SAFETY DATA SHEET

ARALDITE® 2014-1 GB RESIN

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

1.1 Product identifier

Product name : ARALDITE® 2014-1 GB RESIN

Registration number : Not available.

Product code : 00074049

Product description : Not available.

Other means of identification : Not available.

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

Product use : Resin for adhesive systems

1.3 Details of the supplier of the safety data sheet

Supplier : Huntsman Advanced Materials (Europe)BVBA
Everslaan 45
3078 Everberg / Belgium
Tel.: +41 61 299 20 41
Fax: +41 61 299 20 40

e-mail address of person responsible for this SDS : Global_Product_EHS_AdMat@huntsman.com

E-mail address to request full REACH registration number upon EU member State Authority request :
REACH_Registration_Nr_AM@huntsman.com

1.4 Emergency telephone number

Supplier

Telephone number : EUROPE: +32 35 75 1234
France ORFILA: +33(0)145425959
ASIA: +65 6336-6011
China: +86 20 39377888
India: +91 22 4050 6333
Australia: 1800 786 152
New Zealand: 0800 767 437
USA: +1/800/424.9300

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]

Skin Irrit. 2, H315
Eye Irrit. 2, H319
Skin Sens. 1, H317
Aquatic Chronic 2, H411

Ingredients of unknown toxicity : Percentage of the mixture consisting of ingredient(s) of unknown toxicity: 2.9%

Ingredients of unknown ecotoxicity : Percentage of the mixture consisting of ingredient(s) of unknown hazards to the aquatic environment: 2.9%

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

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

SECTION 2: Hazards identification

Classification : Xi; R36/38
R43
N; R51/53

Human health hazards : Irritating to eyes and skin. May cause sensitisation by skin contact.

Environmental hazards : Toxic to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

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 : Warning

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

Precautionary statements

General : Not applicable.

Prevention : Wear protective gloves: > 8 hours (breakthrough time): butyl rubber, Ethyl Vinyl Alcohol Laminate (EVAL), nitrile rubber, neoprene, Polyvinyl Chloride (PVC). Wear eye or face protection. Avoid release to the environment.

Response : IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

Storage : Not applicable.

Disposal : Dispose of contents and container in accordance with all local, regional, national and international regulations.

Hazardous ingredients : Bisphenol A epoxy resin

Supplemental label elements : Not applicable.

Supplemental label elements : Contains epoxy constituents. See information supplied by the manufacturer.

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.

SECTION 3: Composition/information on ingredients

3.2 Mixtures : Mixture

Product/ingredient name	Identifiers	%	Classification 67/548/EEC	Classification Regulation (EC) No. 1272/2008 [CLP]	Type
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	CAS: 25068-38-6 EC: 500-033-5 RRN: 01-2119456619-26	30-60	Xi; R36/38 R43 N; R51/53	Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317 Aquatic Chronic 2, H411	[1]
formaldehyde, oligomeric reaction products with 1-chloro-2, 3-epoxypropane and phenol	CAS: 9003-36-5 EC: 500-006-8 RRN: 01-2119454392-40	7-13	Xi; R38 R43 N; R51/53	Skin Irrit. 2, H315 Skin Sens. 1, H317 Aquatic Chronic 2, H411	[1]
1,4-Bis(2, 3-epoxypropoxy)butane	CAS: 2425-79-8 EC: 219-371-7 RRN: 01-2119494060-45	1-3	Xn; R20/21 Xi; R36/38 R43 R52/53	Acute Tox. 4, H312 Acute Tox. 4, H332 Skin Irrit. 2, H315 Eye Irrit. 2, H319 Skin Sens. 1, H317	[1]
Bis(2,3-epoxypropyl) terephthalate	CAS: 7195-44-0 EC: 230-565-0 RRN: 01-2119909640-43	1-3	Xi; R41, R38 R43	Skin Irrit. 2, H315 Eye Dam. 1, H318 Skin Sens. 1, H317	[1]
			See Section 16 for the full text of the R-phrases declared above.	**See Section 16 for the full text of the H statements declared above.**	

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

SECTION 4: First aid measures

4.1 Description of first aid measures

Eye contact : 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. Get medical attention.

