1. PRODUCT IDENTIFICATION

**Trade Name:** Araldite 2011A US  
**Made In:** U.S.A.  
**Chemical Family:** Epoxy

**Intended Use or Product Type:** Epoxy adhesive resin

2. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>Chemical Identity</th>
<th>Exposure Limits</th>
<th>Carcinogen Status</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ACGIH</td>
<td>OSHA</td>
</tr>
<tr>
<td></td>
<td></td>
<td>TWA</td>
<td>STEL</td>
</tr>
<tr>
<td>112945-52-5</td>
<td>Silicon dioxide, amorphous</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>* Concentration</td>
<td>1.00 - 5.00 % by wt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>25068-38-6</td>
<td>Phenol, 4,4'-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane Bisphenol A diglycidyl ether polymer</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>* Concentration</td>
<td>60.00 - 100.00 % by wt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>3101-60-8</td>
<td>Oxirane, [4-(1,1-dimethylethyl)phenoxy]methyl]-Butylphenyl glycidyl ether</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>* Concentration</td>
<td>1.00 - 5.00 % by wt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>67924-34-9</td>
<td>Phenol, 4-(1,1-dimethylethyl)-, polymer with (chloromethyl)oxirane and 4,4'-(1-methylethylidene)bis[phenol] Bisphenol A epoxy resin</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>* Concentration</td>
<td>10.00 - 30.00 % by wt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>84-74-2</td>
<td>1,2-Benzene dicarboxylic acid, dibutyl ester Dibutyl phthalate</td>
<td>5 mg/m3</td>
<td>NE</td>
</tr>
<tr>
<td>* Concentration</td>
<td>5.00 - 10.00 % by wt</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
3. HAZARDS IDENTIFICATION

**Emergency Overview:** Causes skin and eye irritation. May cause allergic skin reaction.

**Primary Route(s) of Entry:** Dermal; heated product may produce inhalable vapors.

**Chronic:** Prolonged or repeated exposure can cause liver and kidney damage, central nervous system effects and blood abnormalities. Repeated overexposure may cause delayed and serious injury. May cause birth defects and reproductive disorders. Substance can cause allergic reaction.

4. FIRST AID MEASURES

**Ingestion:** Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Seek immediate medical attention.

**Skin:** Immediately wash with soap and water. Remove contaminated clothing and launder before reuse. Destroy contaminated shoes. Seek immediate medical attention.

**Inhalation:** Remove to fresh air. Seek immediate medical attention.

**Eyes:** Immediately flush eyes with water for at least 15 minutes. Seek immediate medical attention.

**Overexposure Effects:** Causes skin and eye irritation. May cause allergic skin reaction.

**Medical Conditions Aggravated by Exposure:** Skin and eye conditions.

**Additional Information:** Referral to a physician is recommended if there is any question about the seriousness of any injury.

5. FIRE FIGHTING MEASURES

**Flash Point:** 273°F (134 °C)

**Flash Point Method Used:** PMCC

**Flammable Limits in Air (Lower - % by volume):** Not established

**Flammable Limits in Air (Upper - % by volume):** Not established

**Fire Fighting Extinguishing Media:** Carbon dioxide, dry chemical, foam, water.

**Fire Fighting Equipment:** Use self-contained breathing apparatus.

**Fire and Explosion Hazards:** Decomposition and combustion products may be toxic.

6. ACCIDENTAL RELEASE MEASURES

**Accidental Release Measures:** Remove spillage by absorbing in absorbent material.
7. HANDLING AND STORAGE

Signal Word: Warning!

Precautions: Can cause skin irritation, eye irritation, and allergic skin reaction. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling. Notice! Possible reproductive health hazard. Overexposure may cause male reproductive disorders and have effects on developing fetus.

Other Handling Information: Nuisance dust may be generated when sanding or sawing cured material.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Skin Protection: Wear impermeable gloves.

Respiratory Protection: Use NIOSH approved organic vapor cartridge respirator when vapor/mist exposure is likely.

Eye Protection: Wear splash-proof chemical goggles.

Engineering Controls: General mechanical and local exhaust in accordance with ACGIH recommendations.

9. PHYSICAL AND CHEMICAL PROPERTIES

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Color</td>
<td>Opaque White</td>
</tr>
<tr>
<td>Odor</td>
<td>Mild</td>
</tr>
<tr>
<td>Physical State</td>
<td>Liquid</td>
</tr>
<tr>
<td>Solubility in Water</td>
<td>Insoluble</td>
</tr>
<tr>
<td>Vapor Pressure</td>
<td>0.0017 mm Hg at 25°C (77 °F)</td>
</tr>
<tr>
<td>Specific Gravity</td>
<td>1.14 - 1.19 (water = 1)</td>
</tr>
<tr>
<td>Boiling Point</td>
<td>&gt; 300°F (&gt; 149 °C)</td>
</tr>
<tr>
<td>Melting Point</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Evaporation Rate</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Density</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Vapor Density</td>
<td>Not Determined</td>
</tr>
<tr>
<td>VOC</td>
<td>0 g/L</td>
</tr>
<tr>
<td>pH</td>
<td>Not Determined</td>
</tr>
<tr>
<td>Coefficient of water/oil</td>
<td>Not Determined</td>
</tr>
</tbody>
</table>

Percent Volatile: Not determined.

