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

1.1 Product identifier

Trade name : ARALDITE® 2031 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 (Europe)BVBA
Address : Everslaan 45
3078 Everberg
Belgium
Telephone : +41 61 299 20 41
Telefax : +41 61 299 20 40

E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.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)

Skin irritation, Category 2	H315: Causes skin irritation.
Eye irritation, Category 2	H319: Causes serious eye irritation.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Chronic aquatic toxicity, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Warning

Hazard statements :

H315	Causes skin irritation.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
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:

P333 + P313	If skin irritation or rash occurs: Get medical advice/ attention.
P391	Collect spillage.

Hazardous components which must be listed on the label:
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane

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)
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	1675-54-3 216-823-5 603-073-00-2 01-2119456619-26	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1; H317 Aquatic Chronic 2; H411	>= 60 - <= 100

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

SECTION 4: First aid measures

4.1 Description of first aid measures

General advice	:	Move out of dangerous area. Show this safety data sheet to the doctor in attendance. Treat symptomatically. Get medical attention if symptoms occur.
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	:	Immediately flush eye(s) with plenty of water. 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.

4.2 Most important symptoms and effects, both acute and delayed

None known.

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	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	High volume water jet

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	:	No data is available on the product itself.

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Specific extinguishing methods	:	No data is available on the product itself.
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.

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	:	Do not breathe vapours or spray mist. 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. Dispose of rinse water in accordance with local and national regulations. Persons susceptible to skin sensitisation problems or asthma,

allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

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

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Contains no substances with occupational exposure limit values.

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Workers	Dermal	Systemic effects, Short-term exposure	8.33 mg/kg bw/day
	Workers	Inhalation	Systemic effects, Short-term exposure	12.25 mg/m3
	Workers	Dermal	Systemic effects, Long-term exposure	8.33 mg/kg bw/day
	Workers	Inhalation	Systemic effects, Long-term exposure	12.25 mg/m3

	Consumers	Dermal	Systemic effects, Short-term exposure	3.571 mg/kg bw/day
	Consumers	Oral	Systemic effects, Short-term exposure	0.75 mg/kg bw/day
	Consumers	Dermal	Systemic effects, Long-term exposure	3.571 mg/kg bw/day
	Consumers	Oral	Systemic effects, Long-term exposure	0.75 mg/kg bw/day

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Fresh water	0.006 mg/l
Remarks:	Assessment Factors	
	Marine water	0.0006 mg/l
	Assessment Factors	
	Freshwater - intermittent	0.018 mg/l
	Assessment Factors	
	Fresh water sediment	0.996 mg/kg
	Equilibrium method	
	Marine sediment	0.0996 mg/kg
	Equilibrium method	
	Soil	0.196 mg/kg
	Equilibrium method	
	Sewage treatment plant	10 mg/l
	Assessment Factors	
	Secondary Poisoning	11 mg/kg
	Fresh water	0.006 mg/l
	Assessment Factors	
	Marine water	0.0006 mg/l
	Assessment Factors	
	Freshwater - intermittent	0.018 mg/l
	Assessment Factors	
	Fresh water sediment	0.996 mg/kg
	Equilibrium method	
	Marine sediment	0.0996 mg/kg

	Equilibrium method	
	Soil	0.196 mg/kg
	Equilibrium method	
	Sewage treatment plant	10 mg/l
	Assessment Factors	
	Secondary Poisoning	11 mg/kg
Siloxanes and Silicones, di-Me, reaction products with silica	Fresh water sediment	> 100 mg/kg
	Assessment Factors	
	Soil	23 mg/kg
	Assessment Factors	

8.2 Exposure controls

Personal protective equipment

Eye 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

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

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

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves. 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).

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.
Recommended Filter type:
Combined particulates and organic vapour type

Filter type : Filter type A-P

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance	:	paste
Colour	:	black
Odour	:	slight
Odour Threshold	:	No data is available on the product itself.
pH	:	ca. 7 (20 °C) Concentration: 500 g/l
Freezing point	:	No data is available on the product itself.
Melting point	:	No data is available on the product itself.
Boiling point	:	> 200 °C
Flash point	:	200 °C Method: Pensky-Martens closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Burning rate	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Vapour pressure	:	ca. 0.01 hPa (20 °C)
Relative vapour density	:	No data is available on the product itself.
Relative density	:	No data is available on the product itself.
Density	:	ca. 1.16 g/cm3 (25 °C)
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.

Auto-ignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	> 200 °C
Viscosity	:	No data is available on the product itself.
Explosive properties	:	No data is available on the product itself.
Oxidizing properties	:	No data is available on the product itself.

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

Stable under recommended storage conditions.
No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

No decomposition if stored and applied as directed.
Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions	:	Stable under normal conditions. No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid	:	None known.

10.5 Incompatible materials

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

10.6 Hazardous decomposition products

Carbon oxides
Burning produces noxious and toxic fumes.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane**:**

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

Acute inhalation toxicity : No data available

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
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

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Species: Rabbit
Assessment: Mild skin irritant
Method: OECD Test Guideline 404
Result: Irritating to skin.

Serious eye damage/eye irritation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Species: Rabbit
Assessment: Mild eye irritant
Method: OECD Test Guideline 405
Result: Irritating to eyes.

Respiratory or skin sensitisation

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Exposure routes: Skin
Species: Mouse
Assessment: May cause sensitisation by skin contact.
Method: OECD Test Guideline 429
Result: Causes sensitisation.

Assessment: No data available

Germ cell mutagenicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:
Genotoxicity in vitro : Metabolic activation: with and without metabolic activation

Method: OECD Test Guideline 476
Result: positive

: Concentration: 0 - 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: positive

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane**:**

Genotoxicity in vivo : Cell type: Germ
Application Route: Oral
Method: OECD Test Guideline 478
Result: negative

Cell type: Somatic
Application Route: Oral
Dose: 0 - 5000 mg/kg
Method: OPPTS 870.5395
Result: negative

Carcinogenicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane**:**
Species: Rat, male and female
Application Route: Oral
Exposure time: 24 month(s)
Dose: 15 mg/kg
Frequency of Treatment: 7 days/week
Method: OECD Test Guideline 453
Result: negative

Species: Mouse, male
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 0.1 mg/kg
Frequency of Treatment: 3 days/week
Method: OECD Test Guideline 453
Result: negative

Species: Rat, female
Application Route: Dermal
Exposure time: 24 month(s)
Dose: 1 mg/kg
Frequency of Treatment: 5 days/week
Method: OECD Test Guideline 453
Result: negative

Carcinogenicity - Assessment : No data available

Reproductive toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane**:**

Effects on fertility : Test Type: Two-generation study
Species: Rat, male and female
Application Route: Oral
Dose: >750 milligram per kilogram
General Toxicity - Parent: No-observed-effect level: 540 mg/kg body weight
General Toxicity F1: No-observed-effect level: 540 mg/kg body weight
Symptoms: No adverse effects
Method: OECD Test Guideline 416
Result: No effects on fertility and early embryonic development were detected.

