

SAFETY DATA SHEET

According to REACH Regulation (EC) No 1907/2006, as amended by UK REACH Regulations SI 2019/758

HUNTSMAN

Enriching lives through innovation

ARALDITE® 2014-2 RESIN

Version	Revision Date:	SDS Number:	Date of last issue: 10.06.2022
1.3	21.06.2024	400001015910	Date of first issue: 03.06.2016

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

1.1 Product identifier

Trade name : ARALDITE® 2014-2 RESIN

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

Use of the Substance/Mixture : Epoxy constituents

1.3 Details of the supplier of the safety data sheet

Company : HUNTSMAN ADVANCED MATERIALS (UK) LIMITED
Address : Ickleton Road, Duxford, Cambridgeshire
CB22 4XQ United Kingdom
Telephone : +41 61 299 20 41
E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsmman.com

1.4 Emergency telephone number

Emergency telephone number : EUROPE: +32 35 75 1234
France ORFILA: +33(0)145425959
ASIA: +65 6336-6011
China: +86 20 39377888
+86 532 83889090
India: + 91 22 42 87 5333
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

Classification (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

Skin irritation, Category 2	H315: Causes skin irritation.
Serious eye damage, Category 1	H318: Causes serious eye damage.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Long-term (chronic) aquatic hazard, Category 2	H411: Toxic to aquatic life with long lasting effects.

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2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

Hazard pictograms	:	  
Signal word	:	Danger
Hazard statements	:	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.
Precautionary statements	:	Prevention: P261 Avoid breathing mist or vapours. P264 Wash skin thoroughly after handling. P273 Avoid release to the environment. P280 Wear protective gloves/ eye protection/ face protection. Response: P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor. P391 Collect spillage.

Hazardous components which must be listed on the label:

bis-[4-(2,3-epoxipropoxy)phenyl]propane

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDEGE)

1,4-bis(2,3-epoxypropoxy)butane

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous components

Chemical name	CAS-No. EC-No. Index-No.	Classification	Concentration (% w/w)

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	Registration number		
bis-[4-(2,3-epoxipropoxy)phenyl]propane	1675-54-3 216-823-5 603-073-00-2	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1; H317 Aquatic Chronic 2; H411 specific concentration limit Eye Irrit. 2; H319 >= 5 % Skin Irrit. 2; H315 >= 5 %	>= 30 - < 50
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE)	- -	Skin Irrit. 2; H315 Skin Sens. 1; H317 Aquatic Chronic 2; H411	>= 10 - < 20
1,4-bis(2,3 epoxypropoxy)butane	2425-79-8 219-371-7 603-072-00-7	Acute Tox. 4; H302 Acute Tox. 4; H332 Acute Tox. 4; H312 Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Chronic 3; H412 Acute toxicity estimate Acute dermal toxicity: 1,100 mg/kg	>= 2.5 - < 3
Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate	Not Assigned -	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1; H317 Repr. 2; H361f STOT RE 2; H373 (Central nervous system, male reproductive organs) Aquatic Chronic 2; H411 M-Factor (Chronic aquatic toxicity): 1	>= 1 - < 2.5
Substances with a workplace exposure limit :			
barium sulfate	7727-43-7 231-784-4		>= 30 - < 50

For explanation of abbreviations see section 16.

Both 25068-38-6 and 1675-54-3 can be used to describe the epoxy resin which is produced through the reaction of bisphenol A and epichlorohydrin

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SECTION 4: First aid measures

4.1 Description of first aid measures

- General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.
- Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
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.
- If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes.
- In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

- Risks : Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye damage.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : Treat symptomatically.

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SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical

Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire

5.2 Special hazards arising from the substance or mixture

Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.

Hazardous combustion products : Carbon oxides
Phenolics
Sulphur oxides

5.3 Advice for firefighters

Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.

Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.

Further information : Collect contaminated fire extinguishing water separately. This must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Refer to protective measures listed in sections 7 and 8.

6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

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6.4 Reference to other sections

For disposal considerations see section 13., See Section 1 for emergency contact information., For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

- Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons. Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
To avoid spills during handling keep bottle on a metal tray.
Dispose of rinse water in accordance with local and national regulations.
- Advice on protection against fire and explosion : Normal measures for preventive fire protection.
- Hygiene measures : When using do not eat or drink. When using do not smoke.
Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

- Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in properly labelled containers.
- Advice on common storage : For incompatible materials please refer to Section 10 of this SDS.
- Recommended storage temperature : 2 - 40 °C
- Further information on storage stability : Stable under normal conditions.

7.3 Specific end use(s)

- Specific use(s) : No data available

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SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
barium sulfate	7727-43-7	TWA (inhalable dust)	10 mg/m3	GB EH40
		TWA (Respirable dust)	4 mg/m3	GB EH40

Derived No Effect Level (DNEL)

Substance name	End Use	Exposure routes	Potential health effects	Value
bis-[4-(2,3-epoxipropoxy)phenyl]propane	Workers	Inhalation	Long-term systemic effects	4.93 mg/m3
	Workers	Dermal	Long-term systemic effects	0.75 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0.87 mg/m3
	Consumers	Dermal	Long-term systemic effects	0.0893 mg/kg bw/day
1,4-bis(2,3-epoxypropoxy)butane	Consumers	Oral	Long-term systemic effects	0.5 mg/kg bw/day
	Workers	Inhalation	Long-term systemic effects	4.7 mg/m3
	Workers	Dermal	Long-term systemic effects	6.66 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	1.16 mg/m3
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFGE)	Consumers	Dermal	Long-term systemic effects	3.33 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	0.33 mg/kg bw/day
	Workers	Dermal	Acute local effects	0.0083 mg/cm2
	Workers	Dermal	Long-term systemic effects	104.15 mg/kg
Reaction mass of bis(2,3-epoxypropyl)	Workers	Inhalation	Long-term systemic effects	29.39 mg/m3
	Consumers	Dermal	Long-term systemic effects	62.5 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	8.7 mg/m3
	Consumers	Oral	Long-term systemic effects	6.25 mg/kg bw/day
Reaction mass of bis(2,3-epoxypropyl)	Workers	Inhalation	Long-term systemic effects	0.025 mg/m3

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terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate				
	Workers	Dermal	Long-term systemic effects	0.05 mg/kg bw/day
barium sulfate	Workers	Inhalation	Long-term systemic effects	10 mg/m3
	Workers	Inhalation	Long-term local effects	10 mg/m3
	Consumer use	Inhalation	Long-term systemic effects	10 mg/m3
	Consumer use	Oral	Long-term systemic effects	13000 mg/kg

Predicted No Effect Concentration (PNEC)

Substance name	Environmental Compartment	Value
bis-[4-(2,3-epoxypropoxy)phenyl]propane	Fresh water	0.006 mg/l
	Marine water	0.001 mg/l
	Fresh water sediment	0.341 mg/kg dry weight (d.w.)
	Marine sediment	0.034 mg/kg dry weight (d.w.)
	Soil	0.065 mg/kg dry weight (d.w.)
	Sewage treatment plant	10 mg/l
	Secondary Poisoning	11 mg/kg
1,4-bis(2,3 epoxypropoxy)butane	Fresh water	0.024 mg/l
	Remarks:Assessment Factors	
	Marine water	0.002 mg/l
	Remarks:Assessment Factors	
	Sewage treatment plant	100 mg/l
	Remarks:Assessment Factors	
	Fresh water sediment	0.084 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Marine sediment	0.008 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Soil	0.003 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Oral	0.028 mg/kg
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFGE)	Fresh water	0.003 mg/l
	Remarks:Assessment Factors	
	Marine water	0 mg/l
	Remarks:Assessment Factors	
	Intermittent use/release	0.0254 mg/l
	Remarks:Assessment Factors	
	Fresh water sediment	0.294 mg/kg dry

