



MATERIAL SAFETY DATA SHEET

Chemtrec 24-Hour Emergency Telephone

Domestic North America
International

(800)424-9300
(800)527-3887

This MSDS complies with 29 CFR 1910.1200 (Hazard Communication)

1. Product and Supplier Identification

Product: Orca 511VIP Vinyl Ester Resin

Product Use: Unsaturated Polyester Resin

Supplier: Fiberlay Inc.
24 S. Idaho St
Seattle, Wa 98134
(206)782-0660

2. Composition

Component	% (w/w)	CAS Number	Exposure Limits
Unsaturated polyester	>58%	Not applicable (mixture)	Not applicable
Styrene Monomer	<42%	100-42-5	20 ppm (ACGIH TLV-TWA) 50 ppm (OSHA 8 hour EL) 85 mg/m ³ (ACGIH TLV) 50 mg/m ³ (WCB 8h EL) 75 mg/m ³ (WCB 15min EL)

3. Hazards Identification

Routes of Entry:

Skin Contact: Moderate Eye Contact: Minor Ingestion: Major Inhalation: Major

Emergency Overview: Central nervous system depressant. High vapour concentration may cause headache, nausea, dizziness, drowsiness and confusion. Causes skin and eye irritation. Aspiration hazard. Swallowing or vomiting of the liquid may result in aspiration into the lungs.

Acute Health Effects: INHALATION: Liquid or spray mist may produce tissue damage on mucous membranes of mouth and respiratory tract. Inhalation of the spray mist may produce severe irritation of respiratory tract, characterized by coughing, choking, or shortness of breath. Respiratory irritation is the most commonly reported effect. High concentrations cause depression

Orca 511VIP V/E INFUSION/RTM RESIN

Hazards Identification, continued

of the central nervous system (CNS) with symptoms such as drowsiness, headache, confusion, incoordination and unconsciousness.

SKIN CONTACT: Very slightly to slightly dangerous in case of skin contact. May cause skin sensitization.

EYE CONTACT: Liquid or spray mist may produce tissue damage on mucous membranes of eyes. Very slightly to slightly dangerous in case of eye contact. May cause eye irritation.

INGESTION: Ingestion may cause effects similar to those experienced under the heading "INHALATION"

Chronic Health Effects: Carcinogenic: Classified 2B (Possible for human) by IARC (Styrene). Repeated exposure to a highly toxic material may produce general deterioration of health by an accumulation in one or many human organs. An increased incidence of lung tumours observed in mice from a recent inhalation study. The relevance of this finding is uncertain since data from other long-term animal studies and from epidemiology studies of workers exposed to styrene do not provide a basis to conclude that styrene is carcinogenic. Lung effects have been observed in the mouse following repeated exposure.

Medical Conditions Aggravated by Exposure:

Pre-existing eye, skin, respiratory tract disorders may be aggravated by exposure.

4. First Aid Measures

INHALATION: This product is flammable. Take proper precautions. Remove victim to fresh air. Give artificial respiration if indicated. Get medical attention.

SKIN CONTACT: Avoid direct contact. Wear chemical protective clothing, if necessary. Quickly and gently blot or brush away excess chemical. Wash gently and thoroughly with water and non-abrasive soap for 20 minutes or until chemical is removed. Under running water, remove contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Completely decontaminate clothing, shoes and leather goods before re-use or discard. If the contact is severe and pain persists after long term rinsing with water, rinse the contaminated area with lukewarm pasteurized milk. After pain has stopped, rinse thoroughly with water. Obtain medical attention immediately.

EYE CONTACT: MAY CAUSE EYE IRRITATION. Check and remove any contact lenses. Flush with plenty of water for at least 20 minutes, occasionally lifting the upper and lower eyelids. DO NOT INTERRUPT FLUSHING. Take care not to contaminate non-affected eye. Seek medical attention.

INGESTION: If patient is conscious, give three or four glasses of water. ***Do not induce vomiting*** Do not give anything by mouth to a convulsing or unconscious person. Get medical attention.

GENERAL COMMENTS: Good personal hygiene is essential. Avoid eating, smoking or drinking in work areas.

5. Fire Fighting Measures

Flash point:	31°C TCC
Autoignition Temperature:	490°C. See information under "Fire Fighting Instructions"
Lower Explosive Limit:	0.09 % by volume
Upper Explosion Limit:	6.8% by volume
Sensitivity to Impact:	No
Sensitivity to Static Discharge:	No

Hazardous Combustion Products: Burning may produce oxides of carbon.

Extinguishing Media: Use carbon dioxide, alcohol foam, or dry chemical. Water should be used to cool surrounding containers.

Fire Fighting Instructions: Vapour will flash and the liquid will burn. Keep away from all sources of ignition and avoid elevated temperatures. Vapours are heavier than air, and may collect in low-lying areas. Firefighters must wear self-contained breathing apparatus and full protective clothing.

6. Accidental Release Measures

Personal Protection: Wear adequate personal protection to prevent skin contact. See Section 8 for specific recommendations

Environmental Precautions: Prevent release into waterways and sewers. Stop spill as soon as possible to prevent contamination of soil, groundwater, or surface water.

Cleanup Procedures: Poisonous, flammable liquid, insoluble or very slightly soluble in water. Keep away from heat. Keep away from sources of ignition. Stop leak if without risk. Absorb with DRY earth, sand, or other non-combustible material. Prevent entry into sewers, basements, or confined areas. Dike if needed. Eliminate all sources of ignition. Call for assistance on disposal. Consult national, provincial, and local regulations.