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane**:**

Effects on foetal development : Species: Rabbit, female
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level: 30 mg/kg body weight
Method: Other guidelines
Result: No teratogenic effects

Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 60 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 180 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Reproductive toxicity - Assessment : No data available

STOT - single exposure

No data available

STOT - repeated exposure

No data available

Repeated dose toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane**:**
Species: Rat, male and female
NOAEL: 50 mg/kg
Application Route: Ingestion
Exposure time: 14 WeeksNumber of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
NOEL: 10 mg/kg
Application Route: Skin contact
Exposure time: 13 WeeksNumber of exposures: 5 d
Method: Subchronic toxicity

Species: Mouse, male
NOAEL: 100 mg/kg
Application Route: Skin contact
Exposure time: 13 WeeksNumber of exposures: 3 d
Method: Subchronic toxicity

Repeated dose toxicity - Assessment : No data available

Aspiration toxicity

No data available

Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects
No data available

Further information
Ingestion: No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane**:**

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 1.5 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	:	EC50 (Daphnia magna (Water flea)): 2.7 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water
Toxicity to algae	:	EC50 (Selenastrum capricornutum (green algae)): 9.4 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

12.2 Persistence and degradability

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane**:**

Biodegradability	:	Inoculum: Sewage (STP effluent) 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

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

12.3 Bioaccumulative potential

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

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

12.4 Mobility in soil

Components:

2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane:

Distribution among environmental compartments : Koc: 445

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:

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 : Can be landfilled or incinerated, when in compliance with local regulations.
Where possible recycling is preferred to disposal or incineration.
Send to a licensed waste management company.

The product should not be allowed to enter drains, water courses or the soil.
Do not contaminate ponds, waterways or ditches with chemical or used container.
Send to a licensed waste management company.
Dispose of as hazardous waste in compliance with local and national regulations.
Dispose of contents/ container to an approved waste disposal plant.

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

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

SECTION 14: Transport information

IATA

14.1 UN number	:	UN 3082
14.2 UN proper shipping name	:	Environmentally hazardous substance, liquid, n.o.s. (BISPHENOL A EPOXY RESIN)
14.3 Transport hazard class(es)	:	9
14.4 Packing group	:	III
Labels	:	Miscellaneous
Packing instruction (cargo aircraft)	:	964
Packing instruction (passenger aircraft)	:	964

IATA (Passenger)

Environmentally hazardous : yes

IATA (Cargo)

Environmentally hazardous : yes

IMDG

14.1 UN number : UN 3082

14.2 UN proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN)
14.3 Transport hazard class(es)	:	9
14.4 Packing group	:	III
Labels	:	9
EmS Code	:	F-A, S-F
14.5 Environmental hazards		
Marine pollutant	:	yes

ADR

14.1 UN number	:	UN 3082
14.2 UN proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN)
14.3 Transport hazard class(es)	:	9
14.4 Packing group	:	III
Labels	:	9
14.5 Environmental hazards		
Environmentally hazardous	:	yes

RID

14.1 UN number	:	UN 3082
14.2 UN proper shipping name	:	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (BISPHENOL A EPOXY RESIN)
14.3 Transport hazard class(es)	:	9
14.4 Packing group	:	III
Labels	:	9
14.5 Environmental hazards		
Environmentally hazardous	:	yes

Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59).	:	This product does not contain substances of very high concern (Regulation (EC) No 1907/2006 (REACH), Article 57).
REACH - List of substances subject to authorisation (Annex XIV)	:	Not applicable
REACH - List of substances subject to authorisation - Future sunset date	:	Not applicable

Other regulations:
Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

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

DSL	:	All components of this product are on the Canadian DSL
AICS	:	On the inventory, or in compliance with the inventory
NZIoC	:	Not 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	:	On the inventory, or 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
TSCA	:	On the inventory, or in compliance with the inventory

Inventories

AICS (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

H315	:	Causes skin irritation.
H317	:	May cause an allergic skin reaction.
H319	:	Causes serious eye irritation.
H411	:	Toxic to aquatic life with long lasting effects.

Full text of other abbreviations

Aquatic Chronic	:	Chronic aquatic toxicity

Eye Irrit.	:	Eye irritation
Skin Irrit.	:	Skin irritation
Skin Sens.	:	Skin sensitisation

Further information

Classification of the mixture:		**Classification procedure:**
Skin Irrit. 2	H315	Calculation method
Eye Irrit. 2	H319	Calculation method
Skin Sens. 1	H317	Calculation method
Aquatic Chronic 2	H411	Calculation method

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

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

1.1 Product identifier

Trade name : ARALDITE® 2031 HARDENER

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

Use of the Substance/Mixture : Hardener

1.3 Details of the supplier of the safety data sheet

Company : Huntsman Advanced Materials (Europe)BVBA
Address : Everslaan 45
3078 Everberg
Belgium
Telephone : +41 61 299 20 41
Telefax : +41 61 299 20 40

E-mail address of person responsible for the SDS : Global_Product_EHS_AdMat@huntsman.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)

Acute toxicity, Category 4	H332: Harmful if inhaled.
Skin corrosion, Category 1B	H314: Causes severe skin burns and eye damage.
Serious eye damage, Category 1	H318: Causes serious eye damage.
Skin sensitisation, Category 1	H317: May cause an allergic skin reaction.
Reproductive toxicity, Category 1B	H360F: May damage fertility.
Specific target organ toxicity - repeated	H373: May cause damage to organs through

exposure, Category 2, Respiratory Tract	prolonged or repeated exposure if inhaled.
Chronic aquatic toxicity, Category 2	H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labelling (REGULATION (EC) No 1272/2008)

Hazard pictograms :

Signal word : Danger

Hazard statements :

H314	Causes severe skin burns and eye damage.
H317	May cause an allergic skin reaction.
H332	Harmful if inhaled.
H360F	May damage fertility.
H373	May cause damage to organs (Respiratory Tract) through prolonged or repeated exposure if inhaled.
H411	Toxic to aquatic life with long lasting effects.

Precautionary statements :

Prevention:

P201	Obtain special instructions before use.
P260	Do not breathe mist or vapours.
P280	Wear protective gloves/ protective clothing/ eye protection/ face protection.

Response:

P303 + P361 + P353	IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water/shower.
P304 + P340 + P310	IF INHALED: Remove person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER/doctor.
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.
P308 + P313	IF exposed or concerned: Get medical advice/ attention.

Hazardous components which must be listed on the label:

2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated

Diethylenetriamine

Aminoethylpiperazine

4,4'-isopropylidenediphenol

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)
2-Propenenitrile, polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated	68683-29-4 Polymer	Skin Irrit. 2; H315 Eye Irrit. 2; H319 Skin Sens. 1; H317	13 - 30
Naphthalene, bis(1-methylethyl)-	38640-62-9 254-052-6 01-2119565150-48	Asp. Tox. 1; H304 Aquatic Acute 1; H400 Aquatic Chronic 1; H410	7 - 13
Fatty acids, C18-unsatd., dimers, oligomeric reaction products with tall-oil fatty acids and triethylenetetramine	68082-29-1 500-191-5 01-2119972320-44	Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Chronic 2; H411	3 - 10
2,2'-Iminodi(ethylamine)	111-40-0 203-865-4 612-058-00-X 01-2119473793-27	Acute Tox. 4; H302 Acute Tox. 2; H330 Acute Tox. 4; H312 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1; H317 STOT SE 3; H335	3 - 10
2-Piperazin-1-ylethylamine	140-31-8 205-411-0 612-105-00-4 01-2119471486-30	Acute Tox. 4; H302 Acute Tox. 3; H311 Skin Corr. 1B; H314 Skin Sens. 1; H317 Repr. 2; H361d STOT RE 1; H372 Aquatic Chronic 3; H412	1 - 3
2,4,6-Tris(dimethylaminomethyl)phenol	90-72-2 202-013-9 603-069-00-0 01-2119560597-27	Skin Corr. 1C; H314 Eye Dam. 1; H318 Skin Sens. 1B; H317	1 - 3
4,4'-Isopropylidenediphenol	80-05-7 201-245-8 604-030-00-0 01-2119457856-23	Eye Dam. 1; H318 Skin Sens. 1; H317 Repr. 1B; H360F STOT SE 3; H335 Aquatic Chronic 2;	0,1 - 1