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		weight (d.w.)
	Remarks:Equilibrium method	
	Marine sediment	0.0294 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Soil	0.237 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Sewage treatment plant	10 mg/l
	Remarks:Assessment Factors	
Siloxanes and silicones, di-Me, reaction products with silica	Fresh water sediment	> 100 mg/kg
	Remarks:Assessment Factors	
	Soil	23 mg/kg
	Remarks:Assessment Factors	
Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate	Fresh water	0.003 mg/l
	Remarks:Assessment Factors	
	Marine water	0 mg/l
	Remarks:Assessment Factors	
	Freshwater - intermittent	0.027 mg/l
	Remarks:Assessment Factors	
	Sewage treatment plant	32 mg/l
	Remarks:Assessment Factors	
	Fresh water sediment	0.044 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Marine sediment	0.004 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Soil	0.007 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
barium sulfate	Fresh water	115 µg/l
	Sewage treatment plant	62.2 mg/l
	Remarks:Assessment Factors	
	Fresh water sediment	600.4 mg/kg
	Remarks:Assessment Factors	
	Soil	207.7 mg/kg
	Remarks:Assessment Factors	

8.2 Exposure controls

Personal protective equipment

Eye/face protection : Eye wash bottle with pure water
Tightly fitting safety goggles
Wear face-shield and protective suit for abnormal processing problems.

Hand protection

Material : butyl-rubber
Break through time : > 8 h

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Material : Nitrile rubber
Break through time : 10 - 480 min

Material : Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time : > 8 h

Remarks : Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.

Skin and body protection : Impervious clothing
Choose body protection according to the amount and concentration of the dangerous substance at the work place.

Respiratory protection : Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Equipment should conform to EN 14387

Filter type : Combined particulates and organic vapour type (A-P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state : liquid

Colour : beige

Odour : slight

Odour Threshold : No data is available on the product itself.

Melting point/freezing point : No data available

Boiling point/boiling range : > 200 °C

Flammability (solid, gas) : No data is available on the product itself.

Lower explosion limit / Lower flammability limit : No data is available on the product itself.

Upper explosion limit / Upper : No data is available on the product itself.

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flammability limit

Flash point : > 100 °C
Method: closed cup

Auto-ignition temperature : does not ignite

Decomposition temperature : > 200 °C

pH : ca. 7 (20 °C)
Concentration: 500 g/l

Viscosity
Viscosity, dynamic : 92,800 mPa.s (25 °C)
Method: Other guidelines

Solubility(ies)
Water solubility : practically insoluble (20 °C)

Solubility in other solvents : No data is available on the product itself.

Partition coefficient: n-octanol/water : No data is available on the product itself.

Vapour pressure : < 1.33 hPa (20 °C)

Density : 1.6 g/cm³ (25 °C)

Relative density : No data is available on the product itself.

Relative vapour density : No data is available on the product itself.

Particle characteristics : No data is available on the product itself.

9.2 Other information

No data is available on the product itself.

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid : None known.

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10.5 Incompatible materials

Materials to avoid : Strong acids and strong bases
Strong oxidizing agents

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Not classified due to lack of data.

Product:

Acute oral toxicity : Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Acute inhalation toxicity : Acute toxicity estimate: > 5 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity : Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg
Method: OECD Test Guideline 420
Assessment: The substance or mixture has no acute oral toxicity
Remarks: No mortality observed at this dose.

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Acute oral toxicity : LD50 (Rat, male and female): > 5,000 mg/kg
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

1,4-bis(2,3 epoxypropoxy)butane:

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Acute oral toxicity : LD50 (Rat, male and female): 1,163 mg/kg
Method: OECD Test Guideline 401
GLP: yes
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute inhalation toxicity : LC50 (Rat): > 2.068 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist

Test atmosphere: dust/mist
Method: Expert judgement
Assessment: The component/mixture is moderately toxic after short term inhalation., The substance/mixture is not toxic on inhalation as defined by dangerous goods regulations.

Acute dermal toxicity : Acute toxicity estimate: 1,100 mg/kg
Method: Converted acute toxicity point estimate

Assessment: The component/mixture is moderately toxic after single contact with skin.

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Acute oral toxicity : LD50 (Rat, female): > 300 - < 2,000 mg/kg
Method: OECD Test Guideline 423
Assessment: The component/mixture is moderately toxic after single ingestion.

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402

Skin corrosion/irritation

Causes skin irritation.

Components:

bis-[4-(2,3-epoxypropoxy)phenyl]propane:

Species	: Rabbit
Exposure time	: 4 h
Assessment	: Irritating to skin.
Method	: OECD Test Guideline 404
Result	: Irritating to skin.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Species	: Rabbit
Method	: OECD Test Guideline 404
Result	: Irritating to skin.

1,4-bis(2,3 epoxypropoxy)butane:

Species	: Rabbit
Method	: OECD Test Guideline 404

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Result : Skin irritation
GLP : yes

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Species : Rabbit
Assessment : Irritating to skin.
Method : No information available.
Result : Irritating to skin.

barium sulfate:

Species : human skin
Assessment : No skin irritation
Result : No skin irritation

Serious eye damage/eye irritation

Causes serious eye damage.

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Species : Rabbit
Assessment : Irritating to eyes.
Method : OECD Test Guideline 405
Result : Irritating to eyes.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Species : Rabbit
Method : OECD Test Guideline 405
Result : No eye irritation

1,4-bis(2,3 epoxypropoxy)butane:

Species : Rabbit
Assessment : Risk of serious damage to eyes.
Method : OECD Test Guideline 405
GLP : yes

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Species : Rabbit
Assessment : Irritant
Method : OECD Test Guideline 405
Result : Normally reversible injuries

Species : Rabbit
Assessment : Corrosive
Result : Irreversible effects on the eye

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barium sulfate:

Species	: Rabbit
Assessment	: No eye irritation
Method	: OECD Test Guideline 405
Result	: No eye irritation

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified due to lack of data.

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Test Type	: Local lymph node assay (LLNA)
Exposure routes	: Skin
Species	: Mouse
Method	: OECD Test Guideline 429
Result	: The product is a skin sensitiser, sub-category 1B.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDEG):

Test Type	: Local lymph node assay (LLNA)
Exposure routes	: Skin
Species	: Mouse
Method	: OECD Test Guideline 429
Result	: May cause sensitisation by skin contact.

1,4-bis(2,3-epoxypropoxy)butane:

Exposure routes	: Skin
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: May cause sensitisation by skin contact.
GLP	: yes

Assessment : Harmful if inhaled.

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Exposure routes	: Skin
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: May cause sensitisation by skin contact.

barium sulfate:

Exposure routes	: Skin
Species	: Mouse
Method	: OECD Test Guideline 429

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Result : Does not cause skin sensitisation.

Germ cell mutagenicity

Not classified due to lack of data.

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: without metabolic activation
Result: positive

Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: Mutagenicity (Salmonella typhimurium - reverse mutation assay)
Result: negative

Genotoxicity in vivo : Test Type: in vivo assay
Species: Mouse (male)
Cell type: Germ
Application Route: Oral
Dose: 3333, 10000 mg/kg
Result: negative

Test Type: gene mutation test
Species: Rat (male)
Cell type: Somatic
Application Route: Oral
Dose: 50,250,500,1000 mg/kg bw/day
Method: OECD Test Guideline 488
Result: negative

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive

Genotoxicity in vivo : Cell type: Somatic
Application Route: Oral
Exposure time: 48 h
Dose: 2000 mg/kg
Method: OECD Test Guideline 474

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Result: negative

Cell type: Somatic
Application Route: Oral
Dose: 2000 mg/kg
Method: OECD Test Guideline 486
Result: negative

1,4-bis(2,3 epoxypoxy)butane:

Genotoxicity in vitro : Test Type: reverse mutation assay
Concentration: 10 - 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive
GLP: yes
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Concentration: 1 - 100 µg/L
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive
GLP: yes
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive
GLP: no
Remarks: Not classified due to data which are conclusive although insufficient for classification.

