in work [in the place currently kept so much].</p> <p>Transport When carrying with a vehicle, carrying of a yellow card is checked. It confirms that there are not breakage of a container and a leak, it loads so that there may not be a shock, a fall, fall, and breakage, and collapse-of-cargo-piles prevention is ensured. At the time of filling and shipping and discharging, it is made to stop at the flat ground to a tank car etc., and a bumping post is installed to it, and it performs it using the compression gas or the pump below the permission pressure of a tank car to it. The residual substance in a hose is completely processed at the time of the desorption of a hose. A tank car and a tanker are equipped with emergency implements for a predetermined display board, fire-extinguishing equipment, and disaster prevention.</p>
<p>The cautions on abandonment</p>	<p>The cautions on abandonment A contaminant etc. is contained to an airtight container, is sent to the permitted industrial-waste-treatment factory, and carries out abandonment disposal.</p>

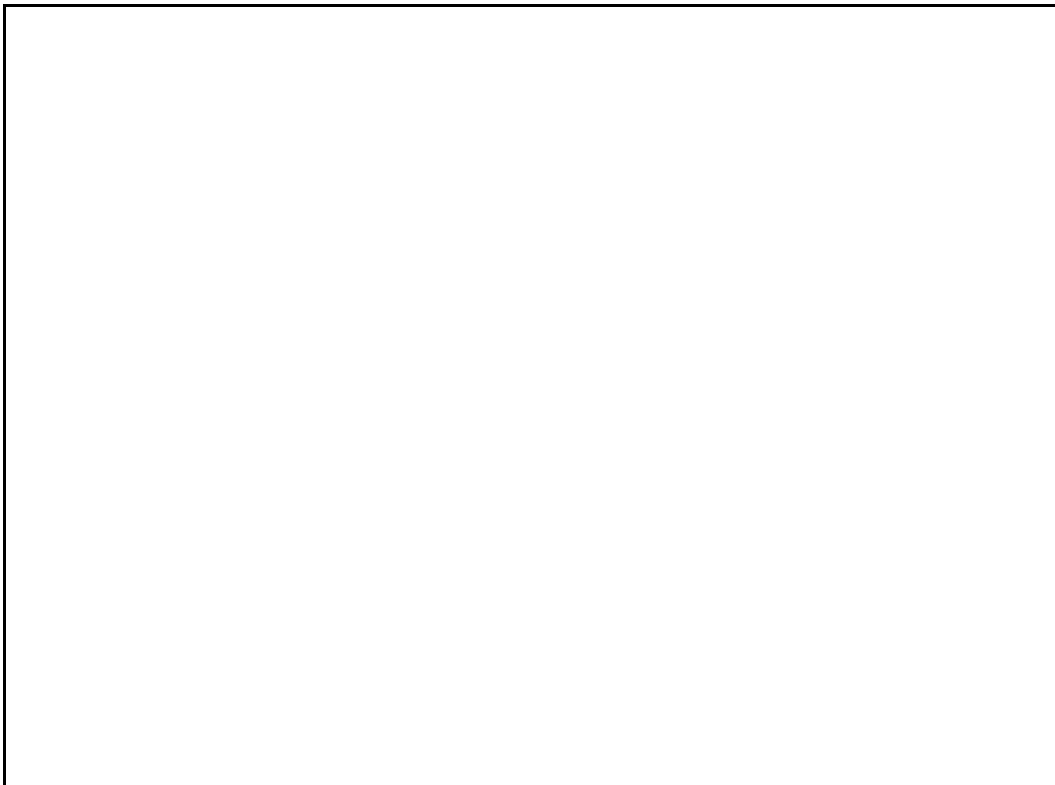
Material Name	Palm kernel acid oil				
Common synonyms	Coconut acid				
UN Number		CAS Number		IMDG CODE	
IMO Pollution Category	C				
Formula		Molecular Weight		Flammable limits in Air (%)	
Appearance	drab			Solubility in Water	insoluble
Specific Gravity	0.8806	Vapor Specific Gravity		Boiling Point()	204
Freezing Point ()		Flash Point()		Ignition Point()	
Steam Pressure					
Corrosion	human :	metal :	Oxidation		
TLV, Toxicity by Ingestion	Japan : L D 50	ACGIH :			
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : It is the one used for food, Most detrimental nature cannot be found.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is combustion, but it doesn't burn easily.</p>				
First Aid	<p>If inhaled</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

