SAFETY DATA SHEET

SECTION 1 PRODUCT AND COMPANY IDENTIFICATION

PRODUCT

Product Name: **Styrene Monomer 80 4-T**
Product Description: Styrene Monomer
Chemical Formula: C_8H_8
Recommended Use: Raw material in industry

COMPANY IDENTIFICATION

Supplier: **UNION PETROCHEMICAL PUBLIC COMPANY LIMITED**
728 Union House Building, Baromratchonnani Rd.,
Bangbumru, Bangplad, Bangkok 10700
Supplier General Contact: +662 881 8288

This (M)SDS is a generic document with no country specific information included.

SECTION 2 HAZARDS IDENTIFICATION

This material is hazardous according to UN GHS Criteria. Classification includes all GHS hazard classes. For hazard categories with two cut-off/concentration limits, classification was based on the higher limit.

CLASSIFICATION:

Flammable liquid: Category 3.
Acute toxicity: Category.4 If you breath it.
Skin corrosion and irritation. Category.2
Acute eye damage and Eye irritation: Category 2A.
Target organ toxicant as the first touch Category 3.
Target organ toxicant from the repeating. Category 1 if you breath it.
Hazardous from choking. Category1
Toxic to aquatic environment. Category.2
Long term toxicity to aquatic environment. Category.3

GHS LABEL ELEMENTS:
Pictogram:

Signal Word: Danger

Hazard Statements:

Highly flammable liquid and vapor.
May be harmful if swallowed and pass in blowhole.
Highly irritation to skin.
Highly irritation to eyes.
Acute irritation to eyes.
Hazardous to respiratory system.
Damage to target organism (Acoustic system) for long term touching or replete if inhale.
Toxic to aquatic environment.
Long term toxicity to aquatic environment.

Precautionary Statements:

Prevention:
Keep away from heat/sparks/open flames/hot surfaces.—No smoking.
Keep container tightly closed.
Ground / bond container and receiving equipment.
Use explosion-proof electrical, ventilating, and lighting equipment.
Use only non-sparking tools.
Take precautionary measures against static discharge.
Avoid breathing dust, flume, gas, mist, vapor and spray.
Wash skin thoroughly after handling.
Do not swallow, drink or smoking when using product.
Use only outdoors or in a well-ventilated area.
Avoid releasing to environment.
Wear protective gloves/protective clothing/eye protection/face protection.

Response:
IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.
IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.
IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. P305 + P351 +
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
Call a POISON CENTER or doctor/physician if you feel unwell.
Do NOT induce vomiting.
If eye irritation persists: Get medical advice/attention.
Take off contaminated clothing and wash before reuse.
In case of fire: Use foam, dry chemical or carbon dioxide (CO_2) for extinction.

Storage:
Store in a well-ventilated place. Keep cool.
P405: Store locked up.

Disposal:
Dispose of contents and container in accordance with local regulations.

Other hazard information:

This product is flammable liquid that may stacking electrostatic charge.

SECTION 3 COMPOSITION / INFORMATION ON INGREDIENTS

This material is defined as a substance.

Hazardous Substance(s) or Complex Substance(s) required for disclosure

Name	CAS#	Concentration*
Styrene	100-42-5	>99.8 %
4-tert-Butylcatechol	98-29-3	3.0-55.0 PPM

* All concentrations are percent by weight unless ingredient is a gas. Gas concentrations are in percent by volume.

SECTION 4 FIRST AID MEASURES

The explanation of first aid measure
General suggestion

First aid providers should pay attention to self-protection. And use the recommended protective equipment (Chemical resistant gloves If there is any potential for exposure, refer to Section 8 of this document for instructions on types and personal protective equipment.

INHALATION

Remove from further exposure. For those providing assistance, avoid exposure to yourself or others. Use adequate respiratory protection. If respiratory irritation, dizziness, nausea, or unconsciousness occurs, seek immediate medical assistance. If breathing has stopped, assist ventilation with a mechanical device or use mouth-to-mouth resuscitation.

SKIN CONTACT

Wash contact areas with amount of water.

EYE CONTACT

Immediately rinse the eyes with running water. If contact lenses are worn, remove them after 5 minutes of rinsing, and continue to rinse your eyes for at least 15 minutes and seek immediate medical attention, preferably an ophthalmologist. Emergency eyewashes should be placed in a location suitable for immediate use.

INGESTION

Seek immediate medical attention. Do not induce vomiting.

