

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

**HUNTSMAN**

Enriching lives through innovation

## ARALDITE® AV 138 M-1

Version 2.1      Revision Date: 13.08.2020      SDS Number: 400001008566      Date of last issue: 27.09.2018  
Date of first issue: 02.09.2015

Print Date 24.11.2020

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

#### 1.1 Product identifier

Trade name : ARALDITE® AV 138 M-1

#### 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 : Berlin: 0049 30 19 24 0 & 0049 30 30 68 6 7 11  
Bonn: 0049 228 19 27 0 & 0049 228 28 7 3 32 11  
Erfurt: 0049 361 73 07 30  
Freiburg: 0049 761 16 24 0  
Göttingen: 0049 51 19 24 0 & 0049 551 38 31 80  
Homburg: 0049 6841 19 24 0  
Mainz: 0049 6131 19 24 0 & 0049 6131 23 24 66  
München: 0049 89 19 24 0  
Nürnberg: 0049 911 39 8 2 45 1  
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.

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Skin sensitisation, Sub-category 1B      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)

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

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

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.	Classification	Concent
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	Index-No. Registration number		ration (% 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	>= 25 - < 30
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol (BFDGE)	- - 01-2119454392-40	Skin Irrit. 2; H315 Skin Sens. 1; H317 Aquatic Chronic 2; H411	>= 2,5 - < 10
1,4-Bis(2,3-epoxypropoxy)butane	2425-79-8 219-371-7 603-072-00-7 01-2119494060-45	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	>= 1 - < 2,5
Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate	Not Assigned - 01-2120065788-39	Acute Tox. 4; H302 Skin Irrit. 2; H315 Eye Dam. 1; H318 Skin Sens. 1; H317 STOT RE 2; H373 (Central nervous system, male reproductive organs) Aquatic Chronic 2; H411	>= 1 - < 2,5

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.  
Consult a physician.  
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 : 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.

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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

None known.

### 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 : 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 : Carbon oxides  
Halogenated compounds  
Carbon dioxide (CO<sub>2</sub>)  
Carbon monoxide

### 5.3 Advice for firefighters

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

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.

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**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.

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**SECTION 7: Handling and storage**

**7.1 Precautions for safe handling**

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

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

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

Storage class (TRGS 510) : 10, Combustible liquids

Further information on storage stability : Stable under normal conditions.

Recommended storage temperature : 2 - 40 °C

### 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	AGW (Inhalable fraction)	10 mg/m <sup>3</sup>	DE TRGS 900
Peak-limit: excursion factor (category)	2;(II)			
		AGW (Alveolate fraction)	1,25 mg/m <sup>3</sup>	DE TRGS 900
Peak-limit: excursion factor (category)	2;(II)			
1-Propene, homopolymer	9003-07-0	AGW (Inhalable fraction)	10 mg/m <sup>3</sup>	DE TRGS 900
Peak-limit: excursion factor (category)	2;(II)			
		AGW (Alveolate fraction)	1,25 mg/m <sup>3</sup>	DE TRGS 900
Peak-limit: excursion factor (category)	2;(II)			
Silica, amorphous, fumed, cryst.-free	112945-52-5	AGW (Inhalable fraction)	4 mg/m <sup>3</sup> (Silica)	DE TRGS 900
Further information	When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			

Not applicable

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

Substance name	End Use	Exposure routes	Potential health effects	Value
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bis-[4-(2,3-epoxipropoxy)phenyl]propane	Workers	Inhalation	Long-term systemic effects	4,93 mg/m <sup>3</sup>
	Workers	Dermal	Long-term systemic effects	0,75 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0,87 mg/m <sup>3</sup>
	Consumers	Dermal	Long-term systemic effects	0,0893 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	0,5 mg/kg bw/day
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Workers	Inhalation	Long-term systemic effects	4,93 mg/m <sup>3</sup>
	Workers	Dermal	Long-term systemic effects	0,75 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	0,87 mg/m <sup>3</sup>
	Consumers	Dermal	Long-term systemic effects	0,0893 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	0,5 mg/kg bw/day
1,4-Bis(2,3-epoxypropoxy)butane	Workers	Inhalation	Long-term systemic effects	4,7 mg/m <sup>3</sup>
	Workers	Dermal	Long-term systemic effects	6,66 mg/kg bw/day
	Consumers	Inhalation	Long-term systemic effects	1,16 mg/m <sup>3</sup>
	Consumers	Dermal	Long-term systemic effects	3,33 mg/kg bw/day
	Consumers	Oral	Long-term systemic effects	0,33 mg/kg bw/day
Barium sulfate	Workers	Inhalation	Long-term systemic effects	10 mg/m <sup>3</sup>
	Workers	Inhalation	Long-term local effects	10 mg/m <sup>3</sup>
	Consumer use	Inhalation	Long-term systemic effects	10 mg/m <sup>3</sup>
	Consumer use	Oral	Long-term systemic effects	13000 mg/kg
Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol	Workers	Dermal	Acute local effects	0,0083 mg/cm <sup>2</sup>