		H411	
Amines, polyethylenepoly-, triethylenetetramine fraction	90640-67-8 - 01-2119487919-13	Acute Tox. 4; H302 Acute Tox. 4; H312 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Chronic 3; H412	0,1 - 1
3-Aminopropyltriethoxysilane	919-30-2 213-048-4 612-108-00-0 -	Acute Tox. 4; H302 Skin Corr. 1B; H314 Skin Sens. 1; H317	0,1 - 1

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.
Symptoms of poisoning may appear several hours later.
Do not leave the victim unattended.

If inhaled : Call a physician or poison control centre immediately.
If unconscious, place in recovery position and seek medical advice.

In case of skin contact : Immediate medical treatment is necessary as untreated wounds from corrosion of the skin heal slowly and with difficulty.
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.
Protect unharmed eye.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.

If swallowed : Keep respiratory tract clear.
Do NOT induce vomiting.
Do not give milk or alcoholic beverages.
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

None known.

4.3 Indication of any immediate medical attention and special treatment needed

SECTION 5: Firefighting measures

5.1 Extinguishing media

Suitable extinguishing media	:	Use extinguishing measures that are appropriate to local circumstances and the surrounding environment.
Unsuitable extinguishing media	:	High volume water jet

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	:	No data is available on the product itself.

5.3 Advice for firefighters

Special protective equipment for firefighters	:	Wear self-contained breathing apparatus for firefighting if necessary.
Specific extinguishing methods	:	No data is available on the product itself.
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. Ensure adequate ventilation. Evacuate personnel to safe areas.

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

None

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Avoid formation of aerosol.
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.
Provide sufficient air exchange and/or exhaust in work rooms.
To avoid spills during handling keep bottle on a metal tray.
Dispose of rinse water in accordance with local and national regulations.
Persons susceptible to skin sensitisation problems or asthma, allergies, chronic or recurrent respiratory disease should not be employed in any process in which this mixture is being used.

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

Hygiene measures : Avoid contact with skin, eyes and clothing. When using do not eat or drink. When using do not smoke. Wash hands before breaks and immediately after handling the product.

7.2 Conditions for safe storage, including any incompatibilities

Requirements for storage areas and containers : Prevent unauthorized access. 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. Observe label precautions. Electrical installations / working materials must comply with the technological safety standards.

Other data : No decomposition if stored and applied as directed.

7.3 Specific end use(s)

SECTION 8: Exposure controls/personal protection

8.1 Control parameters

Occupational Exposure Limits

Components	CAS-No.	Value type (Form of exposure)	Control parameters	Basis
Diethylenetriamine	111-40-0	TWA	1 ppm 4,3 mg/m3	GB EH40
Further information	Can be absorbed through skin. The assigned substances are those for which			

	there are concerns that dermal absorption will lead to systemic toxicity., Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used			
4,4'-isopropylidenediphenol	80-05-7	TWA (inhalable dust)	10 mg/m3	GB EH40
Further information	Where no specific short-term exposure limit is listed, a figure three times the long-term exposure should be used			
		TWA (inhalable dust)	10 mg/m3	2009/161/EU
Further information	Indicative			

Derived No Effect Level (DNEL) according to Regulation (EC) No. 1907/2006:

Substance name	End Use	Exposure routes	Potential health effects	Value
naphthalene, bis(1-methylethyl)-	Workers	Inhalation	Systemic effects, Long-term exposure	30 mg/m3
	Workers	Dermal	Systemic effects, Long-term exposure	4,3 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Long-term exposure	7,4 mg/m3
	Consumers	Dermal	Systemic effects, Long-term exposure	2,1 mg/kg bw/day
	Consumers	Oral	Systemic effects, Long-term exposure	2,1 mg/kg bw/day
Dimer fatty acid (c18) polyamidoamine resin	Workers	Inhalation	Long-term systemic effects	3,9 mg/m3
	Workers	Dermal	Long-term systemic effects	1,1 mg/kg
	Consumers	Inhalation	Long-term systemic effects	0,97 mg/m3
	Consumers	Dermal	Long-term systemic effects	0,56 mg/kg
	Consumers	Oral	Long-term systemic effects	0,56 mg/kg
Diethylenetriamine	Workers	Inhalation	Systemic effects, Short-term exposure	92,1 mg/m3
	Workers	Inhalation	Local effects, Short-term exposure	2,6 mg/m3
	Workers	Dermal	Systemic effects, Long-term exposure	11,4 mg/kg bw/day
	Workers	Inhalation	Systemic effects, Long-term exposure	15,4 mg/m3
	Workers	Dermal	Local effects, Long-term exposure	1,1 mg/cm2
	Workers	Inhalation	Local effects, Long-term exposure	0,87 mg/m3
	Consumers	Oral	Local effects, Short-term exposure	4,88 mg/kg

				bw/day
	Consumers	Inhalation	Systemic effects, Short-term exposure	27,5 mg/m3
	Consumers	Dermal	Systemic effects, Long-term exposure	4,88 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Long-term exposure	4,6 mg/m3
Aminoethylpiperazine	Workers	Inhalation	Long-term systemic effects	10,6 mg/m3
	Workers	Inhalation	Acute systemic effects	10,6 mg/m3
	Workers	Inhalation	Long-term local effects	0,015 mg/m3
	Workers	Inhalation	Acute local effects	80 mg/m3
2,4,6-tris(dimethylaminomethyl)phenol	Workers	Inhalation	Systemic effects, Long-term exposure	0,31 mg/m3
triethylenetetramine	Workers	Inhalation	Systemic effects, Short-term exposure	5380 mg/m3
	Workers	Dermal	Systemic effects, Long-term exposure	0,57 mg/kg bw/day
	Workers	Inhalation	Systemic effects, Long-term exposure	1 mg/m3
	Workers	Dermal	Local effects, Long-term exposure	0,028 mg/m3
	Consumers	Dermal	Systemic effects, Short-term exposure	8 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Short-term exposure	1600 mg/m3
	Consumers	Oral	Systemic effects, Short-term exposure	20 mg/kg bw/day
	Consumers	Dermal	Local effects, Short-term exposure	1 mg/cm2
	Consumers	Dermal	Local effects, Short-term exposure	0,25 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Long-term exposure	0,29 mg/m3
	Consumers	Oral	Systemic effects, Long-term exposure	0,41 mg/kg bw/day
	Consumers	Dermal	Local effects, Long-term exposure	0,43 mg/cm2