Inhalation : Remove victim to fresh air and keep at rest in a position comfortable for breathing. 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. Get medical attention if adverse health effects persist or are severe. 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.

Skin contact : 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. Get medical attention. In the event of any complaints or symptoms, avoid further exposure. Wash clothing before reuse. Clean shoes thoroughly before reuse.

SECTION 4: First aid measures

Ingestion : 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. Get medical attention if adverse health effects persist or are severe. 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. 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 irritation.

Inhalation : No known significant effects or critical hazards.

Skin contact : Causes skin irritation. May cause an allergic skin reaction.

Ingestion : Irritating to mouth, throat and stomach.

Over-exposure signs/symptoms

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

Inhalation : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Ingestion : No specific data.

4.3 Indication of any immediate medical attention and special treatment needed

Notes to physician : Treat symptomatically. Contact poison treatment specialist immediately if large quantities have been ingested or inhaled.

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.

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.

SECTION 5: Firefighting measures

Hazardous thermal decomposition products : Decomposition products may include the following materials:
carbon dioxide
carbon monoxide
sulfur oxides
metal oxide/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. Avoid breathing 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 materials 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.

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 ingest. Avoid breathing vapour or mist. Avoid release to the environment. 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. 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.

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

SECTION 8: Exposure controls/personal protection

required.

Derived effect levels

Product/ingredient name	Type	Exposure	Value	Population	Effects
Bis(2,3-epoxypropyl) terephthalate	DNEL	Long term Dermal	2 mg/kg bw/day	Workers	Systemic
	DNEL	Long term Inhalation	14 mg/m³	Workers	Systemic
	DNEL	Long term Dermal	1 mg/kg bw/day	Consumers	Systemic
	DNEL	Long term Inhalation	3.5 mg/m³	Consumers	Systemic
	DNEL	Long term Oral	1 mg/kg bw/day	Consumers	Systemic

Predicted effect concentrations

Product/ingredient name	Type	Compartment Detail	Value	Method Detail
Bis(2,3-epoxypropyl) terephthalate	PNEC	Fresh water	0.00294 mg/l	Assessment Factors
	PNEC	Marine	0.00029 mg/l	Assessment Factors
	PNEC	PNECintermittent	0.0294 mg/l	Assessment Factors
	PNEC	Sewage Treatment Plant	1.86 mg/l	Assessment Factors
	PNEC	Fresh water sediment	0.00869 mg/kg	Equilibrium Partitioning
	PNEC	Marine water sediment	0.00087 mg/kg	Equilibrium Partitioning
	PNEC	Soil	0.00553 mg/kg	Equilibrium Partitioning

8.2 Exposure controls

Appropriate engineering controls : No special ventilation requirements. Good general ventilation should be sufficient to control worker exposure to airborne contaminants. If this product contains ingredients with exposure limits, use process enclosures, local exhaust ventilation or other engineering controls to keep worker exposure 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.

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), nitrile rubber, neoprene, Polyvinyl Chloride (PVC)

Material of gloves for short term/splash application (10min <BTT<480min): : butyl rubber, Ethyl Vinyl Alcohol Laminate (EVAL), nitrile rubber, neoprene, Polyvinyl Chloride (PVC)

SECTION 8: Exposure controls/personal protection

(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.

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 : 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 : Beige.

Odour : Slight

Odour threshold : Not available.

pH : 7 [Conc. (% w/w): 50%]

Melting point/freezing point : Not available.

Initial boiling point and boiling range : >200°C

Flash point : Closed cup: >100°C

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 : practically insoluble

20 deg C

Partition coefficient: n-octanol/water ($LogK_{ow}$) : Not available.

Auto-ignition temperature : Not available.

Decomposition temperature : >200°C

SECTION 9: Physical and chemical properties

Viscosity : Dynamic (25°C): 92800 mPa·s
Kinematic: Not available.
Kinematic (40°C): Not available.

Explosive properties : Not available.

Oxidising properties : Not available.

