



Safety data sheet
according to 1907/2006/EC, Article 31

Printing date 28.06.2011

Version: 2

Revision: 28.06.2011

1 Identification of the substance/mixture and of the company/undertaking

- **Product identifier**
- **Trade name:** styrene
- **CAS Number:**
100-42-5
- **EC number:**
202-851-5
- **Index number:**
601-026-00-0
- **Registration number** 01-2119457861-32-0006
- **Relevant identified uses of the substance or mixture and uses advised against**
- **Sector of Use**
SU3 Industrial uses: Uses of substances as such or in preparations at industrial sites
SU8 Manufacture of bulk, large scale chemicals (including petroleum products)
SU12 Manufacture of plastics products, including compounding and conversion
SU21 Consumer uses: Private households / general public / consumers
SU22 Professional uses: Public domain (administration, education, entertainment, services, craftsmen)
- **Product category**
PC9b Fillers, putties, plasters, modelling clay
PC9c Finger paints
- **Process category**
PROC1 Use in closed process, no likelihood of exposure
PROC2 Use in closed, continuous process with occasional controlled exposure
PROC3 Use in closed batch process (synthesis or formulation)
PROC5 Mixing or blending in batch processes for formulation of preparations and articles (multistage and/or significant contact)
PROC7 Industrial spraying
PROC8a Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at non-dedicated facilities
PROC8b Transfer of substance or preparation (charging/discharging) from/to vessels/large containers at dedicated facilities
PROC9 Transfer of substance or preparation into small containers (dedicated filling line, including weighing)
PROC10 Roller application or brushing
PROC11 Non industrial spraying
PROC13 Treatment of articles by dipping and pouring
PROC14 Production of preparations or articles by tableting, compression, extrusion, pelletisation
PROC15 Use as laboratory reagent
- **Environmental release category**
ERC1 Manufacture of substances
ERC2 Formulation of preparations
ERC6c Industrial use of monomers for manufacture of thermo-plastics
ERC6d Industrial use of process regulators for polymerisation processes in production of resins, rubbers, polymers
- **Application of the substance / the preparation**
Monomere for the preparation of Copolymeres
Styrene resin
Reaction resin
Intermediate
Chemicals for synthesis
- **Details of the supplier of the safety data sheet**
- **Manufacturer/Supplier:**
Taiwan SM Corp., Kaohsiung plant
NO.7, Industrial 1st Rd, Lin-Yuan
Kaohsiung County 83203
Taiwan, R.O.C.
- **Only Representative**
Instituto Suizo para el Fomento de la Seguridad - Swissi España S.L.U
Calle Lope de Vega 30 Entlo.
E-08005 Barcelona

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reach@swissiesp.com

- **Further information obtainable from:**

Instituto Suizo para el Fomento de la Seguridad

Tel. +34-933036612 (9-16h)

- **Emergency telephone number:** TSMC: +886-7-6414511 Ext. 221

2 Hazards identification

- **Classification of the substance or mixture**
- **Classification according to Regulation (EC) No 1272/2008**



GHS02 flame

Flam. Liq. 3 H226 Flammable liquid and vapour.



GHS08 health hazard

STOT RE 1 H372 Causes damage to organs through prolonged or repeated exposure.

Asp. Tox. 1 H304 May be fatal if swallowed and enters airways.



GHS07

Acute Tox. 4 H332 Harmful if inhaled.

Eye Irrit. 2 H319 Causes serious eye irritation.

STOT SE 3 H335 May cause respiratory irritation.

- **Classification according to Directive 67/548/EEC or Directive 1999/45/EC**



Xn; Harmful

R20-48/20-65: Harmful by inhalation. Harmful: danger of serious damage to health by prolonged exposure through inhalation. Harmful: may cause lung damage if swallowed.



Xi; Irritant

R36/37/38: Irritating to eyes, respiratory system and skin.

R10: Flammable.

- **Label elements**
- **Labelling according to Regulation (EC) No 1272/2008**
The substance is classified and labelled according to the CLP regulation.
- **Hazard pictograms**



GHS02



GHS07



GHS08

- **Signal word** Danger
- **Hazard statements**
H226 Flammable liquid and vapour.
H332 Harmful if inhaled.
H319 Causes serious eye irritation.
H335 May cause respiratory irritation.
H372 Causes damage to organs through prolonged or repeated exposure.
H304 May be fatal if swallowed and enters airways.
- **Precautionary statements**
P260 Do not breathe dust/fume/gas/mist/vapours/spray.