10. STABILITY AND REACTIVITY

Conditions to Avoid: Excessive heat for prolonged periods of time.

Stability: Stable.

Incompatibility: Strong oxidizers, acids and bases.

Hazardous Decomposition Products: Combustion may form toxic materials, such as carbon dioxide, carbon monoxide.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Sensitization: Possible in susceptible individuals.

Carcinogenicity: Based on several dermal studies in mice, IARC had concluded in 1999 that diglycidyl ether of bisphenol A is not classifiable as a human carcinogen (Group 3) and has limited evidence of carcinogenicity in animals.

Skin Irritation: Irritant.

Eye Irritation: Irritant.

Reproduction: For diglycidyl ether of bisphenol A- There were no treatment-related histologic changes noted nor effects on reproductive performance in rats at any oral dose tested.

Teratogenicity: For diglycidyl ether of bisphenol A- No adverse effects on embryonic or fetal development was observed in rabbits after dermal exposure.

Mutagenicity: For diglycidyl ether of bisphenol A- In vitro tests showed mutagenic effects which were not observed with in vivo tests.

Sub-Chronic: Diglycidyl ether of bisphenol A, applied to the skin of rats five times per week for approximately 13 weeks, caused no apparent systemic toxicity with the exception of decreased body weight and body weight gain.

Additional Information: This product contains dibutyl phthalate which may cause adverse reproductive effects in laboratory animals. The relevance to humans is not known.

12. ECOLOGICAL INFORMATION

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Consult qualified local or corporate personnel for method that will comply with local, state and federal health and environmental regulations.

14. TRANSPORT INFORMATION

DOT: Non-Bulk
   Proper Shipping Name: Environmentally hazardous substance, liquid, n.o.s.
   Technical Shipping Name (If n.o.s.): Bisphenol A epoxy resin
   Hazard Class: 9
   ID Number: UN 3082
   Packing Group: PG III
   Marine Pollutant: Marine Pollutant

IATA: Non-Bulk
   Proper Shipping Name: Environmentally hazardous substance, liquid, n.o.s.
   Technical Shipping Name (If n.o.s.): Bisphenol A epoxy resin
   Hazard Class: 9
   ID Number: UN 3082
   Packing Group: PG III
Marine Pollutant: Marine Pollutant
IMDG: Non-Bulk
Proper Shipping Name: Environmentally hazardous substance, liquid, n.o.s.
Technical Shipping Name (If n.o.s.): Bisphenol A epoxy resin
Hazard Class: 9
ID Number: UN 3082
Packing Group: PG III
Marine Pollutant: Marine Pollutant
TDG: Non-Bulk
Proper Shipping Name: Environmentally hazardous substance, liquid, n.o.s.
Technical Shipping Name (If n.o.s.): Bisphenol A epoxy resin
Hazard Class: 9
ID Number: UN 3082
Packing Group: PG III
Marine Pollutant: Marine Pollutant

15. REGULATORY INFORMATION

US Federal Regulations:

Occupational Safety and Health Act (OSHA): This Material Safety Data Sheet (MSDS) has been prepared in compliance with the federal OSHA Hazard Communication Standard 29 CFR 1910.1200. This product is considered to be a hazardous chemical under that standard.


SARA Title III: Section 304 - CERCLA: This product contains the following chemicals regulated under Section 304 (40 CFR 302) as hazardous substance(s) for emergency release notification ("CERCLA" List):

Chemical Name: 1,2-Benzenedicarboxylic acid, dibutyl ester
Common Name: Dibutyl phthalate
CAS Number: 84-74-2
Percent in Composition: 5 - 10 % by wt
Component RQ: 10

SARA Title III: Section 313 Toxic Chemical List (TCL): This product contains a toxic chemical(s) for routine annual toxic chemical release reporting under section 313 (40 CFR 372). This information must be included in all MSDS's copied or distributed for this material.

Chemical Name: 1,2-Benzenedicarboxylic acid, dibutyl ester
Common Name: Dibutyl phthalate
Percent in Composition: 5 - 10 % by wt
Comment:

TSCA Section 8(b) - Inventory Status: All chemical components of this product are in compliance with TSCA inventory requirements.

TSCA Section 12(b) - Export Notification: This product does not contain any chemical(s) that are subject to a Section 12(b) export notification.
International Regulations:

**Australian Inventory Status**: This product contains only chemicals which are currently listed on the Australian Inventory of Chemical Substances.

