

# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

**HUNTSMAN**

Enriching lives through innovation

## ARADUR® 3487 BD

Version	Revision Date:	SDS Number:	Date of last issue: 04.04.2017
1.1	02.02.2018	400001010065	Date of first issue: 04.04.2017

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

#### 1.1 Product identifier

Trade name : ARADUR® 3487 BD

#### 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 : Centres Antipoison et de Toxicovigilance:  
ANGERS: 02 41 48 21 21  
BORDEAUX: 05 56 96 40 80  
LILLE: 0 825 812 822  
LYON: 04 72 11 69 11  
MARSEILLE 04 91 75 25 25  
NANCY: 03 83 32 36 36  
PARIS: 01 40 05 48 48  
RENNES: 02 99 59 22 22  
STRASBOURG: 03 88 37 37 37  
TOULOUSE: 05 61 77 74 47  
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.

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Skin corrosion, Sub-category 1A	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.
Chronic aquatic toxicity, Category 3	H412: Harmful 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.  
H412 Harmful to aquatic life with long lasting effects.

Precautionary statements : **Prevention:**  
P201 Obtain special instructions before use.  
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.  
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:

Diaminopolypropylene glycol

3-aminomethyl-3,5,5-trimethylcyclohexylamine

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine)

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2,2'-iminodi(ethylamine)

4,4'-isopropylidenediphenol

**Additional Labelling:**

Restricted to professional users.

**2.3 Other hazards**

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

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

**3.2 Mixtures**

**Hazardous components**

Chemical name	CAS-No. EC-No. Index-No. Registration number	Classification	Concentration (% w/w)
Reaction products of di-, tri- and tetra-propoxylated propane-1,2-diol with ammonia	Not Assigned - 01-2119557899-12	Skin Corr. 1C; H314 Eye Dam. 1; H318 Aquatic Chronic 3; H412	>= 50 - < 70
3-Aminomethyl-3,5,5-trimethylcyclohexylamine	2855-13-2 220-666-8 01-2119514687-32	Acute Tox. 4; H302 Acute Tox. 4; H312 Skin Corr. 1B; H314 Eye Dam. 1; H318 Skin Sens. 1; H317 Aquatic Chronic 3; H412	>= 10 - < 20
2,2'-Dimethyl-4,4'-methylenebis(cyclohexylamine)	6864-37-5 229-962-1 01-2119497829-12	Acute Tox. 4; H302 Acute Tox. 3; H311 Acute Tox. 2; H330 Skin Corr. 1A; H314 Aquatic Chronic 2; H411 STOT RE 2; H373	>= 5 - < 10
2,2'-Iminodi(ethylamine)	111-40-0 203-865-4 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	>= 5 - < 10
4,4'-Isopropylidenediphenol	80-05-7 201-245-8 01-2119457856-23	Eye Dam. 1; H318 Skin Sens. 1; H317 Repr. 1B; H360F STOT SE 3; H335 Aquatic Chronic 2; H411	>= 3 - < 10

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For explanation of abbreviations see section 16.

### SECTION 4: First aid measures

#### 4.1 Description of first aid measures

- |                         |  |
|-------------------------|--|
| If inhaled              | : Move to fresh air.<br>Keep patient warm and at rest.<br>If symptoms persist, call a physician.   |
| In case of skin contact | : Take off contaminated clothing and shoes immediately.<br>Wash off with soap and plenty of water.<br>If symptoms persist, call a physician. |
| In case of eye contact  | : Immediately flush eye(s) with plenty of water.<br>Remove contact lenses.<br>Seek medical advice.   |
| If swallowed            | : Rinse mouth with water.<br>Do NOT induce vomiting.<br>Consult a physician if necessary.  |

#### 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 | : None known.   |

#### 5.2 Special hazards arising from the substance or mixture

- |                                      |   |
|--------------------------------------|---|
| Specific hazards during firefighting | : Do not use a solid water stream as it may scatter and spread fire.<br>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 : In the event of fire, wear self-contained breathing apparatus.

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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.

#### 6.2 Environmental precautions

Environmental precautions : Prevent product from entering drains.  
Do not allow contact with soil, surface or ground water.

#### 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

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

### 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 : 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.

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

Hygiene measures : Handle in accordance with good industrial hygiene and safety practice. When using do not eat, drink or smoke. Wash hands before breaks and at the end of workday.

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### 7.2 Conditions for safe storage, including any incompatibilities

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

Further information on storage stability : No decomposition if stored and applied as directed.

