

# Material Safety Data Sheet

## ARALDITE® 2011 HO US

### 1. Product and company identification

**Product name** : ARALDITE® 2011 HO US  
**Material uses** : Hardener for adhesive systems  
**MSDS #** : 00066412  
**Validation date** : 8/22/2013.  
**Supplier/Manufacturer** : Huntsman Advanced Materials Americas LLC  
P.O. Box 4980  
The Woodlands, TX 77387  
  
Non-Emergency phone: (800) 257-5547  
  
E-Mail: MSDS@huntsman.com

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

### 2. Hazards identification

**Physical state** : Liquid.  
**Odor** : Slight  
**Color** : Light yellow  
  
**OSHA/HCS status** : This material is considered hazardous by the OSHA Hazard Communication Standard (29 CFR 1910.1200).  
**Emergency overview** : DANGER!  
CAUSES EYE AND SKIN BURNS. HARMFUL IF ABSORBED THROUGH SKIN.  
CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.  
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.

See toxicological information (Section 11)

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

### 3. Composition/information on ingredients

<b>Name</b>	<b>CAS number</b>	<b>%</b>
FATTY ACIDS, C18-UNSATD., DIMERS, POLYMERS WITH TRIETHYLENETETRAMINE	103758-99-2	60 - 100
Dimethyl Dipropyl Triamine	10563-29-8	7 - 13
Triethylenetetramine	112-24-3	3 - 7

## 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** : Symptomatic and supportive therapy as needed. Following severe exposure medical follow-up should be monitored for at least 48 hours.

## 5 . Fire-fighting measures

- Flash point** : Closed cup: >93.33°C (>200°F)
- 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. Do not breathe 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 breathe vapor or mist. Do not ingest. 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. Empty containers retain product residue and can be hazardous. Do not reuse container.
- Storage** : 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. 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. Reference should be made to appropriate monitoring standards. Reference to national guidance documents for methods for the determination of hazardous substances will also be required.
- 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. Considering the parameters specified by the glove manufacturer, check during use that the gloves are still retaining their protective properties. It should be noted that the time to breakthrough for any glove material may be different for different glove manufacturers. In the case of mixtures, consisting of several substances, the protection time of the gloves cannot be accurately estimated.
- 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. If contact is possible, the following protection should be worn, unless the assessment indicates a higher degree of protection: chemical splash goggles and/or face shield. If inhalation hazards exist, a full-face respirator may be required instead.
- 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.

## 8 . Exposure controls/personal protection

**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.

## 9 . Physical and chemical properties

### Appearance

**Physical state** : Liquid.  
**Color** : Light yellow  
**Odor** : Slight  
**pH** : Not available.  
**Boiling/condensation point** : Not available.  
**Melting/freezing point** : Not available.  
**Flash point** : Closed cup: >93.33°C (>200°F)  
**Flammable limits** : Not available.  
**Auto-ignition temperature** : Not available.  
**Vapor pressure** : Not available.  
**Specific gravity** : Not available.  
**Water solubility** : practically insoluble  
**Partition coefficient: n-octanol/water (log Kow)** : Not available.  
**Density** : 0.95 g/cm³ [-3.89°C (25°F)]  
**Vapor density** : Not available.  
**Evaporation rate (butyl acetate = 1)** : 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.

**Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.

## 11 . Toxicological information

### Acute toxicity

Product/ingredient name	Test	Endpoint	Species	Result
Dimethyl Dipropyl Triamine	-	LD50 Dermal	Rabbit	1310 mg/kg
Triethylenetetramine	-	LD50 Oral	Rat	1670 mg/kg
	OECD 402 Acute Dermal Toxicity	LD50 Dermal	Rabbit - Male, Female	1465.4 mg/kg
	OECD 401 Acute Oral Toxicity	LD50 Oral	Rat - Male, Female	1716.2 mg/kg

### Irritation/Corrosion

## 11 . Toxicological information

Product/ingredient name	Test	Species	Result
Dimethyl Dipropyl Triamine Triethylenetetramine	- OECD 405 Acute Eye Irritation/ Corrosion OECD 404 Acute Dermal Irritation/ Corrosion	Rabbit Rabbit  Rabbit	Skin - Corrosive Skin - Corrosive  Eyes - Corrosive
ARALDITE 2011 HO US	-	Other	Skin - Corrosive