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male)
Cell type: Somatic
Application Route: Oral
Exposure time: 4 d
Dose: 187.5 - 750 mg/kg
Method: OECD Test Guideline 474
Result: negative
GLP: yes

Test Type: unscheduled DNA synthesis assay
Species: Rat
Cell type: Liver cells
Application Route: Oral
Method: OECD Test Guideline 486
Result: negative

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Germ cell mutagenicity-Assessment : Weight of evidence does not support classification as a germ cell mutagen., Animal testing did not show any mutagenic effects.

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Genotoxicity in vitro : Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive
GLP: yes

Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: positive
GLP: yes

Test Type: gene mutation test
Test system: Chinese hamster lung cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: positive
GLP: yes

Genotoxicity in vivo : Test Type: Chromosome aberration test in vitro
Species: Mouse (male)
Cell type: Germ
Application Route: Oral
Exposure time: 5 d
Dose: 0 - 720 mg/kg
Method: OECD Test Guideline 483
Result: negative

Test Type: Chromosome aberration test in vitro
Species: Mouse (male)
Cell type: Germ
Application Route: Oral
Exposure time: 5 d
Dose: 0 - 360 mg/kg
Method: OECD Test Guideline 483
Result: negative

Test Type: Micronucleus test
Species: Rat (male and female)
Application Route: Intraperitoneal injection
Dose: 2500 mg/kg
Method: OECD Test Guideline 474
Result: negative

Test Type: Micronucleus test
Species: Rat (male and female)

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Application Route: Intraperitoneal injection
Dose: 1500 mg/kg
Method: OECD Test Guideline 474
Result: negative

barium sulfate:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Carcinogenicity

Not classified due to lack of data.

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Species : Rat, male
Application Route : Oral
Exposure time : 24 month(s)
Dose : 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment : 7 days/week
NOAEL : 15 mg/kg bw/day
Method : OECD Test Guideline 453
Result : negative
Target Organs : Digestive organs

Species : Mouse, male
Application Route : Dermal
Exposure time : 24 month(s)
Dose : 0, 0.1, 10, 100 mg/kg bw/day
Frequency of Treatment : 3 days/week
NOEL : 0.1 mg/kg body weight
Method : OECD Test Guideline 453
Result : negative
Target Organs : Digestive organs

Species : Rat, female
Application Route : Dermal
Exposure time : 24 month(s)
Dose : 0.1, 100, 1000 mg/kg bw/day
Frequency of Treatment : 5 days/week
NOEL : 100 mg/kg body weight
Method : OECD Test Guideline 453
Result : negative

Species : Rat, female

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Application Route : Oral
Exposure time : 24 month(s)
Dose : 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment : 7 days/week
NOAEL : 100 mg/kg bw/day
Method : OECD Test Guideline 453
Result : negative
Target Organs : Digestive organs

Species : Rat, females
Application Route : Oral
Exposure time : 24 month(s)
Dose : 0, 2, 15, or 100 mg/kg bw/day
Frequency of Treatment : 7 days/week
NOEL : 2 mg/kg bw/day
Method : OECD Test Guideline 453
Result : negative
Target Organs : Digestive organs

barium sulfate:

Species : Rat, male and female
Application Route : Oral
Exposure time : 104 weeks
Dose : 60 - 75 mg/kg
Method : OPPTS 870.4200
Result : negative

Species : Mouse, male and female
Application Route : Oral
Dose : 160 - 200 mg/kg
Method : OPPTS 870.4200
Result : negative

Reproductive toxicity

Not classified due to lack of data.

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Dose: 0, 50, 180, 540 or 750 milligram per kilogram
Duration of Single Treatment: 238 d
Frequency of Treatment: 1 daily
General Toxicity - Parent: NOEL: 540 mg/kg body weight
General Toxicity F1: NOEL: 750 mg/kg body weight
Symptoms: No adverse effects
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Effects on foetal development : Species: Rabbit, female
Application Route: Dermal

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Dose: 0, 30, 100 or 300 milligram per kilogram
Duration of Single Treatment: 28 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 30 mg/kg body weight
Developmental Toxicity: NOAEL: 300 mg/kg body weight
Method: Other guidelines
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rabbit, female
Application Route: Oral
Dose: 0, 20, 60 or 180 milligram per kilogram
Duration of Single Treatment: 13 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 60 mg/kg body weight
Developmental Toxicity: NOAEL: 180 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 0, 60, 180 and 540 milligram per kilogram
Duration of Single Treatment: 10 d
Frequency of Treatment: 1 daily
General Toxicity Maternal: NOAEL: 180 mg/kg body weight
Developmental Toxicity: NOAEL: > 540 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Dose: 0, 50, 180, 540 or 750 mg/kg/
Duration of Single Treatment: 238 d
General Toxicity - Parent: NOEL: 750
General Toxicity F1: NOEL: 750 mg/kg body weight
General Toxicity F2: NOAEL: 750 mg/kg body weight
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

1,4-bis(2,3 epoxypropoxy)butane:

Effects on foetal development : Test Type: Pre-natal
Species: Rat, female
Application Route: Oral
Dose: 0/30/100/300 mg/kg bw/day
Duration of Single Treatment: 17 d
General Toxicity Maternal: NOAEL: 300 mg/kg body weight

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Developmental Toxicity: NOAEL: 300 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Effects on fertility : Test Type: reproductive and developmental toxicity study
Species: Rat, male and female
Application Route: Oral
Dose: 0,3,15,30 milligram per kilogram
Frequency of Treatment: 7 days/week
General Toxicity - Parent: NOAEC: 3 mg/kg body weight
General Toxicity F1: NOAEC: 30 mg/kg body weight
Fertility: LOAEL: 15 mg/kg body weight

Test Type: reproductive and developmental toxicity study
Species: Rat, male and female
Application Route: Oral
Dose: 0,2,5,6,15 milligram per kilogram
Frequency of Treatment: 7 days/week
General Toxicity - Parent: NOAEC: 15 mg/kg body weight
General Toxicity F1: NOAEC: 15 mg/kg body weight
Fertility: NOAEL: 15 mg/kg body weight
Method: OECD Test Guideline 443
GLP: yes

Effects on foetal development : Test Type: Embryo-foetal development
Species: Rat, females
Strain: Sprague-Dawley
Application Route: Oral
General Toxicity Maternal: NOEL: 60 mg/kg body weight
Developmental Toxicity: NOEL: 60 mg/kg body weight
Method: OECD Test Guideline 414
GLP: yes

Reproductive toxicity - Assessment : Some evidence of adverse effects on sexual function and fertility, based on animal experiments., Suspected of damaging fertility.

STOT - single exposure

Not classified due to lack of data.

STOT - repeated exposure

Not classified due to lack of data.

Components:

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Exposure routes : Ingestion
Target Organs : Central nervous system, male reproductive organs
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

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Repeated dose toxicity

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Species	: Rat, male and female
NOAEL	: 50 mg/kg
Application Route	: oral (gavage)
Exposure time	: 14 Weeks
Number of exposures	: 7 d
Dose	: 0, 50, 250, 1000 mg/kg/day
Method	: OECD Test Guideline 408

Species	: Rat, male and female
NOAEL	: >= 10 mg/kg
Application Route	: Skin contact
Exposure time	: 13 Weeks
Number of exposures	: 5 d
Dose	: 0, 10, 100, 1000 mg/kg/day
Method	: OECD Test Guideline 411

Species	: Mouse, male
NOAEL	: 100 mg/kg
Application Route	: Skin contact
Exposure time	: 13 Weeks
Number of exposures	: 3 d
Dose	: 0, 1, 10, 100 mg/kg/day
Method	: OECD Test Guideline 411

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Species	: Rat, male and female
NOAEL	: 250 mg/kg
Application Route	: Ingestion
Exposure time	: 13 Weeks
Number of exposures	: 7 d
Method	: Subchronic toxicity

1,4-bis(2,3 epoxypoxoxy)butane:

Species	: Rat, male and female
NOAEL	: 200 mg/kg
Application Route	: Oral
Exposure time	: 28 d
Number of exposures	: daily
Dose	: 25, 100, 200, 400 mg/kg
Method	: Subacute toxicity

Species	: Rat, male and female
NOAEL	: 263 mg/kg
Application Route	: Oral
Exposure time	: 90 h
Number of exposures	: daily
Dose	: 0,30,100,300 mg/kg bw/day

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Method : OECD Test Guideline 408
GLP : yes
Remarks : Information given is based on data obtained from similar substances.