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- P210 *Keep away from heat/sparks/open flames/hot surfaces. - No smoking.*
- P241 *Use explosion-proof electrical/ventilating/lighting/equipment.*
- P301+P310 *IF SWALLOWED: Immediately call a POISON CENTER or doctor/physician.*
- P303+P361+P353 *IF ON SKIN (or hair): Remove/Take off immediately all contaminated clothing. Rinse skin with water/shower.*
- P305+P351+P338 *IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.*
- P501 *Dispose of contents/container in accordance with local/regional/national/international regulations.*
- **Other hazards**
 - **Results of PBT and vPvB assessment**
 - **PBT:** Not applicable.
 - **vPvB:** Not applicable.

3 Composition/information on ingredients

- **Chemical characterization: Substances**
- **CAS No.**
100-42-5 styrene
- **Identification number(s)**
- **EC number:** 202-851-5
- **Index number:** 601-026-00-0

4 First aid measures

- **Description of first aid measures**
- **General information:**
In case of irregular breathing or respiratory arrest provide artificial respiration. Immediately remove any clothing soiled by the product.
- **After inhalation:**
*Supply fresh air or oxygen; call for doctor.
Supply fresh air. If required, provide artificial respiration. Keep patient warm. Consult doctor if symptoms persist.
In case of unconsciousness place patient stably in side position for transportation.*
- **After skin contact:** *Immediately wash with water and soap and rinse thoroughly.*
- **After eye contact:**
Rinse opened eye for several minutes under running water. If symptoms persist, consult a doctor.
- **After swallowing:** *Do not induce vomiting; call for medical help immediately.*
- **Information for doctor:**
- **Most important symptoms and effects, both acute and delayed**
Nausea
Headache
Dizziness
- **Indication of any immediate medical attention and special treatment needed**
No further relevant information available.

5 Firefighting measures

- **Extinguishing media**
- **Suitable extinguishing agents:**
CO₂, powder or water spray. Fight larger fires with water spray or alcohol resistant foam.
- **For safety reasons unsuitable extinguishing agents:** *Water*
- **Special hazards arising from the substance or mixture**
*The vapour is heavier than air, spreads along the ground and distant ignition is possible
Will float and can be reignited on surface water
Carbon monoxide (CO)*

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- **Advice for firefighters**
- **Protective equipment:**
Wear fully protective suit.
Mouth respiratory protective device.

6 Accidental release measures

- **Personal precautions, protective equipment and emergency procedures**
Ensure adequate ventilation
Avoid contact with skin, eyes and clothes.
Keep away from ignition sources.
Mount respiratory protective device.
Wear protective equipment. Keep unprotected persons away.
- **Environmental precautions:** Do not allow to enter sewers/ surface or ground water
- **Methods and material for containment and cleaning up:**
Absorb with liquid-binding material (sand, diatomite, acid binders, universal binders, sawdust).
Dispose contaminated material as waste according to item 13.
Ensure adequate ventilation.
- **Reference to other sections**
See Section 7 for information on safe handling.
See Section 8 for information on personal protection equipment.
See Section 13 for disposal information.

7 Handling and storage

- **Handling:**
- **Precautions for safe handling**
Keep away from heat and direct sunlight.
Ensure good ventilation/exhaustion at the workplace.
Prevent formation of aerosols.
- **Information about fire - and explosion protection:**
Keep ignition sources away - Do not smoke.
Protect against electrostatic charges.
- **Conditions for safe storage, including any incompatibilities**
- **Storage:**
- **Requirements to be met by storerooms and receptacles:**
Store in a cool location.
Check frequently to ensure that stabilizer is adequate (CAS Number 98-29-3)
Unsuitable materials for containers: copper
- **Information about storage in common storage facility:** Not required
- **Further information about storage conditions:**
Store in cool, dry conditions in well sealed receptacles.
Keep container tightly sealed.
- **Specific end use(s)** No further relevant information available.

8 Exposure controls/personal protection

- **Additional information about design of technical facilities:** No further data; see item 7.
- **Control parameters**

· **Ingredients with limit values that require monitoring at the workplace:**

100-42-5 styrene

WEL	Short-term value: 1080 mg/m ³ , 250 ppm Long-term value: 430 mg/m ³ , 100 ppm
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· DNELs**100-42-5 styrene**