9.2 Other information

Density : 1.6 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, 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
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	LC0 Inhalation Vapour	Rat - Male	0.00001 ppm	5 hours
	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat - Female	>2000 mg/kg	-
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat - Male, Female	>5000 mg/kg	-
1,4-Bis(2,3-epoxypropoxy) butane	LD50 Dermal	Rat - Male, Female	>2150 mg/kg	-
	LD50 Oral	Rat - Male, Female	1163 mg/kg	-
Bis(2,3-epoxypropyl) terephthalate	LD50 Dermal	Rat - Male, Female	>2000 mg/kg	-
	LD50 Oral	Rat - Male, Female	>2500 mg/kg	-

Conclusion/Summary : No additional information.

SECTION 11: Toxicological information

Acute toxicity estimates

Route	ATE value
Dermal Inhalation (dusts and mists)	39341.9 mg/kg 53.65 mg/l

Irritation/Corrosion

Product/ingredient name	Test	Species	Route of exposure	Result
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	OECD 404 Acute Dermal Irritation/ Corrosion	Rabbit	Skin	Mild irritant
	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes	Mild irritant
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes	Non-irritant.
	OECD 404 Acute Dermal Irritation/ Corrosion	Rabbit	Skin	Mild irritant
1,4-Bis(2,3-epoxypropoxy) butane	OECD 404 Acute Dermal Irritation/ Corrosion	Rabbit	Skin	Non-irritant.
	OECD 405 Acute Eye Irritation/ Corrosion	Rabbit	Eyes	Severe irritant
Bis(2,3-epoxypropyl) terephthalate	OECD	Rabbit	Skin	Mild irritant
	OECD	Rabbit	Eyes	Corrosive

Conclusion/Summary

Skin : No additional information.

Eyes : No additional information.

Respiratory : No additional information.

Sensitiser

Product/ingredient name	Test	Route of exposure	Species	Result
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	OECD 429 Skin Sensitisation: Local Lymph Node Assay	skin	Mouse	Sensitising
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	OECD 429 Skin Sensitisation: Local Lymph Node Assay	skin	Mouse	Sensitising
1,4-Bis(2,3-epoxypropoxy) butane	OECD 406 Skin Sensitization	skin	Guinea pig	Sensitising
Bis(2,3-epoxypropyl) terephthalate	OECD 406 Skin Sensitization	skin	Guinea pig	Sensitising

Conclusion/Summary

Skin : No additional information.

Respiratory : No additional information.

Mutagenicity

SECTION 11: Toxicological information

Product/ingredient name	Test	Result
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	OECD 471 Bacterial Reverse Mutation Test	Positive
	OECD 476 In vitro Mammalian Cell Gene Mutation Test	Positive
	OECD 478 Genetic Toxicology: Rodent Dominant Lethal Test	Negative
	EPA OPPTS	Negative
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	OECD 471 Bacterial Reverse Mutation Test	Positive
	OECD 476 In vitro Mammalian Cell Gene Mutation Test	Positive
	OECD 473 In vitro Mammalian Chromosomal Aberration Test	Positive
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Negative
	OECD 486 Unscheduled DNA Synthesis (UDS) Test with Mammalian Liver Cells in vivo	Negative
1,4-Bis(2,3-epoxypropoxy) butane	OECD 471 Bacterial Reverse Mutation Test	Positive
	OECD 473 In vitro Mammalian Chromosomal Aberration Test	Positive
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Negative
Bis(2,3-epoxypropyl) terephthalate	OECD 471 Bacterial Reverse Mutation Test	Positive
	OECD 476 In vitro Mammalian Cell Gene Mutation Test	Positive
	OECD 483 Mammalian Spermatogonial Chromosome Aberration Test	Negative
	OECD 474 Mammalian Erythrocyte Micronucleus Test	Negative

Conclusion/Summary : No additional information.

Carcinogenicity

Product/ingredient name	Test	Species	Exposure	Result	Route of exposure	Target organs
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat	2 years; 7 days per week	Negative	Oral	-
	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Rat	2 years; 5 days per week	Negative	Dermal	-
	OECD 453 Combined Chronic Toxicity/ Carcinogenicity Studies	Mouse	2 years; 3 days per week	Negative	Dermal	-

Conclusion/Summary : No additional information.

