

Safety Data Sheet

1. PRODUCT AND COMPANY IDENTIFICATION

Product Name: Sun Sheet-Sunpatch Sheet
 Manufacturer/Supplier: Sanko Techno Co., Ltd.
 Address: 3-10-7 Minami Nagareyama, Nagareyama,
 Chiba, Japan
 Division: Material Dep., Renewal Div.
 Phone Number: 81-4-7157-9935
 Fax Number: 81-4-7157-9700
 Emergency Phone Number: 81-4-7157-9935
 Prepared Date: 1 March 1999
 Revision Date: 31 March 2014
 MSDS Number: PE-03E

2. Hazards Identification Overview

GHS Classification

Inflammable Liquid (Vapor): R3
 Acute Toxicity Oral: R5
 Skin: Not Classified
 Inhalation: R4
 Skin Irritancy / Corrosiveness: R4
 Eye Damage: 2A
 Inhalation / Skin Contact: Not Classified
 Germline Mutation: R2
 Carcinogenesis: R2
 Reproductive Toxicity R1B
 Specified Target Organ / Systemic Toxicity (Single Exposure): R3
 Specified Target Organ / Systemic Toxicity (Multiple Exposure): R1
 Sucked respiratory organ is harmful: R1
 Water Environment Toxicity (Acute): R2
 Water Environment Toxicity (Chronic): Not Classified

GHS Hazard Symbols:



GHS Identification of Danger

Hazard

Hazard and Toxicity Information

- Ignitable Vapor
- Harmful, if swallowed.
- Harmful, if inhaled.
- Skin irritation
- Severe eye irritation
- May cause genetic disorder
- May cause mutagenicity
- May cause central nerve system disorder
- May cause respiratory irritation
- Repeated dose toxicity can cause damage on respiratory, nerve, hematological, and liver.
- Fatal if swallowed or inhaled
- Toxic to aquatic organism
- Hazardous material Type 2 Flammable solid

Cautionary Statement**<Safety Measures>**

- Prior to the usage of this material, obtain handling manual.
- Prior to the usage of this material, read and understand the safety instruction thoroughly.
- Do not eat, drink smoke when this material is handled or prepared or applied.
- Keep away from ignition sources, high temperature, spark, naked flame.
- Smoking must be strictly prohibited.
- Electrical equipment must be of explosion proof construction and grounded.
- Ventilating equipment must be of explosion proof construction.
- Lighting equipment must be of explosion proof construction.
- Apply personal protection gear and ventilation system to avoid exposure.
- Apply protective glove, eye protector, and protective mask
- Handle, prepare, apply this material only in outdoors or in well ventilated area.
- Do not inhale mist, vapor or sprayed substance.
- Wash and rise well after handling.
- Avoid emission into the environment.

<Emergency Measures>

- Fire: Apply appropriate extinguish measure.
- Inhalation: Remove the victim to fresh air immediately. Keep him or her at rest while ensuring respiration. Seek medical attention when nausea remains.
- Ingestion: Do not induce vomiting. Seek medical attention immediately.
- Eye: Immediately and gently flush the affected eye(s) well with copious amount of clean water for 5 minutes. Remove contact lens if possible. Seek medical attention if irritation remains.
- Skin: Immediately wash affected area thoroughly with soap and water. Seek medical attention if irritation remains.

<Storage>

- Store in cool dark place.
- Isolate from heat.
- Prevent from accumulation of heat.
- Keep away from direct sunlight.
- Avoid atmosphere over 30 degree C.

<Disposal Considerations>

- Comply with all national or local recommendations and regulations. Submit material and containers to licensed waste trader.

3. Particularities of substance

Single or mixture: Mixture
 Chemical name: SMC (sheet molding compound)
 United Nations classification : 4.1(inflammable solid)
 United Nations No. : 3175
 Container classification : 2

<Composition and element information>

Component	Epoxy acrylate	Styrene	Acrylic resin	Glass fiber	Others
Content wt%	31~36	21~24	6~7	25~35	7~8
Chemical formula or structural formula	Secret	$\text{CH}_2=\text{CHC}_6\text{H}_5$	Secret	—	—
Official bulletin notification No.	(7)-1506 (Chemical Examination Law)	(3)-4 (Chemical Examination Law), KA(3)-4 (Law of Labor Safety and Health)	(6)-580 (Chemical Examination Law),	—	—
CAS No.	36425-15-7	100-42-6	25086-15-1	—	—
United Nations classification	Class 3 (Inflammable liquid), PG3		Not Specification	—	—
United Nations No.	1866		Not Specification	—	—

4. Classification of danger and harm

Classification name: Combustible solid, acute toxic substance, other harmful substances.
 Danger: Inflammable solid of dangerous material category 2. Component styrene fume is heavier than air, tends to stagnate at a low place, and may form an explosive mixture together with air.
 Toxicity: Component styrene is a kind of organic solvents. Its fume irritates the eye, nose, throat, etc. Inhaling a fume of a high concentration causes vertigo, headache or vomiting. If skin or mucosa is stained, an inflammation occurs.
 Environmental impact: Component styrene is subjected to the Malodor Prevention Law.

