

# ROOF PA100 (Part A)

## SAFETY DATA SHEET ACCORDING TO USA FEDERAL HAZCOM 012

### 1. IDENTIFICATION

#### 1.1. Product Identifier

Code:

A-ROOF-A

Product name

**ROOF PA100 (Part A)**

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use

*High-build aspartic polyurea Base A for water & thermal insulation,  
Liquid Applied Membrane (LAM) applications.  
For professional use only.*

#### 1.3. Details of the supplier of the safety data sheet

Name

Armus LLC

Full address

137 Grand Street 3rd Floor  
New York, NY 10013

Country

United States  
Tel. (+1) 917-957-5383

E-mail address of the competent person responsible for the Safety Data Sheet

bill@armussolutions.com

#### 1.4. Emergency telephone number

For urgent inquiries refer to

Tel. (+1) 917-957-5383 United States

### 2. HAZARDS IDENTIFICATION

#### 2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200). The product thus requires a safety datasheet.

Any additional information concerning the risks for health and/or the environment is given in sections 11 and 12 of this sheet.

Classification and Hazard Statement

**Skin sensitization, category 1**

May cause an allergic skin reaction.

Hazard pictograms:



Signal words: **WARNING**

Hazard statements:

**H317**

May cause an allergic skin reaction.

**Precautionary statements:****Prevention:**

<b>P261</b>	Avoid breathing fumes, mist, or spray.
<b>P280</b>	Wear protective gloves.
<b>P272</b>	Contaminated work clothing should not be allowed out of the workplace.

**Response:**

<b>P333+P313</b>	If skin irritation or rash occurs: Seek medical advice / attention immediately.
<b>P302+P352</b>	IF ON SKIN: Wash with plenty of water.
<b>P363</b>	Wash contaminated clothing before reuse.

**Storage:****Disposal:**

<b>P501</b>	Dispose of contents or container according to local/national/international regulations
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**2.2 Other hazards**

This product is classified as hazardous for the environment pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP).

Classification and Hazard Statement

**Hazardous to the aquatic environment, chronic toxicity, category 3** Harmful to aquatic life with long-lasting effects.

**Hazard statements:**

**H412** Harmful to aquatic life with long-lasting effects.

**Precautionary statements:****Prevention:**

<b>P273</b>	Avoid release into the environment.
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**Response:****Storage:****Disposal:**

<b>P501</b>	Dispose of contents or container according to local/national/international regulations
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### 3. COMPOSITION / INFORMATION ON INGREDIENTS

**3.1. Components**

<i>Chemical Name</i>	<i>CAS-No</i>	<i>EC</i>	<i>INDEX</i>	<i>Conc. %</i>	<i>Classification</i>
Aspartic Acid, N,N'-[methylenebis(2-methyl-4.1-cyclohexanediy)] bis-, 1.1',4.4'-tetraethyl ester	136210-32-7	412-060-9	607-350-00-9	27 < x < 29	Skin sensitization, category 1 H317, Hazardous to the aquatic environment, chronic toxicity, category 3 H412
Aspartic Ester	152637-10-0	---	---	17 < x < 18	Skin sensitization, category 1B H317, Hazardous to the aquatic environment, chronic toxicity, category 3 H412

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Aspartic Acid, N.N'-(methylenedi-4.1-cyclohexanediy) bis-, 1.1',4.4'-tetraethyl ester	136210-30-5	429-270-1	607-521-00-8	11 < x < 12	Skin sensitization, category 1 H317, Hazardous to the aquatic environment, chronic toxicity, category 3 H412
Fumaric acid diethyl ester	623-91-6	210-819-7	---	1 < x < 1.5	Acute toxicity, category 4 H302, Skin irritation, category 2 H315, Specific target organ toxicity - single exposure, category 3 H335, Skin sensitization, category 1 H317

The full wording of hazard (H) phrases is given in section 16 of the sheet.

## 4. FIRST-AID MEASURES

### 4.1. Description of first aid measures

#### GENERAL ADVICE:

Move out of work / application area.  
Consult a physician.  
Show this material safety data sheet to the doctor in attendance.

#### EYES:

Remove contact lenses.  
Keep eyes wide open while rinsing.  
In the case of contact with eyes, rinse immediately with plenty of water and seek medical attention.  
Continue rinsing eyes during transport to medical facility or for at least 30-60 minutes.

#### SKIN:

Take off contaminated clothing and shoes immediately.  
Wash immediately with plenty of water.  
If irritation persists, seek medical advice/attention.  
Wash contaminated clothing before using it again.

#### INHALATION:

Move to fresh air.  
In the event of breathing difficulties, seek medical advice/attention immediately.

#### INGESTION:

Seek medical advice / attention immediately.  
Do not induce vomiting without medical advice.  
Never give anything by mouth to an unconscious person, unless authorized by a doctor.

### 4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product is unknown.

### 4.3. Indication of any immediate medical attention and special treatment needed

Not applicable based on available information.

## 5. FIRE-FIGHTING MEASURES

### 5.1. Extinguishing media

#### *Suitable extinguishing equipment*

The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder, and water spray.

#### *Unsuitable extinguishing equipment*

None in particular.

### 5.2. Special hazards arising from the substance or mixture

#### *Specific hazards during fire fighting*

Do not breathe combustion products.

