

MATERIAL SAFETY DATA SHEET - UNSATURATED POLYESTER RESIN

1. PRODUCT IDENTIFICATION

CHEMICAL FAMILY Synthetic Resin
CHEMICAL NAME Unsaturated Polyester Resin
SYNONYMS None
CHEMICAL ABSTRACTS No. Mixture
NIOSH No. None
HMIS HEALTH 2 FIRE 3 REACTIVITY =1
HAZCHEM CODE 3[Y]E
UN No. 1866

2. COMPOSITION

INGREDIENTS	CAS #	MAXIMUM CONTENT	EXPOSURE LIMITS
Polyester Resin	Propreitory	62%	None assigned
St rene Monomer	1CO-42-5	44%	50 ppm
Fumed Silica		3%	N/A

EEC CLASSIFICATION (Styrene)[R10; Xn; Xi] Flammable. Harmful, Irritant.

R PHRASES (Styrene)-R: 10, 20, 36/38, Flammable. Harmful by inhalation.Irritating to eyes and skin

3. HAZARD IDENTIFICATION

MAIN HAZARDS

FLAMMABILITY Styrene
FLAMMABILITY CLASS (ILO) 1C
FLASH POINT Nominal 35 DEG C
FLAMMABILITY LIMITS 11-61 %

TOXICITY

Styrene
TLV TWA 50 ppm
TLV STEL 100 ppm
PEL TLV 100ppm
PEL C 200 ppm

4 PRODUCT INGESTED

DO NOT MAKE THE CASUALTY VOMIT.Get immediate medical attention. Wash the mouth out with water and give large quantities of water to drink.

PRODUCT INHALED

Remove victim from area of exposure to fresh air. If unconscious, do not give anything to drink, give artificial ventilation and chest compression or place in recovery position as necessary If conscious make the casualty lie or sit down quietly, give oxygen if available. Get immediate medical attention

In all cases of exposure the patient should be transferred to hospital

5. FIRE FIGHTING MEASURES

EXTINGUISHING MEDIA

Water spray, foam, dry chemicals carbon dioxide or any Class B type extinguishing agent. Water may be ineffective since it may not cool the styrene below its flash point.

SPECIAL HAZARDS

FLAMMABILITY

Styrene Monomer

FLAMMABILITY CLASS (ILO) IC

FLASH POINT (open cup) Nominal 35 DEG C

FLAMMABILITY LIMITS 1.1-6.1 %

At elevated temperature polymerisation may take place. If polymerisation takes place in enclosed container, there is a possibility of violent rupture of the container. Product vapours may form an explosive mixture in air.

SPECIAL FIRE FIGHTING PROCEDURES:

Evacuate area and fight fire from a safe distance or a protected location. Approach fire from upwind to avoid hazardous vapours and toxic decomposition of products.

UNSUITABLE EXTINGUISHING MEDIA

Water may be ineffective since it may not cool the Styrene below the flash point.

PROTECTIVE CLOTHING

Firefighters and Others exposed to vapours or products of combustion should wear self-contained breathing apparatus. Equipment should be thoroughly decontaminated after use. In situations of large fires, a fireman's normal protective clothing may not provide adequate protection and chemical resistant clothing may be required.

6. ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTION

Prevent access to area until cleanup has been completed. If TLV in section 8 of this data sheet is exceeded, then suitable respiratory protection must be worn to prevent over exposure. Ensure cleanup is conducted by trained personnel only.

ENVIRONMENTAL PRECAUTIONS

Prevent material entering the water systems, sewers and soil. This product contains styrene monomer, which if spilled or released in quantities greater than the Reportable Quantity (RQ) of 454 kg are **subject** to the reporting requirements of CERCLA and/or SARA (40 CFR Parts 320 & 355).

CLEAN-UP METHODS

Spills

Remove all source of ignition. Ventilate area. Dike the area to prevent the material from entering the water systems or sewers. Absorb spill with absorbent material such as saw dust, vermiculite, or sand and place in closed container for disposal. Note that contaminated absorbent material poses the same hazard as the spilled product.

ADDITIONAL ADVICE

All resins should be regarded as **notifiable under the Hazardous Substances Act of 1973, and** Hazardous Chemical Substances Regulation. Advice should be sought from the Local Authority regarding disposal.

