



DISCLAIMER: The information herein relates to the product named and is based upon information ALFA INTERNATIONAL CORPORATION considers accurate. No warranty expressed or implied is intended. This information is offered solely for your consideration and interpretation. The Corporate Safety and Environmental Affairs Department is responsible for the preparation of this Material Safety Data Sheet.

MATERIAL SAFETY DATA SHEET

Alfa International Corp.

E1072 Part A

MSDS Number: 6702
MSDS Date: 7/6/07

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: E1072 Part A
MANUFACTURER: Alfa International Corp.
ADDRESS: 32 Mechanic Ave., Unit 99, Woonsocket, RI 02895
EMERGENCY PHONE: 866-353-2532
CHEMTREC PHONE: 800-424-9300
OTHER CALLS: 401-765-0503
FAX PHONE: 401-765-0508
CHEMICAL NAME: Silver Filled Bisphenol A / Epichlorohydrin Based Epoxy Resin
PRODUCT USE: Epoxy Resin
PREPARED BY: Alfa International

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT</u>	<u>CAS NO.</u>	<u>% WT</u>	<u>EXPOSURE LIMIT</u>	<u>OSHA PEL</u>	<u>VP</u>
Bisphenol-A-(Epichlorohydrin); Epoxy Resin	25068-38-6	<25%	-	-	-
Silver Coated Glass Spheres	65997-17-3	>7%	-	-	-

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Human Health Hazards: May be irritating to the eyes and skin. Contact with hot material can cause thermal burns. May cause skin sensitization.
Safety Hazards: Material will not burn unless preheated.

SECTION 4: FIRST AID MEASURES

EYE CONTACT: Flush eye with water. Rest eyes for 30 minutes. If redness, burning, blurred vision or swelling persist, consult a physician.
SKIN CONTACT: In case of contact with hot product, immediately flood the affected area with cold water. Wipe excess material from exposed area. Flush exposed skin with water and follow by washing with soap if available. 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. Transport to nearest medical facility for additional treatment.
INGESTION: Do not induce vomiting. Have victim rinse out mouth with water, then drink sips of water to remove taste from mouth. In general, no treatment is necessary unless large quantities of product are ingested. However, get medical advice. If vomiting occurs spontaneously, keep head below hips to prevent aspiration.
INHALATION: Remove victim to fresh air and provide oxygen if breathing is difficult. Give artificial respiration if not breathing. Get medical attention.

SECTION 5: FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA: Use water fog, foam, dry chemical or carbon dioxide.

SPECIAL HAZARDS DURING FIRE FIGHTING:

Material will not burn unless preheated. Clear fire area of all non-emergency personnel. Cool fire exposed containers with water. Container areas exposed to direct flame contact should be cooled with large quantities of water as needed to prevent weakening of container structure.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS:

Do not enter confined fire space without full bunker gear (helmet with face shield, bunker coats, gloves and rubber boots) including a positive pressure NIOSH approved selfcontained breathing apparatus.

SECTION 6: ACCIDENTAL RELEASE MEASURES

PERSONAL PRECAUTIONS: May burn although not readily ignitable.
Use cautious judgement when cleaning up large spills.
Shut off leaks, if possible without personal risk.

ENVIRONMENTAL PRECAUTIONS: Dike and contain.
Contain run-off and dispose of properly.
Remove contaminated soil to remove contaminated trace residues.
Prevent from entering into drains, ditches or rivers.

CLEAN-UP METHODS – SMALL SPILLAGE:
Soak up with an absorbent such as clay, sand or other suitable material.
Place in non-leaking container.
Seal tightly for proper disposal.

CLEAN-UP METHODS – LARGE SPILLAGE:
Remove with vacuum trucks or pump to storage/salvage vessels.
Soak up residue with an absorbent such as clay, sand or other suitable material; place in non-leaking containers for proper disposal.
Flush area with water to remove trace residue.

ADDITIONAL ADVICE: Notify authorities if any exposures to the general public or environment occurs or is likely to occur.
See Section 13 for information on disposal.