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
2,2'-iminodi(ethylamine)	111-40-0	VME	1 ppm 4 mg/m <sup>3</sup>	FR VLE
Further information	Risk for sensitisation of the skin, Indicative exposure limits			
4,4'-isopropylidenediph enol	80-05-7	VME (Dust, inhalable fraction)	10 mg/m <sup>3</sup>	FR VLE
Further information	Possibly reprotoxic to humans, Regulatory binding exposure limits			
		TWA (inhalable dust)	10 mg/m <sup>3</sup>	2009/161/EU
Further information	Indicative, In the Annex to Directive 2009/161/EU, the reference to bisphenol A is deleted with effect from 21 August 2018.			
		TWA (inhalable fraction)	2 mg/m <sup>3</sup>	2017/164/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
diethylenetriamine	Workers	Inhalation	Systemic effects, Short-term exposure	92,1 mg/m <sup>3</sup>
	Workers	Inhalation	Local effects, Short-term exposure	2,6 mg/m <sup>3</sup>
	Workers	Dermal	Systemic effects, Long-term exposure	11,4 mg/kg bw/day
	Workers	Inhalation	Systemic effects,	15,4 mg/m <sup>3</sup>

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			Long-term exposure	
	Workers	Dermal	Local effects, Long-term exposure	1,1 mg/cm <sup>2</sup>
	Workers	Inhalation	Local effects, Long-term exposure	0,87 mg/m <sup>3</sup>
	Consumers	Oral	Local effects, Short-term exposure	4,88 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Short-term exposure	27,5 mg/m <sup>3</sup>
	Consumers	Dermal	Systemic effects, Long-term exposure	4,88 mg/kg bw/day
	Consumers	Inhalation	Systemic effects, Long-term exposure	4,6 mg/m <sup>3</sup>
2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine)	Workers	Inhalation	Long-term systemic effects	0,6 mg/m <sup>3</sup>
	Workers	Inhalation	Long-term local effects	0,96 mg/m <sup>3</sup>
	Workers	Dermal	Long-term systemic effects	0,06 mg/kg
3-aminomethyl-3,5,5-trimethylcyclohexylamine	Workers	Inhalation	Systemic effects, Short-term exposure	20,1 mg/m <sup>3</sup>
	Workers	Inhalation	Local effects, Short-term exposure	20,1 mg/m <sup>3</sup>
	Consumers	Oral	Systemic effects, Long-term exposure	0,526 mg/kg bw/day
Diaminopolypropylene glycol	Workers	Dermal	Long-term systemic effects	2,5 mg/kg
	Workers	Inhalation	Long-term systemic effects	1,36 mg/m <sup>3</sup>
2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine)	Workers	Inhalation	Long-term systemic effects	0,6 mg/m <sup>3</sup>
	Workers	Inhalation	Long-term local effects	0,96 mg/m <sup>3</sup>
	Workers	Dermal	Long-term systemic effects	0,06 mg/kg
2,2'-iminodi(ethylamine)	Workers	Inhalation	Systemic effects, Short-term exposure	92,1 mg/m <sup>3</sup>
	Workers	Inhalation	Local effects, Short-term exposure	2,6 mg/m <sup>3</sup>
	Workers	Dermal	Systemic effects, Long-term exposure	11,4 mg/kg bw/day
	Workers	Inhalation	Systemic effects, Long-term exposure	15,4 mg/m <sup>3</sup>
	Workers	Dermal	Local effects, Long-term exposure	1,1 mg/cm <sup>2</sup>
	Workers	Inhalation	Local effects, Long-term exposure	0,87 mg/m <sup>3</sup>

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	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
3-aminomethyl-3,5,5-trimethylcyclohexylamine	Workers	Inhalation	Systemic effects, Short-term exposure	20,1 mg/m3
	Workers	Inhalation	Local effects, Short-term exposure	20,1 mg/m3
	Consumers	Oral	Systemic effects, Long-term exposure	0,526 mg/kg bw/day

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

Substance name	Environmental Compartment	Value
diethylenetriamine	Fresh water	0,56 mg/l
Remarks:	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	
2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine)	Fresh water	0,4 mg/l
	Marine water	0,04 mg/l
	Freshwater - intermittent	0,046 mg/l
	Sewage treatment plant	1,6 mg/l
	Fresh water sediment	17,4 mg/kg
	Marine sediment	17,4 mg/kg
	Soil	4,56 mg/kg
3-aminomethyl-3,5,5-trimethylcyclohexylamine	Fresh water	0,06 mg/l



