

SAFETY DATA SHEET

ARALDITE® STANDARD G HARDENER

SECTION 1: Identification of the substance/mixture and of the company/undertaking

1.1 Product identifier

Product name : ARALDITE® STANDARD G HARDENER
Registration number : Not available.
Product code : 00087389
Product description :
Other means of identification : Not available.

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

Product use : Hardener for adhesive systems

1.3 Details of the supplier of the safety data sheet

Supplier : EVOCHEM S.A.
Tzaverdella Place
133 41 PHILI , ATTICA - GREECE
Phone.: 0030 210 5590460 , 0030 210 5590155 -
Fax: 0030 210 6254737 , 0030 210 5590244

e-mail address of person responsible for this SDS : info@evochem.gr; vmergoupis@evochem.gr;
sales@evochem.gr
www.evochem.gr

1.4 Emergency telephone number : National Poisoning Center 2107793777

SECTION 2: Hazards identification

2.1 Classification of the substance or mixture

Product definition : Mixture

Classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

Eye Dam. 1, H318
Skin Sens. 1, H317
Aquatic Chronic 2, H411

Ingredients of unknown toxicity :

Ingredients of unknown ecotoxicity :

Classification according to Directive 1999/45/EC [DPD]

The product is classified as dangerous according to Directive 1999/45/EC and its amendments.

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SECTION 2: Hazards identification

| | |
|-------------------------------|---|
| Classification | : Xi; R41 R43 N; R51/53 |
| Human health hazards | : Risk of serious damage to eyes. May cause sensitisation by skin contact. |
| Environmental hazards | : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment. |
| Additional information | : According to Directive 99/45/EC, Article 6, Paragraph 1b, classification derived from direct toxicological testing of the preparation take precedence over classification derived from using the conventional (calculation) method. |

See Section 16 for the full text of the R phrases or H statements declared above.

See Section 11 for more detailed information on health effects and symptoms.

2.2 Label elements**Hazard pictograms**

Signal word : Danger

Hazard statements : Causes serious eye damage.
May cause an allergic skin reaction.
Toxic to aquatic life with long lasting effects.

Precautionary statements

| | |
|------------------------------------|---|
| General | : Read label before use. Keep out of reach of children. If medical advice is needed, have product container or label at hand. |
| Prevention | : Wear protective gloves: > 8 hours (breakthrough time): butyl rubber, Ethyl Vinyl Alcohol Laminated (EVAL). Wear eye or face protection. Avoid release to the environment. |
| Response | : IF IN EYES: Rinse cautiously with water for several minutes. Immediately call a POISON CENTER or physician. |
| Storage | : Not applicable. |
| Disposal | : Dispose of contents and container in accordance with all local, regional, national and international regulations. |
| Hazardous ingredients | : fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine |
| Supplemental label elements | : Not applicable. |

Special packaging requirements

| | |
|--|-------------------|
| Containers to be fitted with child-resistant fastenings | : Not applicable. |
| Tactile warning of danger | : Not applicable. |

2.3 Other hazards

Other hazards which do not result in classification : None known.

| | | | |
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SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

| Product/ingredient name | Identifiers | % | Classification | | Type |
|---|---|-------|--|---|------|
| | | | 67/548/EEC | Regulation (EC) No. 1272/2008 [CLP] | |
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | CAS: 68154-62-1 EC: 614-339-2 RRN: 01-2119972322-40 | 30-60 | Xi; R41, R38 R43 N; R51/53 | Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1A, H317 | [1] |
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | CAS: 68154-62-1 EC: Polymer | 30-60 | Xi; R41, R38 R43 R52/53 | Aquatic Chronic 2, H411 Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 3, H412 | [1] |
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | CAS: 90640-66-7 EC: 292-587-7 RRN: 01-2119487290-37 | 3-7 | Xn; R21/22 C; R34 R43 N; R51/53 See Section 16 for the full text of the R-phrases declared above. | Acute Tox. 4, H302 Acute Tox. 4, H312 Skin Corr. 1B, H314 Eye Dam. 1, H318 Skin Sens. 1, H317 Aquatic Chronic 2, H411 See Section 16 for the full text of the H statements declared above. | [1] |

