

Material Safety Data Sheet

Material Name: PHENOLIC RESIN

ID:

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

Product Trade Name PHENOLIC RESIN

Manufacturer Information

Ergon Armor (601) 933-3540
Corrosion Engineering
P.O. Box 1639 (800) 424-9300
Jackson, MS 39215-1639

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

Component	CAS #	Typical Wt. %	OSHA
Phenol formaldehyde polymer	9003-35-4	85-95	Y
Phenol	108-95-2	10-15	Y
Formaldehyde	50-00-0	<1	Y

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)

This material is classified as hazardous under Federal OSHA regulation.

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

*** Section 3 - Hazards Identification ***

Emergency Overview:

Potential Health Effects

Reddish brown liquid-phenolic odor

WARNING!

HARMFUL IF SWALLOWED, INHALED, OR ABSORBED THROUGH SKIN.

CAUSES EYE, SKIN, AND RESPIRATORY TRACT IRRITATION.

MAY CAUSE ALLERGIC SKIN AND RESPIRATORY REACTIONS.

POTENTIAL CANCER HAZARD.

CONTAINS FORMALDEHYDE WHICH MAY CAUSE CANCER BASED ON ANIMAL DATA.

CAUSES LIVER AND KIDNEY DAMAGE

CONTAINS PHENOL WHICH CAUSES BLOOD EFFECTS AND LIVER DAMAGE.

Potential Health Effects:

Furfuryl alcohol

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Overexposure to vapor or dusts may be irritating to the nose and upper respiratory tract. Chronic exposure to dusts in the ambient air may cause reduced lung function. Direct contact of liquid or vapor to eyes may cause severe irritation with stinging, tearing, redness and swelling. Repeated or prolonged skin contact may cause an allergic skin reaction in sensitive individuals. Prolonged skin contact may cause severe skin irritation and adverse effects on the lungs and kidneys. While swallowing of this material is unlikely in the industrial setting, if swallowed this material may cause severe gastrointestinal irritation, vomiting, diarrhea, sweating, weakness and headache. Based on single exposure animal tests,

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this material is considered to be slightly toxic if swallowed, practically non-toxic if absorbed through skin, slightly irritating to skin and severely irritating to eyes. This material generally contains unreacted formaldehyde.

Formaldehyde

Formaldehyde is severely irritating to eyes and skin and may cause allergic skin or respiratory reactions with asthma-like reactions in some individuals. Vapor or mist may cause irritation of the eyes and upper respiratory tract with effects such as burning of nose and throat, tearing, cough, chest tightness, difficulty in breathing. Formaldehyde is listed as a substance that may reasonably be anticipated to be carcinogenic by the National Toxicology Program (NTP) and is classified as "probably carcinogenic to humans" by the International Agency for Research on Cancer (IARC). Workers with lung disease or limited respiratory capacity should limit exposure to this material. This material contains unreacted phenol which is corrosive to all tissues.

Phenol

Phenol can destroy nerve endings and remove the important warning property that the pain response normally provides when tissue destruction is occurring. Contact with skin causes a whitening or bleaching (depigmentation) of the exposed area, followed by severe burns which may be delayed. Contact of phenol with eyes can cause severe burns which can lead to permanent eye injury and loss of sight. Due to its low volatility, phenol usually does not pose a serious respiratory hazard; however, phenol vapor may be irritating to the respiratory tract. Phenol solid, liquid and vapor are readily absorbed through skin in toxic amounts and absorption occurs faster and in larger amounts if a larger surface area is exposed. Skin absorption can occur at low vapor pressures without discomfort. Phenol poisoning can occur after skin absorption, vapor inhalation or ingestion (swallowing). Symptoms of phenol poisoning develop rapidly after exposure and can include central nervous system (CNS) depression with coma, respiratory depression and death. Symptoms may also include seizures, bloody diarrhea, paleness, sweating, weakness, ringing in the ears, decreased body temperature, shock, metabolic acidosis, cyanosis (bluish appearance of the skin), cardiovascular collapse, methemoglobinemia (reduced capacity of the blood to carry oxygen), hemolytic anemia and liver and kidney damage. Long-term, low-level phenol poisoning can cause diarrhea and dark urine.