Predicted No Effect Concentration (PNEC) according to Regulation (EC) No. 1907/2006:

Substance name	Environmental Compartment	Value
naphthalene, bis(1-methylethyl)-	Fresh water	0,26 µg/l
Remarks:	Assessment Factors	

	Marine water	0,026 µg/l
Assessment Factors		
	Sewage treatment plant	0,15 mg/l
Assessment Factors		
	Fresh water sediment	0,94 mg/kg
Equilibrium method		
	Marine sediment	0,094 mg/kg
Equilibrium method		
	Soil	0,1872 mg/kg
Equilibrium method		
	Secondary Poisoning	25 mg/kg
Assessment Factors		
Dimer fatty acid (c18) polyamidoamine resin	Fresh water	0,00434 mg/l
Assessment Factors		
	Marine water	0,00043 mg/l
Assessment Factors		
	Freshwater - intermittent	0,0434 mg/l
Assessment Factors		
	Sewage treatment plant	3,84 mg/l
Assessment Factors		
	Fresh water sediment	434,02 mg/kg
Equilibrium method		
	Marine sediment	43,4 mg/kg
Equilibrium method		
	Soil	86,78 mg/kg
Equilibrium method		
Diethylenetriamine	Fresh water	0,56 mg/l
Assessment Factors		
	Marine water	0,056 mg/l
Assessment Factors		
	Fresh water sediment	1072 mg/kg
Equilibrium method		
	Marine sediment	107,2 mg/kg
Equilibrium method		

	Soil	214 mg/kg
Equilibrium method		
	Freshwater - intermittent	0,32 mg/l
Assessment Factors		
Aminoethylpiperazine	Fresh water	0,058 mg/l
Assessment Factors		
	Marine water	0,0058 mg/l
Assessment Factors		
	Freshwater - intermittent	0,58 mg/l
Assessment Factors		
	Fresh water sediment	215 mg/kg
Equilibrium method		
	Marine sediment	21,5 mg/kg
Equilibrium method		
	Soil	1 mg/kg
Equilibrium method		
	Sewage treatment plant	250 mg/l
Assessment Factors		
2,4,6-tris(dimethylaminomethyl)phenol	Fresh water	0,084 mg/l
Assessment Factors		
	Marine water	0,0084 mg/l
Assessment Factors		
	Freshwater - intermittent	0,84 mg/l
Assessment Factors		
	Sewage treatment plant	0,2 mg/l
Assessment Factors		
triethylenetetramine	Fresh water	190 µg/l
Assessment Factors		
	Fresh water sediment	95,9 mg/kg
Equilibrium method		
	Marine water	38 µg/l
Assessment Factors		
	Freshwater - intermittent	200 µg/l
Assessment Factors		

		Marine sediment	19,2 mg/kg
	Equilibrium method		
		Soil	19,1 mg/kg
	Equilibrium method		
		Sewage treatment plant	4,25 mg/l
	Assessment Factors		
		Secondary Poisoning	0,18 mg/kg
	Assessment Factors		

8.2 Exposure controls

Personal protective equipment

Eye 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

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

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

Remarks : The suitability for a specific workplace should be discussed with the producers of the protective gloves. 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).

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.
Recommended Filter type:
Combined particulates and organic vapour type

Filter type : Filter type A-P

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Appearance : paste

Colour	:	black
Odour	:	amine-like
Odour Threshold	:	No data is available on the product itself.
pH	:	No data is available on the product itself.
Freezing point	:	No data is available on the product itself.
Melting point		No data is available on the product itself.
Boiling point	:	> 200 °C
Flash point	:	> 100 °C Method: Pensky-Martens closed cup, closed cup
Evaporation rate	:	No data is available on the product itself.
Flammability (solid, gas)	:	No data is available on the product itself.
Burning rate	:	No data is available on the product itself.
Upper explosion limit	:	No data is available on the product itself.
Lower explosion limit	:	No data is available on the product itself.
Vapour pressure	:	< 0,49 hPa (20 °C)
Relative vapour density	:	No data is available on the product itself.
Relative density	:	No data is available on the product itself.
Density	:	1,4 g/cm3 (20 °C)
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.
Auto-ignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	> 200 °C
Viscosity		
Viscosity, dynamic	:	thixotropic
Explosive properties	:	No data is available on the product itself.

Oxidizing properties : No data is available on the product itself.

9.2 Other information

No data available

SECTION 10: Stability and reactivity

10.1 Reactivity

No decomposition if stored and applied as directed.

10.2 Chemical stability

No decomposition if stored and applied as directed.

10.3 Possibility of hazardous reactions

Hazardous reactions : No decomposition if stored and applied as directed.

10.4 Conditions to avoid

Conditions to avoid : No data available

10.5 Incompatible materials

10.6 Hazardous decomposition products

Carbon oxides
Nitrogen oxides (NOx)
Burning produces noxious and toxic fumes.

SECTION 11: Toxicological information

11.1 Information on toxicological effects

Acute toxicity

Acute oral toxicity - Product : Acute toxicity estimate : > 2.000 mg/kg
Method: Calculation method

Acute inhalation toxicity - Product : Acute toxicity estimate : 3,16 mg/l
Exposure time: 4 h
Test atmosphere: dust/mist
Method: Calculation method

Acute dermal toxicity - Product : Acute toxicity estimate : > 2.000 mg/kg
Method: Calculation method

Acute toxicity (other routes of administration) : No data available

Skin corrosion/irritation

Components:

2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**
Species: Rabbit
Assessment: Moderate skin irritant
Result: Irritating to skin.

naphthalene, bis(1-methylethyl)-**:**
Species: Rabbit
Exposure time: 4 h
Assessment: No skin irritation
Method: OECD Test Guideline 404
Result: Normally reversible injuries
GLP: yes

Dimer fatty acid (c18) polyamidoamine resin**:**
Species: human skin
Method: OECD Test Guideline 431
Result: Non-corrosive

Species: human skin
Exposure time: 1 h
Assessment: Irritating to skin.
Method: OECD Test Guideline 439
Result: irritating

Diethylenetriamine**:**
Species: Rabbit
Assessment: Causes burns.
Result: Causes burns.

Aminoethylpiperazine**:**
Species: Rabbit
Result: Causes burns.

2,4,6-tris(dimethylaminomethyl)phenol**:**
Species: Rabbit
Assessment: Corrosive
Method: OECD Test Guideline 404
Result: Corrosive

4,4'-isopropylidenediphenol**:**
Species: Rabbit
Method: OECD Test Guideline 404
Result: No skin irritation

Triethylenetetramine**:**
Species: Rabbit
Method: OECD Test Guideline 405
Result: Corrosive after 3 minutes to 1 hour of exposure

3-aminopropyltriethoxysilane**:**
Species: Rabbit
Method: OECD Test Guideline 404
Result: Causes burns.

Serious eye damage/eye irritation

Components:

2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**
Species: Rabbit
Assessment: Mild eye irritant
Result: slight irritation

naphthalene, bis(1-methylethyl)-**:**
Species: Rabbit
Assessment: No eye irritation
Method: OECD Test Guideline 405
Result: No eye irritation
GLP: yes

Dimer fatty acid (c18) polyamidoamine resin**:**
Species: Rabbit
Assessment: Risk of serious damage to eyes.
Method: OECD Test Guideline 405
Result: Severe eye irritation

Diethylenetriamine**:**
Species: Rabbit
Assessment: Corrosive
Result: Corrosive

Aminoethylpiperazine**:**
Species: Rabbit
Result: Risk of serious damage to eyes.