Type

- [1] Substance classified with a health or environmental hazard
- [2] Substance with a workplace exposure limit
- [3] Substance meets the criteria for PBT according to Regulation (EC) No. 1907/2006, Annex XIII
- [4] Substance meets the criteria for vPvB according to Regulation (EC) No. 1907/2006, Annex XIII
- [5] Substance of equivalent concern

Other means of identification

| REACH Product name | CAS no. | Other | CAS no. |
|--|------------|-------|----------|
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | 90640-66-7 | | 112-57-2 |

SECTION 4: First aid measures

4.1 Description of first aid measures

- Eye contact** : Get medical attention immediately. Call a poison center or physician. Immediately flush eyes with plenty of water, occasionally lifting the upper and lower eyelids. Check for and remove any contact lenses. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician.
- Inhalation** : Get medical attention immediately. Call a poison center or physician. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. If not breathing, if breathing is irregular or if respiratory arrest occurs, provide artificial respiration or oxygen by trained personnel. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband. In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under

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SECTION 4: First aid measures

medical surveillance for 48 hours.

- Skin contact** : Get medical attention immediately. Call a poison center or physician. Wash with plenty of soap and water. Remove contaminated clothing and shoes. Wash contaminated clothing thoroughly with water before removing it, or wear gloves. Continue to rinse for at least 10 minutes. Chemical burns must be treated promptly by a physician. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.
- Ingestion** : Get medical attention immediately. Call a poison center or physician. Wash out mouth with water. Remove dentures if any. Remove victim to fresh air and keep at rest in a position comfortable for breathing. If material has been swallowed and the exposed person is conscious, give small quantities of water to drink. Stop if the exposed person feels sick as vomiting may be dangerous. Do not induce vomiting unless directed to do so by medical personnel. If vomiting occurs, the head should be kept low so that vomit does not enter the lungs. Chemical burns must be treated promptly by a physician. Never give anything by mouth to an unconscious person. If unconscious, place in recovery position and get medical attention immediately. Maintain an open airway. Loosen tight clothing such as a collar, tie, belt or waistband.
- Protection of first-aiders** : No action shall be taken involving any personal risk or without suitable training. If it is suspected that fumes are still present, the rescuer should wear an appropriate mask or self-contained breathing apparatus. It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation. Wash contaminated clothing thoroughly with water before removing it, or wear gloves.

4.2 Most important symptoms and effects, both acute and delayed

Potential acute health effects

- Eye contact** : Causes serious eye damage.
- Inhalation** : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- Skin contact** : May cause an allergic skin reaction.
- Ingestion** : May cause burns to mouth, throat and stomach.

Over-exposure signs/symptoms

- Eye contact** : Adverse symptoms may include the following:
 pain
 watering
 redness
- Inhalation** : No specific data.
- Skin contact** : Adverse symptoms may include the following:
 pain or irritation
 redness
 blistering may occur
- Ingestion** : Adverse symptoms may include the following:
 stomach pains

4.3 Indication of any immediate medical attention and special treatment needed

- Notes to physician** : In case of inhalation of decomposition products in a fire, symptoms may be delayed. The exposed person may need to be kept under medical surveillance for 48 hours.
- Specific treatments** : Symptomatic treatment and supportive therapy as indicated. Following severe exposure the patient should be kept under medical review for at least 48 hours.

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SECTION 5: Firefighting measures**5.1 Extinguishing media**

Suitable extinguishing media : Use an extinguishing agent suitable for the surrounding fire.

Unsuitable extinguishing media : None known.

5.2 Special hazards arising from the substance or mixture

Hazards from the substance or mixture : In a fire or if heated, a pressure increase will occur and the container may burst. This material is toxic to aquatic life with long lasting effects. Fire water contaminated with this material must be contained and prevented from being discharged to any waterway, sewer or drain.

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
nitrogen oxides

5.3 Advice for firefighters

Special precautions for fire-fighters : 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. Clothing for fire-fighters (including helmets, protective boots and gloves) conforming to European standard EN 469 will provide a basic level of protection for chemical incidents.

SECTION 6: Accidental release measures**6.1 Personal precautions, protective equipment and emergency procedures**

For non-emergency personnel : 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 spilt material. Do not breathe vapour or mist. Provide adequate ventilation. Wear appropriate respirator when ventilation is inadequate. Put on appropriate personal protective equipment.