Repeated dose toxicity - Assessment : Harmful if inhaled.

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Species : Rat, male and female
NOEL : 75 mg/kg
NOAEL : 75 mg/kg
Application Route : Oral
Exposure time : 28 d
Method : OECD Test Guideline 407
Target Organs : Central nervous system, male reproductive organs
Assessment : The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

barium sulfate:

Species : Rat
LOEC : ≥ 104 mg/kg, 40 mg/m³
Application Route : Ingestion
Test atmosphere : dust/mist
Exposure time : 5 h
Number of exposures : 5 d
Method : Subchronic toxicity

Aspiration toxicity

Not classified due to lack of data.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment : This substance/mixture does not contain components considered to have endocrine disrupting properties for human health according to UK REACH Article 57(f),

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

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SECTION 12: Ecological information

12.1 Toxicity

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): 2 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 1.8 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 : 11 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: EPA-660/3-75-009

NOEC : 4.2 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: EPA-660/3-75-009

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0.3 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

Ecotoxicology Assessment

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Toxicity to fish : LC50 (Fish): 2.54 mg/l
Exposure time: 96 h
Test substance: Fresh water
Method: Calculation method

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2.55 mg/l
Exposure time: 48 h

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Method: Calculation method

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): > 1.8 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: no

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l
Exposure time: 3 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
GLP: no

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 0.3 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 211
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

1,4-bis(2,3 epoxypoxy)butane:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): 24 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 203
GLP: no

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 75 mg/l
End point: Immobilization
Exposure time: 24 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 202
GLP: no

Toxicity to algae/aquatic plants : EL50 (Pseudokirchneriella subcapitata (green algae)): > 160 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201

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GLP: yes

NOELR (Pseudokirchneriella subcapitata (green algae)): 40 mg/l

Exposure time: 72 h

Test Type: static test

Analytical monitoring: yes

Test substance: Fresh water

Method: OECD Test Guideline 201

GLP: yes

Toxicity to microorganisms : IC50 (activated sludge): > 100 mg/l

Exposure time: 3 h

Test Type: static test

Analytical monitoring: no

Test substance: Fresh water

Method: OECD Test Guideline 209

GLP: no

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): 8.8 mg/l

End point: mortality

Exposure time: 96 h

Test Type: static test

Test substance: Fresh water

Method: OECD Test Guideline 203

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 81 mg/l

aquatic invertebrates

End point: Immobilization

Exposure time: 48 h

Test Type: static test

Test substance: Fresh water

Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants

: EC50 (Selastrum capricornutum (green algae)): > 2.72 mg/l

Exposure time: 72 h

Test Type: static test

Test substance: Fresh water

Method: OECD Test Guideline 201

NOEC (Selastrum capricornutum (green algae)): 0.368 mg/l

Exposure time: 72 h

Test Type: static test

Test substance: Fresh water

Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50 (activated sludge): > 1,000 mg/l

Exposure time: 3 h

Test Type: static test

Test substance: Fresh water

Method: OECD Test Guideline 209

M-Factor (Chronic aquatic : 1

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toxicity)

Ecotoxicology Assessment

Chronic aquatic toxicity : Toxic to aquatic life with long lasting effects.

barium sulfate:

Toxicity to fish	: LC50 : 174 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	: LC50 (Daphnia magna (Water flea)): 14.5 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to algae/aquatic plants	: EC50 : > 100 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201 NOEC : > 1.15 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	: NOEC: 5.8 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 211

12.2 Persistence and degradability

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Biodegradability	: Test Type: aerobic Inoculum: activated sludge, non-adapted Concentration: 20 mg/l Result: Not readily biodegradable. Biodegradation: 5 % Exposure time: 28 d Method: OECD Test Guideline 301F
Stability in water	: Degradation half life (DT50): 4.83 d (25 °C) pH: 4 Method: OECD Test Guideline 111 Remarks: Fresh water

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Degradation half life (DT50): 7.1 d (25 °C)
pH: 9
Method: OECD Test Guideline 111
Remarks: Fresh water

Degradation half life (DT50): 3.58 d (25 °C)
pH: 7
Method: OECD Test Guideline 111
Remarks: Fresh water

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Biodegradability : Test Type: aerobic
Inoculum: activated sludge
Concentration: 3 mg/l
Result: Not biodegradable
Biodegradation: ca. 0 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.E.

1,4-bis(2,3 epoxypropoxy)butane:

Biodegradability : Test Type: aerobic
Inoculum: activated sludge
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 43 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
GLP: yes

Test Type: aerobic
Inoculum: Sewage (STP effluent)
Concentration: 20 mg/l
Result: Not readily biodegradable.
Biodegradation: 38 %
Related to: Dissolved organic carbon (DOC)
Exposure time: 28 d
Method: OECD Test Guideline 301E
GLP: no

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Biodegradability : Test Type: aerobic
Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 52.4 %
Exposure time: 28 d
Method: OECD Test Guideline 301F
GLP: yes

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12.3 Bioaccumulative potential

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Bioaccumulation : Bioconcentration factor (BCF): 31
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 3.242 (25 °C)
pH: 7.1
Method: OECD Test Guideline 117

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Bioaccumulation : Species: Fish
Bioconcentration factor (BCF): 150
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 2.7 - 3.6
Method: OECD Test Guideline 117
GLP: yes

1,4-bis(2,3 epoxypropoxy)butane:

Partition coefficient: n-octanol/water : log Pow: -0.269 (25 °C)
pH: 6.7
Method: OECD Test Guideline 117
GLP: yes

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Partition coefficient: n-octanol/water : log Pow: 0.65 (20 °C)

12.4 Mobility in soil

Components:

bis-[4-(2,3-epoxipropoxy)phenyl]propane:

Distribution among environmental compartments : Koc: 445

Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BPFDE):

Distribution among environmental compartments : Koc: 4460
Method: OECD Test Guideline 121

1,4-bis(2,3 epoxypropoxy)butane:

Distribution among environmental compartments : Koc: 12.59
Method: OECD Test Guideline 121

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12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

12.6 Other adverse effects

Product:

Endocrine disrupting potential : This substance/mixture does not contain components considered to have endocrine disrupting properties for environment according to UK REACH Article 57(f).

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

Components:

Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate:

Additional ecological information : An environmental hazard cannot be excluded in the event of unprofessional handling or disposal.
Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product : Dispose of contents and container in accordance with all local, regional, national and international regulations.
Do not dispose of waste into sewer.
Do not contaminate ponds, waterways or ditches with chemical or used container.

Contaminated packaging : Empty remaining contents.
Dispose of as unused product.
Do not re-use empty containers.