### 5.3. Advice for firefighters

#### *General information*

Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health.  
Always wear full fire prevention gear.  
Collect extinguishing water to prevent it from draining into the sewer system.  
Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

#### *Special protective equipment for firefighters*

Normal firefighting clothing i.e., fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1. Personal precautions, protective equipment, and emergency procedures

Block the leakage.

Wear suitable protective equipment (including personal protective equipment referred to under section 8 of the safety data sheet) to prevent any contamination of skin, eyes, and clothing.

These indications apply for both product users and those involved in emergency procedures.

### 6.2. Environmental precautions

The product must not enter the sewer system or come into contact with surface water or groundwater.

### 6.3. Methods and material for containment and cleaning up

Collect the leaked product.

Absorb spilled product with inert absorbent material.

Make sure the leakage site is well-aired.

Contaminated material should be disposed of in compliance with the provisions set forth in section 13.

### 6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

## 7. HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet.

Do not eat, drink, or smoke during use.

Remove any contaminated clothes and personal protective equipment before entering places in which people eat.

This product must not enter the sewer system or come into contact with surface water or groundwater.

### 7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container.

Store the containers sealed, in a well-ventilated place, away from direct sunlight.

### 7.3. Specific end use(s)

Refer to section 1.2

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1. Control parameters

Not applicable.

### 8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well-aired through effective local ventilation. Personal protective equipment must comply with current regulations.

#### *Hand Protection*

Protect hands with category III work gloves (OSHA 29 CFR 1910.138).  
The following should be considered when choosing work glove material:  
compatibility, degradation, failure time and permeability.

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The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable.  
The gloves' wear time depends on the duration and type of use.

<i>Skin Protection</i>	Wear category I professional long-sleeved overalls and safety footwear. Wash body with soap and water after removing protective clothing.
<i>Eye Protection</i>	Wear airtight protective goggles (OSHA 29 CFR 1910.133).
<i>Respiratory Protection</i>	If the threshold value (e.g., TLV-TWA) is exceeded for the substance or one of the substances present in the product, wear a mask with a NIOSH certified filter, whose class must be chosen according to the limit of use concentration (NIOSH 42 CFR 84, OSHA 29 CFR 1910.134). In the presence of gases or vapors of various kinds and/or gases or vapors containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required. Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited. If the substance considered is odorless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus or external air-intake breathing apparatus. For a correct choice of respiratory protection device, see standard NIOSH 42 CFR 84, OSHA 29 CFR 1910.134.
<i>Environmental Exposure Controls</i>	This product must not enter the sewer system or come into contact with surface water or groundwater.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

Appearance	Liquid
Color	White
Odor	Light
pH	Not applicable
Flash point	> 199.4°F (93°C)
Initial boiling point	> 176°F (80°C)
Density	1.08 g/cm <sup>3</sup> (67.42 lb/ft <sup>3</sup> )
Solubility	Xylene, N-butyl acetate
Auto-ignition temperature	> 842°F (450°C)
Viscosity	> 1700 cP @ 68°F (20°C)
Explosive properties	None
Oxidizing properties	None

## 10. STABILITY AND REACTIVITY

### 10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

### 10.2. Chemical stability

The product is stable in normal conditions of use and storage.

### 10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

### 10.4. Conditions to avoid

None in particular. However, the usual precautions used for chemical products should be respected.

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### 10.5. Incompatible materials

None based on available information.

### 10.6. Hazardous decomposition products

None based on available information.

## 11. TOXICOLOGICAL INFORMATION

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification. It is therefore necessary to take into account the concentration of the individual substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

### 11.1. Information on toxicological effects

#### Metabolism, toxicokinetics, mechanism of action and other information

Not classified based on available information.

#### Information on likely routes of exposure

Not classified based on available information.

#### Delayed and immediate effects as well as chronic effects from short and long-term exposure

Not classified based on available information.

#### Interactive effects

Not classified based on available information.

#### Acute toxicity

<b>Aspartic Acid, N.N'-(methylenedi-4.1-cyclohexanediyl) bis-, 1.1',4.4'-tetraethyl ester</b>	LD50 (Oral (Rat)) > 2000 mg/kg LD50 (Dermal (Rat)) > 2000 mg/kg
<b>Fumaric acid diethyl ester</b>	LD50 (Oral (Rat)) 1367 mg/kg
<b>Aspartic Acid, N.N'-[methylenebis(2-methyl-4,1-cyclohexanediyl)] bis-, 1.1',4.4'-tetraethyl ester</b>	LD50 (Oral (Rat)) > 2000 mg/kg LD50 (Dermal (Rat)) > 2000 mg/kg
<b>Aspartic Ester</b>	LD50 (Oral (Rat)) > 2000 mg/kg LD50 (Dermal (Rat)) > 2000 mg/kg

#### Skin corrosion / irritation

Not classified based on available information.

#### Serious eye damage / irritation

Not classified based on available information.

#### Respiratory or skin sensitization

Sensitizing for the skin.

#### Germ cell mutagenicity

Not classified based on available information.

#### Carcinogenicity

Not classified based on available information.

#### Reproductive toxicity

Not classified based on available information.

#### STOT – single exposure

Not classified based on available information.

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STOT – repeated exposure

Not classified based on available information.

Aspiration toxicity / hazard

Not classified based on available information.

## 12. ECOLOGICAL INFORMATION

This product is dangerous for the environment and is toxic for aquatic organisms. In the long term, it has negative effects on aquatic environment.