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	Workers	Dermal	Long-term systemic effects	104,15 mg/kg
	Workers	Inhalation	Long-term systemic effects	29,39 mg/m3
	Consumers	Dermal	Long-term systemic effects	62,5 mg/kg
	Consumers	Inhalation	Long-term systemic effects	8,7 mg/m3
	Consumers	Oral	Long-term systemic effects	6,25 mg/kg
Silica, amorphous, fumed, cryst.-free	Workers	Inhalation	Long-term systemic effects	4 mg/m3
Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate	Workers	Inhalation	Long-term systemic effects	0,025 mg/m3
	Workers	Dermal	Long-term systemic effects	0,05 mg/kg

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

Substance name	Environmental Compartment	Value
bis-[4-(2,3-epoxipropoxy)phenyl]propane	Fresh water	0,006 mg/l
Remarks:	Assessment Factors	
	Marine water	0,001 mg/l
	Assessment Factors	
	Fresh water sediment	0,341 mg/kg dry weight (d.w.)
	Equilibrium method	
	Marine sediment	0,034 mg/kg dry weight (d.w.)
	Equilibrium method	
	Soil	0,065 mg/kg dry weight (d.w.)
	Equilibrium method	
	Sewage treatment plant	10 mg/l
	Assessment Factors	
	Secondary Poisoning	11 mg/kg
2,2'-[(1-methylethylidene)bis(4,1-phenyleneoxymethylene)]bisoxirane	Fresh water	0,006 mg/l
	Assessment Factors	
	Marine water	0,001 mg/l

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	Assessment Factors	
	Fresh water sediment	0,341 mg/kg dry weight (d.w.)
	Equilibrium method	
	Marine sediment	0,034 mg/kg dry weight (d.w.)
	Equilibrium method	
	Soil	0,065 mg/kg dry weight (d.w.)
	Equilibrium method	
	Sewage treatment plant	10 mg/l
	Assessment Factors	
	Secondary Poisoning	11 mg/kg
1,4-Bis(2,3-epoxypropoxy)butane	Fresh water	0,024 mg/l
	Assessment Factors	
	Marine water	0,002 mg/l
	Assessment Factors	
	Sewage treatment plant	100 mg/l
	Assessment Factors	
	Fresh water sediment	0,084 mg/kg dry weight (d.w.)
	Equilibrium method	
	Marine sediment	0,008 mg/kg dry weight (d.w.)
	Equilibrium method	
	Soil	0,003 mg/kg dry weight (d.w.)
	Equilibrium method	
	Oral	0,028 mg/kg
Barium sulfate	Fresh water	115 µg/l
	Sewage treatment plant	62,2 mg/l
	Assessment Factors	
	Fresh water sediment	600,4 mg/kg
	Assessment Factors	
	Soil	207,7 mg/kg
	Assessment Factors	
Formaldehyde, oligomeric reaction products with 1-chloro-	Fresh water	0,003 mg/l

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2,3-epoxypropane and phenol		
	Assessment Factors	
	Marine water	0,0003 mg/l
	Assessment Factors	
	Intermittent use/release	0,0254 mg/l
	Assessment Factors	
	Fresh water sediment	0,294 mg/kg
	Equilibrium method	
	Marine sediment	0,0294 mg/kg
	Equilibrium method	
	Soil	0,237 mg/kg
	Equilibrium method	
	Sewage treatment plant	10 mg/l
	Assessment Factors	
Reaction mass of bis(2,3-epoxypropyl) terephthalate and tris(oxiranylmethyl) benzene-1,2,4-tricarboxylate	Fresh water	0,00272 mg/l
	Assessment Factors	
	Marine water	0,00027 mg/l
	Assessment Factors	
	Freshwater - intermittent	0,0272 mg/l
	Assessment Factors	
	Sewage treatment plant	32 mg/l
	Assessment Factors	
	Fresh water sediment	0,04404 mg/kg
	Equilibrium method	
	Marine sediment	0,0044 mg/kg
	Equilibrium method	
	Soil	0,00721 mg/kg
	Equilibrium method	

### 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

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

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

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

Appearance : paste

Colour : beige

Odour : slight

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 : 156 °C  
Method: Flash-Point  
GLP: yes

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.

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

Vapour pressure : No data is available on the product itself.

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

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

Density : ca. 1,7 g/cm<sup>3</sup> (25 °C)

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

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

Partition coefficient: n-octanol/water : log Pow: < 2,0  
Method: OECD Test Guideline 117  
GLP: yes

Auto-ignition temperature : No data is available on the product itself.