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	Assessment Factors	
	Marine water	0,006 mg/l
	Assessment Factors	
	Freshwater - intermittent	0,23 mg/l
	Assessment Factors	
	Sewage treatment plant	3,18 mg/l
	Assessment Factors	
	Fresh water sediment	5,784 mg/kg
	Assessment Factors	
	Marine sediment	0,578 mg/kg
	Assessment Factors	
	Soil	1,121 mg/kg
	Assessment Factors	
	Secondary Poisoning	
	Assessment Factors	
Diaminopolypropylene glycol	Secondary Poisoning	6,93 mg/kg
	Assessment Factors	
	Fresh water	0,015 mg/l
	Assessment Factors	
	Marine sediment	0,125 mg/kg
	Equilibrium method	
	Fresh water sediment	0,132 mg/kg
	Equilibrium method	
	Freshwater - intermittent	0,15 mg/l
	Assessment Factors	
	Marine water	0,0143 mg/l
	Assessment Factors	
	Soil	0,0176 mg/kg
	Equilibrium method	
	Sewage treatment plant	7,5 mg/l
	Assessment Factors	
2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine)	Fresh water	0,4 mg/l
	Marine water	0,04 mg/l
	Freshwater - intermittent	0,046 mg/l
	Sewage treatment plant	1,6 mg/l

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	Fresh water sediment	17,4 mg/kg
	Marine sediment	17,4 mg/kg
	Soil	4,56 mg/kg
2,2'-iminodi(ethylamine)	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	
3-aminomethyl-3,5,5-trimethylcyclohexylamine	Fresh water	0,06 mg/l
	Assessment Factors	
	Marine water	0,006 mg/l
	Assessment Factors	
	Freshwater - intermittent	0,23 mg/l
	Assessment Factors	
	Sewage treatment plant	3,18 mg/l
	Assessment Factors	
	Fresh water sediment	5,784 mg/kg
	Assessment Factors	
	Marine sediment	0,578 mg/kg
	Assessment Factors	
	Soil	1,121 mg/kg
	Assessment Factors	
	Secondary Poisoning	
	Assessment Factors	

### 8.2 Exposure controls

#### Engineering measures

Maintain air concentrations below occupational exposure standards.

#### Personal protective equipment

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Eye protection : Safety glasses

Hand protection  
Material : butyl-rubber  
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 : Protective suit

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 : liquid

Colour : light yellow

Odour : ammoniacal

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 : No data is available on the product itself.

Flash point : > 120 °C  
Method: 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.

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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 : 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 g/cm<sup>3</sup> (20 °C)  
Method: estimated

Solubility(ies)  
Water solubility : > 100 g/l partly soluble (20 °C)  
Method: Information given is based on data obtained from similar substances.

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 : No data is available on the product itself.

Viscosity  
Viscosity, dynamic : 30 - 70 mPa.s (25 °C)  
Method: OECD Test Guideline 114

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.

### 10.2 Chemical stability

No decomposition if stored and applied as directed.

### 10.3 Possibility of hazardous reactions

Hazardous reactions : Stable under normal conditions.

### 10.4 Conditions to avoid

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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  
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 : 1,72 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:

Diaminopolypropylene glycol:  
Species: Rabbit  
Method: OECD Test Guideline 404  
Result: Corrosive after 1 to 4 hours of exposure

3-aminomethyl-3,5,5-trimethylcyclohexylamine:  
Species: Rabbit  
Assessment: Causes burns.  
Result: Causes burns.

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):  
Species: Rabbit  
Method: OECD Test Guideline 404  
Result: Causes burns.

2,2'-iminodi(ethylamine):  
Species: Rabbit  
Assessment: Causes burns.

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Result: Causes burns.

4,4'-isopropylidenediphenol:

Species: Rabbit

Method: OECD Test Guideline 404

Result: No skin irritation

### Serious eye damage/eye irritation

#### Components:

Diaminopolypropylene glycol:

Species: Rabbit

Assessment: Corrosive

Method: OECD Test Guideline 405

Result: Irreversible effects on the eye

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Species: Rabbit

Exposure time: 24 h

Assessment: Corrosive

Method: OECD Test Guideline 405

Result: Corrosive

2,2'-iminodi(ethylamine):

Species: Rabbit

Assessment: Corrosive

Result: Corrosive

4,4'-isopropylidenediphenol:

Species: Rabbit

Method: OECD Test Guideline 405

Result: Irreversible effects on the eye

### Respiratory or skin sensitisation

#### Components:

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Exposure routes: Skin

Species: Guinea pig

Assessment: May cause sensitisation by skin contact.