**Canadian Inventory Status**: This product contains only chemicals that are currently listed on the Canadian Domestic Substance List.

**Canadian WHMIS**: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations. D2A D2B

**European Inventory Status (EINECS)**: This product contains only chemicals that are currently listed on the European Inventory of Existing Commercial Chemical Substances (EINECS).

**Japanese Inventory Status**: This product contains one or more chemicals currently not on the Japanese Ministry of International Trade and Industry List of Existing and New Chemical Substances.

State Regulations:

**California Proposition 65**: The following is required composition information. This product contains the following chemical(s) which are currently listed on the California list of Known Carcinogens and Reproductive Toxins:

Chemical Name: 1,2-Benzenedicarboxylic acid, dibutyl ester  
Common Name: Dibutyl phthalate  
CAS Number: 84-74-2  
Percent in Composition: 5 - 10 % by wt  
Comment: Warning! This chemical is known to the State of California to cause birth defects or other reproductive harm.

**Pennsylvania Right-to-Know**: The following is required composition information:

Chemical Name: Phenol, 4,4’-(1-methylethylidene)bis-, polymer with (chloromethyl)oxirane  
Common Name: Bisphenol A diglycidyl ether polymer  
CAS Number: 25068-38-6  
Comment: Not on Pennsylvania Hazardous Substance List

Chemical Name: Phenol, 4-(1,1-dimethylethyl)-, polymer with (chloromethyl)oxirane and 4,4’-(1-methylethylidene)bis[phenol]  
Common Name: Bisphenol A epoxy resin  
CAS Number: 67924-34-9  
Comment: Not on Pennsylvania Hazardous Substance List

Chemical Name: 1,2-Benzenedicarboxylic acid, dibutyl ester  
Common Name: Dibutyl phthalate  
CAS Number: 84-74-2  
Comment: Environmental Hazardous Substance

Chemical Name: Silicon dioxide, amorphous  
CAS Number: 112945-52-5  
Comment: Not on Pennsylvania Hazardous Substance List

16. OTHER INFORMATION

**MSDS No**: 5623

Printed: 4/26/2010  Page 6 of 7
**Reason Issued:** 4/10 update DOT & Haz  
**Approved By:** Matt Austin  
**Title:** EHS Chemist  

**Other Information:** D/KLCBT/CA2 (D10021232) [DD8]

**Disclaimer:** The information and recommendations contained herein are based upon tests in controlled laboratory conditions, are believed to be correct, and are provided for the sole purpose of hazard communication as part of Huntsman's product safety program. This product has not been tested for, and therefore is not recommended or suitable for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended or likely, or for uses for which implantation within the human body is intended, and Huntsman assumes no liability for any such uses.

The information and recommendations contained herein are not intended to constitute performance information concerning the product, which is available in separate technical data sheets available from Huntsman upon request. Users are urged, and are urged to urge others who may come in contact with the product, to obtain and consult data sheets prior to purchase, use, transportation or storage of the product.

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User should consult a legal advisor or the appropriate governmental agency to determine the applicability or effect of any law or regulation with respect to the product. Huntsman does not undertake to furnish advice on such matters.

No person or organization except a duly authorized Huntsman employee is authorized to provide or make available data sheets for Huntsman products. Data sheets from unauthorized sources may contain information that is no longer current or accurate. No part of this data sheet may be reproduced or transmitted in any form, or by any means, without permission in writing from Huntsman. All requests for permission to reproduce material from this data sheet should be directed to Huntsman, Manager, Product Safety at the above address.
1. PRODUCT IDENTIFICATION

Trade Name: Araldite 2011B US
Chemical Family: Polyamide/Amine

Intended Use or Product Type: resin hardener

2. COMPOSITION / INFORMATION ON INGREDIENTS

<table>
<thead>
<tr>
<th>CAS No.</th>
<th>CHEMICAL IDENTITY</th>
<th>EXPOSURE LIMITS</th>
<th>CARCINOGEN STATUS</th>
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</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>ACGIH</td>
<td>OSHA</td>
</tr>
<tr>
<td>TWA</td>
<td>STEL</td>
<td>PEL</td>
<td>STEL</td>
</tr>
<tr>
<td>* 10563-29-8</td>
<td>1,3-Propanediamine, N’-(3-aminopropyl)-N,N-dimethyl-Dimethylene Propylene Triamine</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Common Name: Concentration</td>
<td>5.00 - 10.00 % by wt</td>
<td></td>
<td></td>
</tr>
<tr>
<td>* 68154-62-1</td>
<td>Fatty Acids, C18-Unsatu., Dimers, Polymers with Oleic Acid and Triethylenetetramine Reaction product of TETA, dimer fatty acid, and oleic acid 60.00 - 100.00 % by wt</td>
<td>NE</td>
<td>NE</td>
</tr>
<tr>
<td>Common Name: Concentration</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

NE = Not Established  NR = Not Reviewed  * = OSHA Hazardous Ingredient

3. HAZARDS IDENTIFICATION

Emergency Overview: Causes skin and eye irritation. May cause allergic skin reaction.

