

Material Safety Data Sheet

Material Name: FURALAC® FN RESIN

ID:

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

Product Trade Name FURALAC FN 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
Furfuryl alcohol, formaldehyde polymer	25989-02-0	60-75	Y
Furfural	98-01-1	10-20	Y
Furfuryl alcohol	98-00-0	30-45	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

Dark brown liquid with odor of furfuryl alcohol

WARNING!

HARMFUL IF SWALLOWED, INHALED OR ABSORBED THROUGH SKIN.

CAUSES EYE IRRITATION.

MAY CAUSE ALLERGIC SKIN REACTION.

PROLONGED EXPOSURE TO HIGH VAPOR CONCENTRATIONS CAN CAUSE CENTRAL NERVOUS

SYSTEM DEPRESSION INCLUDING HEADACHE, DIZZINESS, WEAKNESS, CONFUSION, NAUSEA, AND

LOSS OF CONSCIOUSNESS.

Potential Health Effects:

Furfuryl alcohol

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Vapor concentrations of 15.8 ppm have been reported to cause eye and upper respiratory irritation with coughing, reddening of the eyes and blurred vision. Exposure to high vapor concentrations may result in central nervous system (CNS) depression with possible effects such as nausea, headache, drowsiness, dizziness and loss of coordination. This material can be absorbed through the skin. Contact with liquid may be severely irritating to the eyes and repeated contact may cause skin irritation. Although this material has not been reported to produce an allergic response, information from animal studies indicates that repeated contact with furfuryl alcohol may cause allergic skin reaction in susceptible individuals. This material is also considered, on the basis of single exposure animal tests, to be moderately toxic after ingestion (swallowing), skin contact and inhalation.

Material Safety Data Sheet

Material Name: FURALAC® FN RESIN

ID:

Furfural

Inhalation and skin contact are expected to be the primary routes of occupational exposure to this material. Overexposure to furfural vapors has been reported to cause eye and upper respiratory irritation, numbness of the tongue and mucous membranes of the mouth, coughing and breathing difficulty. Exposure to high vapor concentrations may result in central nervous system (CNS) depression with possible effects such as nausea, headache, drowsiness, dizziness, loss of coordination and behavioral changes. Contact with liquid may be severely irritating to the eyes and repeated contact may cause skin irritation. Sensitization studies carried out with human volunteers produced no allergic skin responses, but allergic skin reactions have been infrequently reported in workers. While swallowing of this material is unlikely in the industrial setting, if swallowed this material may cause digestive tract irritation, nausea, vomiting and diarrhea. This material is considered, on the basis of single exposure (acute) animal tests, to be moderately toxic if ingested (swallowed), inhaled or absorbed through skin.

*** 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	162 deg F Flash Point Method TCC
Flammable Limits-	Upper 16.3
	Lower 1.8

Extinguishing Media

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

Material Safety Data Sheet

Material Name: FURALAC® FN RESIN

ID:

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

Furfuryl Alcohol (98-00-0)

ACGIH CEILING	60 mg/m ³ ; 15 ppm
ACGIH Skin designator	Y
ACGIH TWA	40 mg/m ³ ; 10 ppm
OSHA TWA PEL	200 mg/m ³ ; 50 ppm

Furfural (98-01-1)

ACGIH Skin designator	Y
ACGIH TWA	7.9 mg/m ³ ; 2 ppm
OSHA Skin designator	Y
OSHA TWA PEL	20 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.

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.

Material Safety Data Sheet

Material Name: FURALAC® FN RESIN

ID:

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	Dark brown liquid with odor of furfuryl alcohol
pH	NA
Specific Gravity	1.20 @ 25/25 C
Vapor Pressure	1 @ 32 C (90 F)
Vapor Density	3.3 (furfuryl)
Melting Point	NA
Freezing Point	140 F (furfuryl)
Boiling Point	162 C
Solubility In Water	Negligible
Percent Volatile	<60%

*** 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:

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.

Furfuryl Alcohol

The acute data suggests that this material is absorbed through the skin and that death in laboratory animals results from central nervous system depression with respiratory arrest. Sensitization studies in guinea pigs indicated a weak allergenic response to this material, but reports from workplace exposures have not shown

Material Safety Data Sheet

Material Name: FURALAC® FN RESIN

ID:

allergic skin responses. Subchronic inhalation studies in rats and mice up to 32 ppm of this material resulted in lesions of the upper respiratory epithelium. Exposure up to 100 ppm resulted in decreased weight gain and biochemical changes indicative of nerve cell changes. This material does not show the ability to damage DNA in standard bacterial assays, but can cause chromosomal changes in cultured animal cells. This material does not cause chromosomal damage in whole animal assays in mammals.