Method: OECD Test Guideline 406

Result: Causes sensitisation.

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Test Type: Maximisation Test

Exposure routes: Skin

Species: Guinea pig

Method: OECD Test Guideline 406

Result: Does not cause skin sensitisation.

2,2'-iminodi(ethylamine):

Exposure routes: Skin

Species: Mouse

Method: OECD Test Guideline 429

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Result: May cause sensitisation by skin contact.  
Remarks: Causes sensitisation.

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

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.

Assessment: No data available

### Germ cell mutagenicity

#### Components:

Diaminopolypropylene glycol:  
Genotoxicity in vitro : Concentration: 0 - 10000 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

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):  
Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test  
Test system: Chinese hamster lung cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 476  
Result: negative

: Test Type: Chromosome aberration test in vitro  
Test system: Chinese hamster ovary cells  
Metabolic activation: with and without metabolic activation  
Method: OECD Test Guideline 473  
Result: negative

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

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Result: negative

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

### Components:

Diaminopolypropylene glycol:  
Genotoxicity in vivo : Application Route: Oral  
Dose: 500 mg/kg  
Method: OECD Test Guideline 474  
Result: negative

2,2'-iminodi(ethylamine):  
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

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

### **Carcinogenicity**

#### Components:

2,2'-iminodi(ethylamine):  
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

Carcinogenicity - Assessment : No data available



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### Reproductive toxicity

#### Components:

Diaminopolypropylene glycol:

Effects on fertility

: Species: Rat, male and female  
Application Route: Dermal  
Method: OECD Test Guideline 421  
Result: Animal testing did not show any effects on fertility.

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Species: Rat, male and female  
Application Route: Oral  
Dose: 0, 15, 50 and 100 mg/kg/day  
Frequency of Treatment: 7 days/week  
General Toxicity - Parent: No observed adverse effect level:  
15 mg/kg body weight  
General Toxicity F1: No observed adverse effect level: 15  
mg/kg body weight  
Method: OECD Test Guideline 422

2,2'-iminodi(ethylamine):

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

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:

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Effects on foetal  
development

: Species: Rat, female  
Application Route: Oral  
General Toxicity Maternal: No-observed-effect level: 50 mg/kg  
body weight  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Species: Rat  
Application Route: Oral  
Dose: 5, 15 and 45 mg/kg bw /day  
Frequency of Treatment: 7 days/week  
General Toxicity Maternal: No observed adverse effect level: 5  
mg/kg body weight  
Developmental Toxicity: No observed adverse effect level: 45  
mg/kg body weight  
Method: OECD Test Guideline 414  
Result: No teratogenic effects

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### 2,2'-iminodi(ethylamine):

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

### 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

### Components:

#### 4,4'-isopropylidenediphenol:

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

### STOT - single exposure

#### Components:

#### 2,2'-iminodi(ethylamine):

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:

#### 2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Exposure routes: Ingestion  
Target Organs: Liver, Kidney, Adrenal gland, Heart, Blood  
Assessment: May cause damage to organs through prolonged or repeated exposure.

### Repeated dose toxicity

#### Components:

#### Diaminopolypropylene glycol:

Species: Rat, male and female  
NOAEL: 250  
Application Route: Skin contact  
Exposure time: 2 160 h Number of exposures: 5 d  
Method: Subchronic toxicity

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Species: Rat, male and female  
NOAEL: 239  
Application Route: Ingestion  
Exposure time: 744 h Method: Subchronic toxicity

3-aminomethyl-3,5,5-trimethylcyclohexylamine:  
Species: Rat, male and female  
: 60 mg/kg, 200  
Application Route: Ingestion  
Test atmosphere: dust/mist  
Exposure time: 216 h Number of exposures: 6 h  
Method: Subchronic toxicity

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):  
Species: Rat, male and female  
: 12  
Application Route: Inhalation  
Test atmosphere: vapour  
Number of exposures: 5 days/week  
Method: OECD Test Guideline 413