Primary Route(s) of Entry: Dermal; heated product may produce inhalable vapors.

4. FIRST AID MEASURES

Ingestion: Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Seek immediate medical attention.
Skin: Immediately wash with soap and water. Remove contaminated clothing and launder before reuse. Destroy contaminated shoes. Seek immediate medical attention.

Inhalation: Remove to fresh air. Seek immediate medical attention.

Eyes: Immediately flush eyes with water for at least 15 minutes. Seek immediate medical attention.

Overexposure Effects: Causes skin and eye irritation. May cause allergic skin reaction.

Medical Conditions Aggravated by Exposure: Skin and eye conditions.

Additional Information: Referral to a physician is recommended if there is any question about the seriousness of any injury.

5. FIRE FIGHTING MEASURES

Flash Point: > 110°C (> 230 °F)
Flash Point Method Used: PMCC
Flammable Limits in Air (Lower - % by volume): Not established
Flammable Limits in Air (Upper - % by volume): Not established

Fire Fighting Extinguishing Media: Carbon dioxide, dry chemical, foam, water.

Fire Fighting Equipment: Use self-contained breathing apparatus.

Fire and Explosion Hazards: Decomposition and combustion products may be toxic.

6. ACCIDENTAL RELEASE MEASURES

Accidental Release Measures: Remove spillage by absorbing in absorbent material.

7. HANDLING AND STORAGE

Signal Word: Warning!

Precautions: Can cause skin irritation, eye irritation, and allergic skin reaction. Avoid contact with eyes, skin, and clothing. Wash thoroughly after handling.

Other Handling Information: Nuisance dust may be generated when sanding or sawing cured material.

8. EXPOSURE CONTROLS / PERSONAL PROTECTION

Skin Protection: Wear impermeable gloves.

Respiratory Protection: Use NIOSH approved organic vapor cartridge respirator when vapor/mist exposure is likely.

Eye Protection: Wear splash-proof chemical goggles.

Engineering Controls: General mechanical and local exhaust in accordance with ACGIH recommendations.
9. PHYSICAL AND CHEMICAL PROPERTIES

Color: Light Yellow
Odor: Slight
Physical State: Liquid
Solubility in Water: Practically Insoluble
Viscosity: 20000 - 35000 mPa at 25°C (77 °F)
Vapor Pressure: 4 Pa at 20°C (68 °F)
Specific Gravity: 0.9 - 1 at 25°C (77 °F)
Boiling Point: > 200°C (> 392 °F)
Melting Point: Not Determined
Evaporation Rate: Not Determined
Density: 0.95 g/cm³ at 25°C (77 °F)
Vapor Density: Not Determined
pH: 12 at 20°C (68 °F) (1:1 in water)
Coefficient of water/oil: Not Determined

10. STABILITY AND REACTIVITY

Conditions to Avoid: Excessive heat for prolonged periods of time.
Stability: Stable.
Incompatibility: Strong oxidizers and acids.

Hazardous Decomposition Products: Combustion may form toxic materials, such as carbon dioxide, carbon monoxide.
Hazardous Polymerization: Will not occur.

11. TOXICOLOGICAL INFORMATION

Sensitization: Possible in susceptible individuals.
Skin Irritation: Irritant.
Eye Irritation: Irritant.

12. ECOLOGICAL INFORMATION

13. DISPOSAL CONSIDERATIONS

Waste Disposal Method: Consult qualified local or corporate personnel for method that will comply with local, state and federal health and environmental regulations.

14. TRANSPORT INFORMATION
15. REGULATORY INFORMATION

US Federal Regulations:

Occupational Safety and Health Act (OSHA): This Material Safety Data Sheet (MSDS) has been prepared in compliance with the federal OSHA Hazard Communication Standard 29 CFR 1910.1200. This product is considered to be a hazardous chemical under that standard.


SARA Title III: Section 313 Toxic Chemical List (TCL): This product does not contain any chemicals for routine annual toxic chemical release reporting under Section 313 (40 CFR 372).

TSCA Section 8(b) - Inventory Status: All chemical components of this product are in compliance with TSCA inventory requirements.

TSCA Section 12(b) - Export Notification: This product does not contain any chemical(s) that are subject to a Section 12(b) export notification.

International Regulations:

Australian Inventory Status: This product contains only chemicals which are currently listed on the Australian Inventory of Chemical Substances.

Canadian Inventory Status: This product contains only chemicals that are currently listed on the Canadian Domestic Substance List.

Canadian WHMIS: This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations. D2B

European Inventory Status (EINECS): This product contains only chemicals that are currently listed on the European Inventory of Existing Commercial Chemical Substances (EINECS).