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

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

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

IF SWALLOWED, induce vomiting immediately as directed by medical personnel. Get medical attention. Call a Poison Control Center. 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.

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

Fire & Explosion Hazards:

Auto-Ignition Temperature	NE
Flash Point	>230 deg F Flash Point Method TCC
Flammable Limits-	Upper NE
	Lower NE

Extinguishing Media

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Use water spray, 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.

Fire and Explosion Hazards

Avoid breathing fumes from fire-exposed material.

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

Spill or Leak

Contain spill. Stop leak at source if this can be done safely. Ventilate area. Nonessential personnel should leave the area until cleanup is completed. Pump liquid into DOT-approved drums for disposal. Absorb remaining liquid onto inert absorbent and place in DOT approved drums for disposal. Wash area with water. Keep concentrate and wash water from entering sewers or waterways. Consult a regulatory specialist to determine appropriate state or local reporting requirements, for assistance in waste characterization and/or hazardous waste disposal and other requirements listed in pertinent environmental permits.

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

Handling Procedures:

Do not taste or swallow. 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.

Storage Procedures:

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

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

Component Exposure Limits

Formaldehyde (50-00-0)

ACGIH CEILING	0.3ppm (0.37 mg/m ³)
ACGIH Sensitizer designator	Y
OSHA STEL PEL	2 ppm
OSHA TWA PEL	0.75 ppm

Phenol (108-95-2)

ACGIH Skin designator	Y
ACGIH TWA	19 mg/m ³ ; 5 ppm
OSHA Skin designator	Y
OSHA TWA PEL	19 mg/m ³ ; 5 ppm

-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.

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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 below). 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:

Wear appropriate chemical resistant protective clothing and chemical resistant gloves to prevent skin contact. Consult glove manufacturer to determine appropriate type glove material for given application. Rinse contaminated skin promptly. Wash contaminated clothing and clean protective equipment before reuse. Wash skin thoroughly after handling.

Respiratory Protection:

Avoid breathing vapor or mist. When airborne exposure limits are exceeded (see below), 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 * * *

Appearance/Odor	Reddish-brown liquid with odor of phenol
pH	NA
Specific Gravity	1.20 @ 25/25 C
Vapor Pressure	NE
Vapor Density	>1
Melting Point	NE
Freezing Point	NE
Boiling Point	>212 F
Solubility In Water	Negligible
Percent Volatile	NE

* * * 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.

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Incompatibility:

Contact with strong acids causes violent reaction and heat.

Decomposition Products:

Oxides of carbon.

Hazardous Polymerization:

Hazardous polymerization may occur if contaminated with strong mineral acid. Heat will speed polymerization.

*** Section 11 - Toxicological Information ***

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

Phenol-Formaldehyde Resin

Skin allergy was observed in humans and guinea pigs following repeated skin exposure to this material. Workers exposed chronically to dusts of, or coated wood particles with, this material have shown decreased lung function. Acute overexposure has been shown to cause irritation of the eyes, nose, throat and upper respiratory tract. One case report of a worker who spilled this material over a large portion of his body was hospitalized with severe skin lesions, respiratory distress and kidney dysfunction. Single exposure (acute) studies indicate that this material is slightly toxic to rats if swallowed (LD50 2,900 mg/kg), practically non-toxic to rabbits if absorbed through skin (LD50 >20,800 mg/kg), slightly irritating to rabbit skin and severely irritating to rabbit eyes. This material has produced genetic changes in standard tests using bacterial cells and is reported to cause an increased frequency in chromosomal aberrations in peripheral lymphocytes of exposed workers.