SECTION 14: Transport information

14.1 UN number or ID number

ADR	: UN 3082
RID	: UN 3082
IMDG	: UN 3082
IATA	: UN 3082

14.2 UN proper shipping name

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ADR : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(BISPHENOL A EPOXY RESIN, BISPHENOL F EPOXY RESIN)

RID : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(BISPHENOL A EPOXY RESIN, BISPHENOL F EPOXY RESIN)

IMDG : ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.
(BISPHENOL A EPOXY RESIN, BISPHENOL F EPOXY RESIN)

IATA : Environmentally hazardous substance, liquid, n.o.s.
(BISPHENOL A EPOXY RESIN, BISPHENOL F EPOXY RESIN)

14.3 Transport hazard class(es)

	Class	Subsidiary risks
ADR	: 9	
RID	: 9	
IMDG	: 9	
IATA	: 9	

14.4 Packing group

ADR
Packing group : III
Classification Code : M6
Hazard Identification Number : 90
Labels : 9
Tunnel restriction code : (-)

RID
Packing group : III
Classification Code : M6
Hazard Identification Number : 90
Labels : 9

IMDG
Packing group : III
Labels : 9
EmS Code : F-A, S-F

IATA (Cargo)
Packing instruction (cargo aircraft) : 964
Packing instruction (LQ) : Y964
Packing group : III
Labels : Miscellaneous

IATA (Passenger)
Packing instruction (passenger aircraft) : 964

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Packing instruction (LQ) : Y964
Packing group : III
Labels : Miscellaneous

14.5 Environmental hazards

ADR

Environmentally hazardous : yes

RID

Environmentally hazardous : yes

IMDG

Marine pollutant : yes

IATA (Passenger)

Environmentally hazardous : yes

IATA (Cargo)

Environmentally hazardous : yes

14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant EU provisions transposed through retained EU law

UK REACH List of restrictions (Annex 17)	: Conditions of restriction for the following entries should be considered: Number on list 3
UK REACH Candidate list of substances of very high concern (SVHC) for Authorisation	: This product does not contain substances of very high concern.
UK REACH List of substances subject to authorisation (Annex XIV)	: Not applicable

Other regulations:

Take note of The Management of Health and Safety at Work Regulations 1999 (requirements relating to protection of young people at work contained in Regulation 19) and of Directive 94/33/EC on the protection of young people at work.

The components of this product are reported in the following inventories:

DSL : This product contains one or several components that are not on the Canadian DSL nor NDSL.

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AIIC	: Not in compliance with the inventory
ENCS	: Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.
KECI	: Not in compliance with the inventory
PICCS	: Not in compliance with the inventory
IECSC	: Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.
TCSI	: On the inventory, or in compliance with the inventory
TSCA	: On or in compliance with the active portion of the TSCA inventory

Inventories

AICS (Australia), AIIC (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

15.2 Chemical safety assessment

Chemical Safety Assessments for all substances in this product are either Complete or Not applicable.

SECTION 16: Other information

Full text of H-Statements

H302	: Harmful if swallowed.
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.
H361f	: Suspected of damaging fertility.
H373	: May cause damage to organs through prolonged or repeated exposure if swallowed.

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H411 : Toxic to aquatic life with long lasting effects.
H412 : Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	: Acute toxicity
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Eye Dam.	: Serious eye damage
Eye Irrit.	: Eye irritation
Repr.	: Reproductive toxicity
Skin Irrit.	: Skin irritation
Skin Sens.	: Skin sensitisation
STOT RE	: Specific target organ toxicity - repeated exposure
GB EH40	: UK. EH40 WEL - Workplace Exposure Limits
GB EH40 / TWA	: Long-term exposure limit (8-hour TWA reference period)

Further information

Classification of the mixture:

Skin Irrit. 2	H315
Eye Dam. 1	H318
Skin Sens. 1	H317
Aquatic Chronic 2	H411

Classification procedure:

Calculation method
Calculation method
Calculation method
Calculation method

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

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

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

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

1.1 Product identifier

Trade name : ARALDITE® 2014-2 HARDENER

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

Use of the : Adhesives
Substance/Mixture

1.3 Details of the supplier of the safety data sheet

Company : HUNTSMAN ADVANCED MATERIALS (UK) LIMITED
Address : Ickleton Road, Duxford, Cambridgeshire
CB22 4XQ United Kingdom
Telephone : +41 61 299 20 41
E-mail address of person : Global_Product_EHS_AdMat@huntsman.com
responsible for the SDS

1.4 Emergency telephone number

Emergency telephone number : EUROPE: +32 35 75 1234
France ORFILA: +33(0)145425959
ASIA: +65 6336-6011
China: +86 20 39377888
+86 532 83889090
India: + 91 22 42 87 5333
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

Classification (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

Skin irritation, Category 2	H315: Causes skin irritation.
Serious eye damage, Category 1	H318: Causes serious eye damage.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Long-term (chronic) aquatic hazard, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008) as amended by GB-CLP Regulation, UK SI 2019/720, and UK SI 2020/1567)

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Hazard pictograms :



Signal word : Danger

Hazard statements :
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.

Precautionary statements :
Prevention:
P261 Avoid breathing mist or vapours.
P264 Wash skin thoroughly after handling.
P273 Avoid release to the environment.
P280 Wear protective gloves/ eye protection/ face protection.

Response:

P305 + P351 + P338 + P310 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER/ doctor.
P391 Collect spillage.

Hazardous components which must be listed on the label:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction
2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine
Fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine
N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine

2.3 Other hazards

This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous components

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction	- -	Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1A; H317 Aquatic Chronic 2; H411	>= 30 - < 50

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2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine	25513-64-8 247-063-2	Acute Tox. 4; H302 Skin Corr. 1A; H314 Eye Dam. 1; H318 Skin Sens. 1A; H317	>= 5 - < 10
Fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine	68154-62-1 Polymer	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1; H317 Aquatic Chronic 3; H412	>= 2.5 - < 10
N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine	10563-29-8 234-148-4	Acute Tox. 4; H302 Skin Corr. 1A; H314 Eye Dam. 1; H318 Skin Sens. 1B; H317 specific concentration limit Skin Corr. 1A; H314 >= 29.85 % Skin Corr. 1B; H314 9.65 - < 29.85 % Skin Corr. 1C; H314 5 - < 9.65 %	>= 3 - < 5
Substances with a workplace exposure limit :			
barium sulfate	7727-43-7 231-784-4		>= 30 - < 50

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first aid measures

- General advice : Move out of dangerous area.
Consult a physician.
Show this safety data sheet to the doctor in attendance.
Treat symptomatically.
Get medical attention if symptoms occur.
- Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
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.
- If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : If skin irritation persists, call a physician.
If on skin, rinse well with water.
If on clothes, remove clothes.

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- In case of eye contact : Small amounts splashed into eyes can cause irreversible tissue damage and blindness.
In the case of contact with eyes, rinse immediately with plenty of water and seek medical advice.
Continue rinsing eyes during transport to hospital.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.
Take victim immediately to hospital.

4.2 Most important symptoms and effects, both acute and delayed

- Risks : Causes skin irritation.
May cause an allergic skin reaction.
Causes serious eye damage.

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

- Suitable extinguishing media : Water spray
Alcohol-resistant foam
Carbon dioxide (CO₂)
Dry chemical
- Unsuitable extinguishing media : Exercise caution when using a high volume water jet as it may scatter and spread fire

5.2 Special hazards arising from the substance or mixture

- Specific hazards during firefighting : Do not allow run-off from fire fighting to enter drains or water courses.
- Hazardous combustion products : Sulphur oxides
Carbon oxides
Nitrogen oxides (NO_x)

5.3 Advice for firefighters

- Special protective equipment for firefighters : Wear self-contained breathing apparatus for firefighting if necessary.
- Specific extinguishing methods : Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
- Further information : Collect contaminated fire extinguishing water separately. This

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must not be discharged into drains.
Fire residues and contaminated fire extinguishing water must be disposed of in accordance with local regulations.

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

Personal precautions : Use personal protective equipment.
Refer to protective measures listed in sections 7 and 8.

6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.
Prevent further leakage or spillage if safe to do so.
If the product contaminates rivers and lakes or drains inform respective authorities.