### 12.1. Toxicity

#### **Aspartic Acid, N.N'-(methylenedi-4.1-cyclohexanediyl) bis-, 1.1',4.4'-tetraethyl ester**

Toxicity to fish	LC50: 66mg/liter Exposure time: 96 h
Toxicity Crustacea	EC50: 88.6 mg/liter Exposure time: 48 h

#### **Aspartic Acid, N.N'-[methylenebis(2-methyl-4,1-cyclohexanediyl)] bis-, 1.1',4.4'-tetraethyl ester**

Toxicity to fish	LC50 (Danio rerio): 66mg/liter Exposure time: 96 h
Toxicity Crustacea	EC50 (Daphnia magna): 88.6 mg/liter Exposure time: 48 h

#### **Aspartic Ester**

Toxicity to fish	LC50 (Danio rerio): 66mg/liter Exposure time: 96 h
Toxicity Crustacea	EC50 (Daphnia magna): > 100 mg/liter Exposure time: 48 h

### 12.2. Persistence and degradability

#### **Aspartic Ester**

Degradability	NOT rapidly degradable
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### 12.3. Bioaccumulative potential

None based on available information.

### 12.4. Mobility in soil

None based on available information.

### 12.5. Results of PBT and vPvB assessment

On the basis of available data, the product does not contain any Persistent, Bioaccumulative and Toxic (PBT) or very Persistent and very Bio-accumulative (vPvB) in percentages greater than 0.1%.

## 13. DISPOSAL CONSIDERATIONS

### Disposal methods

<i>Waste from residues</i>	Reuse, when possible. Unused product should be considered special non-hazardous waste. Disposal must be performed through an authorized waste management firm, in compliance with local, national, and international regulations.
<i>Contaminated Packaging</i>	Contaminated packaging must be recovered or disposed of in compliance with all waste management regulations.

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## 14. TRANSPORTATION INFORMATION

This product is not dangerous under current provisions of the Code of International Carriage of Dangerous Goods by Road (ADR) and by Road (RID) of the International Maritime Dangerous Codes Code (IMDG), and of the International Air Transport Association (IATA) regulations.

## 15. REGULATORY INFORMATION

### U.S. Federal Regulations

<i>TSCA</i>	All components of this product are listed on US Toxic Substances Control Act (TSCA) Inventory considered as "existing" chemical substances in U.S. commerce.
<i>Clean Air Act Sections 112(b), including 602 Class I Substances, 602 Class II Substances</i>	This product, in compliance to the Act, does not contain any substances regulated as pollutants.
<i>Clean Water Act Priority or/and Toxic Pollutants</i>	This product, in compliance to the Act, does not contain any substances regulated as pollutants.
<i>DEA List I Chemicals (Precursor Chemicals) and List II Chemicals (Essential Chemicals)</i>	No component(s) listed; in compliance with the List.
<i>EPA List of Lists 313 Category Code:</i>	No component(s) listed; in compliance with the List.
<i>EPCRA 302 EHS TPQ</i>	No component(s) listed; in compliance with the List.
<i>CERCLA RQ</i>	No component(s) listed; in compliance with the List.
<i>EPCRA 313 TRI</i>	No component(s) listed; in compliance with the List.
<i>RCRA Code</i>	No component(s) listed; in compliance with the List.
<i>CAA 112 (r) TMP TQ</i>	No component(s) listed; in compliance with the List.

### State Regulations

Massachusetts / Minnesota / New Jersey / New York / Pennsylvania / California  
No component(s) listed; in compliance with the List.

### CA Proposition 65:

This product does not contain any substances known to the State of California to cause cancer, reproductive harm or birth defects.

## 16. OTHER INFORMATION

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

<b>H302</b>	Harmful if swallowed.
<b>H315</b>	Causes skin irritation.
<b>H335</b>	May cause respiratory irritation.
<b>H317</b>	May cause an allergic skin reaction.
<b>H412</b>	Harmful to aquatic life with long-lasting effects.

### LEGEND:

313 CATEGORY CODE	Emergency Planning and Community Right-to Know Act Section 313 Category Code
ADR	European Agreement concerning the carriage of Dangerous goods by Road
CAA 112 (r) RMP TQ	Risk Management Plan Threshold Quantity (Clean Air Act Section 112(R))
CAS NUMBER	Chemical Abstract Service Number
CE50	Effective concentration (required to induce a 50% effect)
CERCLA RQ	Reportable Quantity (Comprehensive Environment Response, Compensation, and Liability Act)

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CLP	EC Regulation 1272/2008
DEA	Drug Enforcement Administration
EmS	Emergency Schedule
EPA	US Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPCRA 302 EHS TPQ	Extremely Hazardous Substance Threshold Planning Quantity (Section 302 Category Code)
EPCRA 304 EHS RQ	Extremely Hazardous Substance Reportable Quantity (Section 304 Category Code)
EPCRA 313 TRI	Toxics Release Inventory (Section 313 Category Code)
GHS	Globally Harmonized System of classification and labeling of chemicals
IATA DGR	International Air Transport Association Dangerous Goods Regulation
IC50	Immobilization Concentration 50%
IMDG	International Maritime Code for dangerous goods
IMO	International Maritime Organization
LC50	Lethal Concentration 50%
LD50	Lethal Dose 50%
OEL	Occupational Exposure Level
PEL	Predicted Exposure Level
RCRA Code	Resource Conservation and Recovery Act Code
REL	Recommended Exposure Limit
RID	Regulation concerning the international transport of dangerous goods by train
TLV	Threshold Limit Value
TLV CEILING	Concentration that should not be exceeded during any time of occupational exposure.
TSCA	Toxic Substances Control Act
TWA STEL	Short-term Exposure Limit
TWA	Time-weighted Average Exposure Limit
VOC	Volatile Organic Compounds
WHMIS	Workplace Hazardous Materials Information System