For emergency responders : If specialised clothing is required to deal with the spillage, take note of any information in Section 8 on suitable and unsuitable materials. See also the information in "For non-emergency personnel".

6.2 Environmental precautions

: Avoid dispersal of spilt 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). Water polluting material. May be harmful to the environment if released in large quantities. Collect spillage.

6.3 Methods and material for containment and cleaning up

Small spill : Stop leak if without risk. Move containers from spill area. Dilute with water and mop up if water-soluble. Alternatively, or if water-insoluble, absorb with an inert dry material and place in an appropriate waste disposal container. Dispose of via a licensed waste disposal contractor.

Large spill : Stop leak if without risk. Move containers from spill area. Approach the 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. Dispose of via a licensed waste disposal contractor. Contaminated absorbent material may pose the same hazard as the spilt product.

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SECTION 6: Accidental release measures

6.4 Reference to other sections : See Section 1 for emergency contact information.
See Section 8 for information on appropriate personal protective equipment.
See Section 13 for additional waste treatment information.

SECTION 7: Handling and storage

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

7.1 Precautions for safe handling

- Protective measures** : Put on appropriate personal protective equipment (see Section 8). 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 vapour or mist. Do not ingest. Avoid release to the environment. If during normal use the material presents a respiratory hazard, use only with adequate ventilation or wear appropriate respirator. 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.
- Advice on general occupational hygiene** : 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. See also Section 8 for additional information on hygiene measures.

7.2 Conditions for safe storage, including any incompatibilities

- : 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. Store locked up. 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 unlabelled containers. Use appropriate containment to avoid environmental contamination.

**Storage hazard class
Huntsman Advanced
Materials**

- : Storage class 10, Environmentally hazardous liquids

7.3 Specific end use(s)

- Recommendations** : Not available.
Industrial sector specific solutions : Not available.

SECTION 8: Exposure controls/personal protection

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

8.1 Control parameters**Occupational exposure limits**

No exposure limit value known.

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SECTION 8: Exposure controls/personal protection

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 monitoring standards, such as the following: European Standard EN 689 (Workplace atmospheres - Guidance for the assessment of exposure by inhalation to chemical agents for comparison with limit values and measurement strategy) European Standard EN 14042 (Workplace atmospheres - Guide for the application and use of procedures for the assessment of exposure to chemical and biological agents) European Standard EN 482 (Workplace atmospheres - General requirements for the performance of procedures for the measurement of chemical agents) Reference to national guidance documents for methods for the determination of hazardous substances will also be required.

Derived effect levels

| Product/ingredient name | Type | Exposure | Value | Population | Effects |
|---|------|-----------------------|--------------------------|------------|----------|
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | DNEL | Long term Inhalation | 3.9 mg/m ³ | Workers | Systemic |
| | DNEL | Long term Dermal | 1.1 mg/kg bw/day | Workers | Systemic |
| | DNEL | Long term Inhalation | 0.97 mg/m ³ | Consumers | Systemic |
| | DNEL | Long term Dermal | 0.56 mg/kg bw/day | Consumers | Systemic |
| | DNEL | Long term Oral | 0.56 mg/kg bw/day | Consumers | Systemic |
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | DNEL | Short term Inhalation | 6940 mg/m ³ | Workers | Systemic |
| | DNEL | Long term Dermal | 0.74 mg/kg bw/day | Workers | Systemic |
| | DNEL | Long term Inhalation | 1.29 mg/m ³ | Workers | Systemic |
| | DNEL | Long term Dermal | 0.036 mg/cm ² | Workers | Local |
| | DNEL | Short term Dermal | 10 mg/kg bw/day | Consumers | Systemic |
| | DNEL | Short term Inhalation | 2071 mg/m ³ | Consumers | Systemic |
| | DNEL | Short term Oral | 26 mg/kg bw/day | Consumers | Systemic |
| | DNEL | Short term Dermal | 1.29 mg/cm ² | Consumers | Local |
| | DNEL | Long term Dermal | 0.32 mg/kg bw/day | Consumers | Systemic |
| | DNEL | Long term Inhalation | 0.38 mg/m ³ | Consumers | Systemic |
| | DNEL | Long term Oral | 0.53 mg/kg bw/day | Consumers | Systemic |
| | DNEL | Long term Dermal | 0.56 mg/cm ² | Consumers | Local |

