

1. IDENTIFICATION OF PREPARATION & OF COMPANY

Product: Polyester Resin
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2. COMPOSITION INFORMATION ON INGREDIENTS

A solution of unsaturated polyester resin in styrene.

Chemicals	Classification	Risk phrases
Styrene	Xi, Xn	R10, R20, R36/R38

3. HAZARDS IDENTIFICATION

Acute effects: Flammable. Harmful by inhalation. Irritating to eyes and skin.

Acute (short-term) exposure: For styrene, short-term exposure in humans results in mucous membrane, eye irritation and gastrointestinal effects.

Chronic (long-term) exposure: For styrene, long-term exposure in humans results in effects on the central nervous system (CNS), such as headache, fatigue, weakness, depression, CSN dysfunction, hearing loss and peripheral neuropathy. Human studies are inconclusive on the reproductive and developmental effects of styrene. Several studies did not report an increase in developmental effects in women who worked in the plastic industry while an increased frequency of spontaneous abortions and decreased frequency of births were reported in another study. Several epidemiological studies suggest there may be an association between styrene exposure and an increased risk of leukaemia and lymphoma. However, the evidence is inconclusive due to confounding factors. EPA's Office of Research and Development has updated previous assessments on the carcinogenic potential of styrene and concluded that styrene is appropriately classified on Group C "possible human carcinogen". However, EPA has not yet given a formal carcinogen classification to styrene.

4. FIRST AID MEASURES

Ingestion:	Do not induce vomiting because of risk of aspiration. Rinse mouth with water. Seek medical attention and or transport to emergency facility immediately.
Inhalation:	Move person to fresh air. If not breathing, give artificial respiration. If breathing is difficult, apply oxygen that should be administered by qualified person. Seek medical attention or transport to a medical facility.
Eyes:	Rinse immediately with plenty of water and continuously for at least 15 minutes. Eyelids should be held away from the eyeball to ensure thorough rinsing. If contact lenses are present, remove them in the first five minutes then continue flushing eyes. Seek medical attention immediately, preferably from an ophthalmologist.
Skin:	Wash affected skin thoroughly with soap and plenty of water.
Note to physician:	The decision of whether to induce vomiting or not should be made by a physician. If lavage is performed, suggest endotracheal and/or oesophageal control. Danger from lung aspiration must be weighed against toxicity when considering emptying the stomach. No specific antidote. Treatment of exposure should be directed at the control of symptoms and the clinical condition of the patient.

5. FIRE-FIGHTING MEASURES

Extinguishing media:	Do not use direct water stream. Water fog or fine spray, carbon dioxide, dry chemical fire extinguishes and foam. Water fog, applied gently, may be used as a blanket for fire extinguishments. General purpose synthetic foams (including AFFF type) or protein foams are preferred if available. Alcohol resistance foams (ATC) type may function.
Unsuitable extinguishing media:	Do not use direct water stream. Straight or direct water streams may not be effective to extinguish fire.
Unusual fire and explosion hazards:	Closed containers may rupture violently at elevated temperatures, such as in a fire. In case of dense smoke, toxic fumes and toxic/irritating compounds is produced. Combustion products may include and are not limited to carbon dioxide, carbon monoxide. Violent steam generation or eruption may occur upon application of direct water stream. Vapours are heavier than air and may travel a long distance and accumulate in low lying areas. Ignition or flashback may occur. Flammable mixtures may exist within the vapour space of containers at room temperature. Flammable concentration of vapour can accumulate at temperatures above 23°C. Spills of these organic liquids on hot fibrous insulations may lead to lowering of the auto ignition temperature, possibly resulting in spontaneous combustion.
Special protective equipment:	Wear positive pressure self-contained breathing apparatus and suitable protective fire-fighting clothing (includes fire-fighting helmet, coat, trousers, boots and gloves). If protective equipment is not available or not used, fight fire from a protected location or a safe distance.

5. FIRE-FIGHTING MEASURES (cont'd)

Specific methods of fire-fighting:	Keep personnel away. Isolate fire area and deny unnecessary entry. Flushing with water to protect personnel and minimize property damage may move burning liquids. Water fog, applied gently, may be used as a blanket for fire extinguishments. Eliminate all ignition sources. Stay upwind. Keep out of low areas where gases (fumes) can accumulate. Do not use direct water stream as this may spread fire. Water may not be effective in extinguishing fire. Move containers from fire area if this is possible without hazard.
Other information:	Cool closed containers with water spray.
Personal protective equipment:	
Respiratory protection:	Do not breathe vapours. Ensure atmospheric levels are maintained below exposure guidelines. Use an approved air-purifying respirator when required for specific operations. For emergency and other conditions where the exposure guideline may be exceeded, also in confined or poorly ventilated areas, use an approved self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply.
Eye/face protection:	Use chemical goggles. If vapour exposure causes eye irritation, use a full-face respirator. Eye wash fountain should be located in immediate work area.
Skin protection:	Wear clean, long-sleeved, body-covering clothing. Gloves made from ethyl vinyl alcohol (EVA), polyvinyl alcohol (PVA) and vinylidene fluoride (VDF)/hexafluoropropylene have shown better resistance to materials that contained styrene than gloves made from butyl rubber, polyvinyl chloride (PVC) or nitrile.