The measure in case of a fire	<p>Fire extinguisher Dry chemical, alcohol-resistant foam, CO2, water spray.</p> <p>The fire-extinguishing method In case of small fire, use dry chemical, CO2, water spray. In case of large fire, use alcohol-resistant foam, water spray. Cool containers with flooding quantities of water.</p> <p>Firefighters protection Wear positive pressure self-contained breathing apparatus(SCBA)</p>
The measure at the time of leak	<p>Notes to a human body A protection implement is worn in the case of work, it takes care that splash does not adhere to the skin or does not inhale gas, and is made to work from the windward. A lee man is evacuated.</p> <p>Notes to environment Eliminate all ignition sources. Stop leak if you can do it without risk. While evacuating people from the circumference of the revealed place, it warns of the danger of a fire and explosion.</p> <p>A method of removing When little, it collects in dryness sand and the container which the quality of another ground and inactive absorber is made to absorb, and can be sealed. It collects, after enclosing with landfill, preventing an outflow and leading to a safe place, when extensive. Prevent entry into waterways or sewers. When it flows out at sea, a lee vessel is kept away from the circumference of the leakage spot.</p>
Personal Protective Equipment and Detector	<p>Personal Protective Equipment Breathing appliance : Organic Gas respirators, Air line mask, Self-contained breathing apparatus. Gloves : Solvent-proof nature protection glove, Rubber gloves. Eye : Goggles, Face shields, Eye protectors. Body : Rubber boots, Protective clothing</p> <p>Detector Flammable Gas Detector</p>
The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is protected using a spray nozzle.</p> <p>Leak on the sea When there is no possibility that gas may affect the circumference, monitoring is performed and it waits for disappearance of gas and liquid. When evaporation of gas needs to be reduced, a sea surface is covered by foam from the windward.</p>

Steam pressure curve



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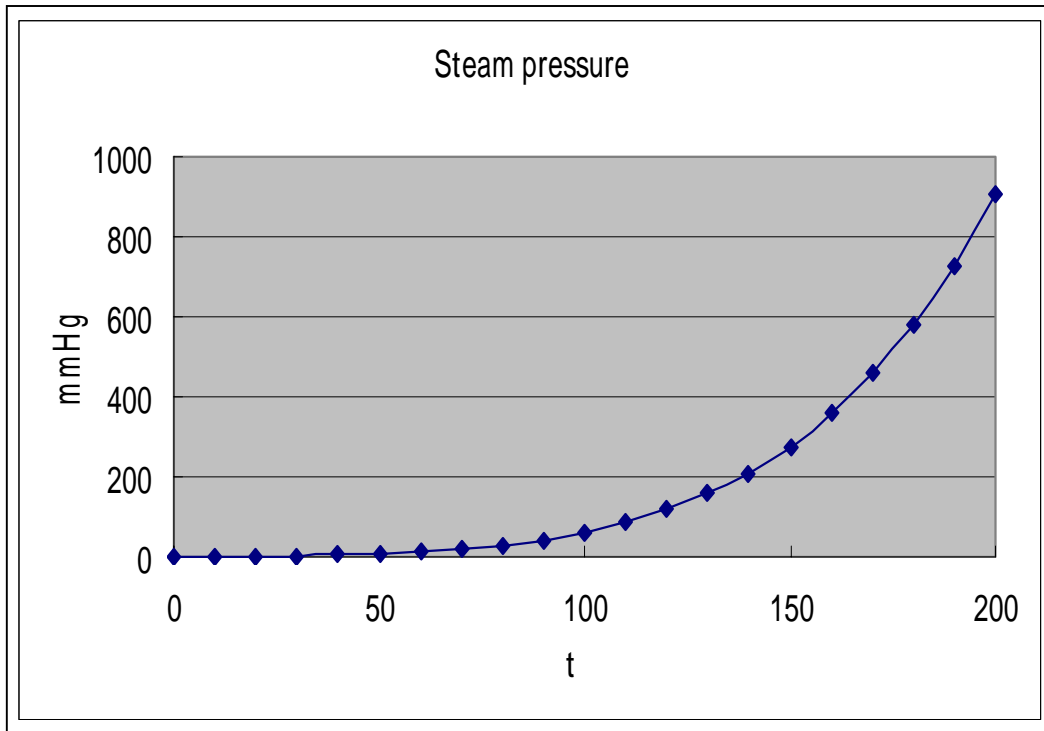