Oral	DNEL population	2.1 mg/kg bw/day (Human) (Long term, systemic effect)
Dermal	DNEL population	343 mg/kg bw/day (Human) (Long term, systemic effect)
	DNEL workers	406 mg/kg bw/ day (Workers) (Long term, systemic effects)
Inhalative	DNEL	17 mg/m ³ (Human)
	DNEL population	174.25 mg/m ³ (general) (Acute, systemic effects)
		182.75 mg/m ³ (Human) (Acute, local effect)
		10.2 mg/m ³ (population) (Long term, systemic effect)
	DNEL workers	306 mg/m ³ (general) (Acute, local effects)
85 mg/m ³ (population) (long-term, systemic effects)		
		289 mg/m ³ (Workers) (Acute, systemic effects)

· PNECs**100-42-5 styrene**

PNEC freshw sed	0.614 mg/kg sed dw (general)
PNEC freshwater	0.028 mg/l (general)
PNEC saltwater	0.0028 mg/l (general)
PNEC water	0.04 mg/l (general) (Intermittent release)

· **Additional information:** The lists valid during the making were used as basis.

· Exposure controls**· Personal protective equipment:****· General protective and hygienic measures:**

Keep away from foodstuffs, beverages and feed.

Immediately remove all soiled and contaminated clothing

Wash hands before breaks and at the end of work.

Avoid contact with the eyes and skin.

· Respiratory protection:

In case of brief exposure or low pollution use respiratory filter device. In case of intensive or longer exposure use self-contained respiratory protective device.

· Protection of hands:

Protective gloves

The glove material has to be impermeable and resistant to the product/ the substance/ the preparation.

Due to missing tests no recommendation to the glove material can be given for the product/ the preparation/ the chemical mixture.

Selection of the glove material on consideration of the penetration times, rates of diffusion and the degradation

· Material of gloves

The selection of the suitable gloves does not only depend on the material, but also on further marks of quality and varies from manufacturer to manufacturer.

· Penetration time of glove material

The exact break through time has to be found out by the manufacturer of the protective gloves and has to be observed.

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· **Eye protection:**

Tightly sealed goggles

9 Physical and chemical properties

· **Information on basic physical and chemical properties**· **General Information**· **Appearance:**

· Form:	Fluid
· Colour:	Colourless
· Odour:	Characteristic

· **pH-value (- g/l) :** neutral· **Change in condition**

· Melting point/Melting range:	-30.7°C
· Boiling point/Boiling range:	145.2°C

· **Flash point:** 31°C· **Flammability (solid, gaseous):** Flammable.· **Ignition temperature:** 480°C· **Danger of explosion:** Product is not explosive. However, formation of explosive air/vapour mixtures are possible.· **Explosion limits:**

· Lower:	1.2 Vol %
· Upper:	8.9 Vol %

· **Oxidizing properties** None· **Vapour pressure at 20°C:** 6 hPa· **Density at 20°C:** 0.906 g/cm³· **Segregation coefficient (n-octanol/water) at 25°C:** 2.96 log POW· **Viscosity:**· **Dynamic at 25°C:** 0.73 mPas· **Other information** No further relevant information available.· **Surface tension** Not applicable· **Granulometry** Not applicable

10 Stability and reactivity

· **Reactivity**· **Chemical stability** The product is stable under ordinary conditions· **Thermal decomposition / conditions to be avoided:** Depends on the additives.· **Possibility of hazardous reactions** Danger of polymerization.· **Conditions to avoid**

Air, light, heat

Keep away from heat, sparks and open flames

· **Incompatible materials:** Strong oxidizing agents.· **Hazardous decomposition products:** No dangerous decomposition products known

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11 Toxicological information

· **Information on toxicological effects**

· **Acute toxicity:**

· **LD/LC50 values relevant for classification:**

100-42-5 styrene

Dermal	LD50	> 2000 mg/kg (rat)
	NOAEL	615 mg/kg bw/day (rat)
Inhalative	LC50	2770 ppm (rat)
	NOAEC	0.020 mg/l (Human) 0.5 mg/l (rat)
Irritation of skin	Resp. irritation	Not respir. sen (general)
	Skin irritation	Irritating (rabbit)
Irritation of eyes	Ocular irritation	Irritating (rabbit)
Sensitisation	Sensitisation	Not skin sens. (general)
	LC50	4.02 mg/l (Fish)

· **Primary irritant effect:**

· **on the skin:** Irritant to skin and mucous membranes.

· **on the eye:** Irritating effect.