6. ACCIDENTAL RELEASE MEASURES

Personal precautions:	Put on adequate protective equipment. Avoid contact with skin and eyes in case of fire. Do not breathe vapours/fumes. Vapour has explosion hazard. Eliminate all sources of ignition in vicinity of spill or released vapour to avoid fire or explosion. For larger spills, warn public of downwind explosion hazard. Check area with explosion meter before re-entering area. Ground and bond all containers and handling equipment.
Environmental precautions:	Keep away from drains, surface water, ground water and soil. If product enters drains or sewers contact the local water authority immediately. For large spills, evacuate unprotected personnel upwind of spills and contain with dike.
Methods for cleaning up:	Pump with explosion-proof equipment. If available, use foam to smother or suppress fumes. Residual can be removed with solvent. Solvents are not recommended for clean-up unless the recommended exposure guidelines and safe handling practices for the specific solvent is followed. Consult appropriate solvent SDS for handling information and exposure guidelines. Alternatively, soak up spills with absorbent material such as sand or vermiculite and collect as much as possible in a clean container for disposal. Residual may be removed/neutralised using trisodium phosphate and water. Dispose according to local regulations

7. HANDLING & STORAGE

Handling:	Practice good care and caution to avoid skin and eye contact. Do not open flames or sources of ignition in handling and storage area. No smoking. Containers, even those that have been emptied, can contain vapours. Do not cut, drill, grind, weld or perform similar operations on or near empty containers. Take precautionary measures against static discharge, electrically ground all equipment.
Storage:	Avoid direct sunlight and keep this product in a cool closed well-ventilated place with temperatures below 20°C. Use of non-sparking, explosion proof and flame-proof equipment/area may be necessary. Minimize sources of ignition, such as static build-up, heat, spark or flame. Keep container closed.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Engineering controls:	Provide general and/or local exhaust ventilation to control airborne concentrations below the recommended exposure guideline. Use only with adequate ventilation.
Exposure limit:	According to National Institute of Occupational Safety & Health (NIOSH). Permissible Exposure Limit (PEL): 100ppm (425mg/m ³) 8 hours TWA exposure at a workday. Recommended exposure limit (REL): 50ppm (215mg/m ³) for 8-10 hours time-weighted average (TWA) exposure. Recommended short term exposure limit (STEL): 40ppm (170mg/m ³) for 15 mins TWA exposure at any time during the work day. Immediately dangerous to life or health (IDLH): 700ppm (2980mg/m ³).

9. PHYSICAL & CHEMICAL PROPERTIES

Physical state:	Viscous liquid.
Odour at low concentrations:	Sweet aromatic odour for styrene.
Odour at high concentrations:	Sharp penetrating disagreeable odour for styrene.
Boiling point:	145.2°C (for styrene part).
Flash point:	32°C (ASTM F 3278-82).
Flammability (LFL):	1.1% vol/vol (for styrene part).
Flammability (UFL):	6.1% vol/vol (for styrene part).
Vapour pressure:	5mmHg @ 21°C (for styrene part).
Auto-ignition temperature:	490°C (for styrene part).
Water solubility:	Practically insoluble.
Density:	1.2 - 1.3g/cc @ 20°C

10. STABILITY & REACTIVITY

Stability:	Stable under the recommended storage and handling conditions. However, note that this material is unstable at elevated temperatures.
Conditions to avoid:	Do not store in open sunshine. Avoid temperatures above 49°C
Materials to avoid:	Oxidising agents. Metal salts, such as ferric and aluminium chlorides. Peroxides.
Hazardous decomposition products:	Hazardous polymerisation may occur.
Avoid contact with:	Metal salts, such as ferric and aluminium chlorides. Peroxides. Avoid temperatures above 49°C. Avoid exposure to direct sunlight. Avoid depletion of inhibitor levels.

11. TOXICOLOGICAL INFORMATION

The base resin is expected to be relatively stable in the environment. The following information is applicable to the styrene component:

Acute toxicity
Ingestion:

Single dose oral toxicity believed to be low. The oral LD50 for rats is expected to be >4000mg/kg. If aspirated (liquid enters the lung) it may be rapidly absorbed through the lungs and result in injury to other body systems.