7. Handling and Storage

Handling Procedures: Keep away from heat and all sources of ignition. Ground all equipment containing material. Do not ingest. Do not breathe gas, fumes, vapor, or spray. Follow safe work procedures and wear appropriate personal protective equipment.

Storage: Keep well away from all sources of ignition. Store in a cool well-ventilated area out of direct sunlight and away from heat and ignitions sources. Do not store near foodstuffs. Styrene should not be stored for longer than 3 months. Containers should be checked weekly after 30 days to determine inhibitor concentration and possible polymerization. Store away from oxidizers and corrosives and other incompatible materials such as sulfuric acid, peroxides, alkali metal, which increase the risk of fire and explosion.

8. Exposure Controls, Personal Protection

Engineering Controls: If used indoors, ensure adequate non-sparking ventilation. Remove all sources of ignition and post "No Smoking" signs in the work place. Keep away from heat, and never weld, cut, or solder empty containers. Use adequate ventilation to reduce concentration to below TLV.

Respiratory Protection: Use a NIOSH approved organic vapour respirator if concentration below minimum IDLH of 500 ppm in the workplace. For vapour concentrations in excess of 500 ppm, use a positive pressure respirator.

Skin Protection: Wear impervious gloves (butyl rubber) and clothing to prevent skin contact.

Eye and Face Protection: Chemical splash-proof goggles must be worn at all times.

Other: Eye wash station should be located near work area.

9. Physical and Chemical Properties

Appearance:	Clear	Boiling Point:	≈146 °C
Odour:	Styrene Odor	Freezing Point:	Not available.
pH:	Not applicable.	Relative Density:	1.1-1.3 (water = 1)
Vapour Pressure:	200 mm Hg	Partition Coefficient:	No data
Solubility:	Insoluble	Evaporation Rate:	Not available.
Vapour Density:	Heavier than air		
Melting Point:	Not applicable.		

10. Stability and Reactivity

Chemical Stability: This product is stable.

Hazardous Polymerization: May polymerize violently with risk of fire and explosion. Uninhibited styrene, or styrene with low inhibitor concentration, polymerizes slowly at room temperature and on exposure to light and air, and readily at elevated temperatures, greater than 65°C (149°F). Polymerization becomes self-sustaining above 95 deg C. Metal salts (e.g. ferric or aluminum chloride), peroxides, oxidizers and strong acids may also cause polymerization.

Incompatibility: Oxygen, oxidizing agents - Increased risk of fire and explosion. Can form explosive peroxides. Strong acids (e.g. sulfuric acid, oleum, chlorosulfonic acid) – Increased temperature and pressure; increased risk of fire and explosion. Alkali metal, graphite compounds, metallic halide salts, peroxides (dibenzoyl peroxide di-tertbutyl peroxide), azoisobutyronitrile – Can initiate polymerization. Byllithium - Explosion can occur. Halogens - Can react with low concentrations of halogens, in the presence of UV light, to form a strong irritant. Can form peroxides in the presence of light and air or on contact with acids. Styrene monomer has been involved in several plant-scale explosions when stored inappropriately or accidentally heated.

Hazardous Decomposition Products: Styrene oxide.

11. Toxicological Information

Acute Exposure (LD₅₀):	Styrene Monomer	5000 mg/kg (oral/rat)
Acute Exposure (LC₅₀):	Styrene Monomer	5640 ppm (Rat, 4 hour exposure)
Chronic Exposure:	See Section 3.	
Exposure Limits:	See Section 2.	
Irritancy:	See Section 3.	
Sensitization:	See Section 3.	
Neurotoxicity:	There is evidence of subtle changes in hearing. Balance, colour vision, the speed of nerve conduction and psychological performance.	
Carcinogenicity:	Styrene is listed by IARC, Group 2B possible human carcinogen.	
Teratogenicity:	Not reported	
Reproductive Toxicity:	There is some evidence that high exposures to styrene can affect the male reproductive system in rats.	
Mutagenicity:	Data cited but not conclusive.	
Synergistic Products:	Styrene metabolism is slowed down by the presence of other organic solvents, including ethyl alcohol. Thus the toxic effects of styrene are enhanced by exposure to other solvents	

12. Ecological Information

Environmental Toxicity: No data available.

Biodegradability: No data available.

13. Disposal Considerations

Review federal, provincial or state, and local government requirements prior to disposal. Store material for disposal as indicated in Storage Conditions. Disposal by controlled incineration may be acceptable.

14. Transport Information

Canadian Transportation of Dangerous Goods Regulations: Resin Solution, Class 3, UN 1866, P.G. III

International Air Transport Association (IATA): Resin Solution, Class 3, UN 1866, P.G. III

International Maritime Organization (IMO): Resin Solution, Class 3, UN 1866, P.G. III, Flash Point = 31°C, EmS No. 3-05, Stowage Category "A"

15. Regulatory Information

CANADIAN FEDERAL REGULATIONS:

CEPA, DOMESTIC SUBSTANCES LIST: Listed

WHMIS CLASSIFICATION: B2, D2A, D2B, F

UNITED STATES REGULATIONS:

29CFR 1910.1200: Hazardous

40CFR 116-117: Hazardous

40CFR 355, Appendices A and B: Not subject to Emergency Planning and Notification

40CFR 372: Listed

40CFR 302: Listed, Reportable Quantity, 1000 lbs (454 Kg)

16. Other Information

Preparation Date: February 2nd, 2008

Prepared by: Fiberlay Inc

Comments: This Material Safety Data Sheet was prepared using information provided by Sewon Chemical Co. Ltd., Fiberlay Inc.

Revisions: None