Reproductive toxicity

SECTION 11: Toxicological information

Product/ingredient name	Test	Species	Result/Result type	Target organs
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	OECD 416 Two-Generation Reproduction Toxicity Study	Rat	Oral: 540 mg/kg NOEL	-
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	OECD 416 Two-Generation Reproduction Toxicity Study	Rat	Oral: 540 mg/kg NOEL	-

Conclusion/Summary : No additional information.

Teratogenicity

Product/ingredient name	Test	Species	Result/Result type
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	OECD 414 Prenatal Developmental Toxicity Study	Rat - Female	>540 mg/kg NOEL
	EPA CFR	Rabbit - Female	>300 mg/kg NOEL
	OECD 414 Prenatal Developmental Toxicity Study	Rabbit - Female	180 mg/kg NOAEL
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	EPA CFR	Rabbit - Female	>300 mg/kg NOEL

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.

Potential acute health effects

Inhalation : No known significant effects or critical hazards.

Ingestion : Irritating to mouth, throat and stomach.

Skin contact : Causes skin irritation. May cause an allergic skin reaction.

Eye contact : Causes serious eye irritation.

Symptoms related to the physical, chemical and toxicological characteristics

Inhalation : No specific data.

Ingestion : No specific data.

Skin contact : Adverse symptoms may include the following:
irritation
redness

Eye contact : Adverse symptoms may include the following:
pain or irritation
watering
redness

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

SECTION 11: Toxicological information

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
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	NOAEL -	50 mg/kg	-
	OECD 411 Subchronic Dermal Toxicity: 90-day Study	NOEL	10 mg/kg	-
	OECD 411 Subchronic Dermal Toxicity: 90-day Study	NOAEL	100 mg/kg	-
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	NOAEL -	250 mg/kg	-
1,4-Bis(2,3-epoxypropoxy) butane	OECD 407 Repeated Dose 28-day Oral Toxicity Study in Rodents	NOAEL -	200 mg/kg	-
Bis(2,3-epoxypropyl) terephthalate	OECD 407 Repeated Dose 28-day Oral Toxicity Study in Rodents	NOAEL -	>240 mg/kg	-

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.

SECTION 12: Ecological information

12.1 Toxicity

Product/ingredient name	Test	Endpoint	Exposure	Species	Result
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	-	Acute EC50	72 hours Static	Algae	9.4 mg/l
	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute EC50	48 hours Static	Daphnia	1.7 mg/l
	-	Acute IC50	3 hours Static	Bacteria	>100 mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute LC50	96 hours	Fish	1.5 mg/l

SECTION 12: Ecological information

	OECD 211 Daphnia Magna Reproduction Test	Chronic	NOEC	Static 21 days Semi-static	Daphnia	0.3	mg/l
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	OECD 201 Alga, Growth Inhibition Test	Acute	EC50	72 hours Static	Algae	1.8	mg/l
	OECD 202 Part I (Daphnia sp. , Acute Immobilisation test)	Acute	EC50	48 hours Static	Daphnia	1.6	mg/l
	-	Acute	IC50	3 hours Static	Bacteria	>100	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Semi-static	Fish	0.55	mg/l
	OECD 211 Daphnia Magna Reproduction Test	Chronic	NOEC	21 days Semi-static	Daphnia	0.3	mg/l
1,4-Bis(2,3-epoxypropoxy) butane	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute	EC50	24 hours Static	Daphnia	75	mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute	EL50	72 hours Static	Algae	>160	mg/l
	OECD 209 Activated Sludge, Respiration Inhibition Test	Acute	IC50	3 hours Static	Bacteria	>100	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	24	mg/l
Bis(2,3-epoxypropyl) terephthalate	OECD 202 *Daphnia* sp. Acute Immobilisation Test	Acute	EC50	48 hours Static	Daphnia	81	mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute	ErC50 (growth rate)	72 hours Static	Algae	2.94	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	8.8	mg/l
	OECD 201 Alga, Growth Inhibition Test	Chronic	NOECr	72 hours Static	Algae - pseudokirchneriella subcapitata	0.327	mg/l

Conclusion/Summary : No additional information.