Most important symptoms and effects, incase of auction and later symptom

In addition to the information found in the description of first aid measures (As mentioned above in Section 4 of this document) and any necessary medical indications and treatment, any significant symptoms and effects. Any additional available information is described in Section 11 Toxicological Information.

Medical considerations that you need to take right away and important take care.
NOTE TO PHYSICIAN

Provide a place with adequate ventilation and oxygen to the patient, if there is a burn, prompt treatment such as a thermal burn. After cleaning the substance Deciding whether to induce vomiting or not Should be done by a doctor If gastric lavage is performed, bronchial and / or esophageal control is recommended. The dangers of lung seeping into the lungs must be compared with toxicity when considering gastric lavage. There is no specific treatment. Treatment of exposure should be directed at the control of symptoms and the pathology of the patient. Skin contact May exacerbate pre-existing dermatitis symptoms

SECTION 5 FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Appropriate Extinguishing Media: Use water fog, foam, dry chemical or carbon dioxide (CO_2) to extinguish flames. General purpose synthetic foam (including AFFF) or protein foam, it is better if alcohol resistant foam (ATC type) may be used.
Inappropriate Extinguishing Media: Straight streams of water may not be effective for extinguishing a fire.

Specific hazards arising from the chemical or mixture

Hazardous combustion substances: The fumes may contain substances and substances produced by combustion that can be toxic and or irritating. Combustion products include the following and may contain other substances: These substances are: carbon monoxide and carbon dioxide.

Unusual Hazards of Fire and Explosion: Containers may rupture as a result of polymerization. Violent steam generation or eruptions may occur as soon as water is injected directly into the hot liquid. Ground all equipment used. The flammable ingredients of this product will ignite rapidly even if ignited by static electricity. The vapor is heavier than air and may travel long distances and accumulate in low-lying areas. Reverse ignition and / or fireballs may occur. Flammable vapors may be found in the upper part of the package at room temperature. Flammable vapors can accumulate at temperatures above the flash point. See section 9. Dense smoke will arise when the product burns.

Fire Fighting Instructions: evacuate people out of the area. Protect the fire area and prevent people involved. To stay up the wind Keep away from low areas where gases (or fumes) of the substance can accumulate. Water may not be effective in extinguishing fires. To cool down, water is sprayed onto the burnt exposed flame containers. Until the fire is extinguished, and the danger of re-ignition has completely disappeared. Fight fire from a protected location or while in a safe environment. Consider using an unmanned hose holder. Or remote-controlled injectors Do not use direct water spray. May cause the fire to spread Eliminate the source of ignition Move containers from fire area if this can be done without danger. Combustible liquids may be moved by flushing water. To prevent damage to property and people Be careful and avoid the accumulation of water. Product may cross through the water surface. Causing more fire distribution. The product may touch a combustible source / object. Contain contaminated water flowing from the fire extinguishing if possible. Contaminated water flowing from the fire extinguishing. If not contained, it may cause damage to the environment. To learn more information on the topic "Spill Accident Management Section" and "Ecological Information" of this Material Safety Data Sheet.

Special protective equipment for fire-fighters: Wear air-tight chemical mask and firefighting suit. (Including firefighting hats, jackets, trousers, boots and gloves) Avoid contact with this material during fire. If exposure is inevitable Replace with a full-fledged chemical-protective firefighting suit with an air tank or hose, and fight fire from a distance. For personal protective equipment after fire or in non-fire splashing situations, please refer to the relevant section.

SECTION 6 ACCIDENTAL RELEASE MEASURES

Notification for persons protection device and how to respond to an emergency:

Protect the leaked area. Keep those who are not involved and are not wearing suitable protective equipment from the area. Prevent people from entering low areas Stay upwind from the point of the leak. Ventilate the leak area. No smoking in the area. Stay upwind from the point of the leak. Ventilate the leak area. No smoking in the area. See section 7 for more information, Handling of Substances and Storage. For additional precautions, in case of many spills the people under the wind of the danger of an explosion. Eliminate sources of ignition in close proximity to leaks or released fumes to avoid fire or explosion. The vapor of the construction is dangerous from an explosion Keep away from sewage pipes Also, check the area where the gas meter ignites before returning to the area. Earthing and earth connection between container and all equipment used for the substance. For more information, see Section 10 of this document. Use appropriate safety equipment. For more information see Section 8, Exposure Controls and Personal Protection.

Environmental precautions:

Prevent leak of material from entering soil, ditches, sewers, waterways and / or groundwater. See Section 12, Ecological Information.