Predicted effect concentrations

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SECTION 8: Exposure controls/personal protection

| Product/ingredient name | Type | Compartment Detail | Value | Method Detail |
|---|------|------------------------|--------------|--------------------------|
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | PNEC | Fresh water | 0.00243 mg/l | Assessment Factors |
| | PNEC | Marine | 0.00024 mg/l | Assessment Factors |
| | PNEC | PNECintermittent | 0.0243 mg/l | Assessment Factors |
| | PNEC | Fresh water sediment | 243 mg/kg | Equilibrium Partitioning |
| | PNEC | Marine water sediment | 24.3 mg/kg | Equilibrium Partitioning |
| | PNEC | Sewage Treatment Plant | 4.21 mg/l | Assessment Factors |
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | PNEC | Soil | 48.6 mg/kg | Equilibrium Partitioning |
| | PNEC | Secondary Poisoning | 0.23 mg/kg | Assessment Factors |
| | PNEC | Fresh water | 0.0068 mg/l | Assessment Factors |
| | PNEC | Marine | 0.0068 mg/l | Assessment Factors |
| | PNEC | PNECintermittent | 0.068 mg/l | Assessment Factors |
| | PNEC | Fresh water sediment | 0.341 mg/kg | Equilibrium Partitioning |
| | PNEC | Marine water sediment | 0.746 mg/kg | Equilibrium Partitioning |
| | PNEC | Soil | 0.274 mg/kg | Equilibrium Partitioning |
| | PNEC | Sewage Treatment Plant | 4.6 mg/l | Assessment Factors |

8.2 Exposure controls

Appropriate engineering controls : If user operations generate dust, fumes, gas, vapour 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.

Individual protection measures

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.

Eye/face protection : 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, gases 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 protection

Hand protection : 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.

Material of gloves for long term application (BTT>480min): : butyl rubber, Ethyl Vinyl Alcohol Laminate (EVAL)

Material of gloves for short term/splash application (10min <BTT<480min): : nitrile rubber

(BTT = Break Through Time)

Use gloves approved to relevant standards e.g. EN 374 (Europe), F739 (US). Suitability and durability of a glove is dependent on usage, e.g. frequency and duration of contact, chemical resistance of glove material and dexterity. Always seek advice from glove suppliers. Additional information can be found for instance at www.gisbau.de.

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SECTION 8: Exposure controls/personal protection

- Body protection** : 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.
- Other skin protection** : Appropriate footwear and any additional skin protection measures should be selected based on the task being performed and the risks involved and should be approved by a specialist before handling this product.
- Respiratory protection** : Recommended: Respiratory protection, filter A 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.
- 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.

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance

- Physical state** : Liquid.
- Colour** : Yellowish.
- Odour** : Amine-like.
- Odour threshold** : Not available.
- pH** : Not available.
- Melting point/freezing point** : Not available.
- Initial boiling point and boiling range** : Not available.
- Flash point** : Closed cup: >150°C [DIN 51758 EN 22719 (Pensky-Martens Closed Cup)]
- Evaporation rate** : Not available.
- Flammability (solid, gas)** : Not available.
- Burning time** : Not applicable.
- Burning rate** : Not applicable.
- Upper/lower flammability or explosive limits** : Not available.
- Vapour pressure** : Not available.
- Vapour density** : Not available.
- Relative density** : Not available.
- Solubility(ies)**
- Water solubility** : Insoluble
- Partition coefficient: n-octanol/water (LogK_{ow})** : Not available.
- Auto-ignition temperature** : Not available.
- Decomposition temperature** : Not available.
- Viscosity** : Dynamic (25°C): 25000 - 30000 mPa·s
Kinematic: Not available.
Kinematic (40°C): Not available.
- Explosive properties** : Not available.
- Oxidising properties** : Not available.

