

Material Safety Data Sheet

Material Name: AROCAST® VINYL ESTER RESIN

ID:

*** Section 1 - Chemical Product and Company Identification ***

Product Trade Name ACROCAST VINYL ESTER RESIN

Manufacturer Information

Ergon Armor

(601) 933-3540

Corrosion Engineering

300 Stevens Drive, Suite 310

(800) 424-9300

Lester, PA 19113

*** Section 2 - Composition / Information on Ingredients ***

CAS #	Component	Percent	OSHA
68002-44-8	Vinyl Ester Resin	45-55	Yes
100-42-5	Styrene	35-45	Yes

The substance(s) marked with a "Y" in the OSHA column, are identified as hazardous chemicals according to the criteria of the OSHA Communication Standard (29 CFR 1910.1200)

The components of this product are all on the TSCA inventory list.

*** Section 3 - Hazards Identification ***

Emergency Overview:

Gray viscous liquid-styrene odor

WARNING!

FLAMMABLE LIQUID AND VAPOR.

PROLONGED EXPOSURE TO HIGH VAPOR CONCENTRATIONS CAN CAUSE CENTRAL NERVOUS SYSTEM DEPRESSION INCLUDING HEADACHE, DIZZINESS, WEAKNESS, CONFUSION, NAUSEA, AND LOSS OF CONSCIOUSNESS.

MAY CAUSE RESPIRATORY TRACT IRRITATION.

CAUSES EYE IRRITATION.

Potential Health Effects:

Styrene

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material.

Hydrocarbons of this type may remove oils from the skin and, because of their drying nature, produce irritation, redness and rash (dermatitis) with repeated or prolonged contact. Hydrocarbons of this type may also be irritating to the eyes and respiratory tract. Overexposure to high atmospheric concentrations of hydrocarbon vapors may result in central nervous system (CNS) depression, with possible effects such as headache, dizziness, weakness, confusion, nausea and unconsciousness. This material is considered, on the basis of single exposure (acute) animal tests, to be slightly toxic if inhaled and moderately irritating to eyes. This material is also considered to have a low order of both acute oral and skin toxicity unless the material is accidentally drawn into the lungs (aspirated). However, as with other similar hydrocarbons, there may be severe lung injury if the material is drawn into the lungs during swallowing or during spontaneous or induced vomiting after swallowing.

Material Safety Data Sheet

Material Name: AROCAST® VINYL ESTER RESIN

ID:

*** Section 4 - First Aid Measures ***

IF IN EYES, immediately flush with plenty of water for at least 15 minutes. Get medical attention immediately.

IF ON SKIN, immediately wash with soap and plenty of water. Remove contaminated clothing and shoes. Get medical attention if symptoms occur. Wash clothing before reuse. Destroy contaminated shoes.

IF SWALLOWED, do NOT induce vomiting. Give water to drink. Get medical attention immediately. NEVER GIVE ANYTHING BY MOUTH TO AN UNCONSCIOUS PERSON.

IF INHALED, remove to fresh air. If not breathing, give artificial respiration. If breathing is difficult, give oxygen. Get medical attention immediately.

*** Section 5 - Fire Fighting Measures ***

Flash Point: 90-95 deg F (32-35 deg C)	Method Used: TCC	Flammability Classification:
Upper Flammable Limit (UFL): 6.1	Lower Flammable Limit (LFL): 1.1	

Fire & Explosion Hazards:

Closed containers of this material may explode when subjected to heat from surrounding fire. Cool exposed containers with water. Avoid breathing fumes from fire exposed material.

Extinguishing Media:

Use water fog, carbon dioxide, foam or dry chemical.

Fire-Fighting Instructions:

Fire fighters and others who may be exposed to products of combustion should wear full fire fighting turn out gear (full Bunker Gear) and self-contained breathing apparatus (pressure demand NIOSH approved or equivalent). Fire fighting equipment should be thoroughly decontaminated after use.

*** Section 6 - Accidental Release Measures ***

Spill or Leak

Isolate hazard area and deny entry to unnecessary or unprotected personnel. Contain spilled liquid with sand or earth. Clean up spill immediately, observing precautions in the Personal Protection section of MSDS. Avoid runoff into storm sewers and ditches which lead to waterways.

Material Safety Data Sheet

Material Name: AROCAST® VINYL ESTER RESIN

ID:

*** Section 7 - Handling and Storage ***

Handling Procedures:

Do not get in eyes, on skin or clothing. Avoid breathing vapor or mist. Keep container closed. Use only with adequate ventilation. Wash thoroughly after handling. Empty container may contain hazardous residues. Use grounding and bonding connection when transferring material to prevent static discharges, fire or explosion.

Storage Procedures:

Avoid excessive heat. Store out of direct sunlight in a cool, well-ventilated place.