Single exposure (acute) studies indicate:

Oral - Moderately Toxic to Rats (LD50 132 mg/kg)

Dermal - Moderately Toxic to Rabbits (LD50 657 mg/kg)

Inhalation - Moderately Toxic to Rats (1-hr and 4-hr LC50s 592 ppm and 233 ppm, respectively)

Eye Irritation - Severely Irritating to Rabbits

Skin Irritation - Slightly Irritating to Rabbits

Furfural

Because of its low vapor pressure, overexposure to furfural is unlikely if adequate ventilation is provided; however, in a manufacturing plant for this material with inadequate ventilation, workers experienced eye and upper respiratory irritation and numbness of the tongue and mucous membrane of the mouth. Subchronic inhalation exposure of hamsters to vapor of this material caused hyperplasia of the nasal epithelium and eye irritation. Repeated inhalation exposure of rats resulted in lung congestion. Studies in animals with oral or intraperitoneal routes of exposure have shown liver and kidney effects with high-dose administration of this material.

Several studies have been conducted to evaluate the potential carcinogenicity of this material. The International Agency for Research on Cancer (IARC) has reviewed this material and determined that it is "not classifiable as to its carcinogenicity to humans" (IARC Monographs, Vol. 63). Exposure of hamsters to this material by inhalation or intratracheal instillation did not result in any increased incidence of cancer. Dietary administration of this material also produced no excess of tumors. Repeated application to the skin of mice for 5-weeks produced some skin tumors. In life-time cancer bioassays conducted by the National Toxicology Program in mice and rats, animals were given this material orally in corn oil at levels up to 60 or 175 mg/kg per day. Some evidence for carcinogenicity was found in male rats, but female rats showed no increased evidence of cancer. In mice, both males and females had increased numbers of liver tumors. This material has generally produced no genetic changes in standard tests using bacterial cells, but has caused chromosomal changes in animal cells and increased sister chromatid exchange in human lymphocytes. Generally, this material has not caused chromosomal damage in whole animal tests; some effects have been observed in fruit flies.

Single exposure (acute) studies indicate:

Oral - Moderately Toxic to Rats (LD50 65-175 mg/kg)

Dermal - Moderately Toxic to Rabbits (LD50 Estimated to be between 310 and 620 mg/kg)

Inhalation - Moderately Toxic to Rats (1-hr and 4-hr LC50s 1,037 ppm and 235 ppm, respectively)

Eye Irritation - Severely Irritating to Rabbits

Skin Irritation - Slightly Irritating to Rabbits

* * * Section 12 - Ecological Information * * *

Ecotoxicity:

A: General Product Information

No information available for the product.

Material Safety Data Sheet

Material Name: FURALAC® FN RESIN

ID:

B: Component Analysis - Ecotoxicity - Aquatic Toxicity

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

Furfuryl Alcohol

24-hr LC50 Daphnia magna: 115 mg/l, Practically Non-toxic
96-hr LC50 Daphnia magna: 328 mg/l, Practically Non-toxic

Furfural

This material is slightly toxic to Daphnia magna (24-hr LC50 33 mg/l; 72-hr LC50 13 mg/l), harlequin fish (48-hr LC50 23 ppm), fathead minnow (96-hr LC50 32 ppm) and gambusia (96-hr LC50 24 ppm).

Environmental Fate:

No data is available concerning the environmental fate, biodegradation or bioconcentration for this product.

*** 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	Furfural
DOT Technical Name	n/a
DOT Hazard Class	6.1
UN Number	UN 2810
DOT Packing Group	PG III
RQ	5000 lbs. (Furfural)

Material Safety Data Sheet

Material Name: FURALAC® FN RESIN

ID:

*** 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
Sudden Release of Pressure	N

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

B: Component Analysis

Furfural

SARA Reportable Quantities 5000 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.

Furfural
Furfuryl alcohol

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.

Furfural
Furfuryl alcohol

Pennsylvania Environmental Hazard

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

Furfural

Pennsylvania Right to Know

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

Furfural
Furfuryl alcohol

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.

Material Safety Data Sheet

Material Name: FURALAC® FN RESIN

ID:

B: Component Analysis – Inventory/Component Analysis - Inventory

Component	CAS #	TSCA	DSL	EINECS
Furfuryl alcohol, formaldehyde polymer	25989-02-0	Yes	Yes	Yes
Furfural	98-01-1	Yes	Yes	Yes
Furfuryl alcohol	98-00-0	Yes	Yes	Yes

C: Component Analysis - WHMIS IDL

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

Component	CAS #	Minimum Concentration
Furfural	98-01-1	1%
Furfuryl	98-00-0	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

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.