9.2 Other information

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SECTION 9: Physical and chemical properties

Density : 0.97 g/cm³ [25°C (77°F)]

SECTION 10: Stability and reactivity

- 10.1 Reactivity** : No specific test data related to reactivity available for this product or its ingredients.
- 10.2 Chemical stability** : The product is stable.
- 10.3 Possibility of hazardous reactions** : Under normal conditions of storage and use, hazardous reactions will not occur.
- 10.4 Conditions to avoid** : No specific data.
- 10.5 Incompatible materials** : strong acids, strong bases, strong oxidising agents
- 10.6 Hazardous decomposition products** : Under normal conditions of storage and use, hazardous decomposition products should not be produced.
 Decomposition products may include the following materials: Carbon oxides, Nitrogen oxides, Burning produces obnoxious and toxic fumes.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

| Product/ingredient name | Endpoint | Species | Result | Exposure |
|---|-------------|-----------------------|--------------|----------|
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | LD50 Dermal | Rat - Male, Female | >2000 mg/kg | - |
| | LD50 Oral | Rat - Female | >2000 mg/kg | - |
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | LD50 Dermal | Rabbit - Male, Female | 1260 mg/kg | - |
| | LD50 Oral | Rat - Male, Female | 1716.2 mg/kg | - |
| | LD50 Oral | Rat - Male | 3250 mg/kg | - |

Conclusion/Summary : No additional information.

Acute toxicity estimates

Not available.

Irritation/Corrosion

| Product/ingredient name | Test | Species | Route of exposure | Result |
|---|---|------------------|-------------------|-----------------|
| ARALDITE STANDARD G HARDENER fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | OECD 404 Acute Dermal Irritation/Corrosion | Rabbit | Skin | Mild irritant |
| | OECD 405 Acute Eye Irritation/Corrosion | Rabbit | Eyes | Corrosive |
| | OECD OECD 431 In Vitro Skin Corrosion: Human Skin Model Test | Human skin model | Skin | Non-corrosive |
| | OECD 405 Acute Eye Irritation/Corrosion | Rabbit | Eyes | Severe irritant |
| | OECD Bovine Corneal Opacity and Permeability Test Method for Identifying Ocular Corrosives and Severe Irritants | Other | Eyes | Non-corrosive |

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| Amines, polyethylenepoly-, tetraethylenepentamine fraction | OECD OECD 439- In Vitro Skin Irritation - Reconstructed Human Epidermis Test Method | Human skin model | Skin | Irritant |
| | OECD 404 Acute Dermal Irritation/Corrosion | Rabbit | Skin | Corrosive |
| | Unknown guidelines | Rabbit | Eyes | Corrosive |

Conclusion/Summary

Skin : ARALDITE® STANDARD G HARDENER
 fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine
 Amines, polyethylenepoly-, tetraethylenepentamine fraction
 Non-irritating to the skin.
 Irritating to skin.
 Corrosive to the skin.

Eyes : ARALDITE® STANDARD G HARDENER
 fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine
 Amines, polyethylenepoly-, tetraethylenepentamine fraction
 Corrosive to eyes.
 Non-corrosive
 Corrosive to eyes.

Respiratory : No additional information.

Sensitiser

| Product/ingredient name | Test | Route of exposure | Species | Result |
|---|---|-------------------|------------|-------------|
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | OECD 429 Skin Sensitisation: Local Lymph Node Assay | skin | Mouse | Sensitising |
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | OECD 406 Skin Sensitization | skin | Guinea pig | Sensitising |

Conclusion/Summary

Skin : No additional information.
Respiratory : No additional information.

Mutagenicity

| Product/ingredient name | Test | Result |
|---|--|----------|
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | OECD 471 Bacterial Reverse Mutation Test | Negative |
| | OECD 476 In vitro Mammalian Cell Gene Mutation Test | Negative |
| | OECD OECD 487- In vitro Mammalian Cell Micronucleus Test | Negative |
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | OECD 471 Bacterial Reverse Mutation Test | Positive |

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| | OECD 479 Genetic Toxicology: In vitro Sister Chromatid Exchange Assay in Mammalian Cells | Positive |
| | OECD 482 Genetic Toxicology: DNA Damage and Repair, Unscheduled DNA Synthesis in Mammalian Cells in vitro | Negative |
| | OECD 474 Mammalian Erythrocyte Micronucleus Test | Negative |

Conclusion/Summary : fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine Amines, polyethylenepoly-, tetraethylenepentamine fraction

Not mutagenic in a standard battery of genetic toxicological tests.

The weight of the scientific evidence indicates that this material is non-genotoxic.