5. First aid

If eye is attacked: Immediately rinse the eye with running water for at least 15 minutes, and consult an oculist.
 If skin is stained: Carefully wipe the affected part with cloth wetted with alcohol, acetone or other solvents, and then rinse it with cold or lukewarm water using soap. If an inflammation has occurred, consult a doctor.
 If inhaled: Move the victim to fresh air, and keep him warm by blanket or the like and still. If the condition is not so serious, have him consult a doctor.

If swallowed: Carefully wash the mouth inside. If possible, force the victim to vomit by introducing a finger inside, and immediately have him treated by doctor.

6. Measure at fire

Extinguishing method: At an initial stage of a fire, use powder, carbon dioxide, dry sand, etc. In case of a large scale fire, shutting out air with foam, etc. is effective.

- For preventing the fire from spreading, sprinkle surrounding facilities, etc. to cool them.
- Move movable combustibles to a safe yard without delay.
- When extinguishing, wear protective instruments, and carry out an extinguishing work windward.

Extinguishing agent: Powder, foam, carbon dioxide and dry sand are effective.

7. Measures at spillage

- Collect scattered substances, and put them in an empty vessel which can hermetically be sealed. Film (cellophane, etc. through which styrene does not pass) may be used for collecting at a hermetic status. In any case, get the substances away from light without delay.
- The ordinary interior illumination causes gentle heating. Solar beam, mercury vapor lamp, etc. which generate an intense ultraviolet ray may cause a strong heating reaction (up to 100°C). So, get other dangerous materials away from the spilled substance without delay. Mask the spilled substance immediately.
- The spilled substance may flow out and be spread by water (rainfall, etc.) So, take measures to get water away.
- Wipe off a slightly spilled substance using a rag wetted with solvent.

8. Precautions in handling and storage

Handling: Do not produce fire, electrostatic charge, spark nor other igniting source. Handle the material in a well ventilated place. Do not irradiate an ultraviolet ray by other than a method specified for preliminary test. Wear protective instruments (goggles, gloves, etc.) Do not forcibly peel off clear plastic film from the surface of Sun sheet, Sunpatch sheet. If peeled off (accidentally or by mistake), seal the material without delay. Process the end of remaining Sun sheet, Sunpatch sheet to avoid a spillage (by cloth tape, ultraviolet hardening, etc.)

Storage: Make sure the vessel or packing is free from leakage. Keep the material in cold and dark place, avoiding a light and keeping fire away. Also avoid excessive humidity or temperature (above 30°C). Store the material in a dangerous material facility away from oxidizing materials, etc.

9. Exposure preventive measure

Control concentration:

Working environment rating standard (Ministry of Labor Notification No. 79)

Styrene 20ppm

Executive Ordinance for Law of Labor Safety and Health

Glass 2.9 mg/m³

Allowable concentration:

Recommendation by Japan Industrial Health Institute (2005 edition)

Styrene 20ppm

Recommendation by ACGIH (1992-93 edition)

TLV-TWA

Styrene 20ppm

TLV-STEL

Styrene 40ppm

(Note) TWA: Time weight average (8 h). STEL: Short time exposure limit (15 min).

Facility countermeasure:

Install local exhaust, shower, hand and eye washing facilities, etc.

Protective instruments:

Organic gas mask, dust mask, goggles, gloves, boots, protective clothes (anti-static, where possible).

10. Physical and chemical nature

Appearance: Solid sheet

Specific gravity: 1.10~2.50 (25°C)

Solubility: Insoluble in water. Partly soluble in acetone or other organic solvents.

Vapor pressure: 600 Pa (20°C, styrene)

Vapor density: 3.6 (styrene) (air = 1)

Boiling point: 145°C (styrene)

11. Danger information (stability, reactivity)

Flash point: 31°C (styrene)

Fire point: 490°C (styrene)

Explosion limits: Upper limit 6.1%, lower limit 1.1% (styrene)

Stability, reactivity: Stable in cold and dark place but, by heat, light or peroxide, heats and hardens upon polymerization reaction.

Combustibility: Yes (Fire Protection Law, dangerous substance category 2, danger grade)

Firing nature (natural firing nature, reactivity with water): No

Oxidizing nature: No

Fine dust explosiveness: No

12. Harm information (for human being, epidemiological information included)

Skin cauterization: No

Irritant nature: Causes an inflammation on skin if got in contact with the material.
Component styrene fume stimulates eye, nose and throat.