7 HANDLING AND STORAGE

SUITABLE MATERIALS

Lacquer lined metal drums.

UNSUITABLE MATERIALS

Most plastic containers.

HANDLING/STORAGE PRECAUTIONS

Avoid eye and prolonged skin contact. Use of a barrier cream is recommended. Avoid inhalation. Avoid improper addition of accelerator and catalyst. The promoter and catalyst should always be mixed into the product separately and never mixed together. The product should be stored below 25 Deg C. in closed Containers away from all sources of heat and ignition. The store should be well ventilated and flame proof.

Keep Storage area away from working area. **Post warning** signs and have appropriate fire extinguishers and spill cleanup equipment in or near the storage area. Empty drums contain vapours. the monomers present in the original resin solution and therefore are at fire, explosion and noxious vapour risk. They should be disposed of by methods that follow recognised safe procedures.

8 EXPOSURE CONTROLS FOR PERSONAL PROTECTION

OCCUPATIONAL EXPOSURE STANDARDS

HSIE	Not available
MAK	Not available
ACGIH	Styrene
TLV-TWA (time weighted average)	50 ppm (213 mg
TLV- STEL(short-term exposure limit)	100 ppm (4-6 mg

NOTICE OF INTENDED CHANGE: For styrene the reduction of TLV to 20 ppm (85 mg m³ and STEL to 40 ppm (170 mg m³ and designation of the carcinogen A4 notation has been proposed. Carcinogen A4: Not classifiable as human carcinogen: Inadequate data on which to classify the substance as a human and/or animal carcinogen.

SKIN: Contact with eyes, skin and mucous membranes can contribute to the overall exposure and may invalidate the TLV

OSHA PERMISSIBLE EXPOSURE LIMITS (PELs)

PEL- TLV(time weighted average) 100 ppm

PEL - C (ceiling exposure limit) 200 ppm

Acceptable maximum **peak** above the acceptable ceiling concentration for an 8-hour shift: 600ppm (5 minutes in any three hours).

ENGINEERING CONTROL MEASURES

Methods to control hazardous conditions are preferred. Methods include a good mechanical ventilation with a non sparking, grounded ventilation system exhausting directly to the outside, separate from other exhaust ventilation systems. Care should be taken in controlling the emission of fumes into the environment. Note that provision should be made for adequate replacement of displaced air. Electric lighting and plugs to be explosion proof

PERSONAL PROTECTION - RESPIRATORY

If TLV level in section 3 is exceeded, then suitable respiratory protection must be worn. Up to 500 ppm a chemical cartridge respirator with organic vapour cartridge(s). Above 500 ppm then full face supplied air respirator, or self contained breathing apparatus should be used. Note that the IDL (immediately dangerous to life or health) concentration of styrene is 700 ppm.

PERSONAL PROTECTION - HAND

Impervious gloves, Note that the resistance of specific materials can vary from product to product. Evaluate the resistance of the product under conditions of use

PERSONAL PROTECTION - EYE

Wear a face shield or chemical goggles or approved safety glasses, Have an emergency eyewash station readily available in the working area,

PERSONAL PROTECTION SKIN

Impervious gloves, coveralls, boots, and/or other resistant protective clothing. Have a safety shower eye wash fountain readily available in the immediate work area,

PERSONAL PROTECTION COMMENTS

Dust generated by grinding or polishing finished products is regarded as hazardous and precautions should be taken to ensure dust concentrations to be maintained below a TLV of 10 mg m³ - Where dust concentrations exceed these values, appropriate dust masks Should be worn.

OTHER PROTECTIVE MEASURE

Remove contaminated clothing immediately. keep contaminated clothing in closed Containers. Discard or launder before rewearing. Inform laundry personnel of contaminated hazards. Do not eat, smoke or drink in work areas.