Carcinogenicity

| Product/ingredient name | Test | Species | Exposure | Result | Route of exposure | Target organs |
|--|----------------------------------|---------|---------------------------|----------|-------------------|---------------|
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | OECD 451 Carcinogenicity Studies | Mouse | 627 days; 3 days per week | Negative | Dermal | - |

Conclusion/Summary : Amines, polyethylenepoly-, tetraethylenepentamine fraction

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.

Reproductive toxicity

| Product/ingredient name | Test | Species | Result/Result type | Target organs |
|---|--|---------|--------------------|---------------|
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | OECD 422 Combined Repeated Dose Toxicity Study with the Reproduction/Developmental Toxicity Screening Test | Rat | Oral: NOAEL | - |

Conclusion/Summary : No additional information.

Teratogenicity

| Product/ingredient name | Test | Species | Result/Result type |
|--|--|-----------------|--------------------|
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | OECD 414 Prenatal Developmental Toxicity Study | Rat - Female | 750 mg/kg NOAEL |
| | OECD 414 Prenatal Developmental Toxicity Study | Rabbit - Female | 125 mg/kg NOAEL |

Conclusion/Summary : No additional information.

Specific target organ toxicity (single exposure)

Not available.

Specific target organ toxicity (repeated exposure)

Not available.

Aspiration hazard

Not available.

Information on the likely routes of exposure : Not available.

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SECTION 11: Toxicological information

Potential acute health effects

- Inhalation** : May give off gas, vapor or dust that is very irritating or corrosive to the respiratory system. Exposure to decomposition products may cause a health hazard. Serious effects may be delayed following exposure.
- Ingestion** : May cause burns to mouth, throat and stomach.
- Skin contact** : May cause an allergic skin reaction.
- Eye contact** : Causes serious eye damage.

Symptoms related to the physical, chemical and toxicological characteristics

- Inhalation** : No specific data.
- Ingestion** : Adverse symptoms may include the following:
stomach pains
- Skin contact** : Adverse symptoms may include the following:
pain or irritation
redness
blistering may occur
- Eye contact** : Adverse symptoms may include the following:
pain
watering
redness

Delayed and immediate effects and also chronic effects from short and long term exposure

Short term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Long term exposure

- Potential immediate effects** : Not available.
- Potential delayed effects** : Not available.

Potential chronic health effects

| Product/ingredient name | Test | Result type | Result | Target organs |
|---|---|-------------|--------------|---------------|
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | OECD 422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test | NOAEL - | 1000 mg/kg/d | - |
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | No official guidelines | NOAEL - | 50 mg/kg/d | lungs |
| | OECD 410 Repeated Dose Dermal Toxicity: 21/28-day Study | NOAEL | 50 mg/kg/d | skin |

- Conclusion/Summary** : No additional information.
- General** : Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.
- 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.
- Other information** : Not available.

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SECTION 12: Ecological information
12.1 Toxicity

| Product/ingredient name | Test | Endpoint | Exposure | Species | Result |
|---|--|---------------------------|----------------------|----------|-----------|
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | OECD 201 Alga, Growth Inhibition Test | Acute EC50 | 72 hours Static | Algae | 2.43 mg/l |
| | OECD 209 Activated Sludge, Respiration Inhibition Test | Acute EC50 | 3 hours Static | Bacteria | 421 mg/l |
| | OECD 202 Part I (Daphnia sp., Acute Immobilisation test) | Acute EC50 | 48 hours Static | Daphnia | 5.18 mg/l |
| | OECD 203 Fish, Acute Toxicity Test | Acute LC50 | 96 hours Semi-static | Fish | 7.07 mg/l |
| | OECD 201 Alga, Growth Inhibition Test | Chronic EC10 | 72 hours Static | Algae | 1.89 mg/l |
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | No official guidelines | Acute EC50 | 2 hours Static | Bacteria | 97.3 mg/l |
| | EU EC C.2 Acute Toxicity for Daphnia | Acute EC50 | 48 hours Static | Daphnia | 24.1 mg/l |
| | OECD 201 Alga, Growth Inhibition Test | Acute ErC50 (growth rate) | 72 hours Static | Algae | 6.8 mg/l |
| | EU EC C.1 Acute Toxicity for Fish | Acute LC50 | 96 hours Semi-static | Fish | 420 mg/l |
| | No official guidelines | Chronic EC10 | 2 hours Static | Bacteria | 46 mg/l |
| | OECD 201 Alga, Growth Inhibition Test | Chronic NOEC | 72 hours Static | Algae | 0.5 mg/l |

Conclusion/Summary : No additional information.

