

M A T E R I A L S A F E T Y D A T A S H E E T

Page 1

Revision Date 5-11-2005

Sold By:

MACH-DYNAMICS
3870 La Sierra Ave., Suite 212, Riverside, CA 92505
Phone (951) 515-3748 Fax (775) 599-4585

Emergency Telephone CHEMTRC (800) 424-9300

SECTION I PRODUCT IDENTIFICATION

PRODUCT TRADE NAME .. Resin, MIL-I-16923, (Type B, C & D)
CHEMICAL FAMILY - EPOXY RESIN
FORMULA -- PROPRIETARY/TRADE SECRET

SECTION II HAZARDOUS INGREDIENTS

MATERIAL/COMPONENT	%	TLV (ACGIH) 8hr TWA	PEL (OSHA) 8hr TWA
EPOXY RESIN	>3	NONE ESTABLISHED	NONE ESTABLISHED

This product is an epoxy resin produced by the condensation reaction of Epichlorohydrin and Bisphenol-A. These raw materials are consumed in the process. Residual levels of Epichlorohydrin are controlled to 1 ppm. ma. in the product.

SECTION II-B ACUTE TOXICITY DATA

NO.	ACUTE ORAL LD50 LC50	ACUTE DERMAL LD50	ACUTE INHALATION
P	11.4 G/KG (RAT)	>20ML/KG (RABBIT)	NO DEATHS IN SAT'D AIR, 8 HR.*
P	15.6 G/KG (MOUSE)		

* This inhalation test may not be relevant due to low volatility of the resin.

HMS CODES

HEALTH 2 FLAMMABILITY 1 REACTIVITY 0

SECTION III PHYSICAL DATA

BOILING POINT (°F): >500

APPEARANCE AND ODOR: LIQUID FORM, MILD ODOR.

VAPOR PRESSURE: .03 (MM HG) **SOLUBILITY IN H2O:** NEGLIGTIBLE

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (°F.): 480 (PMCC)

EXTINGUISHING MEDIA: Use water fog, foam, dry chemical, or CO2.

SPECIAL FIRE FIGHTING PROCEDURES: Material will not burn unless preheated. Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots). Fire fighters should wear full emergency equipment, including self-contained breathing apparatus. Use cold spray to cool down fire & heat exposed containers to keep them from rupturing.

UNUSUAL FIRE AND EXPLOSION HAZARDS / SPECIAL PRECAUTIONS: Store in a cool, dry keep away from open flames and high temperatures. Containers, even those that have been emptied, can contain hazardous product residues. Handle in accordance with the hazard potential of curing agent(s) used. CAUTION: May cause irritation avoid contact with eyes. Avoid prolonged or repeated contact with skin. Wash with soap and water before eating, drinking, smoking, applying cosmetics, or using toilet facilities. Launder contaminated clothing before reuse. Contaminated leather articles, including shoes, can not be decontaminated and should be destroyed to prevent use. Heating resin above 300 deg.F in the presence of air may cause slow oxidative decomposition. Above 500 deg. F. Polymerization may occur. Some curing agents, E.G. Aliphatic polyamines can produce exothermic reactions, which in large masses can cause runaway polymerization and charring of the reactants. Fumes and vapors from these thermal and chemical decompositions vary widely in composition and toxicity. Do not breathe fumes. Use an NIOSH-APPROVED respirator as required to prevent overexposure. In accord with 20 CFR1910.134, use either an atmosphere supply respirator or an air-purifying respirator for organic vapors. If this resin is handled, shipped, or stored in bulk, the recommended pumping temperature is 180 deg. F Max. To prevent thermal burns, avoid skin and eye contact with hot liquid.

SECTION V HEALTH HAZARD DATA

The health effects noted below are consistent with requirements under the OSHA Hazard Communication Standard (29 CFR 1910.1200).

SKIN CONTACT: Based on similar product testing product is moderately irritating to the skin. Based on similar product testing product may cause skin sensitization. Contact with product at elevated temperatures can result in thermal burns.

EYES: Based on similar product testing product is moderately irritating to the eyes. Contact with product at elevated temperatures can result in thermal burns.

INHALATION: Because of its low volatility this product is not likely to be an inhalation hazard.