#### GENERAL BIBLIOGRAPHY:

- GHS rev. 3
- The Merck Index. 10th Edition
- Handling Chemical Safety
- Niosh - Registry of Toxic Effects of Chemical Substances
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy
- 6 NYCRR part 597
- Cal/OSHA website
- California Safe Drinking Water and Toxic Enforcement Act
- EPA website
- Hazard Communication Standard (HCS 2012)
- IARC website
- List Of Lists EPA: Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112® of the Clean Air Act
- Massachusetts 105 CMR Department of public health 670.000: "Right to Know"
- Minnesota Chapter 5206 Department of Labor and Industry Hazardous Substances, Employee "Right to Know".
- New Jersey Worker and Community Right to know Act N.J.S.A.
- NTP. 2011. Report on Carcinogens, 12th Edition.
- OSHA website
- Pennsylvania, Hazardous Substance List, Chapter 323

#### NOTE FOR USERS:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Purchasers must provide product users with adequate training on how to use chemical products.

ARMUS MAKES NO WARRANTIES EXPRESS OR IMPLIED AND ASSUMES NO LIABILITY ARISING FROM THIS INFORMATION OR ITS USE. ARMUS SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR CONSEQUENTIAL

#### Safety Data Sheet

DAMAGES AND SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHT HELD BY OTHERS.

#### CALCULATION METHODS FOR CLASSIFICATION

Product classification derives from criteria established by the OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200), unless determined otherwise in Section 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

Changes to previous review:

The following sections were modified: 02 / 03 / 08 / 11 / 15.

# ROOF PA100 (Part B)

## SAFETY DATA SHEET ACCORDING TO USA FEDERAL HAZCOM 012

### 1. IDENTIFICATION

#### 1.1. Product Identifier

Code:

A-ROOF-B

Product name

**ROOF PA100 (Part B)**

#### 1.2. Relevant identified uses of the substance or mixture and uses advised against

Intended use

*High-build aspartic polyurea Hardener B for water & thermal insulation, Liquid Applied Membrane (LAM) applications. For professional use only.*

#### 1.3. Details of the supplier of the safety data sheet

Name

Armus LLC

Full address

137 Grand Street 3rd Floor  
New York, NY 10013

Country

United States

Tel. (+1) 917-957-5383

E-mail address of the competent person responsible for the Safety Data Sheet

bill@armussolutions.com

#### 1.4. Emergency telephone number

For urgent inquiries refer to

Tel. (+1) 917-957-5383 United States

### 2. HAZARDS IDENTIFICATION

#### 2.1. Classification of the substance or mixture

The product is classified as hazardous pursuant to the provisions set forth in OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200). The product thus requires a safety datasheet.

Any additional information concerning the risks for health and/or the environment is given in sections 11 and 12 of this sheet.

Classification and Hazard Statement

**Acute toxicity, category 4**

**Specific target organ toxicity – single exposure, category 3**

**Skin sensitization, category 1**

Harmful if inhaled.

May cause respiratory irritation

May cause an allergic skin reaction

Hazard pictograms:



Signal words:

**WARNING**

**Hazard statements:**

H332	Harmful if inhaled.
H335	May cause respiration irritation.
H317	May cause an allergic skin reaction.

**Precautionary statements:**

**Prevention:**

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P261	Avoid breathing fumes, mist, or spray.
P280	Wear protective gloves.
P271	Use only outdoors or in a well-ventilated area.
P272	Contaminated work clothing should not be allowed out of the workplace.

**Response:**

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P312	Call a POISON CONTROL CENTER / seek medical attention if you feel unwell
P333+P313	If skin irritation or rash occurs: Seek medical advice / attention immediately.
P304+P340	IF INHALED: Move person to fresh air and keep comfortable.
P302+P352	IF ON SKIN: Wash with plenty of water.
P363	Wash contaminated clothing before reuse.

**Storage:**

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P403+P233	Store in a well-ventilated place. Keep container tightly closed.
P405	Store locked up

**Disposal:**

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P501	Dispose of contents or container according to local/national/international regulations
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**2.2 Other hazards**

This product is classified as hazardous for the environment pursuant to the provisions set forth in EC Regulation 1272/2008 (CLP).

Classification and Hazard Statement

**Hazardous to the aquatic environment, chronic toxicity, category 2**

Toxic to aquatic life with long-lasting effects.

Hazard pictograms:



**Hazard statements:**

H411	Toxic to aquatic life with long-lasting effects.
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**Precautionary statements:**

**Prevention:**

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P273	Avoid release into the environment.
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**Response:**

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P391	Collect spillage.
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**Storage:**

**Disposal:**

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P501	Dispose of contents or container according to local/national/international regulations
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**2.3 Additional hazards.**

Contains isocyanates. May produce an allergic reaction.