12.2 Persistence and degradability

| Product/ingredient name | Test | Period | Result |
|---|---|---------|-----------|
| fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine | OECD 301B Ready Biodegradability - CO2 Evolution Test | 74 days | 0 to 70 % |
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | OECD 302A Inherent Biodegradability: Modified SCAS Test | 84 days | 17 % |

Conclusion/Summary : Amines, polyethylenepoly-, tetraethylenepentamine fraction Not biodegradable

12.3 Bioaccumulative potential

| Product/ingredient name | LogP _{ow} | BCF | Potential |
|--|--------------------|-----|-----------|
| Amines, polyethylenepoly-, tetraethylenepentamine fraction | -3.16 | - | low |

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SECTION 12: Ecological information**12.4 Mobility in soil**

Soil/water partition coefficient (K_{oc}) : Not available.
Mobility : Not available.

12.5 Results of PBT and vPvB assessment

Not applicable.

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

12.7 Other ecological information**SECTION 13: Disposal considerations**

The information in this section contains generic advice and guidance. The list of Identified Uses in Section 1 should be consulted for any available use-specific information provided in the Exposure Scenario(s).

13.1 Waste treatment methods**Product**

Methods of disposal : The generation of waste should be avoided or minimised 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.

Hazardous waste : Yes.

European waste catalogue (EWC)

| Waste code | Waste designation |
|------------|--|
| 07 02 04* | other organic solvents, washing liquids and mother liquors |

Packaging

Methods of disposal : The generation of waste should be avoided or minimised wherever possible. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible.

Special precautions : 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.

SECTION 14: Transport information

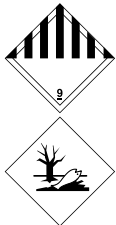
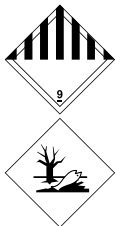
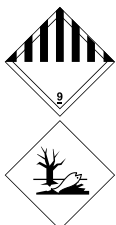
| | 14.1 UN number | 14.2 UN proper shipping name |
|----------------|----------------|---|
| ADR/RID | UN3082 | Environmentally hazardous substance, liquid, n.o.s. (Polyamide resin) |
| IMDG | UN3082 | Environmentally hazardous substance, liquid, n.o.s. (Polyamide resin). Marine pollutant |
| IATA | UN3082 | Environmentally hazardous substance, liquid, n.o.s. (Polyamide resin) |

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SECTION 14: Transport information

| | 14.3 Transport hazard class(es) | 14.4 Packing group | 14.5 Environmental hazards | 14.6 Special precautions for user | Additional information |
|----------------|--|--------------------|----------------------------|---|---|
| ADR/RID | 9  | III | Yes. | Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage. | The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg. <u>Hazard identification number</u> 90 <u>Special provisions</u> 274 335 601 <u>Tunnel code</u> E |
| IMDG | 9  | III | Yes. | Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage. | The marine pollutant mark is not required when transported in sizes of ≤5 L or ≤5 kg. <u>Emergency schedules (EmS)</u> F-A S-F |
| IATA | 9  | III | Yes. | Transport within user's premises: always transport in closed containers that are upright and secure. Ensure that persons transporting the product know what to do in the event of an accident or spillage. | The environmentally hazardous substance mark is not required when transported in sizes of ≤5 L or ≤5 kg. <u>Passenger and Cargo Aircraft</u> Quantity limitation: 450 L Packaging instructions: 964 <u>Cargo Aircraft</u> <u>Only</u> Quantity limitation: 450 L Packaging instructions: 964 |

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SECTION 14: Transport information

14.7 Transport in bulk : Not applicable.

according to Annex II of
MARPOL 73/78 and the IBC
Code

SECTION 15: Regulatory information**15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture****EU Regulation (EC) No. 1907/2006 (REACH)**

This product is compliant with the REACH Regulation EC 1907/2006.