INGESTION: Based on product testing product is considered to have a low order of acute oral toxicity.

SIGNS & SYMPTOMS: Irritation as noted above. Skin sensitizer (allergy) may be evidenced by rashes, especially hives.

AGGRAVATED MEDICAL CONDITIONS: Preexisting eye, skin, and respiratory disorders may be aggravated by exposure to this product. Preexisting skin or lung allergies may increase the chance of developing increased allergy symptoms from exposure to this product.

SUPPLEMENTAL HEALTH INFORMATION: Chronic Studies: Recent 2-year Bioassays in mice exposed by the dermal route to the Diglycidyl Ether of Bisphenol-A Resin (DGEBA), or two other commercial resins which are composed predominantly of Diglycidyl Ether of Bisphenol-A have yielded very little evidence of weak carcinogenicity. DGEBA is a component of this resin. The authors of this work concluded that the renal tumor evidence with this resin "was of no biological significance" and that the resin "is not a systematic carcinogen when applied to the dorsal skin of CF1 mice." Based upon this and all other available information. The international agency for research on cancer (IARC) concluded (1988) that DGEBA was not classified as a carcinogen (IARC Group 3) based on the following: Human evidence--Inadequate: Animal evidence--Inadequate.

Mutagenicity: DGEBA (a component of this product) have proved to be inactive when tested by in vivo mutagenicity assays. It has shown activity by in vitro microbial mutagenicity screening and have both produced chromosomal aberrations in cultured rat liver cells. The significance of this information to man is unknown.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN CONTACT: Remove contaminated clothing/shoes and wipe excess from skin & wash with plenty of soap and water. Get prompt medical attention if irritation occurs. Do not reuse clothing until cleaned. Contaminated leather articles, including shoes can not be decontaminated and should be destroyed to prevent reuse. If contact with hot product occurs immediately flush with cool water for fifteen minutes. Carefully remove clothing; if clothing is stuck to a burn area do not pull it off, but cut around it. Cover burn area with a clean material. Get medical attention immediately.

EYES: Irrigate the eye immediately with water for at least 15 mins. while holding eyelids open. Get medical attention. If contact with hot product occurs immediately flush with cool water for 15 mins. Get medical attention immediately.

INHALATION: Remove to fresh air, give oxygen if breathing is difficult. Get medical attention.

INGESTION: Do not induce vomiting. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical advice. *

NOTE TO PHYSICIAN: * In general emesis induction unnecessary in high viscosity. Low volatility products, E.G., Neat Epoxy Resins.

SECTION VI REACTIVITY DATA

STABILITY: Stable X Unstable

CONDITIONS OR MATERIALS TO AVOID: Can react vigorously with strong oxidation agents, strong lewis or mineral acids, and strong mineral, organic bases/especially primary and secondary aliphatic amines. Reactions with some curing agents may produce considerable heat. Runaway chain reactions may char and decompose the resin system, generating unidentified fumes and vapors that may be toxic.

HAZARDOUS COMBUSTION OR DECOMPOSITION PRODUCTS: Carbon monoxide, aldehydes, acids, and other organic substances may be formed during combustion or elevated (>500 DEG. F.) temperature degradation.

HAZARDOUS POLYMERIZATION:
 May occur with epoxy resins in uncontrolled conditions.
 May occur with catalyst or hardeners in uncontrolled conditions
 X Will not occur

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: May burn although not readily ignitable. Use cautious judgment when cleaning up large spills, *** LARGE SPILLS *** wear respirator and protective clothing as appropriate. Shut off source of leak if safe to do so. Dike and contain. Remove with vacuum pumps or truck to storage/salvage vessels. Soak up residue with an absorbent such as clay, sand or other suitable material; dispose of properly, flush area with water to remove trace residue. *** SMALL SPILLS *** Take up with an absorbent material and dispose of properly.

WASTE DISPOSAL METHOD: Incinerate or bury in an approved chemical disposal facility in a manner which complies with all local, state and federal regulations.