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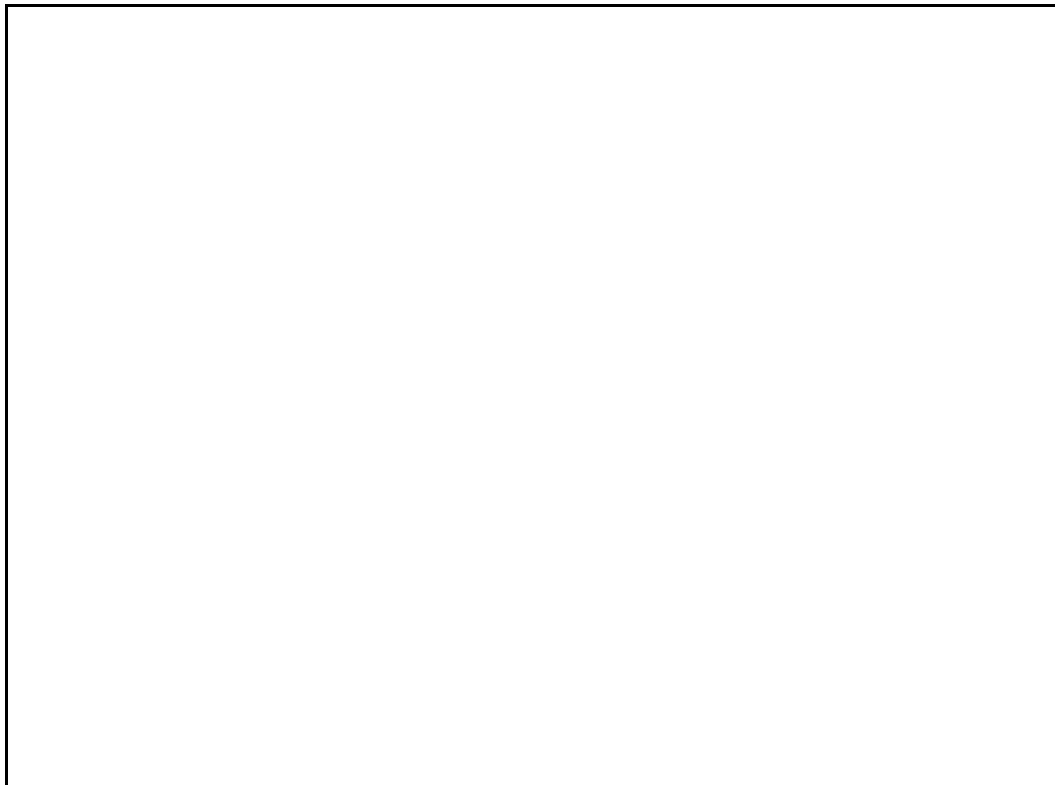
Material Name	Ethylene glycol butyl ether acetate				
Common synonyms	Butyl glycol acetate,2-Butoxyethylacetate,Butyl cellosolve acetate				
UN Number		CAS Number	112-07-2	IMDG CODE	
IMO Pollution Category					
Formula	C4H9OCH2CH2OOCCH3	Molecular Weight	160.2	Flammable limits in Air (%)	0.9 ~ 8.5
Appearance	colorless			Sollubility in Water	easily soluble
Specific Gravity	0.94	Vapor Specific Gravity	5.5	Boiling Point()	192
Freezing Point ()	-64	Flash Point ()	71	Ignition Point ()	340
Steam Pressure	0.225 ~ 0.3mmHg(20)				
Corrosion	human:	metal:	Oxidation		
TLV, Toxicity by Ingestion	Japan : L D50	ACGIH:			
Hazard and Noxiousness	<p>Classification :</p> <p>Noxiousness : Irritating to skin, eyes and throat.</p> <p>Environmental influence : There is biodegradation nature. The accumulation nature to an aquatic life living thing is low.</p> <p>Danger : It is inflammability, and above the flash point, it may mix with air and steam may produce explosive gas. Vapor is heavier than air.</p>				
First Aid	<p>If inhaled Move victim to fresh air. Keep victim warm and quiet. It respire artificially, after loosening clothes and securing a respiratory tract, when breathing has stopped, and when breathing is weak. When breathing is difficult, although it is conscious or when breathing, although it is unconscious, oxygen inhalation is effective.</p> <p>In case of contact Remove and isolate contaminated clothing and shoes. Immediately flush skin with running water for at least 15 minutes. Wash skin with soap and water.</p> <p>When it goes into an eye Immediately hold eyelids open and flush with plenty of water for at least 15 minutes.</p> <p>If swallowed Wash the inside of a mouth with water, and don't make it vomit by force. When vomiting takes place automatically, the body is made to incline so that the inhalation to a tracheal gill may not occur.</p>				

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The measure at the time of leak on the sea	<p>Leak on board As the source of ignition is managed and gas does not enter a closing zone, it washes away overboard with a lot of water. In a lot of outflow, if possible, a bow is turned on the lee. When it cannot turn on the lee, gas is removed using a spray nozzle. It collects, after sprinkling absorbing polymers and a solidifying agent, solidifying and suppressing generating of gas, when it cannot wash away overboard.</p> <p>Leak on the sea Recovery is difficult in order to dissolve in sea water for a short time.</p>

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