Huntsman has pre-registered and is registering all of the substances that it manufactures in or imports into the European Economic Area (EEA) that are subject to Title II of the REACH Regulation.

Annex XIV - List of substances subject to authorisation**Annex XIV**

None of the components are listed.

Substances of very high concern

None of the components are listed.

Annex XVII - Restrictions : Not applicable.
on the manufacture,
placing on the market
and use of certain
dangerous substances,
mixtures and articles

Other EU regulations

Europe inventory : All components are listed or exempted.

Black List Chemicals : Not listed

Priority List Chemicals : Not listed

**Integrated pollution
prevention and control
list (IPPC) - Air** : Not listed

**Integrated pollution
prevention and control
list (IPPC) - Water** : Not listed

National regulations

References : The provision of Safety Data Sheets comes under Regulation 6 of CHIP (CHIP is the recognised abbreviation for the Chemicals Hazard Information and Packaging Regulations). This is an addition to the Health and Safety at Work Act 1974.

Australia inventory (AICS) : All components are listed or exempted.

Canada inventory : All components are listed or exempted.

China inventory (IECSC) : All components are listed or exempted.

Japan inventory : Not determined.

Korea inventory (KECI) : All components are listed or exempted.

**New Zealand Inventory of
Chemicals (NZIoC)** : All components are listed or exempted.

**Philippines inventory
(PICCS)** :

**United States inventory
(TSCA 8b)** : All components are listed or exempted.

**Chemical Weapons
Convention List Schedule I
Chemicals** : Not listed

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SECTION 15: Regulatory information

Chemical Weapons Convention List Schedule II Chemicals : Not listed

Chemical Weapons Convention List Schedule III Chemicals : Not listed

15.2 Chemical Safety Assessment : This product contains substances for which Chemical Safety Assessments are still required.

SECTION 16: Other information

✔ Indicates information that has changed from previously issued version.

Abbreviations and acronyms : ATE = Acute Toxicity Estimate
 CLP = Classification, Labelling and Packaging Regulation [Regulation (EC) No. 1272/2008]
 DNEL = Derived No Effect Level
 EUH statement = CLP-specific Hazard statement
 PNEC = Predicted No Effect Concentration
 RRN = REACH Registration Number

Procedure used to derive the classification according to Regulation (EC) No. 1272/2008 [CLP/GHS]

| Classification | Justification |
|-------------------------|-----------------|
| Eye Dam. 1, H318 | Expert judgment |
| Skin Sens. 1, H317 | Expert judgment |
| Aquatic Chronic 2, H411 | Expert judgment |

Full text of abbreviated H statements : H302 Harmful if swallowed.
 H312 Harmful in contact with skin.
 H314 Causes severe skin burns and eye damage.
 H315 Causes skin irritation.
 H317 May cause an allergic skin reaction.
 H318 Causes serious eye damage.
 H411 Toxic to aquatic life with long lasting effects.
 H412 Harmful to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS] : Acute Tox. 4, H302 ACUTE TOXICITY (oral) - Category 4
 Acute Tox. 4, H312 ACUTE TOXICITY (dermal) - Category 4
 Aquatic Chronic 2, H411 LONG-TERM AQUATIC HAZARD - Category 2
 Aquatic Chronic 3, H412 LONG-TERM AQUATIC HAZARD - Category 3
 Eye Dam. 1, H318 SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
 Skin Corr. 1B, H314 SKIN CORROSION/IRRITATION - Category 1B
 Skin Irrit. 2, H315 SKIN CORROSION/IRRITATION - Category 2
 Skin Sens. 1, H317 SKIN SENSITIZATION - Category 1
 Skin Sens. 1A, H317 SKIN SENSITIZATION - Category 1A

Full text of abbreviated R phrases : R21/22- Harmful in contact with skin and if swallowed.
 R34- Causes burns.
 R41- Risk of serious damage to eyes.
 R38- Irritating to skin.
 R43- May cause sensitisation by skin contact.
 R51/53- Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.
 R52/53- Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Full text of classifications [DSD/DPD] : C - Corrosive
 Xn - Harmful
 Xi - Irritant
 N - Dangerous for the environment

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SECTION 16: Other information

Date of issue/ Date of revision : 3/20/2015.

Date of previous issue : 3/20/2015.

Version : 1.01

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