Formaldehyde

Single exposure (acute) studies indicate that this material is slightly toxic to practically non-toxic if swallowed (rat LD50 3,200-7,500 mg/kg), practically non-toxic if absorbed through skin (rat & rabbit LD50 13,500-17,000 mg/kg) or inhaled (rat 4-hr LC50 21 mg/l) and moderately irritating to rabbit eyes. Repeated workplace exposure causes severe skin, eye and upper respiratory irritation, skin allergy and increases asthma attacks in some individuals. Following repeated inhalation exposure, irritation and inflammation damage to the respiratory tract were noted in laboratory animals. Secondary target organ effects were also noted in several studies. Stomach lining damage was observed in rats following repeated oral exposure. This material is listed as a substance that "may reasonably be anticipated to be" carcinogenic by the National Toxicology Program, is classified as "probably carcinogenic to humans" (2A) by the International Agency for Research on Cancer and is regulated by OSHA as a carcinogen. However, a long-term study of a large workplace population found no association between exposure to this material and cancer. Long-term inhalation studies in rats and mice produced an increased incidence of nasal cavity tumors. No birth defects were noted in the offspring of laboratory animals, even at amounts which produced toxic effects on the mothers and their offspring. An increase in abnormal sperm was noted in rats following a single oral administration. Both positive and negative results have been reported in standard genetic tests using bacteria, animal cells and animals.

Phenol

Single exposure (acute) studies indicate that this material is moderately toxic to rats if swallowed (LD50 317-650 mg/kg), moderately to slightly toxic to rabbits if absorbed through skin (LD50 850-1,400 mg/kg), and corrosive to rabbit eyes and skin. The lethal oral dose in adult humans is reported to be 140-430 mg/kg. Following repeated inhalation exposure to 26 ppm phenol for 3-5 days, tremors, twitching and disturbances in walking rhythm and posture were reported in rats. Following repeated inhalation exposure to vapor of this material, guinea pigs and rabbits exhibited some injury to heart tissue, while rats, mice and rhesus monkeys showed no abnormalities of the heart. Hind limb paralysis was reported in guinea pigs, while rabbits and rats did not exhibit this symptom. Decreased weight gain was observed following administration of this material in the drinking water of mice and rats at levels up to 10,000 ppm for 13-weeks. Following

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continuous administration in the drinking water for 103 weeks at levels up to 5000 ppm, of this material was not considered carcinogenic to mice and rats. This material has shown tumor promotion in mouse skin painting assays. No birth defects were noted in the offspring of rats and mice given phenol in their drinking water during pregnancy. Reduced fetal weight was observed in both species and adverse effects on the mother were noted in mice. This material administered in the drinking water of rats for multiple generations produced increased death of offspring at birth, decreased reproduction and eventual cessation of reproduction at the highest dose level. This material has generally produced no genetic changes in standard tests using bacterial cells; however, positive and negative results have been reported from tests using animals and animal cells. This material is rapidly distributed to tissues in animals within 15 minutes of oral dosing, with the highest concentrations found in the liver, followed by the heart, kidney, lungs, blood and muscle. The concentration of this material in rats was consistently greater in the liver, spleen, kidney, adrenal gland, thyroid glands and lungs than in blood plasma. There is considerable species variation on the metabolism of this material. Humans dosed orally with this material excreted almost all the compound in the urine as phenol glucuronide and sulfate conjugates. Following inhalation of vapor of this material at levels of 6-20 mg/m³ for 8 hours, humans excreted almost all of the absorbed material in their urine within 24 hours. Similar results were noted in humans exposed dermally to an aqueous solution of phenol for 30 minutes. Human studies showed that vapor of this material is absorbed through the skin at a rate somewhat slower than by inhalation but proportional to the concentration of the vapor in the air. Following an accidental spill of a solution of this material on the scalp, face, neck, shoulders and back, a 32-year old male died within ten minutes. He exhibited effects on the skin, lungs, liver, spleen and kidneys.