Japanese Inventory Status: This product contains only chemicals currently listed on the Japanese Ministry of International Trade and Industry List of Existing and New Chemical Substances.

State Regulations:

California Proposition 65: This product does not contain any chemicals currently on the California list of Known Carcinogens and Reproductive Toxins.

Pennsylvania Right-to-Know: The following is required composition information:
Chemical Name: Fatty Acids, C18-Unsatd., Dimers, Polymers with Oleic Acid and Triethylenetetramine
Common Name: Reaction product of TETA, dimer fatty acid, and oleic acid
CAS Number: 68154-62-1
Comment: Not on Pennsylvania Hazardous Substance List

Chemical Name: 1,3-Propanediamine, N'-(3-aminopropyl)-N,N-dimethyl-
Common Name: Dimethylene Propylene Triamine
CAS Number: 10563-29-8
Comment: Not on Pennsylvania Hazardous Substance List

16. OTHER INFORMATION

MSDS No: 5624
Reason Issued: 6/10 update
Approved By: Matt Austin
Title: EHS Chemist

Other Information: DLW (D10020030) [D24]

Disclaimer: The information and recommendations contained herein are based upon tests in controlled laboratory conditions, are believed to be correct, and are provided for the sole purpose of hazard communication as part of Huntsman's product safety program. This product has not been tested for, and therefore is not recommended or suitable for, uses for which prolonged contact with mucous membranes, abraded skin, or blood is intended or likely, or for uses for which implantation within the human body is intended, and Huntsman assumes no liability for any such uses.

The information and recommendations contained herein are not intended to constitute performance information concerning the product, which is available in separate technical data sheets available from Huntsman upon request. Users are urged, and are urged to urge others who may come in contact with the product, to obtain and consult data sheets prior to purchase, use, transportation or storage of the product.

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Material Safety Data Sheet
HARDENER HV 953 US

1. Product and company identification

<table>
<thead>
<tr>
<th>Material uses</th>
<th>Hardener for adhesive systems</th>
</tr>
</thead>
<tbody>
<tr>
<td>MSDS #</td>
<td>00067060</td>
</tr>
<tr>
<td>Validation date</td>
<td>6/7/2012.</td>
</tr>
<tr>
<td>Print date</td>
<td>6/7/2012.</td>
</tr>
<tr>
<td>Supplier/Manufacturer</td>
<td>Huntsman Advanced Materials Americas LLC</td>
</tr>
<tr>
<td></td>
<td>P.O. Box 4980</td>
</tr>
<tr>
<td></td>
<td>The Woodlands, TX 77387</td>
</tr>
<tr>
<td>Non-Emergency phone</td>
<td>(800) 257-5547</td>
</tr>
<tr>
<td>E-Mail</td>
<td><a href="mailto:MSDS@huntsman.com">MSDS@huntsman.com</a></td>
</tr>
</tbody>
</table>

In case of emergency : Chemtrec: (800) 424-9300 or (703) 527-3887

2. Hazards identification

<table>
<thead>
<tr>
<th>Physical state</th>
<th>Liquid.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Odor</td>
<td>Slight</td>
</tr>
<tr>
<td>Color</td>
<td>Light yellow</td>
</tr>
<tr>
<td>OSHA/HCS status</td>
<td>This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).</td>
</tr>
<tr>
<td>Emergency overview</td>
<td>WARNING!</td>
</tr>
<tr>
<td></td>
<td>CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED.</td>
</tr>
<tr>
<td></td>
<td>Do not breathe vapor or mist. Do not ingest. Do not get in eyes or on skin or clothing. Use only with adequate ventilation. Keep container tightly closed and sealed until ready for use. Wash thoroughly after handling.</td>
</tr>
</tbody>
</table>

See toxicological information (Section 11)

GENERAL INFORMATION : Read the entire MSDS for a more thorough evaluation of the hazards.

3. Composition/information on ingredients

<table>
<thead>
<tr>
<th>Name</th>
<th>CAS number</th>
<th>%</th>
</tr>
</thead>
<tbody>
<tr>
<td>Polyamide resin</td>
<td>68082-29-1</td>
<td>60 - 100</td>
</tr>
<tr>
<td>N(3-dimethylaminopropyl)-1,3-propylenediamine</td>
<td>10563-29-8</td>
<td>7 - 13</td>
</tr>
</tbody>
</table>
4. First aid measures

Eye contact: Check for and remove any contact lenses. Immediately flush eyes with plenty of water for at least 15 minutes, occasionally lifting the upper and lower eyelids. Get medical attention immediately.

Skin contact: In case of contact, immediately flush skin with plenty of water for at least 15 minutes while removing contaminated clothing and shoes. Wash clothing before reuse. Clean shoes thoroughly before reuse. Get medical attention immediately.

Inhalation: Move exposed person to fresh air. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. Loosen tight clothing such as a collar, tie, belt or waistband. Get medical attention immediately.