Species: Rat, male and female  
NOAEL: 2,5 mg/kg  
Application Route: oral (gavage)  
Exposure time: 3 months Number of exposures: 5 days/week  
Dose: 2.5, 12, 60 mg/kg bw/day  
Method: OECD Test Guideline 408  
Target Organs: Liver, Blood, Kidney, Adrenal gland, Heart

2,2'-iminodi(ethylamine):  
Species: Rat, male and female  
: 70 - 80  
Application Route: Ingestion  
Test atmosphere: vapour  
Exposure time: 360 h Number of exposures: 7 d  
Method: Subchronic toxicity

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

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

Species: Rat, male and female  
LOAEL: 600 mg/kg  
Application Route: Ingestion  
Exposure time: 672 h Number of exposures: 7 d

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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:

Diaminopolypropylene glycol:

Toxicity to fish : EC50 (Oncorhynchus mykiss (rainbow trout)): > 15 mg/l  
Exposure time: 96 h  
Test Type: semi-static test  
Test substance: Fresh water  
Method: OECD Test Guideline 203

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LC50 : 772,14 mg/l  
Exposure time: 96 h  
Test Type: static test  
Test substance: Marine water  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 80 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

EC50 (Acartia tonsa): 418,34 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Marine water

Toxicity to algae : ErC50 (Selenastrum capricornutum (green algae)): 15 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

ErC10 (Selenastrum capricornutum (green algae)): 1,4 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

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

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Toxicity to fish : LC50 (Leuciscus idus (Golden orfe)): 110 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 : 23 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

Toxicity to algae : EC50 : 37 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 : EC10 : 1 120 mg/l  
Exposure time: 18 h  
Method: Measured

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(Pseudomonas putida): 1 120 mg/l  
Exposure time: 18 h  
Test Type: static test  
Test substance: Fresh water

### 2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Toxicity to fish : LC50 (Oryzias latipes (Orange-red killifish)): 22,4 mg/l  
Exposure time: 96 h  
Test Type: semi-static test  
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 4,57 mg/l  
Exposure time: 48 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 202

Toxicity to algae : EC50 (Other): 7,9 mg/l  
Exposure time: 72 h  
Test Type: static test  
Test substance: Fresh water  
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC20 (activated sludge): 160 mg/l  
Exposure time: 30 min  
Test Type: static test  
Method: ISO 8192

Toxicity to daphnia and other aquatic invertebrates (Chronic toxicity) : NOEC: 4 mg/l  
Exposure time: 21 d  
Species: Daphnia magna (Water flea)  
Test Type: semi-static test  
Method: OECD Test Guideline 211

### Ecotoxicology Assessment

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

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

### 2,2'-iminodi(ethylamine):

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

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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.

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: Fish Life Cycle Toxicity  
Remarks: Toxic to aquatic organisms.

M-Factor (Chronic aquatic toxicity) : 1

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

### 12.2 Persistence and degradability

#### Components:

Diaminopolypropylene glycol:

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Biodegradability : Inoculum: Mixture  
Result: Not biodegradable  
Biodegradation: 0 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301B

Stability in water : Degradation half life (DT50): 12 Months (25 °C)  
pH: 6,5  
Method: No information available.  
Remarks: Fresh water

### 3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Biodegradability : Inoculum: activated sludge  
Concentration: 6,9 mg/l  
Result: Not readily biodegradable.  
Biodegradation: 8 %  
Exposure time: 28 d  
Method: Directive 67/548/EEC Annex V, C.4.A.

### 2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Biodegradability : Result: Not readily biodegradable.  
Biodegradation: 0 %  
Exposure time: 28 d  
Method: OECD Test Guideline 301C

Inoculum: activated sludge  
Result: Not biodegradable  
Biodegradation: < 1 %  
Exposure time: 28 d  
Method: OECD Test Guideline 302B

### 2,2'-iminodi(ethylamine):

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 %

### 4,4'-isopropylidenediphenol:

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

## 12.3 Bioaccumulative potential

### Components:

Diaminopolypropylene glycol:  
Partition coefficient: n- : log Pow: 1,34 (25 °C)



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octanol/water

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Partition coefficient: n-  
octanol/water : log Pow: 0,99 (23 °C)  
pH: 6,34  
Method: OECD Test Guideline 107

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Bioaccumulation : Species: Cyprinus carpio (Carp)  
Exposure time: 28 d  
Bioconcentration factor (BCF): < 60  
Test substance: Fresh water  
Method: flow-through test  
Remarks: Does not bioaccumulate.