6.3 Methods and material for containment and cleaning up

Methods for cleaning up : Soak up with inert absorbent material (e.g. sand, silica gel, acid binder, universal binder, sawdust).
Keep in suitable, closed containers for disposal.

6.4 Reference to other sections

For disposal considerations see section 13., See Section 1 for emergency contact information., For personal protection see section 8.

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Technical measures : Ensure that eyewash stations and safety showers are close to the workstation location.

Local/Total ventilation : Ensure adequate ventilation.

Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitisation of susceptible persons.
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
Do not breathe vapours/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.
Smoking, eating and drinking should be prohibited in the application area.
To avoid spills during handling keep bottle on a metal tray.
Dispose of rinse water in accordance with local and national regulations.

Advice on protection against fire and explosion : Normal measures for preventive fire protection.

Hygiene measures : When using do not eat or drink. When using do not smoke.

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Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Keep container tightly closed in a dry and well-ventilated place. Containers which are opened must be carefully resealed and kept upright to prevent leakage. Keep in properly labelled containers.

Advice on common storage : For incompatible materials please refer to Section 10 of this SDS.

Recommended storage temperature : 2 - 40 °C

Further information on storage stability : Stable under normal conditions.

7.3 Specific end use(s)

Specific use(s) : No data available

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
barium sulfate	7727-43-7	TWA (inhalable dust)	10 mg/m3	GB EH40
		TWA (Respirable dust)	4 mg/m3	GB EH40

Derived No Effect Level (DNEL)

Substance name	End Use	Exposure routes	Potential health effects	Value
N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine	Workers	Inhalation	Long-term systemic effects	3.7 mg/m3
	Workers	Inhalation	Acute systemic effects	7.5 mg/m3
	Workers	Inhalation	Long-term local effects	3.7 mg/m3
	Workers	Inhalation	Acute local effects	7.5 mg/m3
	Workers	Dermal	Long-term systemic effects	0.67 mg/kg
	Consumers	Inhalation	Long-term systemic effects	0.65 mg/m3
	Consumers	Inhalation	Long-term local effects	0.65 mg/m3
	Consumers	Oral	Long-term systemic effects	0.2 mg/kg
2,2,4(or 2,4,4)-	Consumers	Oral	Long-term systemic	0.05 mg/kg

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Trimethylhexane-1,6-diamine			effects	
barium sulfate	Workers	Inhalation	Long-term systemic effects	10 mg/m3
	Workers	Inhalation	Long-term local effects	10 mg/m3
	Consumer use	Inhalation	Long-term systemic effects	10 mg/m3
	Consumer use	Oral	Long-term systemic effects	13000 mg/kg

Predicted No Effect Concentration (PNEC)

Substance name	Environmental Compartment	Value
N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine	Fresh water	9.2 µg/l
	Remarks:Assessment Factors	
	Marine water	0.92 µg/l
	Remarks:Assessment Factors	
	Freshwater - intermittent	92 µg/l
	Remarks:Assessment Factors	
	Sewage treatment plant	18.1 mg/l
	Remarks:Assessment Factors	
	Fresh water sediment	0.0336 mg/kg dry weight (d.w.)
	Marine sediment	0.0034 mg/kg dry weight (d.w.)
	Soil	0.0013 mg/kg dry weight (d.w.)
Siloxanes and silicones, di-Me, reaction products with silica	Fresh water sediment	> 100 mg/kg
	Remarks:Assessment Factors	
	Soil	23 mg/kg
	Remarks:Assessment Factors	
2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine	Fresh water	0.102 mg/l
	Remarks:Assessment Factors	
	Marine water	0.01 mg/l
	Remarks:Assessment Factors	
	Sewage treatment plant	72 mg/l
	Remarks:Assessment Factors	
	Fresh water sediment	0.662 mg/kg
	Marine sediment	0.062 mg/kg
barium sulfate	Fresh water	115 µg/l
	Sewage treatment plant	62.2 mg/l
	Remarks:Assessment Factors	
	Fresh water sediment	600.4 mg/kg
	Remarks:Assessment Factors	
	Soil	207.7 mg/kg
	Remarks:Assessment Factors	

8.2 Exposure controls

Personal protective equipment

Eye/face protection : Eye wash bottle with pure water
Tightly fitting safety goggles

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		Wear face-shield and protective suit for abnormal processing problems.
Hand protection		
Material	:	butyl-rubber
Break through time	:	> 8 h
Material	:	Nitrile rubber
Break through time	:	10 - 480 min
Material	:	Ethyl Vinyl Alcohol Laminate (EVAL)
Break through time	:	> 8 h
Remarks	:	Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Respiratory protection	:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines. Equipment should conform to EN 14387
Filter type	:	Combined particulates, inorganic and acidic gas/vapour, ammonia/amines and organic vapour type (ABEK-P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	paste
Colour	:	black
Odour	:	amine-like
Odour Threshold	:	No data is available on the product itself.
Melting point/freezing point	:	No data available
Boiling point	:	> 200 °C
Flammability (solid, gas)	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.

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Flash point	:	> 100 °C Method: closed cup
Auto-ignition temperature	:	> 200 °C
Decomposition temperature	:	> 200 °C
pH	:	substance/mixture is non-soluble (in water)
Viscosity		
Viscosity, dynamic	:	75 - 150 Pas (20 °C) Method: DIN, Other
Solubility(ies)		
Water solubility	:	insoluble (20 °C)
Solubility in other solvents	:	No data is available on the product itself.
Partition coefficient: n-octanol/water	:	No data is available on the product itself.
Vapour pressure	:	0.001 hPa
Density	:	ca. 1.6 g/cm ³
Relative density	:	No data is available on the product itself.
Relative vapour density	:	No data is available on the product itself.
Particle characteristics	:	No data is available on the product itself.

9.2 Other information

Miscibility with water	:	immiscible
Molecular weight	:	No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	No hazards to be specially mentioned.
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10.4 Conditions to avoid

Conditions to avoid	:	None known.
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10.5 Incompatible materials

Materials to avoid : Strong acids and strong bases
Strong oxidizing agents

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

SECTION 11: Toxicological information

11.1 Information on hazard classes as defined in Regulation (EC) No 1272/2008

Acute toxicity

Not classified due to lack of data.

Product:

Acute oral toxicity : Acute toxicity estimate: > 2,000 mg/kg
Method: Calculation method

Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction:

Acute oral toxicity : LD50 (Rat, female): > 2,000 mg/kg
Method: OECD Test Guideline 423
Assessment: The substance or mixture has no acute oral toxicity

Acute dermal toxicity : LD50 (Rat, male and female): > 2,000 mg/kg
Method: OECD Test Guideline 402
Assessment: The substance or mixture has no acute dermal toxicity

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Acute oral toxicity : LD50 (Rat): 910 mg/kg
Method: OECD Test Guideline 401

N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Acute oral toxicity : LD50 (Rat, male and female): 1,669 mg/kg
Method: OECD Test Guideline 401
GLP: no
Assessment: The component/mixture is moderately toxic after single ingestion.

Skin corrosion/irritation

Causes skin irritation.

Product:

Species : reconstructed human epidermis (RhE)
Method : OECD Test Guideline 435
Result : Irritating to skin.

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Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction:

Species	: human skin
Assessment	: May cause eye and skin irritation.
Method	: OECD Test Guideline 431
Result	: May cause eye and skin irritation.

Species	: human skin
Assessment	: Irritant
Method	: OECD Test Guideline 439
Result	: Irritating to skin.

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Species	: Rabbit
Assessment	: Causes severe burns.
Result	: Corrosive after 3 minutes or less of exposure

Fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine:

Assessment	: Irritating to skin.
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N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Species	: Rabbit
Assessment	: Causes severe burns.
Method	: OECD Test Guideline 404
Result	: Extremely corrosive and destructive to tissue.
GLP	: yes

barium sulfate:

Species	: human skin
Assessment	: No skin irritation
Result	: No skin irritation

Serious eye damage/eye irritation

Causes serious eye damage.

Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction:

Species	: Rabbit
Method	: OECD Test Guideline 405
Result	: Corrosive

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Species	: Rabbit
Method	: OECD Test Guideline 405
Result	: Corrosive

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Fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine:

Assessment : Irritating to eyes.

N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Assessment : Risk of serious damage to eyes.
Result : Risk of serious damage to eyes.
GLP : no

barium sulfate:

Species : Rabbit
Assessment : No eye irritation
Method : OECD Test Guideline 405
Result : No eye irritation

Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified due to lack of data.

Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction:

Exposure routes : Skin
Species : Mouse
Method : OECD Test Guideline 429
Result : The product is a skin sensitiser, sub-category 1A.

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Exposure routes : Skin
Species : Guinea pig
Method : OECD Test Guideline 406
Result : The product is a skin sensitiser, sub-category 1A.

Fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine:

Assessment : May cause sensitisation by skin contact.

N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Test Type : Maximisation Test
Exposure routes : Skin
Species : Guinea pig
Assessment : Probability or evidence of low to moderate skin sensitisation rate in humans
Method : OECD Test Guideline 406
Result : Probability or evidence of low to moderate skin sensitisation rate in humans
GLP : yes

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barium sulfate:

Exposure routes	:	Skin
Species	:	Mouse
Method	:	OECD Test Guideline 429
Result	:	Does not cause skin sensitisation.

Germ cell mutagenicity

Not classified due to lack of data.

Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction:

Genotoxicity in vitro	:	Metabolic activation: with and without metabolic activation Method: OECD Test Guideline 471 Result: negative
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Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487
Result: negative

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Genotoxicity in vitro	:	Test Type: Ames test Test system: Salmonella typhimurium Concentration: 5000 ug/plate Metabolic activation: with and without metabolic activation Method: Directive 67/548/EEC, Annex, B.13/14 Result: negative
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Test Type: Chromosome aberration test in vitro
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Concentration: 2 mg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Genotoxicity in vivo	:	Species: Chinese hamster (male and female) Cell type: Bone marrow Application Route: Oral Dose: 825 - 1000 mg/kg Method: OECD Test Guideline 474 Result: negative
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Test Type: In vivo micronucleus test

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Species: Mouse (male and female)
Application Route: Oral
Dose: 850 - 1000 mg/kg
Method: OECD Test Guideline 474
Result: negative

N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro
Test system: Human lymphocytes
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487
Result: negative
GLP: yes

Test Type: reverse mutation assay
Test system: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Test Type: In vitro mammalian cell gene mutation test
Test system: mouse lymphoma cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Test Type: reverse mutation assay
Test system: Salmonella tryphimurium and E. coli
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

barium sulfate:

Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Carcinogenicity

Not classified due to lack of data.

Components:

N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Species : Mouse, male
Application Route : Dermal

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Exposure time : 20 month(s)
Dose : 1.25/56.3 mg/animal
Frequency of Treatment : 3 daily
NOAEL : ≥ 56.3 mg/kg body weight
Result : negative
Remarks : Information given is based on data obtained from similar substances.

barium sulfate:

Species : Rat, male and female
Application Route : Oral
Exposure time : 104 weeks
Dose : 60 - 75 mg/kg
Method : OPPTS 870.4200
Result : negative

Species : Mouse, male and female
Application Route : Oral
Dose : 160 - 200 mg/kg
Method : OPPTS 870.4200
Result : negative

Reproductive toxicity

Not classified due to lack of data.

Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Result: Animal testing did not show any effects on fertility.

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Dose: 10, 60, 120 mg/kg bw/day
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Effects on foetal development : Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: NOAEL: 50,000 ppm
Result: No teratogenic effects

N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Effects on fertility : Test Type: OECD Test Guideline 422
Species: Rat, male and female
Application Route: Oral
Dose: 5, 15 and 50 mg/kg bw/d
General Toxicity - Parent: NOAEL: 15 mg/kg body weight

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General Toxicity F1: NOAEL: 15 mg/kg body weight
Method: OECD Test Guideline 422
Result: Animal testing did not show any effects on fertility.
GLP: yes

Effects on foetal development : Test Type: reproductive and developmental toxicity study
Species: Rat, male and female
Application Route: Oral
Dose: 5, 15 and 50 mg/kg bw/d
General Toxicity Maternal: NOAEL: 15 mg/kg body weight
Developmental Toxicity: NOAEL: 15 mg/kg body weight
Method: OECD Test Guideline 422
Result: Not classified
GLP: yes
Remarks: Information given is based on data obtained from similar substances.

Reproductive toxicity - Assessment : No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

STOT - single exposure

Not classified due to lack of data.

STOT - repeated exposure

Not classified due to lack of data.

Repeated dose toxicity

Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction:

Species : Rat, male and female
NOAEL : 1000 mg/kg
Application Route : Ingestion
Exposure time : 6 Weeks
Number of exposures : 7 d
Method : Subacute toxicity

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Species : Rat, male and female
NOAEL : 10 mg/kg bw/day
Application Route : Ingestion
Exposure time : 13 Weeks
Number of exposures : Daily
Dose : 10, 60, 180mg/kg bw
Target Organs : Liver

Species : Rat, male and female
LOAEL : 60 mg/kg bw/day
Application Route : Ingestion
Exposure time : 13 Weeks
Number of exposures : Daily
Dose : 10, 60, 180mg/kg bw
Target Organs : Liver

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N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Species	: Rat, male and female
	: 500 mg/m ³
Application Route	: Inhalation
Test atmosphere	: vapour
Exposure time	: 21 d 6 h
Number of exposures	: 5 days/week
Dose	: 550 mg/m ³
Method	: Subchronic toxicity
Remarks	: Based on data from similar materials

Species	: Mouse, male
NOAEL	: >= 56.3 mg/kg/d
Application Route	: Skin contact
Number of exposures	: 3 d
Method	: Chronic toxicity
Remarks	: Based on data from similar materials

Species	: Rat, male and female
NOAEL	: 41 mg/kg
NOAEL	: 1,000 mg/l, ppm
Application Route	: oral (feed)
Exposure time	: 20 months
Number of exposures	: 3 times/week
Dose	: 1000/7500/15000 ppm
Method	: OECD Test Guideline 408

barium sulfate:

Species	: Rat
LOEC	: >= 104 mg/kg, 40 mg/m ³
Application Route	: Ingestion
Test atmosphere	: dust/mist
Exposure time	: 5 h
Number of exposures	: 5 d
Method	: Subchronic toxicity

Aspiration toxicity

Not classified due to lack of data.