Methods and materials for containment and cleaning process:

Contain spilled material, if applicable, earthing and grounding between container and all work-related equipment. Pump the material using non-sparking and explosion-proof equipment. (explosion-proof equipment), if applicable, cover with foam or suppress the substance. Keep it in a suitable container and label it. See section 13 for more information on waste disposal.

SECTION 7 HANDLING AND STORAGE

Safety precautions when handling and storage:

Keep material away from heat, sparks and open flame. Use only with adequate ventilation. Always keep the container closed. Avoid contact with eyes, skin and clothing. Avoid inhalation cough. Do not swallow. Wash hands after contact. No smoking causing a flame or a source of ignition. In the transport and storage area and earth connection between containers, personnel, and all equipment before handling or handling the substance. Use of non-sparking tools or an explosion-proof tool may be necessary. Depending on the type of operation. The vapor is heavier than air and may travel long distances and accumulate in low-lying areas. Reverse ignition and / or fireballs may occur. Containers, even empty containers. It may still contain vapors. Do not cut, drill, grind, or perform similar operations on or near empty containers. Do not use air pressure for moving the product. Leakage of materials on hot fiber insulators has the potential to cause self-ignition at lower temperatures and potentially cause spontaneous combustion. This product is a poor conductive and can cause a build-up of static charge. Even if the bunch is connected to the grounding device. If the electric charge has accumulated sufficiently, the flammable mixture flames.

Can happen Operations on the use of substances that can support the formation of static ions. Not limited to mixing but also filtration, pumping at high flow rates. Splash filling Vaporization of substances (mists) and sprays; filling of tanks and containers; Cleaning the tank Sampling, measurement, transfer switching Working with vacuum trucks See Section 8 for more information on Exposure Controls / Personal Protection.

Storage

Reduce sources of ignition, such as static electricity, heat, sparks, or open flames. Always cover containers. Maintain the level of the inhibitor and the dissolved oxygen content in the substance. Do not expel the gases in the package of this material with nitrogen. The recommended oxygen level is: 10-15 parts per million oxygen level. At least The recommended inhibitor level is 10 to 20 parts per million (ppm). See Section 10 of this document for more information. Explosive mixtures are prevented by keeping the storage temperature below 29 ° C (84 ° F) or by covering the vapor area with a nitrogen-oxygen mixture. In a ratio of 95% to 5% to 92% to 8%.

Stability of storage

Maximum storage Temperature: 30 degree Celsius
Storage time: 24 months

SECTION 8 EXPOSURE CONTROLS / PERSONAL PROTECTION

Control parameters/Exposure limits:
Exposure limits/standards (Note: Exposure limits are not additive)

Components	rules	Category list	values
Styrene	ACGIH	TWA	10 ppm
	Additional information: CNS impair CNS impairment; URT irr: upper respiratory tract irritation; peripheral neuropathy: peripheral neuropathy; BEI: Biological exposure index (see section BEI®); A3: Animal carcinogen with unknown relevance to humans; OTO: Ototoxicant (ototoxicant).		
	ACGIH	STEL	20 ppm
	Additional information: CNS impair CNS impairment; URT irr: upper respiratory tract irritation; peripheral neuropathy: peripheral neuropathy; BEI: Biological exposure index (see section BEI®); A3: Animal carcinogen with unknown relevance to humans; OTO: Ototoxicant (ototoxicant).		
	TH OEL	TWA	100 ppm
	TH OEL	CEIL	200 ppm
	TH OEL	PEAK	600 ppm
4-tert-Butylcatechol	US WEEL	CEIL	2 mg/m3
	Additional information: skin; DSEN: Symbol indicating skin sensitization.		

Biological limits

Component	CAS number	Control parameters	Bio-samples	Keeping time	Maxiumum concentration	Ref.
Styrene	100-42-5	Mandolic acid combined with phenyl glycolic acid	urine	At the end of the shift (as soon as possible after exposure)	400 mg/g Creatinine	ACGIH BEI
		styrene	urine	At the end of the shift (as soon as possible after exposure)	40 mg/l	ACGIH BEI

Exposure control
Engineering controls

Engineering controls shall be used to control atmospheric concentrations below the legal or recommended exposure level. If appropriate exposure levels cannot be determined or recommended Use only with adequate ventilation. Local ventilation is required for certain operations.

PERSONAL PROTECTION

Personal protection measures: Eye / face protection: Use chemical safety glasses, eye mask. If exposure causes eye discomfort, use a full-face chemical protective mask.