### Conclusion/ Summary

**Skin** : Corrosive to the skin.

### Sensitizer

Product/ingredient name	Test	Route of exposure	Species	Result
Dimethyl Dipropyl Triamine Triethylenetetramine	- OECD 406 Skin Sensitization	skin skin	Guinea pig Guinea pig	Sensitizing Sensitizing

### Mutagenicity

Product/ingredient name	Test	Result
Dimethyl Dipropyl Triamine  Triethylenetetramine	Experiment: In vitro Subject: Bacteria Experiment: In vitro Subject: Mammalian-Animal Experiment: In vivo Subject: Mammalian-Animal	Negative  Negative  Negative

**Conclusion/  
Summary** : Triethylenetetramine The weight of the scientific evidence indicates that this material is non-genotoxic.

### Carcinogenicity

Product/ingredient name	Test	Species	Dose	Exposure	Result/Result type
Triethylenetetramine	OECD 451 Carcinogenicity Studies	Mouse - Male	42 mg/kg	3 days per week	Negative - Dermal - NOAEL

### Reproductive toxicity

**Conclusion/  
Summary** : Triethylenetetramine In accordance with column 2 of Annex VII - X of Regulation (EC) No 1907/2006, the test for this property of the substance does not need to be conducted.

### Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
Triethylenetetramine	OECD 414 Prenatal Developmental Toxicity Study OECD 414 Prenatal Developmental Toxicity Study	Rat  Rabbit	Negative - Oral  Negative - Dermal

## 11 . Toxicological information

### Potential acute health effects

- Inhalation** : Irritating to respiratory system.
- Ingestion** : Harmful if swallowed. May cause burns to mouth, throat and stomach.
- Skin contact** : Corrosive to the skin. Causes burns. Toxic in contact with skin. May cause sensitization by skin contact.
- Eye contact** : Corrosive to eyes. Causes burns.

### Potential chronic health effects

Product/ingredient name	Test	Endpoint	Species	Result
Triethylenetetramine	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Sub-chronic NOAEL Oral	Rat - Male, Female	50 mg/kg/d

- General** : Contains material that may cause target organ damage, based on animal data. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- Target organs** : Contains material which may cause damage to the following organs: kidneys, lungs, liver.
- Carcinogenicity** : No known significant effects or critical hazards.
- Mutagenicity** : No known significant effects or critical hazards.
- Teratogenicity** : No known significant effects or critical hazards.
- Developmental effects** : No known significant effects or critical hazards.
- Fertility effects** : No known significant effects or critical hazards.

### Medical conditions aggravated by over-exposure

Pre-existing skin disorders and disorders involving any other target organs mentioned in this MSDS as being at risk may be aggravated by over-exposure to this product.

## 12 . Ecological information

- Environmental effects** : No known significant effects or critical hazards.

### Aquatic ecotoxicity

Product/ingredient name	Test	Endpoint		Exposure	Species	Result	
Dimethyl Dipropyl Triamine	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test	Acute	EC50	48 hours	Daphnia	9.2	mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute	ErC50 (growth rate)	72 hours	Algae	21	mg/l
Triethylenetetramine	No official guidelines	Acute	EC50	30 minutes Static	Bacteria	800	mg/l
	EU EC C.2 Acute Toxicity for <i>Daphnia</i>	Acute	EC50	48 hours Static	Daphnia	31.1	mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute	ErC50 (growth rate)	72 hours Semi-static	Algae	20	mg/l

## 12 . Ecological information

	EPA OPPTS EPA OTS 797.1400 No official guidelines	Acute	LC50	96 hours	Fish	330	mg/l
		Chronic	EC10	Static 30 minutes	Bacteria	42.5	mg/l
	OECD OECD 202: Part II (Daphnia sp., Reproduction Test	Chronic	EC10	Static 21 days	Daphnia	1.9	mg/l
	OECD 201 Alga, Growth Inhibition Test	Chronic	NOEC	Semi-static 72 hours	Algae	<2.5	mg/l