SECTION VIII SHIPPING DATA

D.O.T. SHIPPING NAME.....: NOT A REGULATED MATERIAL
TECHNICAL SHIPPING NAME.....: NONE ESTABLISHED
D.O.T. HAZARD CLASS.....: NONE ESTABLISHED
UN/NA NUMBER.....: NONE ESTABLISHED

SECTION IX SPECIAL PROTECTION INFORMATION

RESPIRATORY PROTECTION: Not ordinarily required.

VENTILATION: Local exhaust recommended.

PROTECTIVE GLOVES: Chemically resistant rubber type gloves recommended.

EYE PROTECTION: Chemical glasses or goggles with side shields recommended.

OTHER PROTECTIVE EQUIPMENT: Wear chemical resistant clothing to minimize contact. Eye wash fountains and Safety showers should be available for emergency use.

SECTION IX SPECIAL PRECAUTIONS

PRECAUTIONS TO BE TAKEN IN HANDLING AND STORAGE: Practice and observe good housekeeping procedures in personal hygiene and cleanliness. Avoid skin and eye contact, as well as, breathing of vapors or fumes especially when material is heated.

ENVIRONMENTAL RELEASE INFORMATION: Keep out of surface waters, sewers, and waterways entering or leading to surface waters. Notify authorities if any exposure to the general public or environmental occurs or is likely to occur.

If this product becomes a waste, it would not be a hazardous waste by RCRA criteria (40 CFR 261). Place in an appropriate disposal facility in compliance with local regulations.

SECTION X OTHER REGULATORY CONTROLS

All ingredients of this compound are listed on the EPA/TSCA Inventory of Chemical Substances.

Protection of stratospheric ozone (pursuant to section 611 of the clean air act amendments of 1990); per 40 CFR part 82. The base resin does not contain nor was it directly manufactured with any class 1 or class 2 ozone depleting substances.

FOR INDUSTRY USE ONLY!!!

The information contained herein is based on the data available to us and is believed to be accurate. The data is offered in good faith as typical values and not as product specification. The information in this data sheet was compiled from information supplied by the vendors of the components of this compound. **Seller** makes no warranty either expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. The recommended industrial hygiene and safe handling procedures are believed to be genuinely applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate.

Seller assumes no responsibility for injury from the use of the product described herein. The information is intended only to assist in the safe handling of this material.

SECTION IV FIRE AND EXPLOSION HAZARD DATA

FLASH POINT (F): 280° (TOC)

FLAMMABLE LIMITS % (LOWER-UPPER): Not Determined

IGNITION TEMPERATURE-AIT (DEGREES C): 560

Actual Autoignition Temperatures (AIT's) can be affected by the concentration of vapors and oxygen, vapor/air contact time, pressure, volume, catalytic impurities, etc. Process conditions should be analyzed to determine if the AIT's may be higher or lower.

EXTINGUISHING MEDIA: SMALL FIRES: Dry chemical, CO₂
LARGE FIRES: Water spray, fog, or foam

SPECIAL EQUIPMENT & FIRE FIGHTING PROCEDURES: Isolate hazard and evacuate area. Stay upwind and avoid smoke and fumes. Use water spray to cool tanks and reduce vapors. CAUTION: Contact between water and molten material may cause spattering. If smoke and fumes can not be avoided, wear full protective clothing with hood and breathing air supply. Run-off from fire control may cause pollution.

UNUSUAL FIRE AND EXPLOSION HAZARDS: When material is in flake / solid form OSHA Class III B Combustible Material. Dust may form explosive mixture in air. Hazardous carbon monoxide and nitrogen oxides may be produced in a fire. Follow appropriate National Fire Protection Association (NFPA) codes for handling and storage facilities.

HANDLING & STORAGE CONDITIONS: Avoid breathing vapors or mists. Avoid breathing dust. Avoid contact with eyes, skin or clothing. Wash thoroughly after handling. Store inside in a cool, dry, well-ventilated area away from heat, sparks, and flame. Do not store with strong oxidizing materials. Keep containers upright and tightly closed.

SECTION V HEALTH HAZARD DATA

PRINCIPAL HEALTH HAZARDS (Including Significant Routes, Effects, Symptoms of overexposure, and medical conditions Aggravated by Exposure)

May irritate skin, eyes, nose and throat. May cause allergic skin rashes. May permeate the skin in toxic amounts. Inhalation may cause nausea, headache, weakness, runny nose, cough, and asthma like reactions on repeated exposure with shortness of breath and wheezing. Severe respiratory sensitization may cause chronic lung disease. High or repeated exposures may cause liver and kidney effects. Long-term exposure may cause inflammation of the bladder.