Skin protection:

Hand protection: Use gloves that are chemically resistant to this material. If there are long periods of exposure or repeated exposure Examples of recommended glove materials are: Chlorine Nate, Polyethylene, Polyethylene, Ethyl vinyl alcohol laminate (“EVAL”), Polyvinyl alcohol (“PVA”). Used for making gloves that can be used are: butyl rubber, neoprene, nitrile / butadiene rubber (nitrile or "NBR"), polyvinyl chloride ("PVC" or " vinyl ”). Avoid gloves made from. Natural rubber (latex) Note: Selection of specific gloves for specific applications and during various working periods. Other relevant factors must be considered, such as resistance to other chemicals that must be performed. Physical properties (Cut / puncture protection, mobility, heat protection) and other features. Along with advice / requirements provided by the glove supplier.

The prevention on the other hazards: If you have been exposed for a long period of time or are exposed repeatedly Use protective clothing that is resistant to this material. The selection of specific items such as a visor, gloves, boots, apron or full body protection will depend on the operation.

Respiratory protection: Respiratory protection must be worn. If the concentration of the substance in the atmosphere has the potential to exceed the specified or recommended exposure level. If appropriate exposure levels cannot be determined or recommended Use a standard air filter mask. The selection of a respirator or self-contained breathing apparatus will depend on the nature of work and the concentration of atmospheric substances that are likely to occur in the area. For emergency situations Use a respirator with a standard compressed air tank. In a confined space Or in poorly ventilated areas, use a chemical respirator with a compressed air tank or a type with air hose.To keep personal protective equipment working efficiently The air filter used should be made of the following materials: organic vapor cartridge.

SECTION 9 PHYSICAL AND CHEMICAL PROPERTIES

Note: Physical and chemical properties are provided for safety, health and environmental considerations only and may not fully represent product specifications. Contact the Supplier for additional information.

GENERAL INFORMATION

Physical State: Liquid
Color: Colorless/Clear
Odour: sweet
Odour Threshold: N/D
PH values: Do not adjust
Melting point: -30.6 degree Celsius (From book/articles)
Freezing point: -30.6 degree Celsius (From book/articles)
Boiling point (760mmHg): 145 degree Celsius (From book/articles)
Flash point: 31 degree Celsius (From book/articles) in close containe
Evaporation Rate (n-butyl acetate = 1): N/D
Flammability (Solid, Gas): It is not expected to form an explosive dust-air mixture.
Flammability (liquid): Flammable liquids where static buildup may occur.
Minimum explosive value: 0.9%(V) (From book/articles)
Maximum explosive value: 6.8%(V) (From book/articles)
Vapor Pressure: 6.62 hPa (78 mm Hg) at 20°C (From book/articles)
Vapor Density (Air = 1): 3.6 (From book/articles)
Vapor Density (water = 1): 0.906 at 20°C ASTM D891
Solubility in water: 0.32 g/l at 20°C (From book/articles)
Solubility coefficient (in ETOH/Water): low Pow:2.95 measured
Flash Point: 460°C (From book/articles)
Decomposition Temperature: N/D
Viscosity: <=0.73 mPa s ASTM D445
Kinetic viscosity: N/D
Explosive viscosity: N/D
Oxidation ability: N/D
Liquid viscosity: 0.906 g/cm^3 at 20°C (From book/articles)
Molecular weight: N/D

SECTION 10 STABILITY AND REACTIVITY

CHEMICAL STABILITY: Stable under recommended storage conditions. Please refer to Section 7 for more information on storage.

POSSIBILITY OF HAZARDOUS REACTIONS:

To occur, maintain the level of the inhibitor and dissolved oxygen content in the substance. Do not expel the gases in the package of this material with nitrogen. Polymerization can also be catalyzed: lack of air, metal salts, peroxides, rust. Without an inhibitor, it can cause polymerization and clog the pressure relief device.

CONDITIONS TO AVOID: Avoid temperatures higher than 30 ° C (86 ° F). Exposure to higher temperatures can cause the product to decompose. Avoid contact with static electricity. Do not cover the vapor area on top of the storage container or expel the vapor area with inert gas to avoid reducing the oxygen concentration. Avoid direct exposure to sunlight.

INHIBITED MATERIALS: 4-tert-Butylcatechol Inhibitor concentration (Parts per million): 10 – 55

INCOMPATIBLE MATERIALS:

Avoid contact with oxidizing substances. Avoid contact with the caustic acid (potassium hydroxide). Caustic soda, metal halides. Avoid contact with adsorbents such as cellulose (cellulose). Clay is the main component of sawdust, avoid accidental peroxide contact.