Ingestion: Wash out mouth with water. Do not induce vomiting unless directed to do so by medical personnel. Never give anything by mouth to an unconscious person. Get medical attention immediately.

Notes to physician: No specific treatment. Treat symptomatically. Call medical doctor or poison control center immediately if large quantities have been ingested.

5. Fire-fighting measures

Flash point: Closed cup: 110°C (230°F) [DIN 51758 EN 22719 (Pensky-Martens Closed Cup)]
Hazardous thermal decomposition products: Decomposition products may include the following materials:
  - carbon dioxide
  - carbon monoxide
  - nitrogen oxides

Extinguishing media

Suitable: Use an extinguishing agent suitable for the surrounding fire.
Not suitable: None known.
Special exposure hazards: Promptly isolate the scene by removing all persons from the vicinity of the incident if there is a fire. No action shall be taken involving any personal risk or without suitable training.

Special protective equipment for fire-fighters: Fire-fighters should wear appropriate protective equipment and self-contained breathing apparatus (SCBA) with a full face-piece operated in positive pressure mode.

6. Accidental release measures

Personal precautions: No action shall be taken involving any personal risk or without suitable training. Evacuate surrounding areas. Keep unnecessary and unprotected personnel from entering. Do not touch or walk through spilled material. Avoid breathing vapor or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment (see Section 8).

Environmental precautions: Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers. Inform the relevant authorities if the product has caused environmental pollution (sewers, waterways, soil or air).

Methods for cleaning up: Stop leak if without risk. Move containers from spill area. Approach release from upwind. Prevent entry into sewers, water courses, basements or confined areas. Wash spillages into an effluent treatment plant or proceed as follows. Contain and collect spillage with non-combustible, absorbent material e.g. sand, earth, vermiculite or diatomaceous earth and place in container for disposal according to local regulations (see section 13). Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilled product. Note: see section 1 for emergency contact information and section 13 for waste disposal.
7. Handling and storage

Handling: Put on appropriate personal protective equipment (see Section 8). Eating, drinking and smoking should be prohibited in areas where this material is handled, stored and processed. Workers should wash hands and face before eating, drinking and smoking. Remove contaminated clothing and protective equipment before entering eating areas. Persons with a history of skin sensitization problems should not be employed in any process in which this product is used. Do not get in eyes or on skin or clothing. Do not ingest. Avoid breathing vapor or mist. Use only with adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Keep in the original container or an approved alternative made from a compatible material, kept tightly closed when not in use. Keep away from acids. Empty containers retain product residue and can be hazardous. Do not reuse container.

Storage: Store between the following temperatures: 2 to 40°C (35.6 to 104°F). Store in accordance with local regulations. Store in original container protected from direct sunlight in a dry, cool and well-ventilated area, away from incompatible materials (see section 10) and food and drink. Separate from acids. Keep container tightly closed and sealed until ready for use. Containers that have been opened must be carefully resealed and kept upright to prevent leakage. Do not store in unlabeled containers. Use appropriate containment to avoid environmental contamination.

8. Exposure controls/personal protection

Consult local authorities for acceptable exposure limits.

Recommended monitoring procedures: If this product contains ingredients with exposure limits, personal, workplace atmosphere or biological monitoring may be required to determine the effectiveness of the ventilation or other control measures and/or the necessity to use respiratory protective equipment.

Engineering measures: Use only with adequate ventilation. If user operations generate dust, fumes, gas, vapor or mist, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure to airborne contaminants below any recommended or statutory limits.

Hygiene measures: Wash hands, forearms and face thoroughly after handling chemical products, before eating, smoking and using the lavatory and at the end of the working period. Appropriate techniques should be used to remove potentially contaminated clothing. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reusing. Ensure that eyewash stations and safety showers are close to the workstation location.

Personal protection

Respiratory: In case of inadequate ventilation wear respiratory protection. Respirator selection must be based on known or anticipated exposure levels, the hazards of the product and the safe working limits of the selected respirator.

Hands: Chemical-resistant, impervious gloves complying with an approved standard should be worn at all times when handling chemical products if a risk assessment indicates this is necessary. >8 hours (breakthrough time): butyl rubber, Ethyl Vinyl Alcohol Laminate (EVAL)

Eyes: Safety eyewear complying with an approved standard should be used when a risk assessment indicates this is necessary to avoid exposure to liquid splashes, mists or dusts.

Skin: Personal protective equipment for the body should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.

Environmental exposure controls: Emissions from ventilation or work process equipment should be checked to ensure they comply with the requirements of environmental protection legislation. In some cases, fume scrubbers, filters or engineering modifications to the process equipment will be necessary to reduce emissions to acceptable levels.