Acute toxicity: For styrene ¹⁾

Mouse Inhaled; LD₅₀ 9,500 mg/m³/4h

Rat Inhaled; LD₅₀ 24 g/m³/4h

Mouse Oral; LD₅₀ 316 mg/kg

Rat Oral; LD₅₀ 5,000 mg/kg

Human being Inhaled; LCL₀ 10,000 ppm/30min

TCL₀ 600ppm

Symptom of human being by exposure to styrene ²⁾

Concentration (ppm) Symptom

Below 10 No sense of odor

60 Gives odor but does not irritate mucosa

100 Gives strong but tolerable odor

200-400 Strong and offensive odor

600 Gives strong odor, and irritates eye and nose

800 Irritates eye and throat strongly. Tastes metallic.

Causes sleepiness, tranquillity and lethargy.

Carcinogenicity: Japan Industrial Health Institute classifies styrene in group 2B (maybe carcinogenic for human being although proofs are not sufficient) ³⁾. IARC also classifies it in 2B (may be carcinogenic) ⁴⁾, but other main organs (NTP, EPA, EC, ACGIH) do not ⁵⁾.

Variation generative nature (microorganism, chromosome anomaly): Styrene is Negative by Ames Test ⁶⁾. Epoxy acrylate is also negative by Ames Test.

Others: Styrene is excreted in urine as mandelic acid and phenyl glyoxylic acid ⁷⁾.

13. Environmental Impact Information

Biodecomposition nature: According to existing chemical substance inspection results by Ministry of International Trade and Industry, the

biodecomposition nature of styrene is judged good⁹⁾.

Fish toxicity:	TLm96	Dace	51ppm (styrene) ⁹⁾
	TLm96	Guppy	68ppm (styrene) ⁹⁾
	TLm96	Shrimp	52ppm (styrene) ¹⁰⁾

14. Precautions in discarding

Must be disposed of little by little while paying attention in case of incineration.
Disposal of solidified Sun sheet, Sunpatch sheet as industrial waste may be entrusted to an
Industrial waste disposing agent.

15. Precautions in transportation

- Pack the Sun sheet, Sunpatch sheet taking care not to damage the clear plastic film on Sun sheet, Sunpatch sheet and end treatment except for solidified Sun sheet, Sunpatch sheet.
 - Make sure the vessel and packing are free from leakage. Prevent the packing from breakage incidental to tipover, dropping, loosening, etc.
 - Avoid direct sunshine and penetration of rainwater.
 - Strictly observe the Fire Protection Law, Road Transportation Vehicle Law, Ship Safety Law, Harbor Rules and Laws and other related laws.
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16. Applied laws

Fire Protection Law:

Dangerous substance category 2, inflammable solid (designated quantity 1000 kg)

Law of Labor Safety and Health:

Ordinance's Appended Table, No. 1 dangerous substance (inflammable one), Organic Rules, category 2, organic solvent (styrene 5% min. contained)

Ship Safety Law:

Rules of Transportation by Ships and Storage of Dangerous Substances (Danger Rules), Appended Table 6 (combustible solids)

Aviation Law:

Appended Table 4 (combustible solids)

Related rules:

Malodor Prevention Law (Article 2, Malodorous substances)

Harbor Rules and Laws (dangerous substances, combustible solids)

Oceanic Pollution Prevention Law (substances in category 1B in Ordinance's Appended Table)

Law of Rules for Examination, Manufacture, etc. of Chemical Substances (Chemical Examination Law)

"Directive Related to Labor Health of Glass Fiber and Rock Wool" (Ministry of Labor, January, 1993)

Others (quoted documents, etc.)

Quoted documents

- 1) NIOSH: Registry of Toxic Effects of Chemical Substances (1992, CD-ROM DB)
- 2) Masayuki IKEDA: Industrial Medicine 24, 581-598 (1982)
- 3) Japan Industrial Health Institute Recommendation of Allowable Concentration, etc.: Industrial Medicine 34, 372 (1992)
- 4) IARC Monographs, Suppl. 7 (1987)

- 5) Styrene Industry Association: MSDS
- 6) J. Huff et al. ; Environmental Health Perspectives, 32, 247-270 (1991)
- 7) Health & Safety Executive ; Toxicity Review-Styrene (1981)
- 8) Official Gazette of Ministry of International Trade and Industry, December 25, 1979
- 9) C. J. middlebrooks et al. ; NTIS, PB-239, 127, Oct. (1973)
- 10) K. S. Price, et al ; J. WPCF 46, Jan. (1974)
- 11) Others
 - Petrochemical Industry Association: Styrene Safety Data Sheet No. 20 (1984)
 - Glass Fiber Association: "Impact of Long Glass Fiber on Human Body" (March, 1993)

Handling of description

The description is based on documents, information, etc. available at present stage, but contents, physico-chemical natures, etc. are not guaranteed values. The precautions are intended for ordinary cases. In case of special handling, take safety measures suited for particular uses.