· **Sensitization:** No sensitizing effects known

· **CMR effects (carcinogenicity, mutagenicity and toxicity for reproduction)** None

· **Germ cell mutagenicity** None

· **Carcinogenicity:** None

12 Ecological information

· **Toxicity**

· **Acquatic toxicity:**

100-42-5 styrene

LC50/EC50	4.9 mg/l (Algae)
	4.7 mg/l (general)
	500 mg/l (Micro-organisms)
NOEC	1.01 mg/l (general)

· **Persistence and degradability** Easily biodegradable

· **Behaviour in environmental systems:**

· **Bioaccumulative potential** Does not accumulate in organisms

· **Mobility in soil** Adsorption to solid phase is possible

· **Additional ecological information:**

· **General notes:**

Water hazard class 2 (German Regulation) (Self-assessment): hazardous for water

Do not allow product to reach ground water, water course or sewage system.

Danger to drinking water if even small quantities leak into the ground.

· **Results of PBT and vPvB assessment**

· **PBT:** Not applicable.

· **vPvB:** Not applicable.

· **Other adverse effects** No further relevant information available.

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13 Disposal considerations

- **Waste treatment methods**
- **Recommendation**
Must not be disposed together with household garbage. Do not allow product to reach sewage system.
- **Uncleaned packaging:**
- **Recommendation:** Disposal must be made according to official regulations.

14 Transport information

- | | |
|---|---|
| · UN-Number | |
| · ADR, IMDG, IATA | 2055 |
| · UN proper shipping name | |
| · ADR | 2055 STYRENE MONOMER, STABILIZED |
| · IMDG, IATA | STYRENE MONOMER, STABILIZED |
| · Transport hazard class(es) | |
| · ADR | |
|  | |
| · Class | 3 Flammable liquids. |
| · Label | 3+6.1 |
| · IMDG, IATA | |
|  | |
| · Class | 3 Flammable liquids. |
| · Label | 3+6.1 |
| · Packing group | |
| · ADR, IMDG, IATA | III |
| · Environmental hazards: | |
| · Marine pollutant: | No |
| · Special precautions for user | Warning: Flammable liquids. |
| · Danger code (Kemler): | 369 |
| · EMS Number: | F-E,S-D |
| · Transport in bulk according to Annex II of MARPOL73/78 and the IBC Code | Not applicable. |
| · UN "Model Regulation": | UN2055, STYRENE MONOMER, STABILIZED, 3 (6.1), III |

15 Regulatory information

- **Safety, health and environmental regulations/legislation specific for the substance or mixture**
- **Inventory - United States - Toxic Substances Control Act (TSCA)** Substance is listed.
- **US - FIFRA - Pesticide Product Other Ingredients** Substance is not listed.
- **OECD - List of High Production Volume Chemicals** Substance is not listed.
- **Canada - Selected Substances Identified as Priority for Action** No information
- **U.S. - EPA - HPV (High Production Volume) Challenge Program Chemical List** Substance is not listed.

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- **NIOSH - Health Standards - Pesticides** Substance is not listed.
- **Inventory - Canada - Domestic Substances List (DSL)** Substance is listed.
- **Philippines Inventory of Chemicals and Chemical Substances** Substance is listed.
- **Inventory-China** Substance is listed.
- **Australian Inventory of Chemical Substances** Substance is listed.

· Japan Existing and New Chemical Substances (ENCS)		
100-42-5	styrene	3-4

· Inventory - Korea - Existing and Evaluated Chemical Substances		
100-42-5	styrene	KE-35342

· Standard for the Uniform Scheduling of Drugs and Poisons		
100-42-5	styrene	S5

- **Chemical safety assessment:** A Chemical Safety Assessment has been carried out.

16 Other information

This information is based on our present knowledge. However, this shall not constitute a guarantee for any specific product features and shall not establish a legally valid contractual relationship.

- **Exposure scenarios**

This SDS has one annex which includes the Exposure Scenarios developed in the Chemical Safety Assessment. Exposure Scenarios in local languages will be published as soon as they are available.

- **Abbreviations and acronyms:**

ADR: Accord européen sur le transport des marchandises dangereuses par Route (European Agreement concerning the International Carriage of Dangerous Goods by Road)

RID: Règlement international concernant le transport des marchandises dangereuses par chemin de fer (Regulations Concerning the International Transport of Dangerous Goods by Rail)

IMDG: International Maritime Code for Dangerous Goods

IATA: International Air Transport Association

ICAO: International Civil Aviation Organization

GHS: Globally Harmonized System of Classification and Labelling of Chemicals

EINECS: European Inventory of Existing Commercial Chemical Substances

CAS: Chemical Abstracts Service (division of the American Chemical Society)

DNEL: Derived No-Effect Level (REACH)

PNEC: Predicted No-Effect Concentration (REACH)

LC50: Lethal concentration, 50 percent

LD50: Lethal dose, 50 percent

- *** Data compared to the previous version altered.**