6/7/2012. 00067060

Distributed By
Freeman Manufacturing & Supply Co.
www.freemansupply.com  800-321-8511
9. Physical and chemical properties

General information
Appearance
Physical state : Liquid.
Color : Light yellow
Odor : Slight

Important health, safety and environmental information
pH : 12 [Conc. (% w/w): 50%]
Boiling/condensation point : >200°C (>392°F)
Melting/freezing point : Not available.
Flash point : Closed cup: 110°C (230°F) [DIN 51758 EN 22719 (Pensky-Martens Closed Cup)]
Flammable limits : Not available.
Auto-ignition temperature : Not available.
Decomposition temperature : >200°C (>392°F)
Vapor pressure : 0.004 kPa (0.03 mm Hg) [20°C]
Specific gravity : Not available.
Water solubility : practically insoluble
Partition coefficient: n-octanol/water (log Kow) : Not available.
Viscosity : Dynamic: 20000 to 35000 mPa·s (20000 to 35000 cP)
Density : 0.95 g/cm³ [25°C (77°F)]
Vapor density : Not available.
Evaporation rate (butyl acetate = 1) : Not available.
VOC : Not available.

10. Stability and reactivity

Chemical stability : The product is stable.
Under normal conditions of storage and use, hazardous reactions will not occur.

Hazardous polymerization : Under normal conditions of storage and use, hazardous polymerization will not occur.
Conditions to avoid : No specific data.
Materials to avoid : strong acids, strong bases, strong oxidising agents
Hazardous decomposition products : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

11. Toxicological information

Potential acute health effects
Inhalation : Irritating to respiratory system.
Ingestion : Harmful if swallowed.
Skin : Harmful in contact with skin. Irritating to skin. May cause sensitization by skin contact.
Eyes : Irritating to eyes.

Acute toxicity
Product/ingredient name
Result
Species
Dose
Exposure

6/7/2012.
11. Toxicological information

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>LD50 Dermal</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N(3-dimethylaminopropyl)-1,3-propylenediamine</td>
<td>Rabbit</td>
<td>1310 mg/kg</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Irritation/Corrosion

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Result</th>
<th>Species</th>
<th>Score</th>
<th>Exposure</th>
<th>Observation</th>
</tr>
</thead>
<tbody>
<tr>
<td>N(3-dimethylaminopropyl)-1,3-propylenediamine</td>
<td>Skin - Corrosive</td>
<td>Rabbit</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

Skin: N(3-dimethylaminopropyl)-1,3-propylenediamine: Corrosive to the skin.

Sensitizer

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Route of exposure</th>
<th>Species</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>N(3-dimethylaminopropyl)-1,3-propylenediamine</td>
<td>skin</td>
<td>Guinea pig</td>
<td>Sensitizing</td>
</tr>
</tbody>
</table>

Mutagenicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Experiment</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td>N(3-dimethylaminopropyl)-1,3-propylenediamine</td>
<td>-</td>
<td>Experiment: In vitro Subject: Bacteria</td>
<td>Negative</td>
</tr>
</tbody>
</table>

Potential chronic health effects

Chronic effects: Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

Target organs: No known significant effects or critical hazards.

Carcinogenicity: No known significant effects or critical hazards.

Mutagenicity: No known significant effects or critical hazards.

Teratogenicity: No known significant effects or critical hazards.

Fertility effects: No known significant effects or critical hazards.

Developmental effects: No known significant effects or critical hazards.

Medical conditions aggravated by over-exposure

Pre-existing skin disorders may be aggravated by over-exposure to this product.

12. Ecological information

Environmental effects: No known significant effects or critical hazards.

Aquatic ecotoxicity

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Result</th>
<th>Species</th>
<th>Exposure</th>
</tr>
</thead>
<tbody>
<tr>
<td>N(3-dimethylaminopropyl)-1,3-propylenediamine</td>
<td>OECD 202 Daphnia sp. Acute Immobilisation Test</td>
<td>Acute EC50 9.2 mg/L</td>
<td>Daphnia</td>
<td>48 hours</td>
</tr>
<tr>
<td></td>
<td>OECD 201 Alga, Growth Inhibition Test</td>
<td>Acute ErC50 (growth rate) 21 mg/L</td>
<td>Algae</td>
<td>72 hours</td>
</tr>
</tbody>
</table>

Biodegradability

<table>
<thead>
<tr>
<th>Product/ingredient name</th>
<th>Test</th>
<th>Result</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

6/7/2012.
12. Ecological information

**N(3-dimethylaminopropyl)-1,3-propylenediamine**

- **ISO ISO 7827, 1984 - Evaluation in an aqueous medium of the ultimate aerobic biodegradability of organic compounds**: 100% - Readily - 28 days
- **Potential Bioaccumulative potential**: Low
- **Other ecological information**
  - **Biological Oxygen Demand (BOD 5 DAY)**: Not Determined
  - **Chemical Oxygen Demand (COD)**: Not Determined

**Bioaccumulative potential**

- **Product/ingredient name**: N(3-dimethylaminopropyl)-1,3-propylenediamine
- **Aquatic half-life**: -
- **Photolysis**: -
- **Biodegradability**: Readily

**Other adverse effects**

- **N(3-dimethylaminopropyl)-1,3-propylenediamine**: No known significant effects or critical hazards.