Partition coefficient: n-  
octanol/water : log Pow: 2,3 (23 °C)  
pH: 10  
Method: OECD Test Guideline 107

2,2'-iminodi(ethylamine):

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

### 12.4 Mobility in soil

#### Components:

3-aminomethyl-3,5,5-trimethylcyclohexylamine:

Distribution among  
environmental compartments : Koc: 928

2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine):

Distribution among  
environmental compartments : Koc: 1195

2,2'-iminodi(ethylamine):

Distribution among  
environmental compartments : Koc: 19111

### 12.5 Results of PBT and vPvB assessment

#### Product:

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

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### 12.6 Other adverse effects

No data available

## 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.
- 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.  
(2,2'-DIMETHYL-4,4'METHYLENEBIS(CYCLOHEXYLAMINE), DIETHYLENE TRIAMINE)
- 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.  
(2,2'-DIMETHYL-4,4'METHYLENEBIS(CYCLOHEXYLAMINE), DIETHYLENE TRIAMINE)
- 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 : no

### ADR

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**14.1 UN number** : UN 2735  
**14.2 UN proper shipping name** : POLYAMINES, LIQUID, CORROSIVE, N.O.S.  
(2,2'-DIMETHYL-4,4'METHYLENEBIS(CYCLOHEXYLAMINE), DIETHYLENE TRIAMINE)  
**14.3 Transport hazard class(es)** : 8  
**14.4 Packing group** : II  
Labels : 8  
**14.5 Environmental hazards**  
Environmentally hazardous : no

### RID

**14.1 UN number** : UN 2735  
**14.2 UN proper shipping name** : POLYAMINES, LIQUID, CORROSIVE, N.O.S.  
(2,2'-DIMETHYL-4,4'METHYLENEBIS(CYCLOHEXYLAMINE), DIETHYLENE TRIAMINE)  
**14.3 Transport hazard class(es)** : 8  
**14.4 Packing group** : II  
Labels : 8  
**14.5 Environmental hazards**  
Environmentally hazardous : no

### 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) : bisphenol A

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

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

Occupational Illnesses (R-461-3, France) : 49, 51, 49 bis

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.

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### 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), NZIOIC (New Zealand), PICCS (Philippines), TCSI (Taiwan), TSCA (United States of America (USA))

## 15.2 Chemical safety assessment

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

## SECTION 16: Other information

### Full text of H-Statements

H302 : Harmful if swallowed.

H311 : Toxic in contact with skin.

H312 : Harmful in contact with skin.

H314 : Causes severe skin burns and eye damage.

H317 : May cause an allergic skin reaction.

H318 : Causes serious eye damage.

H330 : Fatal if inhaled.

H335 : May cause respiratory irritation.

H360F : May damage fertility.

H373 : May cause damage to organs through prolonged or repeated exposure if swallowed.

H411 : Toxic to aquatic life with long lasting effects.

H412 : Harmful to aquatic life with long lasting effects.

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### Full text of other abbreviations

Acute Tox.	:	Acute toxicity
Aquatic Chronic	:	Chronic aquatic toxicity
Eye Dam.	:	Serious eye damage
Repr.	:	Reproductive toxicity
Skin Corr.	:	Skin corrosion
Skin Sens.	:	Skin sensitisation
STOT RE	:	Specific target organ toxicity - repeated exposure
STOT SE	:	Specific target organ toxicity - single exposure
2009/161/EU	:	Europe. COMMISSION DIRECTIVE 2009/161/EU establishing a third list of indicative occupational exposure limit values in implementation of Council Directive 98/24/EC and amending Commission Directive 2000/39/EC
2017/164/EU	:	Commission Directive (EU) 2017/164 establishing a fourth list of indicative occupational exposure limit values pursuant to Council Directive 98/24/EC, and amending Commission Directives 91/322/EEC, 2000/39/EC and 2009/161/EU
FR VLE	:	France. Occupational Exposure Limits (INRS)
2009/161/EU / TWA	:	Limit Value - eight hours
2017/164/EU / TWA	:	Limit Value - eight hours
FR VLE / VME	:	Time Weighted Average

### Further information

#### Classification of the mixture:

Acute Tox. 4	H332
Skin Corr. 1A	H314
Eye Dam. 1	H318
Skin Sens. 1	H317
Repr. 1B	H360F
Aquatic Chronic 3	H412

#### Classification procedure:

Calculation method
Calculation method
Calculation method
Calculation method
Calculation method
Calculation method

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# SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006

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## ARADUR® 3487 BD

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