**Safety Data Sheet**

### 3. COMPOSITION / INFORMATION ON INGREDIENTS

#### 3.1. Components

<i>Chemical Name</i>	<i>CAS-No</i>	<i>EC</i>	<i>INDEX</i>	<i>Conc. %</i>	<i>Classification</i>
Hexamethylene-1.6-diisocyanate homopolymer	28182-81-2	500-060-2	---	74 < x < 76	Acute toxicity, category 4 H332, Specific target organ toxicity - single exposure, category 3 H335, Skin sensitization, category 1 H317
Aliphatic polyisocyanate 1	164250-92-4	642-404-2	---	17 < x < 18	Acute toxicity, category 4 H332, Specific target organ toxicity - single exposure, category 3 H335, Skin sensitization, category 1B H317, Hazardous to the aquatic environment, chronic toxicity, category 2 H411
Aliphatic polyisocyanate 2	29891-05-2	---	---	7.5 < x < 8.5	Acute toxicity, category 4 H332, Specific target organ toxicity - single exposure, category 3 H335, Skin sensitization, category 1B H317, Hazardous to the aquatic environment, chronic toxicity, category 2 H411
Aliphatic polyisocyanate 3	1809331-98-3	---	---	0.4 < x < 0.7	Acute toxicity, category 4 H332, Specific target organ toxicity - single exposure, category 3 H335, Skin sensitization, category 1 H317, Hazardous to the aquatic environment, chronic toxicity, category 2 H411

The full wording of hazard (H) phrases is given in section 16 of the sheet.

### 4. FIRST-AID MEASURES

#### 4.1. Description of first aid measures

<b>GENERAL ADVICE:</b>	Move out of work / application area. Consult a physician. Show this material safety data sheet to the doctor in attendance.
<b>EYES:</b>	Remove contact lenses. Keep eyes wide open while rinsing. In the case of contact with eyes, rinse immediately with plenty of water and seek medical attention. Continue rinsing eyes during transport to medical facility or for at least 30-60 minutes.
<b>SKIN:</b>	Take off contaminated clothing and shoes immediately. Wash immediately with plenty of water. If irritation persists, seek medical advice/attention. Wash contaminated clothing before using it again.
<b>INHALATION:</b>	Move to fresh air. In the event of breathing difficulties, seek medical advice/attention immediately.

**INGESTION:** Seek medical advice / attention immediately.  
Do not induce vomiting without medical advice.  
Never give anything by mouth to an unconscious person, unless authorized by a doctor.

#### 4.2. Most important symptoms and effects, both acute and delayed

Specific information on symptoms and effects caused by the product is unknown.

#### 4.3. Indication of any immediate medical attention and special treatment needed

Not applicable based on available information.

## 5. FIRE-FIGHTING MEASURES

### 5.1. Extinguishing media

*Suitable extinguishing equipment* The extinguishing equipment should be of the conventional kind: carbon dioxide, foam, powder, and water spray.

*Unsuitable extinguishing equipment* None in particular.

### 5.2. Special hazards arising from the substance or mixture

*Specific hazards during fire fighting* Do not breathe combustion products.

### 5.3. Advice for firefighters

*General information* Use jets of water to cool the containers to prevent product decomposition and the development of substances potentially hazardous for health.  
Always wear full fire prevention gear.  
Collect extinguishing water to prevent it from draining into the sewer system.  
Dispose of contaminated water used for extinction and the remains of the fire according to applicable regulations.

*Special protective equipment for fire-fighters* Normal firefighting clothing i.e., fire kit (BS EN 469), gloves (BS EN 659) and boots (HO specification A29 and A30) in combination with self-contained open circuit positive pressure compressed air breathing apparatus (BS EN 137).

## 6. ACCIDENTAL RELEASE MEASURES

### 6.1. Personal precautions, protective equipment, and emergency procedures

Block the leakage.

Wear suitable protective equipment (including personal protective equipment referred to under section 8 of the safety data sheet) to prevent any contamination of skin, eyes, and clothing.

These indications apply for both product users and those involved in emergency procedures.

### 6.2. Environmental precautions

The product must not enter the sewer system or come into contact with surface water or groundwater.

### 6.3. Methods and material for containment and cleaning up

Collect the leaked product.

Absorb spilled product with inert absorbent material.

Make sure the leakage site is well-aired.

Contaminated material should be disposed of in compliance with the provisions set forth in section 13.

### 6.4. Reference to other sections

Any information on personal protection and disposal is given in sections 8 and 13.

## 7. HANDLING AND STORAGE

### 7.1. Precautions for safe handling

Before handling the product, consult all the other sections of this material safety data sheet.  
Do not eat, drink, or smoke during use.

Remove any contaminated clothes and personal protective equipment before entering places in which people eat.  
This product must not enter the sewer system or come into contact with surface water or groundwater.

### 7.2. Conditions for safe storage, including any incompatibilities

Store only in the original container.  
Store the containers sealed, in a well-ventilated place, away from direct sunlight.

### 7.3. Specific end use(s)

Refer to section 1.2

## 8. EXPOSURE CONTROLS / PERSONAL PROTECTION

### 8.1. Control parameters

Not applicable.

### 8.2. Exposure controls

As the use of adequate technical equipment must always take priority over personal protective equipment, make sure that the workplace is well-aired through effective local ventilation. Personal protective equipment must comply with current regulations.