11.2 Information on other hazards

Endocrine disrupting properties

Product:

Assessment	: This substance/mixture does not contain components considered to have endocrine disrupting properties for human health according to UK REACH Article 57(f),
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Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

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Neurological effects

No data available

Further information

No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

Reaction products of fatty acid dimers and trimers, C18 (unsaturated) alkyl and fatty acids, C18 (unsaturated) alkyl with amines, polyethylenepoly-, triethylenetetramine fraction:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): 7.07 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 5.18 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): 2.43 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50 (activated sludge): 421 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 174 mg/l
Exposure time: 48 h
Method: DIN 38412

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 31.5 mg/l
Exposure time: 24 h
Method: DIN 38412

Toxicity to algae/aquatic plants : ErC50 (Pseudokirchneriella subcapitata (algae)): 43.5 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

EC50 (Pseudokirchneriella subcapitata (algae)): 37.1 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

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NOEC (Pseudokirchneriella subcapitata (algae)): 16 mg/l
Exposure time: 72 h
Method: OECD Test Guideline 201

Toxicity to microorganisms : IC50 (Pseudomonas putida): 89 mg/l
Exposure time: 17 h

Toxicity to fish (Chronic toxicity) : NOEC: 10.9 mg/l
Exposure time: 30 d
Species: Brachydanio rerio (zebrafish)
Method: OECD Test Guideline 210

Lowest Observed Effect Concentration: 10.9 mg/l
Exposure time: 30 d
Species: Brachydanio rerio (zebrafish)
Method: OECD Test Guideline 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 1.02 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211

Lowest Observed Effect Concentration: 1.02 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Method: OECD Test Guideline 211

Toxicity to soil dwelling organisms : NOEC: >= 1,000 mg/kg
Exposure time: 56 d
Species: Eisenia fetida (earthworms)
Method: OECD Test Guideline 222

EC50: >= 1,000 mg/kg
Exposure time: 56 d
Species: Eisenia fetida (earthworms)
Method: OECD Test Guideline 222

Fatty acids, C18-unsatd., dimers, polymers with oleic acid and triethylenetetramine:

Ecotoxicology Assessment

Chronic aquatic toxicity : Harmful to aquatic life with long lasting effects.

N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): > 100 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 203
GLP: yes

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 9.2 mg/l
End point: Immobilization

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Exposure time: 48 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 202
GLP: yes

Toxicity to algae/aquatic plants : ErC50 (Selenastrum capricornutum (green algae)): 21 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

NOEC (Selenastrum capricornutum (green algae)): 5.7 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

Toxicity to microorganisms : EC50 (Pseudomonas putida): 181 mg/l
Exposure time: 16 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: DIN 38 412 Part 8
GLP: no

barium sulfate:

Toxicity to fish : LC50 : 174 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : LC50 (Daphnia magna (Water flea)): 14.5 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 : > 100 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

NOEC : > 1.15 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water

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Method: OECD Test Guideline 201

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 5.8 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 211

12.2 Persistence and degradability

Components:

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Biodegradability : Inoculum: activated sludge
Concentration: 11.4 mg/l
Result: Not readily biodegradable.
Biodegradation: 7 %
Exposure time: 28 d

N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Biodegradability : Test Type: aerobic
Result: Readily biodegradable.
Biodegradation: 100 %
Related to: Dissolved organic carbon (DOC)
Exposure time: 28 d
Method: OECD Test Guideline 301A
Test substance: Fresh water
GLP: yes

12.3 Bioaccumulative potential

Components:

2,2,4(or 2,4,4)-Trimethylhexane-1,6-diamine:

Partition coefficient: n-octanol/water : log Pow: -0.3 (25 °C)
Method: OECD Test Guideline 117

N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine:

Partition coefficient: n-octanol/water : log Pow: -0.56 (25 °C)
pH: 11.6
Method: OECD Test Guideline 107

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Product:

Assessment : This substance/mixture contains no components considered to be either persistent, bioaccumulative and toxic (PBT), or very persistent and very bioaccumulative (vPvB) at levels of 0.1% or higher.

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12.6 Other adverse effects

Product:

Endocrine disrupting potential	:	This substance/mixture does not contain components considered to have endocrine disrupting properties for environment according to UK REACH Article 57(f).
Additional ecological information	:	An environmental hazard cannot be excluded in the event of unprofessional handling or disposal. Toxic to aquatic life with long lasting effects.

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Dispose of contents and container in accordance with all local, regional, national and international regulations. Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container.
Contaminated packaging	:	Empty remaining contents. Dispose of as unused product. Do not re-use empty containers.

SECTION 14: Transport information

14.1 UN number or ID number

ADR	:	UN 3082
RID	:	UN 3082
IMDG	:	UN 3082
IATA	:	UN 3082

14.2 UN proper shipping name

ADR	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (POLYAMIDE RESIN)
RID	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (POLYAMIDE RESIN)
IMDG	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (POLYAMIDE RESIN)
IATA	:	Environmentally hazardous substance, liquid, n.o.s. (POLYAMIDE RESIN)

14.3 Transport hazard class(es)

Class	Subsidiary risks
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ADR	:	9
RID	:	9
IMDG	:	9
IATA	:	9

14.4 Packing group

ADR

Packing group	:	III
Classification Code	:	M6
Hazard Identification Number	:	90
Labels	:	9
Tunnel restriction code	:	(-)

RID

Packing group	:	III
Classification Code	:	M6
Hazard Identification Number	:	90
Labels	:	9

IMDG

Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F

IATA (Cargo)

Packing instruction (cargo aircraft)	:	964
Packing instruction (LQ)	:	Y964
Packing group	:	III
Labels	:	Miscellaneous

IATA (Passenger)

Packing instruction (passenger aircraft)	:	964
Packing instruction (LQ)	:	Y964
Packing group	:	III
Labels	:	Miscellaneous

14.5 Environmental hazards

ADR

Environmentally hazardous	:	yes
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RID

Environmentally hazardous	:	yes
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IMDG

Marine pollutant	:	yes
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IATA (Passenger)

Environmentally hazardous	:	yes
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IATA (Cargo)

Environmentally hazardous	:	yes
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14.6 Special precautions for user

The transport classification(s) provided herein are for informational purposes only, and solely based upon the properties of the unpackaged material as it is described within this Safety Data

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Sheet. Transportation classifications may vary by mode of transportation, package sizes, and variations in regional or country regulations.

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

15.1 Safety, health and environmental regulations/legislation specific for the substance or mixture

Relevant EU provisions transposed through retained EU law

UK REACH List of restrictions (Annex 17)	:	Conditions of restriction for the following entries should be considered: Number on list 3
UK REACH Candidate list of substances of very high concern (SVHC) for Authorisation	:	This product does not contain substances of very high concern.
UK REACH List of substances subject to authorisation (Annex XIV)	:	Not applicable

Other regulations:

Take note of The Management of Health and Safety at Work Regulations 1999 (requirements relating to protection of young people at work contained in Regulation 19) and of Directive 94/33/EC on the protection of young people at work.

The components of this product are reported in the following inventories:

DSL	:	All components of this product are on the Canadian DSL
AIIC	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory
NZIoC	:	On the inventory, or in compliance with the inventory
ENCS	:	On the inventory, or in compliance with the inventory
KECI	:	On the inventory, or in compliance with the inventory
PICCS	:	Not in compliance with the inventory
IECSC	:	On the inventory, or in compliance with the inventory
TCSI	:	On the inventory, or in compliance with the inventory

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TSCA : All substances listed as active on the TSCA inventory

Inventories

AICS (Australia), AIIC (Australia), DSL (Canada), IECSC (China), ENCS (Japan), KECI (Korea), NZIOIC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

15.2 Chemical safety assessment

Chemical Safety Assessments for all substances in this product are either Complete or Not applicable.

SECTION 16: Other information

Full text of H-Statements

H302	: Harmful if swallowed.
H314	: Causes severe skin burns and eye damage.
H315	: Causes skin irritation.
H317	: May cause an allergic skin reaction.
H318	: Causes serious eye damage.
H319	: Causes serious eye irritation.
H411	: Toxic to aquatic life with long lasting effects.
H412	: Harmful to aquatic life with long lasting effects.

Full text of other abbreviations

Acute Tox.	: Acute toxicity
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Eye Dam.	: Serious eye damage
Eye Irrit.	: Eye irritation
Skin Corr.	: Skin corrosion
Skin Irrit.	: Skin irritation
Skin Sens.	: Skin sensitisation
GB EH40	: UK. EH40 WEL - Workplace Exposure Limits
GB EH40 / TWA	: Long-term exposure limit (8-hour TWA reference period)

Further information

Classification of the mixture:

Skin Irrit. 2	H315
Eye Dam. 1	H318
Skin Sens. 1	H317
Aquatic Chronic 2	H411

Classification procedure:

Based on product data or assessment
Calculation method
Calculation method
Calculation method

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