*** Section 8 - Exposure Controls / Personal Protection ***

Component Exposure Limits

Styrene (100-42-5)

ACGIH: 85 mg/m³; 20 ppm (TLV-TWA)
ACGIH: 170 mg/m³; 40 ppm (TLV-STEL)
OSHA: 100 ppm (PEL-TWA)
OSHA: 200 ppm (Ceiling)

-Only those components with exposure limits are printed in this section.

-Skin contact limits designated with a "Y" above have skin contact effect. Air sampling alone is insufficient to accurately quantitate exposure. Measures to prevent significant cutaneous absorption may be required.

-ACGIH Sensitizer designator with a value of "Y" above means that exposure to this material may cause allergic reactions.

Engineering Controls:

Investigate engineering techniques to reduce exposures below airborne exposure limits. Provide ventilation if necessary to control exposure levels below airborne exposure limits (see above). If practical, use local mechanical exhaust ventilation at sources of air contamination such as open process equipment. Consult ACGIH ventilation manual or NFPA Standard 91 for design of exhaust systems.

PERSONAL PROTECTIVE EQUIPMENT

As prescribed in the OSHA Standard for Personal Protective Equipment (29 CFR 1910.132), employers must perform a Hazard Assessment of all workplaces to determine the need for, and selection of, proper protective equipment for each task performed.

Eyes/Face Protective Equipment:

Where there is potential for eye contact, wear chemical goggles and have eye flushing equipment available.

Skin Protection:

Neoprene or Polyvinyl chloride gloves should be worn when handling this material. Wear face shield and chemical resistant clothing such as a rubber apron when splashing may occur. Wash contaminated clothing and clean protective equipment before reuse. Rinse contaminated skin promptly. Wash skin thoroughly after handling.

Material Safety Data Sheet

Material Name: AROCAST® VINYL ESTER RESIN

ID:

Respiratory Protection:

Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see above), use NIOSH approved respiratory protection equipment appropriate to the material and/or its components. Consult respirator manufacturer to determine appropriate type equipment for given application. Observe respirator use limitations specified by NIOSH or the manufacturer. For emergency and other conditions where exposure limit may be significantly exceeded, use an approved full face positive-pressure, self-contained breathing apparatus or positive-pressure airline with auxiliary self-contained air supply. Respiratory protection programs must comply with 29 CFR § 1910.134.

*** Section 9 - Physical & Chemical Properties ***

Physical State:	Liquid	Appearance:	Gray, viscous liquid
Odor:	Sharp, styrene	Vapor Pressure:	7 mg/Hg @ 20 deg C
Vapor Density:	3.6 (air =1)	Boiling Point:	294 deg F (176 degC)
Melting Point:	NE	Specific Gravity:	1.04-1.06 @ 25/25 Deg C
pH:	N/A	Viscosity:	250-550 cps @ 25deg C
VOC:	35-45% (un-catalyzed)	Solubility Water:	Insoluble

*** Section 10 - Chemical Stability & Reactivity Information ***

Chemical Stability:

This material is chemically stable under normal and anticipated storage and handling conditions. However, this material can undergo hazardous polymerization. See Hazardous Polymerization below for conditions to avoid.

Incompatibility:

Avoid caustic, acids, oxidizing material metallic halides (salts).

Decomposition Products:

Oxides of carbon.

Hazardous Polymerization:

Heat will speed polymerization. Oxygen-free atmosphere may cause polymerization. Although this material usually contains inhibitors, uninhibited monomer vapor may form polymer in vents and other confined spaces.

*** Section 11 - Toxicological Information ***

Acute Toxicity:

A: General Product Information

No information available for the product.

Material Safety Data Sheet

Material Name: AROCAST® VINYL ESTER RESIN

ID:

B: Component Analysis –

Data on this material and/or its components are summarized below.

Styrene

Single exposure (acute) studies indicate that this material is practically non-toxic to rats if swallowed (LD50 5,000 mg/kg) or rabbits if absorbed through skin (LD50 >20,000 mg/kg), slightly toxic to rats if inhaled (4-hr LC50 2770 ppm), and moderately irritating to rabbits eyes. One application to rabbit skin (ear) produced no appreciable reaction, while 20 applications over 4 weeks produced moderate irritation with blister formation and hair loss. Two applications, occluded on the shaven abdomen, produced marked irritation. Exposure of human volunteers to styrene vapor in the range of 400 ppm to 800 ppm produced irritation of the eyes and upper respiratory tract; symptoms of central nervous system (CNS) depression such as headache, nausea and dizziness occurred at concentrations of 100 ppm or more. Long-term inhalation exposure of rats, rabbits and guinea pigs produced effects on the liver and hearing threshold response. Long-term oral administration of this material to rats, mice and dogs showed effects on the liver, kidney and red blood cells. No increases in birth defects or effects on reproductive ability have been observed in multiple species exposed by either oral administration or inhalation.