Decomposition temperature : > 200 °C

Viscosity  
Viscosity, dynamic : 200 000 - 700 000 mPa.s (20 °C)  
Method: ISO 2555

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 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.

### 10.5 Incompatible materials

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

### 10.6 Hazardous decomposition products

Hazardous decomposition products : carbon dioxide  
carbon monoxide  
Halogenated compounds

## SECTION 11: Toxicological information

### 11.1 Information on toxicological effects

#### Acute toxicity

Acute oral toxicity - Product : LD50 Oral (Rat, female): > 2 000 mg/kg  
Method: OECD Test Guideline 420  
GLP: yes

Acute inhalation toxicity - Product : Acute toxicity estimate : > 20 mg/l  
Exposure time: 4 h  
Test atmosphere: vapour  
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:

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

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:

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

Result: Skin irritation

GLP: yes

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

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

### Serious eye damage/eye irritation

#### Product:

Species: Rabbit  
Method: OECD Test Guideline 405  
Result: Mild eye irritant  
GLP: yes

### Respiratory or skin sensitisation

#### Product:

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

Assessment: No data available

### Germ cell mutagenicity

#### Product:

Genotoxicity in vitro : Test Type: Ames test  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 471  
Result: positive  
GLP: yes

### Components:

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

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

Test Type: gene mutation test  
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

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

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

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

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

Genotoxicity in vivo : Test Type: In vivo micronucleus test  
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  
Test species: Rat  
Cell type: Liver cells  
Application Route: Oral  
Method: OECD Test Guideline 486  
Result: negative

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

Genotoxicity in vivo : Cell type: Germ  
Application Route: Oral  
Exposure time: 5 d  
Dose: 0 - 720 mg/kg  
Method: OECD Test Guideline 483  
Result: negative

Cell type: Germ  
Application Route: Oral  
Exposure time: 5 d  
Dose: 0 - 360 mg/kg  
Method: OECD Test Guideline 483  
Result: negative

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Application Route: Oral  
Dose: 2500 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

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

### Components:

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

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

### **Carcinogenicity**

#### Components:

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

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  
No observed adverse effect level: 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  
No-observed-effect level: 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  
No-observed-effect level: 100 mg/kg body weight  
Method: OECD Test Guideline 453  
Result: negative

Species: Rat, female  
Application Route: Oral

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Exposure time: 24 month(s)  
Dose: 0, 2, 15, or 100 mg/kg bw/day  
Frequency of Treatment: 7 days/week  
No observed adverse effect level: 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  
No-observed-effect level: 2 mg/kg bw/day  
Method: OECD Test Guideline 453  
Result: negative  
Target Organs: Digestive organs

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: 0, 50, 180, 540 or 750 milligram per kilogram  
Duration of Single Treatment: 238 d  
Frequency of Treatment: 1 daily  
General Toxicity - Parent: No-observed-effect level: 540 mg/kg body weight  
General Toxicity F1: No-observed-effect level: 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.

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

Species: Rat, male and female  
Application Route: Oral  
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  
Dose: 0, 30, 100 or 300 milligram per kilogram  
Duration of Single Treatment: 28 d  
Frequency of Treatment: 1 daily

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General Toxicity Maternal: No observed adverse effect level:  
30 mg/kg body weight  
Developmental Toxicity: No observed adverse effect level:  
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: No observed adverse effect level:  
60 mg/kg body weight  
Developmental Toxicity: No observed adverse effect level:  
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: No observed adverse effect level:  
180 mg/kg body weight  
Developmental Toxicity: No observed adverse effect level: >  
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:  
Species: Rabbit, female  
Application Route: Dermal  
General Toxicity Maternal: No observed adverse effect level:  
30 mg/kg body weight  
Result: No teratogenic effects

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

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: No observed adverse effect level:  
300 mg/kg body weight  
Developmental Toxicity: No observed adverse effect level:  
300 mg/kg body weight  
Method: OECD Test Guideline 414  
GLP: yes  
Remarks: Information given is based on data obtained from similar substances.

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

Test Type: Embryo-foetal development  
Species: Rat, females  
Strain: Sprague-Dawley  
Application Route: Oral  
Developmental Toxicity: No-observed-effect level: 60 mg/kg body weight  
Method: OECD Test Guideline 414  
GLP: yes

Test Type: reproductive and developmental toxicity study  
Species: Rat, male and female  
Strain: Sprague-Dawley  
Application Route: Oral  
Developmental Toxicity: No-observed-effect level: 3 mg/kg body weight

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: 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:

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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-epoxypropoxy)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  
Method: OECD Test Guideline 408  
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:  
Species: Rat, male and female  
NOAEL: 75  
Application Route: Ingestion  
Exposure time: 672 h Number of exposures: 7 d  
Method: Subacute toxicity  
Target Organs: Central nervous system, male reproductive organs  
Assessment: The substance or mixture is classified as specific target organ toxicant, repeated exposure, category 2.