Inhalation:

Vapour concentrations are attainable and could be hazardous on single exposure.

Skin contact:

Prolonged skin contact is unlikely to result in absorption of harmful amounts. The LD50 for skin absorption in rabbits is believed to be >2000mg/kg.

Irritation
Carcinogenicity:

An increased incidence of lung tumours was observed in mice from a recent inhalation study on styrene. The relevance of this finding to humans is uncertain since data from other long-term animal studies and from epidemiological studies of workers exposed to styrene do not provide a basis to conclude that styrene is carcinogenic.

Developmental/reproductive effects:

Human studies have not reported an increase in developmental effects in women who worked in the plastic industry, while an increased frequency of spontaneous abortions and a decreased frequency of births were reported in a study on the reproductive effects of styrene in humans. However, these studies are not conclusive, due to the lack of exposure data and confounding factors. Animal studies have not reported developmental or reproductive effects from inhalation exposure to styrene. Lung tumours have been observed in the offspring of orally exposed mice. Excessive exposure may cause irritation to upper respiratory tract (nose and throat), narcotic effects, anaesthetic effects. Prolonged or repeated exposure is not likely to cause eye irritation.

Inhalation:

Eyes:

Skin:

Other information:

Material may stick to skin causing irritation upon removal. Repeated excessive exposure to high amounts may cause effects on the central nervous system, liver and kidney. Repeated excessive exposure to high amounts may cause respiratory or eye irritation. Repeated excessive exposure to smaller amounts may cause effects on the central nervous system. Repeated excessive exposure to smaller amounts may cause eye irritation or respiratory irritation. Some studies in humans allege that repeated exposure to styrene may result in minor, sub-clinical decrease in the ability to discriminate between colours. Lung effects have been observed in mice following repeated exposure to styrene. Styrene is reported to have caused hearing loss in laboratory animals upon exposure to high concentrations >800ppm. However, the relevance of this to humans is unknown.

12. ECOLOGICAL INFORMATION

Of the ingredients in this preparation, environment impact is expected to be particularly influenced by the solvent.

Mobility and

bioaccumulation potential:	Resin:	No data available.
	Styrene:	Bio concentration from water to n-octanol is low. (BCF < 100 or log POW<3). Potential for mobility in soil is low (500<Koc<2000).
Degradation:	Resin:	Biodegradation under aerobic laboratory conditions is below detectable limits.
	Styrene:	Degradation is expected in the atmospheric environment within minutes to hours.
Aquatic toxicity:	Styrene:	Material is toxic to aquatic organisms (1mg/l < LC50/EC50/IC50 < 10mg/l in most sensitive species).

13. DISPOSAL CONSIDERATIONS

Product disposal:	Do not dump into any sewers, on the ground or into any body of water. Any disposal practice must be in compliance with all local and national laws and regulations.
Contaminated packaging:	Empty containers must be disposed of as hazardous waste unless all remaining product adhering to the container walls has been removed. Hazard warning labels can then be removed from the container walls and the container sent for recycling or disposal in accordance with local regulations. Washing must be disposed of safely and in accordance with local regulations. If the container is reconditioned, the reconditioning company should be made aware of the nature of the original contents.

14. TRANSPORT INFORMATION

Proper shipping name:	Resin solution		
Road, Rail & Barge			
ADR/RID Loaded:	3-31(C)	Empty: 3-41	Label: 3
Barge ADNR Loaded:	3-3	Empty: 3-6	Label: 2A
Kemler Code:	30	PENOS code: S	
Trem Card No. CEFIC:	30GF1-III	Classification Code: F1	
UN No:	UN 1866	Packing Group: III	
Sea			
IMO/IMDG Class:	3	Label:	3
EMS:	3-05	MFAG:	310
Marine Pollutant:	No	Packing Group:	III
UN No:	UN 1866		
Air			
IATA/ICAO Class:	3	Packing Group:	III
UN No:	UN 1866		
Packaging Instruction (Pass & Cargo):	309	Packaging Instruction (Cargo):	310

15. REGULATORY INFORMATION

Chemical name:	Polyester resin solution in styrene.
Labelling:	According to EEC directives relating to packaging and labelling of dangerous substances and UK Chemicals Hazard Information and Packaging for Supply (CHIPS) legislation.
Symbols:	(Xn) Harmful.
Risk phrases:	R10, Flammable. R20, Harmful by inhalation. R36/38, Irritating to eye and skin.
Safety phrases:	S23, Do not breathe vapours. S51, Use only in well ventilated areas.

16. OTHER INFORMATION

The information contained in this data sheet is based on present state of knowledge and current national legislation (CHIPS). It provides guidance on health, safety and environmental aspects of the product and should not be construed as any guarantee of technical performance or suitability for the particular applications.