<i>Hand Protection</i>	Protect hands with category III work gloves (OSHA 29 CFR 1910.138). The following should be considered when choosing work glove material: compatibility, degradation, failure time and permeability. The work gloves' resistance to chemical agents should be checked before use, as it can be unpredictable. The gloves' wear time depends on the duration and type of use.
<i>Skin Protection</i>	Wear category I professional long-sleeved overalls and safety footwear. Wash body with soap and water after removing protective clothing.
<i>Eye Protection</i>	Wear airtight protective goggles (OSHA 29 CFR 1910.133).
<i>Respiratory Protection</i>	If the threshold value (e.g., TLV-TWA) is exceeded for the substance or one of the substances present in the product, wear a mask with a NIOSH certified filter, whose class must be chosen according to the limit of use concentration (NIOSH 42 CFR 84, OSHA 29 CFR 1910.134). In the presence of gases or vapors of various kinds and/or gases or vapors containing particulate (aerosol sprays, fumes, mists, etc.) combined filters are required. Respiratory protection devices must be used if the technical measures adopted are not suitable for restricting the worker's exposure to the threshold values considered. The protection provided by masks is in any case limited. If the substance considered is odorless or its olfactory threshold is higher than the corresponding TLV-TWA and in the case of an emergency, wear open-circuit compressed air breathing apparatus or external air-intake breathing apparatus. For a correct choice of respiratory protection device, see standard NIOSH 42 CFR 84, OSHA 29 CFR 1910.134.
<i>Environmental Exposure Controls</i>	This product must not enter the sewer system or come into contact with surface water or groundwater.

## 9. PHYSICAL AND CHEMICAL PROPERTIES

### 9.1. Information on basic physical and chemical properties

Appearance	Liquid solution
Color	Transparent

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Odor	Light
pH	Not applicable
Flash point	> 199.4°F (93°C)
Initial boiling point	< 176°F (80°C)
Density	1.08 g/cm <sup>3</sup> (67.42 lb/ft <sup>3</sup> )
Solubility	Xylene, N-butyl acetate
Auto-ignition temperature	> 842°F (450°C)
Viscosity	> 1500 cP @ 68°F (20°C)
Explosive properties	None
Oxidizing properties	None

## 10. STABILITY AND REACTIVITY

### 10.1. Reactivity

There are no particular risks of reaction with other substances in normal conditions of use.

### 10.2. Chemical stability

The product is stable in normal conditions of use and storage.

### 10.3. Possibility of hazardous reactions

No hazardous reactions are foreseeable in normal conditions of use and storage.

### 10.4. Conditions to avoid

None in particular. However, the usual precautions used for chemical products should be respected.

### 10.5. Incompatible materials

None based on available information.

### 10.6. Hazardous decomposition products

None based on available information.

## 11. TOXICOLOGICAL INFORMATION

In the absence of experimental data for the product itself, health hazards are evaluated according to the properties of the substances it contains, using the criteria specified in the applicable regulation for classification. It is therefore necessary to take into account the concentration of the individual substances indicated in section 3, to evaluate the toxicological effects of exposure to the product.

### 11.1. Information on toxicological effects

#### Metabolism, toxicokinetics, mechanism of action and other information

Not classified based on available information.

#### Information on likely routes of exposure

Not classified based on available information.

#### Delayed and immediate effects as well as chronic effects from short and long-term exposure

Not classified based on available information.

#### Interactive effects

Not classified based on available information.

#### Acute toxicity

##### **Hexamethylene-1.6-diisocyanate homopolymer**

LD50 (Oral (Rat)) > 5000 mg/kg  
 LD50 (Dermal (Rabbit)) > 2000 mg/kg  
 LC50 (Inhalation mists/powders (Rat)) 0.554 mg/liter  
 Exposure time: 4 h

##### **Aliphatic Polyisocyanate 1**

LD50 (Oral (Rat)) > 5000 mg/kg

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LD50 (Dermal (Rat)) > 2000 mg/kg  
LC50 (Inhalation mists/powders (Rat)) 0.351 mg/liter  
Exposure time: 4 h

#### **Aliphatic Polyisocyanate 2**

LD50 (Oral (Rat)) > 5000 mg/kg  
LD50 (Dermal (Rat)) > 2000 mg/kg  
LC50 (Inhalation mists/powders (Rat)) 0.351 mg/liter  
Exposure time: 4 h

#### **Aliphatic Polyisocyanate 3**

LD50 (Oral (Rat)) > 2000 mg/kg  
LD50 (Dermal (Rabbit)) > 2000 mg/kg  
LC50 (Inhalation mists/powders (Rat)) 0.351 mg/liter  
Exposure time: 4 h

#### Skin corrosion / irritation

Not classified based on available information.

#### Serious eye damage / irritation

Not classified based on available information.

#### Respiratory or skin sensitization

Sensitizing for the skin.

#### Germ cell mutagenicity

Not classified based on available information.

#### Carcinogenicity

Not classified based on available information.

#### Reproductive toxicity

Not classified based on available information.

#### STOT – single exposure

Not classified based on available information.

#### STOT – repeated exposure

Not classified based on available information.

#### Aspiration toxicity / hazard

Not classified based on available information.

## **12. ECOLOGICAL INFORMATION**

This product is dangerous for the environment and is toxic for aquatic organisms. In the long term, it has negative effects on aquatic environment.