SECTION 7: HANDLING AND STORAGE

HANDLING: Avoid prolonged or repeated contact with skin, eyes and clothing. Avoid contact with skin, eyes and clothing. Wash thoroughly after handling. **WARNING!** May cause skin and eye irritation. May cause skin sensitization. This resin may be handled, shipped and stored at elevated temperature in bulk. The recommended pumping temperature is 180 Degrees Fahrenheit. 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, cannot be decontaminated and should be destroyed to prevent reuse. To prevent thermal burns avoid contact with hot product.

STORAGE: Store in a cool, dry place with adequate ventilation. Keep containers closed when not in use. Keep away from open flames and high temperatures.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

PROTECTIVE MEASURES: Wear protective clothing specified for normal operations.

EYE PROTECTION: Avoid contact with eyes.
Wear chemical goggles if there is potential contact with eyes.
Safety spectacles.

HAND PROTECTION: Butyl
EVAL-Laminate

SKIN AND BODY PROTECTION: Wear chemical-resistant gloves and other clothing as required to minimize contact.

RESPIRATORY PROTECTION: No respiratory protection is usually required under normal conditions of use.

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

APPEARANCE: Clear

PHYSICAL STATE: Viscous Liquid

BOILING POINT:
F: >500
C: >260

FLASH POINT:
F: 480
C: 249

VAPOR PRESSURE: 0.03 mbar
@ F: 171
C: 77

RELATIVE DENSITY: 3.6

SOLUBILITY IN WATER: Negligible

SECTION 10: STABILITY AND REACTIVITY

CONDITIONS TO AVOID: Avoid high temperatures.

INCOMPATIBILITY (MATERIAL TO AVOID):

Can react vigorously with strong oxidizing agents, strong lewis or mineral acid, and strong mineral and organic bases.
Avoid contact with water or liquids.
Do not allow molten product to contact water or other liquids.
This can cause violent eruptions, splatter hot material, or ignite flammable material.
Reaction with some curing agents may produce considerable heat and possible violent decomposition.

HAZARDOUS REACTIONS:

Stable under normal use conditions.
Hazardous polymerization will not occur.

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE ORAL TOXICITY: LD50 – Low toxicity, LD50 > 2000 mg/kg.

ACUTE DERMAL TOXICITY: LD50 – Low toxicity, LD50 > 2000 mg/kg.

SENSITIZATION: May cause skin sensitization.

CARCINOGENICITY: Recent 2-year bioassays in rats and mice exposed by the dermal route to the diglycidyl ether of bisphenol A (BADGE) yielded no evidence of carcinogenicity to the skin or any other organs. This study clarifies prior equivocal results from a 2-year mouse skin painting study, which were suggestive, but not conclusive, for weak carcinogenic activity. **Note:** Diglycidyl ether of bisphenol A (BADGE) is a component in all BPA/ECH based epoxy resins.

MUTAGENICITY: Resins of this type, liquid resins based on diglycidyl ether of bisphenol A have proved to be inactive when tested by in vivo mutagenicity assays. These resins have shown activity in in-vitro microbial mutagenicity screening and have produced chromosomal aberrations in cultured rat liver cells. The significance of these tests to man is unknown.

POTENTIAL HEALTH EFFECTS

Inhalation: Not expected to be a relevant route of exposure, however, under conditions where exposure to vapors or mists is possible, could cause respiratory tract irritation.

Skin: May be mildly irritating to the skin.
Contact with hot material can cause thermal burns which may result in permanent damage.
May cause skin sensitization.

Eyes: May be mildly irritating to the eyes.
Contact with hot material can cause thermal burns which may result in permanent damage or blindness.

Ingestion: Not likely to be a relevant route of exposure.

SECTION 12: ECOLOGICAL INFORMATION

BIODEGRADABILITY: This section will be updated as ecological reviews are completed.

ECOTOXICITY: This section will be updated as ecological reviews are completed.

SECTION 13: DISPOSAL CONSIDERATIONS

PRODUCT DISPOSAL: If this material 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 and federal regulations.

SECTION 14: TRANSPORT INFORMATION

CFR_ROAD NOT REGULATED FOR TRANSPORT
IATA_C NOT REGULATED FOR TRANSPORT
IMDG NOT REGULATED FOR TRANSPORT
CFR_RAIL NOT REGULATED FOR TRANSPORT

SECTION 15: REGULATORY INFORMATION

The regulatory information is not intended to be comprehensive. Other regulations may apply to this material.

