

Section 9. Physical and chemical properties

Appearance

Physical state	: Liquid.
Color	: Colorless.
Odor	: Characteristic. Aromatic.
Odor threshold	: 0.1 ppm
pH	: Not applicable.
Melting point	: Not available.
Boiling point	: 145.2°C (293.4°F)
Flash point	: Closed cup: 31.1°C (88°F)
Burning time	: Not applicable.
Burning rate	: Not applicable.
Evaporation rate	: >1 (ether (anhydrous) = 1)
Flammability (solid, gas)	: Not available.
Lower and upper explosive (flammable) limits	: Lower: 1.1% Upper: 6.1%
Vapor pressure	: 0.57 kPa (4.3 mm Hg) [room temperature]
Vapor density	: 3.6 [Air = 1]
Relative density	: 1.03 to 1.1
Solubility	: Not available.
Solubility in water	: Not applicable.
Partition coefficient: n-octanol/water	: Not available.
Auto-ignition temperature	: Not available.
Decomposition temperature	: Not available.
SADT	: Not applicable.
Viscosity	: Not available.

Section 10. Stability and reactivity

Reactivity	: No specific test data related to reactivity available for this product or its ingredients.
Chemical stability	: The product is stable.
Possibility of hazardous reactions	: Hazardous reactions or instability may occur under certain conditions of storage or use.
Conditions to avoid	: Avoid all possible sources of ignition (spark or flame). Do not pressurize, cut, weld, braze, solder, drill, grind or expose containers to heat or sources of ignition. Do not allow vapor to accumulate in low or confined areas.
Incompatible materials	: Reactive or incompatible with the following materials: oxidizing materials Reactive or incompatible with the following materials: acids and alkalis.
Hazardous decomposition products	: Under normal conditions of storage and use, hazardous decomposition products should not be produced.

Section 11. Toxicological information

Information on toxicological effects

Acute toxicity

Product/ingredient name	Result	Species	Dose	Exposure
Styrene	LC50 Inhalation Gas.	Rat	2770 ppm	4 hours
	LC50 Inhalation Vapor	Rat	11800 mg/m ³	4 hours
	LD50 Oral	Rat	2650 mg/kg	-

Irritation/Corrosion

Product/ingredient name	Result	Species	Score	Exposure	Observation
Styrene	Eyes - Mild irritant	Human	-	50 parts per million	-
	Eyes - Moderate irritant	Rabbit	-	24 hours 100 milligrams	-
	Eyes - Severe irritant	Rabbit	-	100 milligrams	-
	Skin - Mild irritant	Rabbit	-	500 milligrams	-
	Skin - Moderate irritant	Rabbit	-	100 Percent	-

Sensitization

Not available.

Mutagenicity

Not available.

Carcinogenicity

Not available.

Conclusion/Summary : Styrene manufacturers vary on their determination that the GHS hazard classification criteria for carcinogenicity has been met.

Styrene is listed by IARC as a possible carcinogen to humans (Group 2B) based on "limited evidence" in humans, "limited evidence" in animals and "other relevant data". The United States NTP listed styrene as reasonably anticipated to be a human carcinogen based on "limited evidence" from studies in humans, "sufficient evidence" from studies in experimental animals, and supporting data on mechanisms of carcinogenesis. The significance of these results for humans has not been established through risk assessment.

Classification

Product/ingredient name	OSHA	IARC	NTP
Styrene	-	2B	Reasonably anticipated to be a human carcinogen.

Reproductive toxicity

Not available.

Teratogenicity

Not available.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Section 11. Toxicological information

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

Potential acute health effects

Eye contact : Causes serious eye irritation.
Inhalation : Harmful if inhaled.
Skin contact : Causes skin irritation.
Ingestion : Irritating to mouth, throat and stomach.

Symptoms related to the physical, chemical and toxicological characteristics

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness
Inhalation : No specific data.
Skin contact : Adverse symptoms may include the following:
irritation
redness
Ingestion : No specific data.

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Long term exposure

Potential immediate effects : Not available.
Potential delayed effects : Not available.

Potential chronic health effects

Not available.

General : No known significant effects or critical hazards.
Carcinogenicity : Suspected of causing cancer. Risk of cancer depends on duration and level of exposure.
Mutagenicity : No known significant effects or critical hazards.
Teratogenicity : No known significant effects or critical hazards.
Developmental effects : No known significant effects or critical hazards.
Fertility effects : No known significant effects or critical hazards.

Numerical measures of toxicity

Acute toxicity estimates

Section 11. Toxicological information

Route	ATE value
Oral	2766 mg/kg
Inhalation (gases)	2996.8 ppm
Inhalation (vapors)	12.77 mg/l

Section 12. Ecological information

Toxicity

Product/ingredient name	Result	Species	Exposure
Styrene	Acute EC50 1400 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	72 hours
	Acute EC50 720 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours
	Acute EC50 4700 µg/l Fresh water	Daphnia - Daphnia magna	48 hours
	Acute LC50 52000 µg/l Marine water	Crustaceans - Artemia salina - Nauplii	48 hours
	Acute LC50 4020 µg/l Fresh water	Fish - Pimephales promelas	96 hours
	Chronic NOEC 63 µg/l Fresh water	Algae - Pseudokirchneriella subcapitata	96 hours

Persistence and degradability

Not available.

Bioaccumulative potential

Product/ingredient name	LogP _{ow}	BCF	Potential
Styrene	0.35	13.49	low

Mobility in soil

Soil/water partition coefficient (K_{oc}) : Not available.

Other adverse effects : No known significant effects or critical hazards.