2,4,6-tris(dimethylaminomethyl)phenol**:**
Species: Rabbit
Assessment: Corrosive
Result: Corrosive

4,4'-isopropylidenediphenol**:**
Species: Rabbit
Method: OECD Test Guideline 405
Result: Irreversible effects on the eye

Triethylenetetramine**:**
Species: Rabbit
Assessment: Corrosive
Method: OECD Test Guideline 404
Result: Corrosive

3-aminopropyltriethoxysilane**:**
Species: Rabbit
Method: OECD Test Guideline 405
Result: Risk of serious damage to eyes.

Respiratory or skin sensitisation

Components:

2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: May cause sensitisation by skin contact.

naphthalene, bis(1-methylethyl)-**:**
Test Type: Maximisation Test
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: Does not cause skin sensitisation.

Dimer fatty acid (c18) polyamidoamine resin**:**
Test Type: LLNA (Local Lymph Node Assay)
Exposure routes: Skin contact
Species: Mouse
Assessment: May cause sensitisation by skin contact.
Method: OECD Test Guideline 429
Result: May cause sensitisation by skin contact.

Diethylenetriamine**:**
Exposure routes: Skin
Species: Mouse
Method: OECD Test Guideline 429
Result: May cause sensitisation by skin contact.
Remarks: Causes sensitisation.

Exposure routes: Respiratory Tract
Species: Mouse
Result: Does not cause respiratory sensitisation.

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

2,4,6-tris(dimethylaminomethyl)phenol**:**
Exposure routes: Skin
Species: Guinea pig
Method: OECD Test Guideline 406
Result: negative

Assessment: The product is a skin sensitiser, sub-category 1B.
Result: The product is a skin sensitiser, sub-category 1B.

4,4'-isopropylidenediphenol**:**
Exposure routes: Skin
Species: Mouse

Method: OECD Test Guideline 429
Result: Does not cause skin sensitisation.

Exposure routes: Skin
Species: Humans
Assessment: May cause sensitisation by skin contact.
Result: Causes sensitisation.

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

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

Components:

naphthalene, bis(1-methylethyl)-**:**
Assessment: May be harmful if swallowed or if inhaled.
Does not cause skin sensitisation.

Dimer fatty acid (c18) polyamidoamine resin**:**
Assessment: May cause an allergic skin reaction.

Germ cell mutagenicity

Components:

naphthalene, bis(1-methylethyl)-**:**
Genotoxicity in vitro : Test Type: Chromosome aberration test in vitro
Test species: Chinese hamster ovary cells
Concentration: 9.5 - 60 µg/L
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

: Test Type: Ames test
Test species: Salmonella typhimurium
Concentration: 92 mg/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

: Test Type: In vitro mammalian cell gene mutation test
Test species: mouse lymphoma cells
Concentration: 40 - 60 mg/ml
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476

Result: negative

Dimer fatty acid (c18) polyamidoamine resin**:**

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

: Test Type: Micronucleus test
Test species: Human lymphocytes
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 487
Result: negative

: Test Type: Ames test
Test species: Salmonella typhimurium
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

Aminoethylpiperazine**:**

Genotoxicity in vitro : Concentration: 5000 ug/plate
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 476
Result: negative

: Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

2,4,6-tris(dimethylaminomethyl)phenol**:**

Genotoxicity in vitro : Concentration: 5000 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 471
Result: negative

: Concentration: 2500 ug/plate
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

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

4,4'-isopropylidenediphenol**:**
Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Result: negative

Triethylenetetramine**:**
Genotoxicity in vitro : Concentration: 0 - 200 µg/L
Metabolic activation: negative
Method: OECD Test Guideline 482
Result: negative

3-aminopropyltriethoxysilane**:**
Genotoxicity in vitro : Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 473
Result: negative

Components:

naphthalene, bis(1-methylethyl)-**:**
Genotoxicity in vivo : Test Type: Micronucleus test
Test species: Mouse (male and female)
Application Route: Intraperitoneal injection
Dose: 1.92 g/kg
Method: OECD Test Guideline 474
Result: negative

Diethylenetriamine**:**
Genotoxicity in vivo : Cell type: Somatic
Application Route: Oral
Dose: 85 - 850 mg/kg
Method: OECD Test Guideline 474
Result: negative

Application Route: Oral
Result: negative

Aminoethylpiperazine**:**
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Dose: 175 - 560 mg/kg
Method: OECD Test Guideline 474
Result: negative

4,4'-isopropylidenediphenol**:**
Genotoxicity in vivo : Method: OECD Test Guideline 474
Result: negative

Triethylenetetramine**:**
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Dose: 0 - 600 mg/kg
Method: OECD Test Guideline 474
Result: negative

3-aminopropyltriethoxysilane**:**
Genotoxicity in vivo : Application Route: Intraperitoneal injection
Method: OECD Test Guideline 474
Result: negative

Components:

naphthalene, bis(1-methylethyl)-**:**
Germ cell mutagenicity-Assessment : Tests on bacterial or mammalian cell cultures did not show mutagenic effects.

Dimer fatty acid (c18) polyamidoamine resin**:**
Germ cell mutagenicity-Assessment : In vitro tests did not show mutagenic effects

Germ cell mutagenicity-Assessment : No data available

Carcinogenicity

Components:

Diethylenetriamine**:**
Species: Mouse, (male)
Application Route: Dermal
Dose: 56.3 mg/kg
Frequency of Treatment: 3 daily
Result: negative

4,4'-isopropylidenediphenol**:**
Species: Rat, (male and female)
Application Route: Oral
Exposure time: 103 weeks
Frequency of Treatment: 7 daily
Result: negative

Triethylenetetramine**:**
Species: Mouse, (male)
Application Route: Dermal
Dose: 42 mg/kg

Frequency of Treatment: 3 daily
Method: OECD Test Guideline 451
Result: negative

Carcinogenicity - Assessment : No data available

Reproductive toxicity

Components:

Dimer fatty acid (c18) polyamidoamine resin**:**
Effects on fertility : Species: Rat, male and female
Application Route: Oral
Dose: 0, 100, 300, 1000 mg/kg bw/d
Frequency of Treatment: 7 days/week
General Toxicity - Parent: No observed adverse effect level: 1 000 mg/kg body weight
Method: OECD Test Guideline 422
Result: Animal testing did not show any effects on fertility.

Diethylenetriamine**:**
Species: Rat, male and female
Application Route: Oral
General Toxicity - Parent: No observed adverse effect level: 30 mg/kg wet weight
Method: OECD Test Guideline 421
Result: positive

Aminoethylpiperazine**:**
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Result: No effects on fertility and early embryonic development were detected.

2,4,6-tris(dimethylaminomethyl)phenol**:**
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Remarks: No significant adverse effects were reported

4,4'-isopropylidenediphenol**:**
Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 416
Result: Embryotoxic effects and adverse effects on the offspring were detected.