NOTIFICATION STATUS

AICS: y
DSL: y
INV (CN): y
ENCS (JP): y
TSCA: y
EU NLP: y
KECI (KR): y
PICCS (PH): y

US. EPA CERCLA Hazardous Substances (40 CFR 302)

Reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight <= 700) No RQ

SARA 311/312 Hazards

Hazard Chronic Health

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 313 Toxic Chemicals (40 CFR 372.65) - Supplier Notification Required

Reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight <= 700) Concentration No De minimis

US. EPA Emergency Planning and Community Right-To-Know Act (EPCRA) SARA Title III Section 302 Extremely Hazardous Substance (40 CFR 355, Appendix A)

Reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight <= 700) Threshold Planning Quantity: No TPQ

Reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight <= 700) Reportable quantity: No RQ

New Jersey Right-To-Know Chemical List

Reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight <= 700) Not Listed

Additional Components Not Found In Section 2:

Components	CAS-No.	Concentration	Remarks
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Phenyl Glycidyl Ether	122-60-1	< 6 PPM	Not Listed
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Pennsylvania Right-To-Know Chemical List

Reaction product: bisphenol-A-(epichlorhydrin); epoxy resin (number average molecular weight <= 700) Not Listed

Additional Components Not Found In Section 2:

MATERIAL SAFETY DATA SHEET

Alfa International Corp.

E1072 Part B

MSDS Number: 6072-B

MSDS Date: 7/6/07

SECTION 1: PRODUCT AND COMPANY IDENTIFICATION

PRODUCT NAME: E1072 Catalyst

MANUFACTURER: Alfa International Corp.
ADDRESS: 32 Mechanic Ave., Unit 99, Woonsocket, RI 02895

EMERGENCY PHONE: 866-353-2532
CHEMTREC PHONE: 800-424-9300
OTHER CALLS: 401-765-0503
FAX PHONE: 401-765-0508

CHEMICAL NAME: Triethylenetetramine
CHEMICAL FAMILY: Aliphatic Amines

PRODUCT USE: Curing Agent (Hardener)
PREPARED BY: Alfa International

SECTION 2: COMPOSITION/INFORMATION ON INGREDIENTS

<u>INGREDIENT</u>	<u>CAS NO.</u>	<u>% WT</u>	<u>% VOL</u>
Triethylenetetramine	112-24-3	>90%	>90%

SECTION 3: HAZARDS IDENTIFICATION

EMERGENCY OVERVIEW:

Toxic in contact with skin.
Corrosive.
Moderate respiratory irritant.
Severe skin irritant.
Severe eye irritant.
May cause sensitization by skin contact.

POTENTIAL HEALTH EFFECTS

Eyes: Causes eye burns. May cause blindness. Severe eye irritation.

Skin: Toxic in contact with skin. Causes skin burns.

Ingestion: If ingested, severe burns of the mouth and throat, as well as a danger of perforation of the oesophagus and the stomach.

Inhalation: Can cause severe eye, skin and respiratory tract burns. May cause nose, throat, and lung irritation. Inhalation of vapors and/or aerosols in high concentration may cause irritation of respiratory system.

CHRONIC HEALTH HAZARDS:

This product contains no listed carcinogens according to IARC, ACGIH, NTP and/or OSHA in concentrations of 0.1 percent or greater. Prolonged contact may result in chemical burns and permanent damage. Repeated or prolonged contact causes sensitization, asthma and eczemas.

MEDICAL CONDITIONS GENERALLY AGGRAVATED BY EXPOSURE:

Eye disease Skin disorders and Allergies. Adverse skin effects (such as rash, irritation or corrosion). Adverse eye effects (such as conjunctivitis or corneal damage). Adverse respiratory effects (such as cough, tightness of chest or shortness of breath). Asthma.

SECTION 4: FIRST AID MEASURES

- GENERAL ADVICE:** Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.
- EYES:** Rinse immediately with plenty of water also under the eyelids for at least 20 minutes. Remove contact lenses.
- SKIN:** Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay. Wash off immediately with plenty of water for at least 20 minutes. Cover wound with sterile dressing. Take off contaminated clothing and shoes immediately.
- INGESTION:** Do not induce vomiting without medical advice. Drink 1 or 2 glasses of water. If a person vomits when lying on his back, place him in the recovery position. Prevent aspiration of vomit. Turn victim's head to the side.
- INHALATION:** If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately. Move to fresh air.