12.2 Persistence and degradability

Product/ingredient name	Test	Period	Result
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	OECD Derived from OECD 301F (Biodegradation Test)	28 days	5 %
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	EU	28 days	0 %
1,4-Bis(2,3-epoxypropoxy) butane	OECD 301F Ready Biodegradability - Manometric Respirometry Test	28 days	43 %

SECTION 12: Ecological information

Conclusion/Summary : 4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane: Not readily biodegradable.

Bis(2,3-epoxypropyl) terephthalate: Readily biodegradable

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	Fresh water 4.83 days Fresh water 3.58 days Fresh water 7.1 days	-	Not readily
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	-	-	Not readily
1,4-Bis(2,3-epoxypropoxy) butane	-	-	Not readily
Bis(2,3-epoxypropyl) terephthalate	Fresh water 4.93 days	-	-

12.3 Bioaccumulative potential

Product/ingredient name	$LogP_{ow}$	BCF	Potential
4,4'-Isopropylidenediphenol, oligomeric reaction products with 1-chloro-2, 3-epoxypropane	3.242	31	low
formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	2.7 to 3.6	-	low
1,4-Bis(2,3-epoxypropoxy) butane	-0.269	-	low
Bis(2,3-epoxypropyl) terephthalate	1.7	-	low

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 08*	other still bottoms and reaction residues

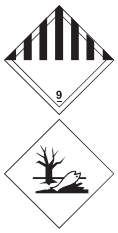
Packaging

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.

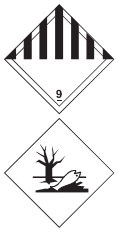
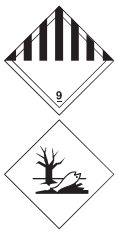
Special precautions : This material and its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilt material and runoff and contact 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. BISPHENOL A/F EPOXY RESIN (Bisphenol A epoxy resin)
IMDG	UN3082	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A/F EPOXY RESIN) (Bisphenol A epoxy resin). Marine pollutant (Bisphenol A epoxy resin, Bisphenol F epoxy resin)
IATA	UN3082	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A/F EPOXY RESIN) (Bisphenol A epoxy resin)

	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.	**Hazard identification number** 90 **Special provisions** 274 335 601 **Tunnel code** E

SECTION 14: Transport information

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.	**Emergency schedules (EmS)** 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.	**Passenger and Cargo Aircraft** Quantity limitation: 450 L Packaging instructions: 964 **Cargo Aircraft Only**Quantity limitation: 450 L Packaging instructions: 964

14.7 Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code : Not applicable.

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

Substances of very high concern

None of the components are listed.

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

Other EU regulations

Europe inventory : All components are listed or exempted.

Black List Chemicals : Not listed

SECTION 15: Regulatory information

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) :

Canada inventory :

China inventory (IECSC) :

Japan inventory :

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) :

Chemical Weapons Convention List Schedule I Chemicals : Not listed

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
Skin Irrit. 2, H315	Calculation method
Eye Irrit. 2, H319	Calculation method
Skin Sens. 1, H317	Calculation method
Aquatic Chronic 2, H411	Calculation method

SECTION 16: Other information

Full text of abbreviated H statements :

H312 Harmful in contact with skin.
H315 Causes skin irritation.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H319 Causes serious eye irritation.
H332 Harmful if inhaled.
H411 Toxic to aquatic life with long lasting effects.

Full text of classifications [CLP/GHS] :

Acute Tox. 4, H312	ACUTE TOXICITY: SKIN - Category 4
Acute Tox. 4, H332	ACUTE TOXICITY: INHALATION - Category 4
Aquatic Chronic 2, H411	AQUATIC TOXICITY (CHRONIC) - Category 2
Eye Dam. 1, H318	SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 1
Eye Irrit. 2, H319	SERIOUS EYE DAMAGE/ EYE IRRITATION - Category 2
Skin Irrit. 2, H315	SKIN CORROSION/IRRITATION - Category 2
Skin Sens. 1, H317	SKIN SENSITIZATION - Category 1

Full text of abbreviated R phrases :

R20/21- Harmful by inhalation and in contact with skin.
R41- Risk of serious damage to eyes.
R38- Irritating to skin.
R36/38- Irritating to eyes and 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] :

Xn - Harmful
Xi - Irritant
N - Dangerous for the environment

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

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

SECTION 16: Other information

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