Components:

naphthalene, bis(1-methylethyl)-**:**
Effects on foetal development : Species: Rat, female
Application Route: Oral
Dose: 100, 250, 625 mg/kg

Duration of Single Treatment: 20 d
Frequency of Treatment: 7 days/week
General Toxicity Maternal: Lowest observed adverse effect level: 250 mg/kg body weight
Teratogenicity: No observed adverse effect level: 625 mg/kg body weight
Embryo-foetal toxicity: No observed adverse effect level: 625 mg/kg body weight
Method: Directive 67/548/EEC, Annex V, B.31.
Result: No teratogenic effects

Diethylenetriamine**:**

Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 100 mg/kg body weight
Method: OECD Test Guideline 421
Result: No adverse effects

Aminoethylpiperazine**:**

Test Type: Embryo-foetal development
Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 100 mg/kg body weight
Embryo-foetal toxicity: No observed adverse effect level: 1 000 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Test Type: Fertility/early embryonic development
Species: Rabbit, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: 75 mg/kg body weight
Embryo-foetal toxicity: No observed adverse effect level: 75 mg/kg body weight
Method: OECD Test Guideline 414
Result: Teratogenicity and developmental toxicity

4,4'-isopropylidenediphenol**:**

Species: Rat, female
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: < 160 mg/kg body weight
Method: OECD Test Guideline 416
Result: No teratogenic effects

Triethylenetetramine**:**

Species: Rat
Application Route: Oral
General Toxicity Maternal: No observed adverse effect level: > 750 mg/kg body weight
Method: OECD Test Guideline 414

Result: No teratogenic effects

Species: Rabbit
Application Route: Dermal
General Toxicity Maternal: No observed adverse effect level: 125 mg/kg body weight
Method: OECD Test Guideline 414
Result: No teratogenic effects

Components:

naphthalene, bis(1-methylethyl)-:
Reproductive toxicity - Assessment : No evidence of adverse effects on sexual function and fertility, or on development, based on animal experiments.

Aminoethylpiperazine:
Reproductive toxicity - Assessment : Some evidence of adverse effects on development, based on animal experiments.

4,4'-isopropylidenediphenol:
Reproductive toxicity - Assessment : Clear evidence of adverse effects on sexual function and fertility, based on animal experiments.

STOT - single exposure

Components:

Diethylenetriamine:
Target Organs: Respiratory Tract
Assessment: May cause respiratory irritation.

4,4'-isopropylidenediphenol:
Assessment: The substance or mixture is classified as specific target organ toxicant, single exposure, category 3 with respiratory tract irritation.

STOT - repeated exposure

Components:

Aminoethylpiperazine:
Exposure routes: Inhalation
Target Organs: Respiratory Tract
Assessment: Causes damage to organs through prolonged or repeated exposure.

Repeated dose toxicity

Components:

naphthalene, bis(1-methylethyl)-:
Species: Rat, male and female
NOAEL: 170 mg/kg
Application Route: oral (feed)
Exposure time: 4 320 hNumber of exposures: 7 d
Dose: 170, 340, and 670 mg/kg

Method: Subchronic toxicity
Remarks: No significant adverse effects were reported

Dimer fatty acid (c18) polyamidoamine resin**:**
Species: Rat, male and female
NOAEL: 1000 mg/kg
NOAEL: 1 000 mg/kg
Application Route: Oral
Exposure time: 14 days Number of exposures: Once daily
Dose: 0, 100, 300, 1000 mg/kg bw/d
Group: yes
Method: OECD Test Guideline 422
Target Organs: Liver

Diethylenetriamine**:**
Species: Rat, male and female
: 70 - 80
Application Route: Ingestion
Test atmosphere: vapour
Exposure time: 360 hNumber of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
NOAEL: 114
Application Route: Skin contact
Exposure time: 9 600 hNumber of exposures: 6 d
Method: Chronic toxicity

Aminoethylpiperazine**:**
Species: Rat, male and female
NOAEL: 152
Application Route: Oral
Exposure time: 28 dMethod: OECD Test Guideline 422

Species: Rat, male and female
NOAEL: > 1000
Application Route: Skin contact
Exposure time: 29 dNumber of exposures: 6h/application, 5d/week
Method: OECD Test Guideline 410

Species: Rat, male and female
: 0,2
Application Route: Inhalation
Exposure time: 90 dNumber of exposures: 6h/d, 5d/week
Method: OECD Test Guideline 413
Target Organs: Respiratory Tract
Assessment: The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 1.

Species: Rat, male and female
: 53,3
Application Route: Inhalation
Exposure time: 90 dNumber of exposures: 6h/d, 5d/week
Method: OECD Test Guideline 413

2,4,6-tris(dimethylaminomethyl)phenol**:**
Species: Rat, male and female
NOEL: 15 mg/kg
Application Route: Ingestion
Exposure time: 1 032 hNumber of exposures: 7 d
Method: Subacute toxicity

4,4'-isopropylidenediphenol**:**
Species: Dog, male and female
: 75 mg/kg, 10
Application Route: Ingestion
Test atmosphere: dust/mist
Exposure time: 2 160 hNumber of exposures: 7 d
Method: Subchronic toxicity

Species: Rat, male and female
LOAEL: 600 mg/kg
Application Route: Ingestion
Exposure time: 672 hNumber of exposures: 7 d
Method: Subchronic toxicity

Triethylenetetramine**:**
Species: Rat, male and female
NOAEL: 50 mg/kg
Application Route: Ingestion
Exposure time: 26 WeeksNumber of exposures: 7 d
Method: Subchronic toxicity

3-aminopropyltriethoxysilane**:**
Species: Rat, male and female
NOAEL: 200 mg/kg
Application Route: Ingestion
Exposure time: 2 160 hMethod: Subchronic toxicity

Components:

naphthalene, bis(1-methylethyl)-**:**

Repeated dose toxicity - Assessment	:	May be harmful if swallowed or if inhaled. No adverse effect has been observed in chronic toxicity tests.

Dimer fatty acid (c18) polyamidoamine resin**:**

Repeated dose toxicity - Assessment	:	No adverse effect has been observed in chronic toxicity tests.

Aspiration toxicity

Components:

naphthalene, bis(1-methylethyl)-**:**
May be fatal if swallowed and enters airways.

Experience with human exposure

General Information: No data available

Inhalation: No data available

Skin contact: No data available

Eye contact: No data available

Ingestion: No data available

Toxicology, Metabolism, Distribution
No data available

Neurological effects
No data available

Further information
Ingestion: No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 1 000 mg/l Exposure time: 48 h Method: OECD Test Guideline 202
Toxicity to algae	:	EC50 (No information available.): > 1 000 mg/l Exposure time: 72 h Method: OECD Test Guideline 201

naphthalene, bis(1-methylethyl)-**:**

Toxicity to fish	:	LC50 : > 0,5 mg/l Exposure time: 96 h Test Type: semi-static test Method: Directive 67/548/EEC, Annex V, C.1. Remarks: Aquatic toxicity is unlikely due to low solubility.

Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): > 0,16 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202 Remarks: Aquatic toxicity is unlikely due to low solubility. EL50 (Daphnia magna (Water flea)): 1,7 mg/l Exposure time: 48 h Test Type: semi-static test Method: OECD Test Guideline 202
Toxicity to algae	:	NOECr (Desmodesmus subspicatus (Scenedesmus subspicatus)): ca. 0,15 mg/l Exposure time: 72 h Test Type: static test Method: DIN 38412 GLP: no Remarks: Aquatic toxicity is unlikely due to low solubility.
M-Factor (Acute aquatic toxicity)	:	1
	:	
Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity)	:	NOEC: 0,013 mg/l Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202
M-Factor (Chronic aquatic toxicity)	:	1

Dimer fatty acid (c18) polyamidoamine resin**:**

Toxicity to fish	:	LC50 (Brachydanio rerio (zebrafish)): 7,07 mg/l Exposure time: 96 h Method: OECD Test Guideline 203
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 7,07 mg/l Exposure time: 48 h Test Type: static test Method: OECD Test Guideline 202
Toxicity to algae	:	EC50 (Selenastrum capricornutum (green algae)): 4,34 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 201 EC10 (Selenastrum capricornutum (green algae)): 1,78 mg/l

Exposure time: 72 h
Test Type: static test
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50 (activated sludge): 384 mg/l
Exposure time: 3 h
Test Type: static test
Method: OECD Test Guideline 209

Diethylenetriamine**:**

Toxicity to fish : LC50 : 430 mg/l
Exposure time: 96 h
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.1.

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 32 mg/l
Exposure time: 48 h
Test Type: static test
Test substance: Fresh water

Toxicity to algae : EbC50 (Selenastrum capricornutum (green algae)): 1 164 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to fish (Chronic toxicity) : NOEC: 10 mg/l
Exposure time: 28 d
Test Type: semi-static test
Test substance: Fresh water
Method: OECD Test Guideline 210

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 5,6 mg/l
Exposure time: 21 d
Species: Daphnia magna (Water flea)
Test Type: semi-static test
Test substance: Fresh water
Method: Directive 67/548/EEC, Annex V, C.20

Toxicity to soil dwelling organisms : EC50: > 1 000 mg/kg
Exposure time: 56 d
Species: Eisenia fetida (earthworms)
Method: OECD Test Guideline 222

Ecotoxicology Assessment
Acute aquatic toxicity : This product has no known ecotoxicological effects.

Aminoethylpiperazine**:**

Toxicity to fish : LC50 : 2 190 mg/l

Exposure time: 96 h
Test Type: static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 58 mg/l
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202
Remarks: Harmful to aquatic organisms, may cause long-term adverse effects in the aquatic environment.

Toxicity to algae : EC50 (Selenastrum capricornutum (green algae)): > 1 000 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to soil dwelling organisms : LC50: 712 mg/kg
Exposure time: 56 d
Species: Eisenia fetida (earthworms)
Method: OECD Test Guideline 222

NOEC: 500 mg/kg
Exposure time: 56 d
Species: Eisenia fetida (earthworms)
Method: OECD Test Guideline 222

2,4,6-tris(dimethylaminomethyl)phenol**:**

Toxicity to fish : LC50 (Cyprinus carpio (Carp)): 175 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water

Toxicity to daphnia and other aquatic invertebrates : LC50 : 718 mg/l
Exposure time: 96 h
Test Type: static test
Test substance: Marine water

Toxicity to algae : ErC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): 84 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

NOEC (Desmodesmus subspicatus (Scenedesmus subspicatus)): 6,25 mg/l
Exposure time: 72 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 201

Ecotoxicology Assessment
Chronic aquatic toxicity : This product has no known ecotoxicological effects.

4,4'-isopropylidenediphenol**:**

Toxicity to fish	:	LC50 (Oncorhynchus mykiss (rainbow trout)): 7,5 mg/l Exposure time: 96 h
Toxicity to daphnia and other aquatic invertebrates	:	EC50 : 3,9 - 10,2 mg/l Exposure time: 48 h (Ceriodaphnia dubia (Water flea)):
Toxicity to algae	:	EC50 (Selenastrum capricornutum (green algae)): 2,5 - 3,1 mg/l Exposure time: 96 h
Toxicity to fish (Chronic toxicity)	:	NOEC: 0,016 mg/l Exposure time: 444 d Species: Pimephales promelas (fathead minnow) Test Type: flow-through test Test substance: Fresh water Method: EPA OPPTS 850.1500 Remarks: Toxic to aquatic organisms.
M-Factor (Chronic aquatic toxicity)	:	1
Ecotoxicology Assessment Chronic aquatic toxicity	:	Toxic to aquatic life with long lasting effects.

Triethylenetetramine**:**

Toxicity to fish	:	LC50 (Pimephales promelas (fathead minnow)): 330 mg/l Exposure time: 96 h Test Type: static test Test substance: Fresh water Method: EPA OTS 797.1400
Toxicity to daphnia and other aquatic invertebrates	:	EC50 (Daphnia magna (Water flea)): 31,1 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.2.
Toxicity to algae	:	ErC50 (Selenastrum capricornutum (green algae)): 20 mg/l Exposure time: 72 h Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 201
Toxicity to microorganisms	:	EC50 (activated sludge): 800 mg/l Exposure time: 0,5 h Test Type: static test Test substance: Fresh water
Toxicity to daphnia and other	:	EC10: 1,9 mg/l

aquatic invertebrates (Chronic toxicity)		Exposure time: 21 d Species: Daphnia magna (Water flea) Test Type: semi-static test Test substance: Fresh water Method: OECD Test Guideline 202
Ecotoxicology Assessment Acute aquatic toxicity	:	This product has no known ecotoxicological effects.

3-aminopropyltriethoxysilane**:**

Toxicity to fish	:	LC50 (Brachydanio rerio (zebrafish)): > 934 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)): 331 mg/l Exposure time: 48 h Test Type: static test Test substance: Fresh water Method: OECD Test Guideline 202
Toxicity to algae	:	EC50 (Desmodesmus subspicatus (Scenedesmus subspicatus)): > 1 000 mg/l Exposure time: 72 h Test Type: static test Test substance: Fresh water Method: Directive 67/548/EEC, Annex V, C.3.
Toxicity to microorganisms	:	EC50 (Pseudomonas putida): 43 mg/l Exposure time: 5,75 h Test Type: static test Test substance: Fresh water

12.2 Persistence and degradability

Components:

2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[[2-(1-piperazinyl)ethyl]amino]butyl-terminated**:**

Biodegradability	:	Result: Not readily biodegradable.

naphthalene, bis(1-methylethyl)-**:**

Biodegradability	:	Inoculum: activated sludge Concentration: 0,2 mg/l Result: Not readily biodegradable. Biodegradation: 30 - 35 % Exposure time: 56 d Method: OECD Test Guideline 310

Dimer fatty acid (c18) polyamidoamine resin**:**

Biodegradability	:	Test Type: aerobic Inoculum: activated sludge Result: Not readily biodegradable.