### **12.1. Toxicity**

#### **Hexamethylene-1.6-diisocyanate homopolymer**

Toxicity to fish	LC50 (Danio rerio): > 100 mg/liter Exposure time: 96 h
Toxicity Crustacea	EC50 (Danio magna): > 100 mg/liter Exposure time: 48 h
Toxicity for Algae / Aquatic Plants	EC50 (Scenedesmus Subspicatus): > 50 mg/liter Exposure time: 72 h

#### **Aliphatic Polyisocyanate 1**

Toxicity to fish	LC50 (Danio rerio): 89 mg/liter Exposure time: 96 h
Toxicity Crustacea	EC50 (Daphnia magna): > 100 mg/liter Exposure time: 48 h

#### **Aliphatic Polyisocyanate 2**

#### **Safety Data Sheet**

Toxicity to fish	LC50 (Danio rerio): 89 mg/liter Exposure time: 96 h
Toxicity Crustacea	EC50 (Daphnia magna): > 100 mg/liter Exposure time: 48 h

#### **Aliphatic Polyisocyanate 3**

Toxicity to fish	LC50 (Danio rerio): 89 mg/liter Exposure time: 96 h
Toxicity Crustacea	EC50 (Daphnia magna): > 100 mg/liter Exposure time: 48 h

### **12.2. Persistence and degradability**

#### **Hexamethylene-1.6-diisocyanate**

##### **homopolymer**

Degradability NOT rapidly degradable

#### **Aliphatic Polyisocyanate 2**

Degradability NOT rapidly degradable

#### **Aliphatic Polyisocyanate 3**

Degradability NOT rapidly degradable

### **12.3. Bioaccumulative potential**

None based on available information.

### **12.4. Mobility in soil**

None based on available information.

### **12.5. Results of PBT and vPvB assessment**

On the basis of available data, the product does not contain any Persistent, Bioaccumulative and Toxic (PBT) or very Persistent and very Bio-accumulative (vPvB) in percentages greater than 0.1%.

## **13. DISPOSAL CONSIDERATIONS**

### **Disposal methods**

*Waste from residues* Reuse, when possible.  
Unused product should be considered special non-hazardous waste.  
Disposal must be performed through an authorized waste management firm, in compliance with local, national, and international regulations.

*Contaminated Packaging* Contaminated packaging must be recovered or disposed of in compliance with all waste management regulations.

## **14. TRANSPORTATION INFORMATION**

### **ADR/RID**

UN/ID No.	UN 3082 In accordance with Special Provision 375, this product, when is packed in receptacles of a capacity 5kg or 5L, is not submitted to ADR provisions.
Proper shipping name	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aliphatic Polyisocyanate 1; Aliphatic Polyisocyanate 2; Aliphatic Polyisocyanate 3)
Class	9
Packing Group	III
Labels	Label 9



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Environmental Hazards  
Environmental Labels

Environmentally Hazardous



HIN – Kemler: 90  
Limited Quantities: 5L  
Tunnel Restriction Code: None

### IMDG

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UN/ID No. UN 3082  
In accordance with Section 2.10.2.7 of IMDG Code, this product, when is packed in receptacles of a capacity 5kg or 5L, is not submitted to IMDG Code provisions.

Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aliphatic Polyisocyanate 1; Aliphatic Polyisocyanate 2; Aliphatic Polyisocyanate 3)

Class 9  
Packing Group III  
Labels Label 9

Environmental Hazards  
Environmental Labels

Marine Pollutant



EMS: F-A, S-F  
Limited Quantities: 5L  
Special Provisions:

### IATA

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UN/ID No. UN 3082  
In accordance with SP A197, this product, when is packed in receptacles of a capacity 5kg or 5L, is not submitted to IATA dangerous goods regulations.

Proper shipping name ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (Aliphatic Polyisocyanate 1; Aliphatic Polyisocyanate 2; Aliphatic Polyisocyanate 3)

Class 9  
Packing Group III  
Labels Label 9

Environmental Hazards  
Environmental Labels

Environmentally Hazardous



Packing instruction (cargo aircraft) Maximum Quantity: 450L, Packing instruction: 964  
Packing instruction (passenger aircraft) Maximum Quantity: 450L, Packing instruction: 964  
Special precautions for user: A97, A158, A197, A215

## 15. REGULATORY INFORMATION

### U.S. Federal Regulations

#### *TSCA*

All components of this product are listed on US Toxic Substances Control Act (TSCA) Inventory considered as "existing" chemical substances in U.S. commerce.

*Clean Air Act Sections 112(b), including 602 Class I Substances, 602 Class II Substances*

This product, in compliance to the Act, does not contain any substances regulated as pollutants.

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<i>Clean Water Act Priority or/and Toxic Pollutants</i>	This product, in compliance to the Act, does not contain any substances regulated as pollutants.
<i>DEA List I Chemicals (Precursor Chemicals) and List II Chemicals (Essential Chemicals) EPA List of Lists 313 Category Code:</i>	No component(s) listed; in compliance with the List.
<i>EPCRA 302 EHS TPQ</i>	No component(s) listed; in compliance with the List.
<i>CERCLA RQ</i>	No component(s) listed; in compliance with the List.
<i>EPCRA 313 TRI</i>	No component(s) listed; in compliance with the List.
<i>RCRA Code</i>	No component(s) listed; in compliance with the List.
<i>CAA 112 (r) TMP TQ</i>	No component(s) listed; in compliance with the List.