NOTES TO PHYSICIANS OR FIRST AID PROVIDERS:

Application of corticosteroid cream has been effective in treating skin irritation.

SECTION 5: FIRE-FIGHTING MEASURES

SUITABLE EXTINGUISHING MEDIA:

Alcohol-resistant foam, carbon dioxide, dry chemical, dry sand, limestone powder.

SPECIFIC HAZARDS:

May generate ammonia gas. May generate toxic nitrogen oxide gases. Use of water may result in the formation of very toxic aqueous solutions. Do not allow run-off from fire fighting to enter drains or water courses. Incomplete combustion may form carbon monoxide. Downwind personnel must be evacuated. Burning produces obnoxious and toxic fumes.

SPECIAL PROTECTIVE EQUIPMENT FOR FIRE-FIGHTERS:

Avoid contact with the skin. A face shield should be worn. Use personal protective equipment. Wear self contained breathing apparatus for fire fighting if necessary.

FURTHER INFORMATION: Do not allow run-off from fire fighting to enter drains or water courses.

SECTION 6: ACCIDENTAL RELEASE MEASURES

- PERSONAL PRECAUTIONS:** Use self-contained breathing apparatus and chemically protective clothing. Wear suitable protective clothing, gloves and eye/face protection. Evacuate personnel to safe areas.
- ENVIRONMENTAL PRECAUTIONS:** Construct a dike to prevent spreading.
- METHODS FOR CLEANING UP:** Approach suspected leak areas with caution. Place in appropriate chemical waste container.
- ADDITIONAL ADVICE:** If possible, stop flow of product.

SECTION 7: HANDLING AND STORAGE

HANDLING: Do not use sodium nitrite or other nitrosating agents in formulations containing this product. Suspected cancercausing nitrosamines could be formed. Avoid contact with skin and eyes. Emergency showers and eye

wash stations should be readily accessible. Adhere to work practice rules established by government regulations. Avoid breathing vapors and/or aerosols. Avoid contact with eyes. Use only in well-ventilated areas. Use personal protective equipment. When using, do not eat, drink or smoke.

STORAGE: Store in steel containers preferably located outdoors, above ground, and surrounded by dikes to contain spills or leaks. Do not store near acids. Keep containers tightly closed in a dry, cool and well-ventilated place.

TECHNICAL MEASURES & PRECAUTIONS: Do not store in reactive metal containers.

SECTION 8: EXPOSURE CONTROLS/PERSONAL PROTECTION

ENGINEERING MEASURES: Provide readily accessible eye wash stations and safety showers.
Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.

PERSONAL PROTECTIVE EQUIPMENT:
Respiratory protection -- Wear appropriate respirator when ventilation is inadequate.
Hand protection -- Neoprene gloves, butyl-rubber, nitrile rubber, impervious gloves. The breakthrough time of the selected glove(s) must be greater than the intended use period.

EYE PROTECTION: Full face shield with goggles underneath.
Chemical resistant goggles must be worn.

SKIN AND BODY PROTECTION: Impervious clothing.
Full rubber suit (rain gear).
Rubber or plastic boots.
Long sleeve shirts and trousers without cuffs.
Slicker suit.

ENVIRONMENTAL EXPOSURE CONTROLS: Construct a dike to prevent spreading.

SPECIAL INSTRUCTIONS FOR PROTECTION AND HYGIENE:
Discard contaminated leather articles. Remove contaminated clothing. Drench affected area with water for at least 15 minutes.
Provide readily accessible eye wash stations and safety showers.
Wash at the end of each workshift and before eating, smoking or using the toilet.