DOSAGES OF DECOMPOSITION SUBSTANCES:

Decomposition products depend on the temperature, air availability and the presence of other materials.

SECTION 11 TOXICOLOGICAL INFORMATION

Information about possible touch channels
Ingestion, Inhaled, if on skin, if in eyes

Exposure route	Conclusion / Note
Acute toxicity in contact with skin	A vapor concentration to a level that can be dangerous with a single exposure can occur. Excessive exposure may cause irritation of the upper respiratory tract (nose and throat). May have an anesthetic or drug-like effect. Which was found to have dizziness and lethargy LC50, Rat, 4hr., cough, 11.8 mg/l
Skin corrosion and irritation	Based on product testing Prolonged exposure causes irritation and redness of the skin. Repeated exposure to the substance May burn the skin Symptoms can include pain, localized redness, swelling, or tissue damage. May cause dry and scaly skin
Acute toxicity if swallowed:	Very low toxicity if swallowed. No harmful effects were expected. From swallowing a small amount of the substance Ingestion may cause irritation of the mouth, throat and digestive tract.LD**50**, rat, > **5**,**000** mg/kg
Serious eye damage and eye irritation	Based on product testing, may cause moderate eye irritation. May cause moderate injury to the corneal area. The vapor may cause eye irritation. Which will cause a slight discomfort and redness. Cough can cause secretion of tears.
Allergy to substances	For skin sensitization: No relevant data found. For respiratory sensitization: No relevant data found.
Specific target organ toxicity - single exposure	May cause respiratory irritation. Exposure route: if inhaled Target organ: Respiratory system.

Hazard to the lower respiratory tract or cause pneumonia (Aspiration Hazard).	Can be fatal if swallowed and enters the air vents
Chronic toxicity (Shown with long exposure and repeated exposure Have chronic / long lasting effects - no immediate effects Unless other documents are specified)	Specific target organ toxicity - repeated exposure In laboratory animals, effects have been reported on the following organs: Central nervous system kidney liver Respiratory tract The effect on the lungs of the mice would occur after repeated exposure to polystyrene. Polystyrene has been reported to cause hearing loss in laboratory animals. Exposure to polystyrene on a regular basis and at high concentrations was found to cause hearing impairment in workers. Some studies in humans claim that repeated exposure to polystyrene can cause a slight decrease in color discrimination.
Carcinogenesis	In the experiment to give the substance inhalation Found that the opportunity that caused The lung tumors of guinea pigs are greater. The relevance of these results to humans is unclear. This is because data from the guinea pig lung tumors investigation, coupled with the study of long-term effects in laboratory animals, and data from epidemiological studies on workers exposed to polystyrene were unable to produce results. To conclude that Polystyrene is a carcinogen.
Making babies deformed	Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause congenital defects in laboratory animals.
Reproductive toxicity	From animal studies It was found to not affect the reproductive system.
Causing the mutation	The results of the genetic toxicity studies of in vitro organisms are not conclusive. The results of the genetic toxicity studies of animal embryos have not been conclusive.

Acute toxicity (Shown with short exposure And immediate impact - no chronic / long-lasting effects Unless stated in other documents)

Acute toxicity if swallowed: Very low toxicity if swallowed. No harmful effects were expected. From swallowing a small amount of the substance Ingestion may cause irritation of the mouth, throat and digestive tract.

Based on product testing: LD50, Rat,>5,000 mg/kg

Information of components

Styrene: LD50, Rat,>5,000 mg/kg

4-tert-Butylcatechol: LD50, Rat, male and female ,815 mg/kg as OECD 401

Acute toxicity in contact with skin

A vapor concentration to a level that can be dangerous with a single exposure can occur. Excessive exposure may cause irritation of the upper respiratory tract (nose and throat). May have an anesthetic or drug-like effect. Which was found to have dizziness and lethargy

LC50, Rat, 4hr., cough, 11.8 mg/l

Information of components

Styrene: LD50, Rat, cough,11.8 mg/kg

4-tert-Butylcatechol: LD50 not recomended

Skin corrosion and irritation

Based on product testing
Prolonged exposure causes irritation and redness of the skin.
Repeated exposure to the substance May burn the skin Symptoms can include pain, localized redness, swelling, or tissue damage.
May cause dry and scaly skin

Component information:

Styrene: Prolonged exposure causes irritation and redness of the skin.Repeated exposure to the substance May burn the skin Symptoms can include pain, local redness, swelling, or tissue damage.May cause dry and scaly skin

4-tert-Butylcatechol: Short-term exposure may burn the skin. Symptoms that occur, including pain Swelling, redness, and tissue damage. May cause skin bleaching (White on the skin).It is classified as a skin corrosive substance according to US Department of Transportation (DOT) requirements.