**PBT**

- **Not applicable.**

13. Disposal considerations

**Waste disposal**

- The generation of waste should be avoided or minimized wherever possible. Significant quantities of waste product residues should not be disposed of via the foul sewer but processed in a suitable effluent treatment plant. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

14. Transport information

**Proper shipping name**

- **DOT**: Not regulated.
- **TDG**: Not regulated.
- **IMDG**: Not regulated.
- **IATA**: Not regulated.
## 14. Transport Information

<table>
<thead>
<tr>
<th>Regulatory Information</th>
<th>UN number</th>
<th>Classes</th>
<th>PG*</th>
<th>Label</th>
<th>Additional information</th>
</tr>
</thead>
<tbody>
<tr>
<td>DOT Classification</td>
<td>Not regulated.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>TDG Classification</td>
<td>Not regulated.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IMDG Class</td>
<td>Not regulated.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>IATA-DGR Class</td>
<td>Not regulated.</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
</tr>
</tbody>
</table>

PG*: Packing group

## 15. Regulatory Information

### U.S. Federal regulations

- **HCS Classification**: Irritating material, Sensitizing material
- **U.S. Federal regulations**: United States inventory (TSCA 8b): All components are listed or exempted.
- **TSCA 5(a)2 final significant new use rule (SNUR)**: None.
- **TSCA 5(e) substance consent order**: None.
- **TSCA 12(b) one-time export notification**: None.
- **TSCA 12(b) annual export notification**: None.
- **SARA 302/304/311/312 extremely hazardous substances**: SARA 302/304/311/312 extremely hazardous substances: No Ingredient Listed
- **SARA 311/312 hazard identification**: SARA 311/312 MSDS distribution - chemical inventory - hazard identification: No Ingredient Listed
- **Clean Air Act Section 111 - Volatile Organic Compounds (VOC)**: Not available.
- **Clean Air Act Section 112(b) Hazardous Air Pollutants (HAPs)**: Product name: No Ingredients Listed.
- **Clean Air Act - Ozone Depleting Substances (ODS)**: This product does not contain nor is it manufactured with ozone depleting substances.
- **SARA 313**: No ingredients listed.

**CERCLA: Hazardous substances**: No ingredients listed.
15. Regulatory information

STATE REGULATIONS:

PENNSYLVANIA - RTK: None of the components are listed.

California Prop 65: This product contains no listed substances known to the State of California to cause cancer, birth defects or other reproductive harm, at levels which would require a warning under the statute.

Canada
WHMIS (Canada): Class D-2B: Material causing other toxic effects (Toxic).
CEPA DSL: All components are listed or exempted.

This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.

International lists:
Australia inventory (AICS): All components are listed or exempted.
China inventory (IECSC): All components are listed or exempted.
Japan inventory: At least one component is not listed.
Korea inventory: All components are listed or exempted.
New Zealand Inventory of Chemicals (NZIoC): All components are listed or exempted.
Philippines inventory (PICCS): All components are listed or exempted.

16. Other information

Label requirements:

CAUSES RESPIRATORY TRACT, EYE AND SKIN IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF ABSORBED THROUGH SKIN OR IF SWALLOWED.

Hazardous Material Information System (U.S.A.):

<table>
<thead>
<tr>
<th>Health</th>
<th>Flammability</th>
<th>Physical hazards</th>
<th>Personal protection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>1</td>
<td>0</td>
<td>0</td>
</tr>
</tbody>
</table>

The customer is responsible for determining the PPE code for this material.

National Fire Protection Association (U.S.A.):

Flammability: 1
Health: 2
Instability: 0
Special: 0

Date of printing: 6/7/2012.
Date of issue: 6/7/2012.
Date of previous issue: No previous validation.
Version: 1

Indicates information that has changed from previously issued version.

Notice to reader
16. Other information

While the information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

IN ALL CASES, IT IS THE RESPONSIBILITY OF THE USER TO DETERMINE THE APPLICABILITY OF SUCH INFORMATION AND RECOMMENDATIONS AND THE SUITABILITY OF ANY PRODUCT FOR ITS OWN PARTICULAR PURPOSE.

THE PRODUCT MAY PRESENT HAZARDS AND SHOULD BE USED WITH CAUTION. WHILE CERTAIN HAZARDS ARE DESCRIBED IN THIS PUBLICATION, NO GUARANTEE IS MADE THAT THESE ARE THE ONLY HAZARDS THAT EXIST.

Hazards, toxicity and behaviour of the products may differ when used with other materials and are dependent upon the manufacturing circumstances or other processes. Such hazards, toxicity and behaviour should be determined by the user and made known to handlers, processors and end users.

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