* * * Section 12 - Ecological Information * * *

Ecotoxicity:

A: General Product Information

No information available for the product.

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

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

Formaldehyde

This material is practically non-toxic to slightly toxic to aquatic organisms (LC50s 24-1,000 mg/l). High concentrations of this material are used as disinfectants to kill viruses, bacteria, fungi and parasites.

Phenol

24-hr LC50 Daphnia magna: 12-31 mg/l, Slightly Toxic
48-hr LC50 Channel catfish: 31-82 mg/l, Slightly Toxic
96-hr LC50 Rainbow trout: 8.9 mg/l, Moderately Toxic
96-hr LC50 Fathead minnows: 36 mg/l, Slightly Toxic

Environmental Fate:

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

Formaldehyde

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The theoretical oxygen demand (ThOD) is 1.068. The 5-day biochemical oxygen demand (BOD) was 60% using sewage seed. The 5-day BOD was 47-99% using activated sludge and 0% using pure bacteria culture. This material is not known to bioconcentrate or bioaccumulate.

Phenol

This material is rapidly aerobically degraded in water and soil. The octanol/water partition coefficient (log Kow) is 1.46. The theoretical oxygen demand (ThOD) is between 2.26-2.40 g/g. The 20-day biochemical oxygen demand (BOD) has been measure as 2.33 p/p (97.9% ThOD), while the chemical oxygen demand (COD) is 2.38 g/g (KMnO4). The inhibitory concentration (IH50) is 798.9 mg/l.

*** Section 13 - Disposal Considerations ***

US EPA Waste Numbers & Descriptions:

A: General Product Information

Recover, reclaim or recycle when practical. Dispose of in an approved landfill if allowed locally. Comply with federal, state, and local regulations. Dispose of in a permitted waste management facility if landfill is not practical.

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	NOT REGULATED BY DOT
DOT Technical Name	NA
DOT Hazard Class	NA
UN Number	NA
DOT Packing Group	NA
RQ	1000 lbs (Phenol) 100 lbs (Formaldehyde)

*** Section 15 - Regulatory Information ***

US Federal Regulations

Hazard Categories Under Criteria of SARA Title III Rules (40 CFR Part 370)

Immediate (Acute) Health	Y
Delayed (Chronic) Health	Y
Fire	N
Reactive	Y

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Sudden Release of Pressure N

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

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

Formaldehyde
Phenol

SARA Title III, Section 302

This product does contain chemical(s), as indicated below, currently on the Extremely Hazardous Substance List, Section 302, SARA Title III. See Section 2 for further details regarding concentrations and registry numbers.

Formaldehyde
Phenol

B: Component Analysis

Phenol

SARA Reportable Quantities	500 LBS
CERCLA RQ	1000 LBS

Formaldehyde

SARA Reportable Quantities	500 LBS
CERCLA RQ	100 LBS

State Regulations

A: General Product Information

No additional information available.

B: Component Analysis – State

Massachusetts Right to Know

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

Formaldehyde
Phenol

New Jersey Right to Know

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

Formaldehyde
Phenol

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Pennsylvania Environmental Hazard

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

Formaldehyde
Phenol

Pennsylvania Right to Know

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

Formaldehyde
Phenol

California Prop 65 - Carcinogen

This product contains a chemical(s) currently on the California list of Known Carcinogens.

Formaldehyde (trace)

Other Regulations

A: General Product Information

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

B: Component Analysis – Inventory/Component Analysis - Inventory

Component	CAS #	TSCA	EINECS	DSL
Phenol formaldehyde polymer	9003-35-4	Y	Y	Y
Phenol	108-95-2	Y	Y	Y
Formaldehyde	50-00-0	Y	Y	Y

C: Component Analysis - WHMIS IDL

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

Component	CAS #	Minimum Concentration
Formaldehyde	50-00-0	0.1%
Phenol	108-95-2	1%

*** 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

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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.