Serious eye damage and eye irritation
Based on product testing, may cause moderate eye irritation. May cause moderate injury to the corneal area. The vapor may cause eye irritation. Which will cause a slight discomfort and redness. Cough can cause secretion of tears.

Component information:

Styrene: May cause moderate eye irritation. May cause moderate injury to the corneal area. The vapor may cause eye irritation. Which will cause a slight discomfort and redness. Cough can cause secretion of tears.

4-tert-Butylcatechol: May cause severe irritation and corneal injury, which can lead to vision loss and even blindness. May cause chemical burns

Allergy to substances
For skin sensitization: No relevant data found.
For respiratory sensitization: No relevant data found.

Component information:

Styrene: For sensitization of the skin: No relevant data found. For respiratory sensitization: No relevant data found.

4-tert-Butylcatechol: It causes an allergic reaction to the human skin. Caused an allergic skin reaction when tested in guinea pigs.For respiratory sensitization: No relevant data found.

Specific target organ toxicity - single exposure
May cause respiratory irritation. Exposure route: if inhaled Target organ: Respiratory system.

Component information:

Styrene: May cause respiratory irritation. Exposure route: if inhaled. Target organ: Respiratory system

4-tert-Butylcatechol: I The substance or mixture is not classified as organ specific toxin. In one touch

Hazard to the lower respiratory tract or cause pneumonia (Aspiration Hazard).
Can be fatal if swallowed and enters the air vents

Component information:

Styrene: Can be fatal if swallowed and enters the air vents.

4-tert-Butylcatechol: Substances that may enter the lungs during swallowing Or vomiting resulting in tissue damage or pneumonia

Chronic toxicity (Shown with long exposure and repeated exposure Have chronic / long lasting effects - no immediate effects Unless other documents are specified)

Specific target organ toxicity - repeated exposure
In laboratory animals, effects have been reported on the following organs:
Central nervous system
kidney
liver
Respiratory tract
The effect on the lungs of the mice would occur after repeated exposure to polystyrene.
Polystyrene has been reported to cause hearing loss in laboratory animals. Exposure to polystyrene on a regular basis and at high concentrations was found to cause hearing impairment in workers.
Some studies in humans claim that repeated exposure to polystyrene can cause a slight decrease in color discrimination.

Component information:

Styrene: In laboratory animals, effects have been reported on the following organs:
Central nervous system
kidney
liver
Respiratory tract
The effect on the lungs of the mice would occur after repeated exposure to polystyrene.Polystyrene has been reported to cause hearing loss in laboratory animals. Exposure to polystyrene on a regular basis and at high concentrations was found to cause hearing impairment in workers.Some studies in humans claim that repeated exposure to polystyrene can cause a slight decrease in color discrimination.

4-tert-Butylcatechol: In laboratory animals, effects have been reported on the following organs:
Liver, Stomach

Carcinogenesis
In the experiment to give the substance inhalation Found that the opportunity that caused The lung tumors of guinea pigs are greater. The relevance of these results to humans is unclear. This is because data from the guinea pig lung tumors investigation, coupled with the study of long-term effects in laboratory animals, and data from epidemiological studies on workers exposed to polystyrene were unable to produce results. To conclude that Polystyrene is a carcinogen.

Component information:

Styrene: In the experiment to give the substance inhalation Found that the opportunity that caused The lung tumors of guinea pigs are greater. The relevance of these results to humans is unclear. This is because data from the guinea pig lung tumors investigation, coupled with the study of long-term effects in laboratory animals, and data from epidemiological studies on workers exposed to polystyrene were unable to produce results. To conclude that Polystyrene is a carcinogen.
4-tert-Butylcatechol: N/D

Components	Name	Category
Styrene	IARC	Group 2A: Likely probable to cause cancer in humans. Suspected to be a human carcinogen. And / or is an animal carcinogen.
	US NTP	
	ACGIH	A3: Carcinogen that has been confirmed to be effective in animals. But it is still unclear in humans.

Making babies deformed
Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause congenital defects in laboratory animals.