Component Carcinogenicity

This material is listed as a possible human carcinogen (Group IIb) by the International Agency for Research on Cancer (IARC). This listing is based on limited evidence for the carcinogenicity of this material in animal models and the potential carcinogenicity of the oxide, a metabolite of this material. A number of long-term bioassays with this material have been conducted in various animal models and taken together, have not shown clear evidence of carcinogenicity. Similarly, in multiple epidemiology studies of workers employed in reinforced plastic industry, styrene-butadiene rubber manufacturing or styrene manufacturing operations, some have reported increased incidences of cancer of the lymphatic and hematopoietic systems while others have reported no increases in cancer. Evaluation of these data using a pharmacokinetic model and results of DNA binding studies of metabolites of this material indicate that the carcinogenic potential of this material is extremely low and unlikely to present notable occupational hazard. This material has not shown mutagenic activity in standard tests with bacteria or in animal cells in culture. A number of studies have evaluated the ability of this material to cause chromosomal damage in exposed workers, but contradictory findings render these reports inconclusive. The oxide of this material has been reported to be mutagenic in standard bacterial and animal cell tests.

*** Section 12 - Ecological Information ***
--

Ecotoxicity:

A: General Product Information

No information available for the product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

No information available for the product.

Environmental Fate:

Data on this material and/or its components are summarized below.

Material Safety Data Sheet

Material Name: AROCAST® VINYL ESTER RESIN

ID:

*** Section 13 - Disposal Considerations ***

US EPA Waste Numbers & Descriptions:

A: General Product Information

Recover, reclaim or recycle when practical.

Disposal via incineration is recommended. Appropriate pretreatment and disposal in an authorized landfill is acceptable. In all cases, dispose of material in accordance with all applicable federal, state, and local laws and regulations. Consult appropriate regulatory officials or your attorney for information on such disposal.

Note: Chemical additions to, processing of, or otherwise altering this material may make this waste management information incomplete, inaccurate, or otherwise inappropriate. Furthermore, state and local waste disposal requirements may be more restrictive or otherwise different from federal laws and regulations.

B: Component Waste Numbers

No EPA Waste Numbers are applicable for this product's components.

*** Section 14 - Transportation Information ***

US DOT Information

DOT Name: Resin Solution
DOT Technical Name:
DOT Hazard Class: 3
UN Number: UN1866
DOT Packing Group: PGIII

*** Section 15 - Regulatory Information ***

US Federal Regulations

A: General Product Information

This product is considered hazardous under 29 CFR 1910.1200 (Hazard Communication).

B: Component Analysis

SARA Title III, Section 313

This product does contain chemical(s) which are defined as toxic chemicals under and subject to the reporting requirements of, Section 313 of Title III of the Superfund Amendments and Reauthorization Act of 986 and 40 CFR Part 372. See Section 2

Material Safety Data Sheet

Material Name: AROCAST® VINYL ESTER RESIN

ID:

Styrene

CERCLA Reportable Quantities (40 CFR 302.4):

Styrene 1000 LBS

SARA 311/312: Acute: Y Chronic: Y Fire: Y Pressure: N Reactive: Y

State Regulations

A: General Product Information

No additional information available.

B: Component Analysis – State

The following components appear on one or more of the following state hazardous substances lists:

Massachusetts Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Massachusetts Right to Know Substance List.

Styrene

New Jersey Right to Know

This product does contain the following chemical(s), as indicated below, currently on the New Jersey Right-to-Know Substances List.

Styrene

Pennsylvania Environmental Hazard

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Environmental Hazard List.

Styrene

Pennsylvania Right to Know

This product does contain the following chemical(s), as indicated below, currently on the Pennsylvania Hazardous Substance List.

Styrene

Other Regulations

A: General Product Information

All components are on the U.S. EPA TSCA Inventory List.

B: Component Analysis – Inventory Component Analysis - Inventory

CAS #	Component	TSCA	DSL	EINECS
68002-44-8	Vinyl Ester Resin	Yes	Yes	Yes
100-42-5	Styrene	Yes	Yes	Yes

Material Safety Data Sheet

Material Name: AROCAST® VINYL ESTER RESIN

ID:

C: Component Analysis - WHMIS IDL

The following components are identified under the Canadian Hazardous Products Act Ingredient Disclosure List:

Component	CAS #	Disclosure / Classifications
Styrene	100-42-5	0.1% / B2, D2A

* * * Section 16 - Other Information * * *

Key/Legend

EPA = Environmental Protection Agency; TSCA = Toxic Substance Control Act; ACGIH = American Conference of Governmental Industrial Hygienists; IARC = International Agency for Research on Cancer; NIOSH = National Institute for Occupational Safety and Health; NTP = National Toxicology Program; OSHA = Occupational Safety and Health Administration; NFPA = National Fire Protection Association; HMIS = Hazardous Material Identification System; CERCLA = Comprehensive Environmental Response, Compensation and Liability Act; SARA = Superfund Amendments and Reauthorization Act

The information presented herein is believed to be factual as it has been derived from the works and opinions of persons believed to be qualified experts; however, nothing contained in this information is to be taken as a warranty or representation for which Ergon Armor bears legal responsibility. The user should review any recommendations in the specific context of the intended use to determine whether they are appropriate.