EXPOSURE LIMIT(S):

Triethylenetetramine	Time Weighted Average (TWA): WEEL	1 ppm	6 mg/m ³
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SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES

COLOR: Amber

ODOR: Fishy

PHYSICAL STATE: Liquid

pH: Alkaline

BOILING POINT:
F: 531
C: 277

FLASH POINT:
C: >115.56

VAPOR PRESSURE (mmHg): <0.01 mmHG
@ F: 70
C: 21

RELATIVE VAPOR DENSITY: 5.61

DENSITY: 0.98 g/cm³ (61.179 lb/ft³)

@ F: 70
C: 21

SECTION 9: PHYSICAL AND CHEMICAL PROPERTIES (con't)

SOLUBILITY IN WATER: Completely soluble.

MOLECULAR WEIGHT: 146 g/mol

VISCOSITY: 20 mPa.s

@ F: 77
C: 25

SECTION 10: STABILITY AND REACTIVITY

STABILITY: Stable under normal conditions.

MATERIALS TO AVOID: Sodium hypochlorite.
Organic acids (i.e. acetic acid, citric acid etc.).
Mineral acids.
Product slowly corrodes copper, aluminum, zinc and galvanized surfaces.
Reaction with peroxides may result in violent decomposition of peroxide possibly creating an explosion.
CAUTION! N-Nitrosamines, many of which are known to be potent carcinogens, may be formed when the product comes in contact with nitrous acid, nitrites or atmospheres with high nitrous oxide concentrations.
Nitrous acid and other nitrosating agents.
Oxidizing agents.

Hazardous decomposition products: Nitric acid.
Ammonia.
Nitrogen oxides (NOx).
Nitrogen oxide can react with water vapors to form corrosive nitric acid.
Carbon monoxide, Carbon dioxide.
Nitrosamine.

SECTION 11: TOXICOLOGICAL INFORMATION

ACUTE HEALTH HAZARD:

Ingestion: **LD50:** 2,500 mg/kg
Species: Rat

Inhalation: No data is available on the product itself.

Skin: **LD50:** 805 mg/kg
Species: Rabbit

EYE IRRITATION/CORROSION: Severe eye irritation.

ACUTE DERMAL IRRITATION/CORROSION: Severe skin irritation.

SENSITIZATION: May cause sensitization by skin contact. Sensitization has occurred in laboratory animals after repeated exposures.

CHRONIC HEALTH HAZARD: Results from a battery of short term genotoxicity tests on this material or its components indicate mutagenic activity.

SECTION 12: ECOLOGICAL INFORMATION

ECOTOXICITY EFFECTS:

Aquatic toxicity: No data is available on the product itself.

Toxicity to other organisms: No data available.

PERSISTENCE AND DEGRADABILITY:

Mobility: No data available.

Bioaccumulation: No data is available on the product itself.

SECTION 13: DISPOSAL CONSIDERATIONS

WASTE FROM RESIDUES / UNUSED PRODUCTS: Contact supplier if guidance is required.

CONTAMINATED PACKAGING: Dispose of container and unused contents in accordance with federal, state, and local requirements.

SECTION 14: TRANSPORT INFORMATION

CFR

Proper Shipping Name: Triethylenetetramine

Class: 8

UN/ID No.: UN2259

Packing Group: II

IATA

Proper Shipping Name: Triethylenetetramine

Class: 8

UN/ID No.: UN2259

Packing Group: II

IMDG

Proper Shipping Name: Triethylenetetramine

Class: 8

UN/ID No.: UN2259

Packing Group: II

CTC

Proper Shipping Name: Triethylenetetramine

Class: 8

UN/ID No.: UN2259

Packing Group: II

SECTION 15: REGULATORY INFORMATION

Country	Regulatory List	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer.
Canada	DSL	Included on Inventory.
Australia	AICS	Included on Inventory.
Japan	ENCS	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.

Philippines	PICCS	Included on Inventory.
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EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification:

Acute Health Hazard Chronic Health Hazard

EPA SARA Title III Section 313 (40 CFR 372) Component(s) above 'de minimus' level:

None.

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

This product does not contain any chemicals known to State of California to cause cancer, birth defects or any other harm.

WHMIS Hazard Classification

Toxic Material Causing Immediate and Serious Toxic Effects, Toxic Material Causing Other Toxic Effects, Corrosive Material.

SECTION 16: OTHER INFORMATION

HMIS RATING:

Health: 3

Flammability: 1

Physical hazard: 0

Prepared by: Alfa International Corp.