### Persistence and degradability

Product/ingredient name	Test	Period	Result
Dimethyl Dipropyl Triamine	ISO ISO 7827, 1984 - Evaluation in an aqueous medium of the ultimate aerobic biodegradability of organic compounds	28 days	100 %
Triethylenetetramine	OECD 302A Inherent Biodegradability: Modified SCAS Test	84 days	20 %
	OECD 301D Ready Biodegradability - Closed Bottle Test	162 days	0 %

**Conclusion/Summary** : Triethylenetetramine Not biodegradable

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
Dimethyl Dipropyl Triamine	-	-	Readily

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
Dimethyl Dipropyl Triamine	0.5	-	low
Triethylenetetramine	-2.65	-	low

**Other adverse effects** : No known significant effects or critical hazards.

### Other ecological information

**BOD5** : Not Determined

**COD** : Not Determined

**TOC** : Not Determined

## 13 . Disposal considerations





**Waste disposal** : The generation of waste should be avoided or minimized wherever possible. 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. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. 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** : Polyamines, liquid, corrosive, n.o.s. (DIMETHYL DIPROPYL TRIAMINE)  
**TDG** : Polyamines, liquid, corrosive, n.o.s. (DIMETHYL DIPROPYL TRIAMINE)  
**IMDG** : Polyamines, liquid, corrosive, n.o.s. (DIMETHYL DIPROPYL TRIAMINE)  
**IATA** : Polyamines, liquid, corrosive, n.o.s. (DIMETHYL DIPROPYL TRIAMINE)

Regulatory information	UN number	Classes	PG*	Label	Additional information
<b>DOT Classification</b>	UN2735	8	III		-
<b>TDG Classification</b>	UN2735	8	III		-
<b>IMDG Class</b>	UN2735	8	III		<b>Emergency schedules (EmS)</b> F-A, S-B
<b>IATA-DGR Class</b>	UN2735	8	III		<b>Passenger and Cargo Aircraft</b> Quantity limitation: 5 L Packaging instructions: 852 <b>Cargo Aircraft Only</b> Quantity limitation: 60 L Packaging instructions: 856

PG\* : Packing group

## 15 . Regulatory information

### United States

**HCS Classification** : Toxic material  
Corrosive material  
Sensitizing material  
Target organ effects

### U.S. Federal regulations

**TSCA 8(b) inventory** : **United States inventory (TSCA 8b)**: All components are listed or exempted.  
**TSCA 5(a)2 final significant new use rule (SNUR)** : No ingredients listed.

**TSCA 5(e) substance consent order** : No ingredients listed.

**TSCA 12(b) export notification** : No ingredients listed.



## 15 . Regulatory information

**SARA 311/312** : Immediate (acute) health hazard  
Delayed (chronic) health hazard

**Clean Air Act Section 112 (b) Hazardous Air Pollutants (HAPs)** : 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.

### State regulations

**PENNSYLVANIA - RTK** : Triethylenetetramine

**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.

### International regulations

#### **Canada**

**WHMIS (Canada)** : Class D-2B: Material causing other toxic effects (Toxic).  
Class E: Corrosive material

**CEPA DSL** : At least one component is not listed.

**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**: Not determined.  
**Korea inventory**: At least one component is not listed.  
**Malaysia Inventory (EHS Register)**: Not determined.  
**New Zealand Inventory of Chemicals (NZIoC)**: At least one component is not listed.  
**Philippines inventory (PICCS)**: At least one component is not listed.  
**Taiwan inventory (CSNN)**: Not determined.

## 16 . Other information

**Label requirements** : CAUSES EYE AND SKIN BURNS. HARMFUL IF ABSORBED THROUGH SKIN. CAUSES RESPIRATORY TRACT IRRITATION. MAY CAUSE ALLERGIC SKIN REACTION. MAY BE HARMFUL IF SWALLOWED. CONTAINS MATERIAL THAT MAY CAUSE TARGET ORGAN DAMAGE, BASED ON ANIMAL DATA.

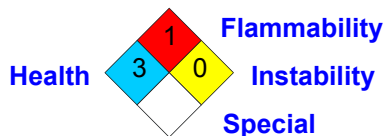
**Hazardous Material Information System (U.S.A.)** :

Health	*	3
Flammability		1
Physical hazards		0
Personal protection		

## 16 . Other information

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

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



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Indicates information that has changed from previously issued version.

### Notice to reader

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**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.**

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