Component information:

Styrene: Has been toxic to the fetus in laboratory animals at doses toxic to the mother. Did not cause congenital defects in laboratory animals.

4-tert-Butylcatechol: N/D

Reproductive toxicity
From animal studies It was found to not affect the reproductive system.

Component information:

Styrene: From animal studies It was found to not affect the reproductive system.

4-tert-Butylcatechol: Limited data from animal experiments suggest that the material may affect reproduction.

Causing the mutation
The results of the genetic toxicity studies of in vitro organisms are not conclusive. The results of the genetic toxicity studies of animal embryos have not been conclusive.

Component information:

Styrene: The results of the genetic toxicity studies of in vitro organisms are not conclusive. The results of the genetic toxicity studies of animal embryos have not been conclusive.

4-tert-Butylcatechol: The results of the genetic toxicity studies of in vitro organisms are not conclusive. The results of the genetic toxicity studies of animal embryos have not been conclusive.

SECTION 12 ECOLOGICAL INFORMATION

The information given is based on data available for the material, the components of the material, and similar materials.

ECOTOXICITY

Methods	Time range	Oganism/species	Result
Acute toxicity	96 Hour	Oncorhynchus mykiss (rainbow trout),	LC50 4.1 mg / l
	48 Hour	Daphnia magna (Water flea)	LC50 23 mg / l
	48 Hour	Daphnia magna (Water flea)	LC50 4.7 mg / l
	72 Hour	Pseudokirchneriella subcapitata (green algae)	LC50 4.9 mg / l
	96 Hour	Pseudokirchneriella subcapitata (green algae)	LC50 0.28 mg / l
Chronic toxicity	21 day	Daphnia magna (Water flea)	LC50 1.01 mg / l
	14 day	Eisenia fetida (earthworm),	LC50 120 mg / l

Persistence and degradability

Sources	Method	Exposure period	Result
Ethanol-water	Calculation	-	log Kow 2.95
water	Biodegradation Under high oxygen laboratory conditions (BOD20 or BOD28 / ThOD> 40%), this material is expected to be biodegradable.	28 day	Biodegradation 87

Theoretical amount of oxygen required: 3.08 mg / mg.

Chemical oxygen demand (COD): 2.89 mg / mg dichromate (Dichromate).

Biochemical oxygen demand (BOD)

Incubation Time	BOD
5 d	34 %
10 d	47 %
20 d	54 %

Optical deterioration
Test Type: Half-life (indirect photosynthesis)
Substances that provoke allergic reactions (Sensitizer): OH radicals
Atmospheric half-life: 3.5 h
Methods: Obtained by estimation.

Bio accumulative potential

Bioaccumulation: The likelihood of accumulation in living organisms is low (BFC < 100, log Pow < 3).
Partition coefficient of n-octanol / water (log Pow): 2.95 measured.
Bioconcentration factor (BCF): 13.5 Fish was measured.

Mobility in the soil

Their mobility in soil is relatively low (Koc between 500 and 2000).
Partition coefficient (Koc): 520 - 920 Estimated.

Results from PBT and vPvB assessment

This material is not classified as a lasting residue. Accumulative or Toxic (PBT) This material is not classified as extremely persistent or highly accumulated in living organisms (vPvB).

Other adverse effects

This material is not listed in the Montreal Protocol on ozone depleting substances.

SECTION 13 DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Do not allow material to enter floor drains or into any body of water. The waste disposal method must comply with local and national laws and regulations. Local requirements may vary. It is the duty of the waste producer to inspect the waste and to conduct legal disposal. As a dealer the company has no control over the handling or production

processes of the occupant or user of the substance the above disposal methods are for products in the conditions identified in Part 2 of the Chemical Safety Data Sheet (Composition / Information on Ingredients) for unused or non-contaminated substances. The proper disposal method is Delivering it to an authorized waste disposal receiver Using methods: kiln with high heat or other thermal equipment.

SECTION 14 TRANSPORT INFORMATION

Classification for road and rail transport:

Proper shipping name	STYRENE MONOMER, STABILIZED
UN number	UN 2055
Type	3
Packing group	III

Classification for sea transport (IMO / IMDG)

Proper shipping name	STYRENE MONOMER, STABILIZED
UN number	UN 2055
Type	3
Packing group	III
Marine pollution	None
Transportation in Bulk	Consult IMO regulations before transporting ocean bulk

Complies with Annex I or II of MARPOL 73/78 and the IBC or IGC Code.