9 PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE	Pale yellow , purple pink , white or blue tinted.		
ODOUR	Fruity odour at low concentrations. Sharp at high concentrations		
pH	Not applicable		
BOILING POINT RANGE	145 - 148 deg C		
FREEZING POINT -	-30.6 Deg C		
FLASH POINT	35 Styrene (closed cup)		
FLAMMABILITY	1.1 - 6.1 % v/v (Styrene)		
AUTOFLAMMABILITY	490 Deg C		
EXPLOSIVE PROPERTIES	Styrene	LEL 1.1%	UEL 6.1%
OXIDISING PROPERTIES	None		
VAPOUR PRESSURE	Styrene	0.60 kPa at 20 DEG C	0.81 kPa at 25 DEG C
DENSITY	1.11 - 1.23gcm ³		
SOLUBILITY IN WATER	Practically insoluble in water <0.05%		

10. STABILITY AND REACTIVITY

CONDITIONS TO AVOID

Heat, sparks, Open flames, ignition Sources

INCOMPATIBLE MATERIALS

Oxidizing agents and Strong Acids

HAZARDOUS DECOMPOSITION PRODUCTS

Heating to decomposition may cause the emission of irritating, acrid fumes. styrene may form styrene oxide as decomposition product.

11 TOXICOLOGICAL INFORMATION

ACUTE TOXICITY

Acute oral LD 50 (rat) is 5000 mg./kg

SKIN AND EYE CONTACT

Causes moderate irritation to skin and eyes

SUB CHRONIC TOXICITY

Styrene is a direct skin irritant

CARCINOGENICITY

The IARC (International Agency for Research on Cancer) has that there is inadequate evidence for the carcinogenicity of styrene in humans. The IARC classification for styrene is group 2B; Possibly carcinogenic to humans - Notice of intended change of Styrene classification to group A4. Inadequate data on which to Classify the substance as a human and /or animal carcinogen. Note that styrene oxide, a product of styrene metabolism in the body, is carcinogenic in animals.

MUTAGENICITY

Most Studies conducted on styrene have proved inconclusive.

REPRODUCTIVE TOXICITY

There is some evidence that at high exposures (400 mg /kg styrene dosed orally to rats for 60 days) styrene can affect the male reproductive system. In a three generation study, rats were exposed to 200 ppm styrene orally. Despite some reporting deficiencies, it appears there are no treatment related effects on **male or female fertility or on their offspring.**

12 ECOLOGICAL INFORMATION

AQUATIC TOXICITY - FISH	No data available
AQUATIC TOXICITY - DAPHNIA	No data available

AQUATIC TOXICITY - ALGAE	No data available
BIODEGRADABILITY	No data available
BIOACCUMULATION	No data available
MOBILITY	No data available
GERMAN WGK	No data available

13 .DISPOSAL CONSIDERATIONS

DISPOSAL METHODS

Disposal of liquid resin should only occur under conditions approved by local authorities. See also section 6. It may be necessary to wet dust generated from polishing or grinding finished products in order to avoid airborne dispersal thereof,

DISPOSAL OF PACKAGING

Empty drums etc. contain vapours of styrene and pose a health and fire hazard and Should be disposed of occur under conditions approved by local authorities.

14. TRANSPORT INFORMATION

TARIFF No.	3907
UN No	1866
SUBSTANCE IDENTITY No	Not available
ADR/RID CLASS	Not available
ADR/RID ITEM No.	Not available
ADR/RID HAZARD IDENTITY No.	Not available
IMDG SHIPPING NAME	Resin solution
•• IMDG - CLASS	Class 3.3
IIVIDG PACKAGING GROUP	111
IMDG - MARINE POLLUTANT	Yes
IMDG - EMS No,	3-05
IMDG - MFAG TABLE No.	310
IATA - SHIPPING NAME	Resin solution
IATA _ CLASS	Class 3
IATA - SUBSIDIARY RISK(S)	None
ADNR - CLASS	Not available
UK - DESCRIPTION	Not available
UK - EMERGENCY ACTION CODE	Not available
UK - CLASSIFICATION	Not available
TREMCARD No.	Not available

15. REGULATORY INFORMATION

HAZARD CLASSIFICATION Flammable, Harmful. Irritant. [Rio; Xn; Xi] (Styrene)

RISK PHRASES Flammable. Harmful by inhalation. Irritating to eyes and skin.
- [R; 10,20, 3ii1~8J

SAFETY PHRASES Not available

NATIONAL LEGISLATION South African Hazardous Substance Act 15 of 1973
South African Occupational Health & Safety Act (85 OF 1993)

16. OTHER INFORMATION

CAS No	None
EINECS No,	Not available
EEC ANNEX 1 No.	Not available
MITI No.	Not available
FDA LIST No.	Not available
LISTING - TOSCA	Not available
LISTING - ACOIN	Not available