#### State Regulations

Massachusetts / Minnesota / New Jersey / New York / Pennsylvania / California  
No component(s) listed; in compliance with the List.

#### CA Proposition 65:

This product does not contain any substances known to the State of California to cause cancer, reproductive harm or birth defects.

## 16. OTHER INFORMATION

Text of hazard (H) indications mentioned in section 2-3 of the sheet:

<b>H332</b>	Harmful if inhaled.
<b>H335</b>	May cause respiratory irritation.
<b>H317</b>	May cause an allergic skin reaction.
<b>H411</b>	Toxic to aquatic life with long-lasting effects.

#### LEGEND:

313 CATEGORY CODE	Emergency Planning and Community Right-to Know Act Section 313 Category Code
ADR	European Agreement concerning the carriage of Dangerous goods by Road
CAA 112 (r) RMP TQ	Risk Management Plan Threshold Quantity (Clean Air Act Section 112(R))
CAS NUMBER	Chemical Abstract Service Number
CE50	Effective concentration (required to induce a 50% effect)
CERCLA RQ	Reportable Quantity (Comprehensive Environment Response, Compensation, and Liability Act)
CLP	EC Regulation 1272/2008
DEA	Drug Enforcement Administration
EmS	Emergency Schedule
EPA	US Environmental Protection Agency
EPCRA	Emergency Planning and Community Right-to-Know Act
EPCRA 302 EHS TPQ	Extremely Hazardous Substance Threshold Planning Quantity (Section 302 Category Code)
EPCRA 304 EHS RQ	Extremely Hazardous Substance Reportable Quantity (Section 304 Category Code)
EPCRA 313 TRI	Toxics Release Inventory (Section 313 Category Code)
GHS	Globally Harmonized System of classification and labeling of chemicals
IATA DGR	International Air Transport Association Dangerous Goods Regulation
IC50	Immobilization Concentration 50%
IMDG	International Maritime Code for dangerous goods
IMO	International Maritime Organization
LC50	Lethal Concentration 50%
LD50	Lethal Dose 50%
OEL	Occupational Exposure Level
PEL	Predicted Exposure Level
RCRA Code	Resource Conservation and Recovery Act Code
REL	Recommended Exposure Limit
RID	Regulation concerning the international transport of dangerous goods by train

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TLV	Threshold Limit Value
TLV CEILING	Concentration that should not be exceeded during any time of occupational exposure.
TSCA	Toxic Substances Control Act
TWA STEL	Short-term Exposure Limit
TWA	Time-weighted Average Exposure Limit
VOC	Volatile Organic Compounds
WHMIS	Workplace Hazardous Materials Information System

#### GENERAL BIBLIOGRAPHY:

- GHS rev. 3
- The Merck Index. 10th Edition
- Handling Chemical Safety
- Niosh - Registry of Toxic Effects of Chemical Substances
- INRS - Fiche Toxicologique (toxicological sheet)
- Patty - Industrial Hygiene and Toxicology
- N.I. Sax - Dangerous properties of Industrial Materials-7, 1989 Edition
- ECHA website
- Database of SDS models for chemicals - Ministry of Health and ISS (Istituto Superiore di Sanità) - Italy
- 6 NYCRR part 597
- Cal/OSHA website
- California Safe Drinking Water and Toxic Enforcement Act
- EPA website
- Hazard Communication Standard (HCS 2012)
- IARC website
- List Of Lists EPA: Consolidated List of Chemicals Subject to EPCRA, CERCLA and Section 112® of the Clean Air Act
- Massachusetts 105 CMR Department of public health 670.000: "Right to Know"
- Minnesota Chapter 5206 Department of Labor and Industry Hazardous Substances, Employee "Right to Know".
- New Jersey Worker and Community Right to know Act N.J.S.A.
- NTP. 2011. Report on Carcinogens, 12th Edition.
- OSHA website
- Pennsylvania, Hazardous Substance List, Chapter 323

#### NOTE FOR USERS:

The information contained in the present sheet are based on our own knowledge on the date of the last version. Users must verify the suitability and thoroughness of provided information according to each specific use of the product.

This document must not be regarded as a guarantee on any specific product property.

The use of this product is not subject to our direct control; therefore, users must, under their own responsibility, comply with the current health and safety laws and regulations. The producer is relieved from any liability arising from improper uses.

Purchasers must provide product users with adequate training on how to use chemical products.

ARMUS MAKES NO WARRANTIES EXPRESS OR IMPLIED AND ASSUMES NO LIABILITY ARISING FROM THIS INFORMATION OR ITS USE. ARMUS SHALL NOT BE LIABLE UNDER ANY LEGAL THEORY FOR CONSEQUENTIAL DAMAGES AND SHALL NOT BE RESPONSIBLE FOR THE USE OF THIS PRODUCT IN A MANNER TO INFRINGE ON ANY PATENT OR ANY OTHER INTELLECTUAL PROPERTY RIGHT HELD BY OTHERS.

#### CALCULATION METHODS FOR CLASSIFICATION

Product classification derives from criteria established by the OSHA Hazard Communication Standard (HCS) (29 CFR 1910.1200), unless determined otherwise in Section 11 and 12.

The data for evaluation of chemical-physical properties are reported in section 9.

#### Changes to previous review:

The following sections were modified: 02 / 03 / 08 / 11 / 15.