Species: Rat, male and female  
NOEL: 75  
Application Route: Ingestion  
Exposure time: 672 h Number of exposures: 7 d  
Method: Subacute toxicity

Repeated dose toxicity - : No data available  
Assessment

### Aspiration toxicity

No data available

### Experience with human exposure

General Information: No data available

Inhalation: No data available

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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

#### Components:

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

Remarks: No data available

## SECTION 12: Ecological information

### 12.1 Toxicity

#### Product:

Toxicity to daphnia and other aquatic invertebrates : NOEC (Daphnia magna (Water flea)): > 100 mg/l  
End point: Immobilization  
Exposure time: 48 h  
Test Type: Immobilization  
Remarks: No toxicity at the limit of solubility

#### Components:

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

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

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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:  
Toxicity to fish : LC50 (Fish): 2,54 mg/l  
Exposure time: 96 h  
Method: Calculation method

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 2,55 mg/l  
Exposure time: 48 h  
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  
Test substance: Fresh water  
Method: OECD Test Guideline 201

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  
Remarks: Information given is based on data obtained from similar substances.

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

Toxicity to fish : LC50 (Brachydanio rerio (zebrafish)): 24 mg/l  
End point: mortality

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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  
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  
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)): 81 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water

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Toxicity to algae/aquatic plants : EC50 (Selenastrum capricornutum (green algae)): > 2,72 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

### 12.2 Persistence and degradability

#### Product:

Biodegradability : Inoculum: activated sludge  
Biodegradation: 67 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B  
GLP: yes  
Remarks: The 10 day time window criterion is not fulfilled.

#### Components:

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

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

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:

Biodegradability : 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.

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### 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

## 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

#### Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

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

### 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

## 12.4 Mobility in soil

### Components:

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

Distribution among environmental compartments : Koc: 445

#### Formaldehyde, oligomeric reaction products with 1-chloro-2,3-epoxypropane and phenol:

Distribution among : Koc: 4460

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environmental compartments      Method: OECD Test Guideline 121

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

Distribution among                      : Koc: 12,59

environmental compartments      Method: OECD Test Guideline 121

### 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.

#### 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.

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## SECTION 13: Disposal considerations

### 13.1 Waste treatment methods

Product    : 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.

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## SECTION 14: Transport information

#### IATA

14.1 UN number                                      : UN 3082

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**14.2 UN proper shipping name** : Environmentally hazardous substance, liquid, n.o.s.  
(BISPHENOL A EPOXY RESIN, BISPHENOL F 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, BISPHENOL F 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, BISPHENOL F 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, BISPHENOL F EPOXY RESIN)

**14.3 Transport hazard class(es)** : 9

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## ARALDITE® AV 138 M-1

Version 2.1      Revision Date: 13.08.2020      SDS Number: 400001008566      Date of last issue: 27.09.2018  
Date of first issue: 02.09.2015

Print Date 24.11.2020

**14.4 Packing group** : III

Labels : 9

### 14.5 Environmental hazards

Environmentally hazardous : yes

### 14.7 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 - List of substances subject to authorisation (Annex XIV) : Not applicable

REACH - List of substances subject to authorisation - Future sunset date : Not applicable

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).

Seveso III: Directive 2012/18/EU of the European Parliament and of the Council on the control of major-accident hazards involving dangerous substances.

E2 ENVIRONMENTAL HAZARDS

Water contaminating class (Germany) : WGK 2 obviously hazardous to water  
Classification according to AwSV, Annex 1 (5.2)

TA Luft List (Germany) : Total dust:  
Not applicable  
: Inorganic substances in powdered form:  
Not applicable  
: Inorganic substances in vapour or gaseous form:  
Not applicable  
: Organic Substances:  
Not applicable  
: Carcinogenic substances:  
Not applicable  
: Mutagenic:  
Not applicable  
: Toxic to reproduction:  
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:

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

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

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- TSCA : Not On TSCA Inventory
- AICS : Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.
- DSL : This product contains one or several components that are not on the Canadian DSL nor NDSL.
- ENCS : Notified. Allowed to be imported / manufactured only by the notifiers. Please contact your Huntsman sales representative for more information.
- NZIoC : Not in compliance with the inventory
- 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.

### 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.

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## 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.
- 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  
Skin Irrit. : Skin irritation  
Skin Sens. : Skin sensitisation  
STOT RE : Specific target organ toxicity - repeated exposure  
DE TRGS 900 : Germany. TRGS 900 - Occupational exposure limit values.  
DE TRGS 900 / AGW : Time Weighted Average

### Further information

#### Classification of the mixture:

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

#### Classification procedure:

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

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