Classification for air transport (IATA / ICAO)

Proper shipping name	STYRENE MONOMER, STABILIZED
UN number	UN 2055
Type	3
Packing group	III

This information is not intended to convey any specific regulations or operating requirements applicable to this product. Shipping ratings may vary by container volume and may be subject to regional or country requirements. Additional shipping-related information can be obtained from your sales representative or customer service and is actually in compliance with the regulations and laws relating to the transport of any such chemical or material. It is the responsibility of the carrier or the person responsible for the delivery of the message.

SECTION 15 REGULATORY INFORMATION

Emergency Decree on Prevention of the Use of Volatile Substances 2535 B.E.
No data
Hazardous Substance Act, B.E. 2535
This product may be controlled for its intended use by the relevant government agencies as described below. For details, Please refer to the applicable regulations or laws. To decide what action to take In accordance with the law or not (registration of registration Or requesting permission According to specific criteria and methods) before undertaking any business activity such as production, import, export, or having in possession for transport or storage.
Department of Agriculture
No data

Department of Energy Business
No data

Department of Livestock
No data

Department of Industrial Works
Prohibited and / or restricted to use

Food and Drug Administration
No data

Department of Fisheries
No data

SECTION 16 OTHER INFORMATION

Explanation

ACGIH	Limit value (TLV) by the American Association of Industrial Hygiene (ACGIH).
ACGIH BEI	ACGIH-Biological Exposure Index (BEI)
CEIL	The amount of concentration that may be allowed
PEAK	The maximum amount of concentration for a limited time
STEL	Short-term maximum exposure
TH OEL	The final account of the announcement of the Ministry of Interior Safety in work regarding environmental conditions (chemicals)
TWA	Average concentration over a period of normal work
US WEEL	USA. Workplace Environmental Exposure Levels (WEEL)

Full text of other abbreviations
AICS - List of Authorized Australian Products; ANTT - Brazilian land transport; ASTM - American Society for the Testing of Materials; bw - body weight; CMR - Carcinogen, Mutagenic Agent Or substances that are toxic to the reproductive system; DIN - the standard of the German Institute for Standardization; DSL - list of products authorized in the country (Canada); ECx - Concentration related to the percentage of response; ELx - the filling rate in relation to the percentage of response; EmS - Emergency Schedule; ENCS - Authorized Chemical and New Chemicals (Japan); ErCx - Concentration related to percentage response of growth rate; ERG - Emergency Action Guide; GHS - the same system all over the world; GLP - Good Laboratory Practice; IARC - International Cancer Research Organization; IATA - International Air Transport Association; IBC - International Law on Ships and Ship Equipment for Carrying Hazardous Chemicals in Total Tonnage; IC50 - Concentration required to reduce the reaction to 50%; ICAO - International Civil Aviation Organization; IECSC - China List of Authorized Chemicals; IMDG - Cross border transport of dangerous goods by water; IMO - International Maritime Organization; ISHL - Industrial Law for Safety and Health (Japan); ISO - International Organization for Standardization; KECI - Korea's List of Authorized Chemicals; LC50 - the concentration of the substance that caused the death of half of the animal; LD50 - the amount of substance that causes the death of half of the animal. (Median cyst volume); MARPOL - Pollution Prevention of Ships Convention; n.o.s. - not otherwise specified; Nch - Chilean standard; NO (A) EC - concentrations with no effect. (Unpleasant); NO (A) EL - level with no effect. (Unpleasant); NOELR - no found filling rate; NOM - Official Standard of Mexico; NTP - National Toxicology Center; NZIoC - New Zealand Inventory of Chemicals; OECD - Organization for Economic Cooperation and Development; OPPTS - Office of Chemical Safety and Pollution Prevention; PBT - residue accumulated in living organisms and is toxic; PICCS - Philippines Chemical Inventory; (Q) SAR - Relationship of Reaction and Three-Dimensional Structure (Quantitative); REACH - Regulation (European Commission) No. 1907/2006 Regulation of the Registration, Evaluation, Permission and Disposal of Chemicals; SADT - temperature at which the substance decomposes itself; SDS - Safety Data Sheet; TCSI - Taiwan Chemical Substance List; TDG - Dangerous Goods Transport; TSCA - Toxic Substance Control Law (U.S); UN - United Nations; UNRTDG - United Nations Manual for the Transportation of Dangerous Goods; vPvB - Residual and Highly Accumulated in Organisms; WHMIS - Workplace Hazardous Substance Information System Document

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