HUMAN HEALTH EFFECTS:

Human health effects of overexposure by eye or skin contact may include eye irritation with discomfort, tearing, or blurring of vision; skin irritation with discomfort or rash; or allergic skin rashes. This compound has been infrequently associated with skin sensitization in humans. Overexposure by inhalation, skin absorption, or ingestion may cause abnormal liver functions as detected by laboratory tests.

HUMAN HEALTH EFFECTS (CONT.):

Skin contact may include skin irritation with discomfort or rash. This compound may cause skin sensitization with allergic skin rashes in susceptible humans. Evidence suggests that skin permeation can occur in amounts capable of producing the effects of systemic toxicity.

Eye contact may include severe eye irritation with discomfort, tearing, or blurring of vision.

Inhalation may include non specific discomfort, such as nausea, headache, or weakness; irritation of the upper respiratory passages, including runny nose or cough; asthma-like reactions (respiratory sensitization) with shortness of breath, wheezing, or cough, possibly occurring on subsequent reexposure to concentrations below established exposure limits; some cases of more severe respiratory sensitization may result in chronic lung disorders with symptoms of lung insufficiency.

Animal data suggests that repeated gross overexposures may cause abnormal liver or kidney function as detected by laboratory tests. There are published reports that some workers who may have been exposed to this material over a 5-10 year period developed "allergic cystitis" with frequent, painful urination and inflammation of the bladder.

Individuals with preexisting diseases of the skin, liver, kidney or lungs may have increased susceptibility to the toxicity of excessive exposures.

Carcinogenicity Information & Toxicological information:

None of the components present in this material at concentrations equal to or greater than .1% are listed by IARC, NTP, OSHA or ACGIH as a carcinogen.

Inhalation 4-hour LC50:	3.2 mg/L in rats (aerosol)
Skin absorption ALD:	1500 mg/kg in rabbits
Ingestion Oral LD50:	650 mg/kg in rats

This compound is a skin and eye irritant and is a skin sensitizer in tests with laboratory animals.

Skin: Single, lethal doses cause pulmonary edema. Sublethal doses caused marked dermatitis but no systemic toxicity to animals.

Ingestion: Single high oral doses caused decreased food consumption, weight loss, and decreased activity in rats indicative of general malaise. Repeated exposures to low oral doses caused an allergic reaction in sensitized animals. Repeated ingestion of higher doses caused slight kidney damage and liver degeneration.

Tests in animals demonstrate no carcinogenic activity. Tests in some animals indicate that the compound may have developmental toxicity, but only at dose levels that are also maternally toxic. Tests in animals for reproductive effects have not been performed. Toxic effects described in animals from short exposures by inhalation, ingestion, or skin contact include liver effects and kidney effects. Tests in animals demonstrate no carcinogenic activity. While mutagenicity tests have yielded inconsistent results, the weight of evidence indicates that m-Phenylenediamine is mutagenic in cultured bacterial and mammalian cells. Tests in some animals indicate that the compound may have embryotoxic activity.

EMERGENCY AND FIRST AID PROCEDURES:

SKIN CONTACT: In case of contact immediately wash skin thoroughly with large amounts of soap and water. Wash clothing before reuse. Call a physician. If molten material gets on skin, cool rapidly with cold water. Do not attempt to peel material from skin. Obtain medical treatment for thermal burns.

EYE CONTACT: In case of contact, Immediately flush eyes with large amounts of water for at least 15 mins. Get medical attention promptly.

INHALATION: If inhaled, Remove to fresh air. If not breathing or in respiratory distress, clear persons' airway and start artificial respiration. If breathing is difficult, give oxygen. Get medical attention promptly.

INGESTION: If swallowed, immediately give 2 glasses of water and induce vomiting. Call a physician. Never give anything by mouth to an unconscious person.