Biodegradation: 0 - 70 %
Exposure time: 74 d
Method: OECD Test Guideline 301B

Diethylenetriamine**:**

Biodegradability : Inoculum: activated sludge
Result: Readily biodegradable.
Biodegradation: 87 %
Exposure time: 21 d
Method: OECD Test Guideline 301D

Photodegradation : Test Type: Air
Rate constant: 500000
Degradation (direct photolysis): 50 %

Aminoethylpiperazine**:**

Biodegradability : Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301F

Biochemical Oxygen Demand (BOD) : 5 mg/l
Incubation time: 5 d

Chemical Oxygen Demand (COD) : 560 mg/l

Photodegradation : Test Type: Air
Degradation (direct photolysis): 50 %

Test Type: Water

2,4,6-tris(dimethylaminomethyl)phenol**:**

Biodegradability : Inoculum: activated sludge
Concentration: 2 mg/l
Result: Not readily biodegradable.
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

4,4'-isopropylidenediphenol**:**

Biodegradability : Result: Not readily biodegradable.
Biodegradation: 1 - 2 %
Exposure time: 28 d

Triethylenetetramine**:**

Biodegradability : Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 162 d
Method: OECD Test Guideline 301D

Inoculum: activated sludge
Result: Not readily biodegradable.
Biodegradation: 20 %
Exposure time: 84 d
Method: OECD Test Guideline 302 A

3-aminopropyltriethoxysilane**:**

Biodegradability : Inoculum: activated sludge
Concentration: 8,95 mg/l
Result: Not readily biodegradable.
Biodegradation: 67 %
Exposure time: 28 d
Method: Directive 67/548/EEC Annex V, C.4.A.

12.3 Bioaccumulative potential

Components:

naphthalene, bis(1-methylethyl)-**:**

Bioaccumulation : Species: Cyprinus carpio (Carp)
Exposure time: 60 d
Bioconcentration factor (BCF): 770 - 6 400
Test substance: Fresh water
Method: flow-through test

Partition coefficient: n-octanol/water : log Pow: 6,081
Method: QSAR

Dimer fatty acid (c18) polyamidoamine resin**:**

Bioaccumulation : Bioconcentration factor (BCF): 77,4
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: 10,34
Method: OECD Test Guideline 117

Diethylenetriamine**:**

Bioaccumulation : Species: Cyprinus carpio (Carp)
Exposure time: 42 d
Bioconcentration factor (BCF): 0,3 - 6,3
Test substance: Fresh water
Method: flow-through test
Remarks: Bioaccumulation is unlikely.

Partition coefficient: n-octanol/water : log Pow: -1,58 (20 °C)
pH: 7

Aminoethylpiperazine**:**

Bioaccumulation : Species: Fish
Remarks: Does not bioaccumulate.

Partition coefficient: n-octanol/water : log Pow: -1,48 (20 °C)

2,4,6-tris(dimethylaminomethyl)phenol**:**

Partition coefficient: n-octanol/water	:	log Pow: 0,219 (21,5 °C) Method: OPPTS 830.7550
Triethylenetetramine**:**		
Partition coefficient: n-octanol/water	:	log Pow: -2,65 (20 °C) Method: OECD Test Guideline 117
3-aminopropyltriethoxysilane**:**		
Bioaccumulation	:	Species: Cyprinus carpio (Carp) Bioconcentration factor (BCF): 3,4 Remarks: Does not bioaccumulate.
Partition coefficient: n-octanol/water	:	log Pow: 1,7 (20 °C) pH: 7

12.4 Mobility in soil

Components:

naphthalene, bis(1-methylethyl)-**:**		
Distribution among environmental compartments	:	Koc: 36108 Method: QSAR
Diethylenetriamine**:**		
Distribution among environmental compartments	:	Koc: 19111
Aminoethylpiperazine**:**		
Distribution among environmental compartments	:	Koc: ca. 37000
Triethylenetetramine**:**		
Distribution among environmental compartments	:	Koc: 1584,9 - 5012 Method: OECD Test Guideline 106

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

No data available

SECTION 13: Disposal considerations

13.1 Waste treatment methods

Product	:	Do not dispose of waste into sewer. Do not contaminate ponds, waterways or ditches with chemical or used container. Send to a licensed waste management company.

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

SECTION 14: Transport information

IATA

14.1 UN number	:	UN 2735
14.2 UN proper shipping name	:	Polyamines, liquid, corrosive, n.o.s. (DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)
14.3 Transport hazard class(es)	:	8
14.4 Packing group	:	II
Labels	:	Corrosive
Packing instruction (cargo aircraft)	:	855
Packing instruction (passenger aircraft)	:	851

IMDG

14.1 UN number	:	UN 2735
14.2 UN proper shipping name	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)
14.3 Transport hazard class(es)	:	8
14.4 Packing group	:	II
Labels	:	8
EmS Code	:	F-A, S-B
14.5 Environmental hazards		
Marine pollutant	:	yes

ADR

14.1 UN number	:	UN 2735
14.2 UN proper shipping name	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)
14.3 Transport hazard class(es)	:	8
14.4 Packing group	:	II
Labels	:	8
14.5 Environmental hazards		
Environmentally hazardous	:	yes

RID

14.1 UN number	:	UN 2735
14.2 UN proper shipping	:	POLYAMINES, LIQUID, CORROSIVE, N.O.S.

name

(DIETHYLENE TRIAMINE, DIISOPROPYLNAPHTHALENE)

14.3 Transport hazard class(es) : 8

14.4 Packing group : II

Labels : 8

14.5 Environmental hazards

Environmentally hazardous : yes

Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - Candidate List of Substances of Very High Concern for Authorisation (Article 59). : 4,4'-isopropylidenediphenol

Other regulations:

Take note of Directive 92/85/EEC regarding maternity protection or stricter national regulations, where applicable.

Take note of Directive 94/33/EC on the protection of young people at work or stricter national regulations, where applicable.

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

DSL : All components of this product are on the Canadian DSL

AICS : 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 : On the inventory, or 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

TSCA : On the inventory, or in compliance with the inventory

Inventories

AICS (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

SECTION 16: Other information

Full text of H-Statements

H302	:	Harmful if swallowed.
H304	:	May be fatal if swallowed and enters airways.
H311	:	Toxic in contact with skin.
H312	:	Harmful in contact with skin.
H314	:	Causes severe skin burns and eye damage.
H315	:	Causes skin irritation.
H317	:	May cause an allergic skin reaction.
H318	:	Causes serious eye damage.
H319	:	Causes serious eye irritation.
H330	:	Fatal if inhaled.
H335	:	May cause respiratory irritation.
H360F	:	May damage fertility.
H361d	:	Suspected of damaging the unborn child.
H372	:	Causes damage to organs through prolonged or repeated exposure if inhaled.
H400	:	Very toxic to aquatic life.
H410	:	Very toxic to aquatic life with long lasting effects.
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 Acute	:	Acute aquatic toxicity
Aquatic Chronic	:	Chronic aquatic toxicity
Asp. Tox.	:	Aspiration hazard
Eye Dam.	:	Serious eye damage
Eye Irrit.	:	Eye irritation
Repr.	:	Reproductive toxicity
Skin Corr.	:	Skin corrosion
Skin Irrit.	:	Skin irritation
Skin Sens.	:	Skin sensitisation
STOT RE	:	Specific target organ toxicity - repeated exposure
STOT SE	:	Specific target organ toxicity - single exposure

Further information

Classification of the mixture:		**Classification procedure:**
Acute Tox. 4	H332	Calculation method
Skin Corr. 1B	H314	Calculation method
Eye Dam. 1	H318	Calculation method

Skin Sens. 1	H317	Calculation method
Repr. 1B	H360F	Calculation method
STOT RE 2	H373	Calculation method
Aquatic Chronic 2	H411	Calculation method

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