Section 13. Disposal considerations

Disposal methods : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Vapor from product residues may create a highly flammable or explosive atmosphere inside the container. Do not cut, weld or grind used containers unless they have been cleaned thoroughly internally. Avoid dispersal of spilled material and runoff and contact

Section 13. Disposal considerations

with soil, waterways, drains and sewers.

Section 14. Transport information

	DOT Classification	Mexico Classification	IMDG	IATA
UN number	UN1866	UN1866	UN1866	UN1866
UN proper shipping name	RESIN SOLUTION (contains STYRENE MONOMER)	RESIN SOLUTION (contains STYRENE MONOMER)	RESIN SOLUTION (contains STYRENE MONOMER)	RESIN SOLUTION (contains STYRENE MONOMER)
Transport hazard class(es)	3 	3  	3  	3 
Packing group	III	III	III	III
Environmental hazards	Yes.	Yes.	Yes.	No.
Additional information	Reportable quantity 2351.6 lbs / 1067.6 kg [264.82 gal / 1002.5 L] Package sizes shipped in quantities less than the product reportable quantity are not subject to the RQ (reportable quantity) transportation requirements.	-	-	-

Special precautions for user : **Transport within user's premises:** always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage.

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not available.

Section 15. Regulatory information

U.S. Federal regulations : **TSCA 8(a) PAIR**: 4-tert-butylpyrocatechol; Siloxanes and Silicones, di-Me; Octyl Phenol Ethoxylate; octamethylcyclotetrasiloxane; triethyl phosphate; 2-methoxy-1-methylethyl acetate
TSCA 8(a) CDR Exempt/Partial exemption: Not determined
TSCA 8(c) calls for record of SAR: triethyl phosphate
United States inventory (TSCA 8b): Not determined.
Clean Water Act (CWA) 307: Naphthenic acids, copper salts; ethylbenzene; phenol
Clean Water Act (CWA) 311: styrene; xylene; phenol

Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs) : Listed

Clean Air Act Section 602 Class I Substances : Not listed

Clean Air Act Section 602 Class II Substances : Not listed

SARA 302/304

Composition/information on ingredients

Name	%	EHS	SARA 302 TPQ		SARA 304 RQ	
			(lbs)	(gallons)	(lbs)	(gallons)
Phenol	0.00	Yes.	500 / 10000	-	1000	-
ethylene oxide	0.00	Yes.	1000	-	10	-

SARA 304 RQ : 500000000 lbs / 227000000 kg [56307094.7 gal / 213145539.9 L]

SARA 311/312

Classification : Fire hazard
 Immediate (acute) health hazard
 Delayed (chronic) health hazard

SARA 313

	Product name	CAS number	%
Form R - Reporting requirements	styrene	100-42-5	42.52
Supplier notification	styrene	100-42-5	42.52

State regulations

Massachusetts : The following components are listed: STYRENE MONOMER

New York : The following components are listed: Styrene

New Jersey : The following components are listed: STYRENE MONOMER; BENZENE, ETHENYL-

Pennsylvania : The following components are listed: BENZENE, ETHENYL-

California Prop. 65

WARNING: This product contains less than 0.1% of a chemical known to the State of California to cause cancer.

WARNING: This product contains less than 1% of a chemical known to the State of California to cause birth defects or other reproductive harm.

Section 15. Regulatory information

Ingredient name	Cancer	Reproductive	No significant risk level	Maximum acceptable dosage level
ethylbenzene	Yes.	No.	41 µg/day (ingestion) 54 µg/day (inhalation)	No.
ethylene oxide	Yes.	Yes.	Yes.	Yes.

International regulations

International lists

- : **Australia inventory (AICS):** Not determined.
- : **China inventory (IECSC):** Not determined.
- : **Japan inventory:** Not determined.
- : **Korea inventory:** Not determined.
- : **Malaysia Inventory (EHS Register):** Not determined.
- : **New Zealand Inventory of Chemicals (NZIoC):** Not determined.
- : **Philippines inventory (PICCS):** Not determined.
- : **Taiwan inventory (CSNN):** Not determined.

Canada inventory

- : Not determined.

Section 16. Other information

Hazardous Material Information System (U.S.A.)

Health	*	2
Flammability		3
Physical hazards		1

Caution: HMIS® ratings are based on a 0-4 rating scale, with 0 representing minimal hazards or risks, and 4 representing significant hazards or risks. Although HMIS® ratings are not required on SDSs under 29 CFR 1910.1200, the preparer may choose to provide them. HMIS® ratings are to be used with a fully implemented HMIS® program. HMIS® is a registered mark of the National Paint & Coatings Association (NPCA). HMIS® materials may be purchased exclusively from J. J. Keller (800) 327-6868.

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.)



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History

Date of printing : 6/1/2015.

Section 16. Other information

Date of issue/Date of revision	: 6/1/2015.
Date of previous issue	: 5/30/2015.
Version	: 5
Prepared by	Health, Safety and Environmental Department
Email	: For questions regarding the SDS contact: iasafety@ip-corporation.com
Key to abbreviations	: ATE = Acute Toxicity Estimate BCF = Bioconcentration Factor GHS = Globally Harmonized System of Classification and Labelling of Chemicals IATA = International Air Transport Association IBC = Intermediate Bulk Container IMDG = International Maritime Dangerous Goods LogPow = logarithm of the octanol/water partition coefficient MARPOL 73/78 = International Convention for the Prevention of Pollution From Ships, 1973 as modified by the Protocol of 1978. ("Marpol" = marine pollution) UN = United Nations
References	: OSHA Hazard Communication Standard, March 2012 (29 CFR 1910.1200)

Indicates information that has changed from previously issued version.

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Final determination of suitability of any material is the sole responsibility of the user. All materials may present unknown hazards and should be used with caution. Although certain hazards are described herein, we cannot guarantee that these are the only hazards that exist.