Note to Physicians:

Severe overexposure may cause facial, pharyngeal, and occasionally, laryngeal edema. Death may be rapid due to acute respiratory distress. Less severe cases have responded to corticosteroids and antihistamines; more severe cases have required tracheostomy.

PROTECTION INFORMATION

GENERALLY APPLICABLE CONTROL MEASURES: Good general ventilation should be provided to keep dust and vapor concentrations below the recommended exposure limit and prevent the formation of explosive dust mixtures in the air.

PERSONAL PROTECTIVE EQUIPMENT: Have available and use as appropriate.

Eye / Face Protection:

Chemical splash goggles, safety glasses (side shields preferred). Additionally, wear a full-length face shield where the possibility exists for face contact due to splashing or spraying of material.

Respirators:

A NIOSH/MSHA approved air-purifying respirator with a high efficiency dust filter (HEPA) and an organic vapor cartridge or canister may be permissible under certain circumstances where airborne concentrations are expected to exceed exposure limits. Protection provided by air purifying respirators is limited. Use a positive pressure air supplied respirator if there is any potential for an uncontrolled release, when exposure levels are not known, or any other circumstance where air purifying respirators may not provide adequate protection.

Protective Clothing:

When there is a potential for skin contact, have available and wear as appropriate: butyl or neoprene gloves; butyl apron, pants, jacket, hood, and boots; or totally encapsulating chemical suit with breathing air supply. When there is a potential for contact with hot/molten material, wear heat resistant clothing.

Engineering controls:

Good general ventilation should be provided to keep dust and vapor concentrations below the recommended exposure limit and prevent the formation of explosive dust mixtures in air.

SECTION VI REACTIVITY DATA

INSTABILITY: Stable at normal temperatures and conditions of storage. Moist air and excess heat cause product quality to degrade.

INCOMPATIBILITY: Incompatible with oxidizing agents.

DECOMPOSITION: Decomposes to carbon monoxide and nitrogen oxides if overheated.

POLYMERIZATION: Will not occur.

SECTION VII SPILL OR LEAK PROCEDURES

STEPS TO BE TAKEN IN CASE MATERIAL IS RELEASED OR SPILLED: Evacuate area and keep upwind of spill. If molten, contain spill with sand or earth dam. Allow to freeze and transfer to a covered metal container for disposal. Avoid causing dust. Flush area with detergent and water. Water spray may be used to control and disperse vapors. Comply with Federal, State, and local regulations on reporting releases.

Safeguards (Personnel): Note: Review Firefighting Procedures Sections before proceeding with clean-up. Use appropriate Personal Protection during clean-up.

WASTE DISPOSAL METHOD: Comply with Federal, State, and local regulations. If approved, may be incinerated, sent to an approved hazardous material disposal area, or transferred to a disposal contractor.

AQUATIC TOXICITY: This compound is moderately toxic (96-hour LC50 is 1-50 mg/L). The 96-hour LC50 in freshwater algae is 2.4 mg/L.

SECTION VIII SHIPPING DATA

D.O.T. SHIPPING NAME:.....: Phenylenediamines
TECHNICAL SHIPPING NAME:.....: CONTAINS m-Phenylenediamine
D.O.T. HAZARD CLASS.....: Poison B, 6.1
UN/NA NUMBER.....: UN 1673
PACKING GROUP.....: III

SECTION IX ECOTOXICOLOGICAL INFORMATION

Aquatic Toxicity

96-hour LC50, fathead minnows: 1,618 mg/L
48-hour EC50, daphnia magna: 1.4 mg/L
96-hour EC50, green algae: .16 mg/L

SECTION X MSDS Revision

Revision Date: 5-11-2005 Format/Review

FOR INDUSTRY USE ONLY!!!

The information contained herein is based on the data available to us and is believed to be accurate. The data is offered in good faith as typical values and not as product specification. The information in this data sheet was compiled from information supplied by the vendors of the components of this compound. **Seller** makes no warranty either expressed or implied regarding the accuracy of these data or the results to be obtained from the use thereof. The recommended industrial hygiene and safe handling procedures are believed to be genuinely applicable. However, each user should review these recommendations in the specific context of the intended use and determine whether they are appropriate. **Seller** assumes no responsibility for injury from the use of the product described herein. The information is intended only to assist in the safe handling of this material.