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.

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)

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

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.
Keep patient warm and at rest.
If symptoms persist, call a physician.

In case of skin contact : Take off contaminated clothing and shoes immediately.
Wash off with soap and plenty of water.
If symptoms persist, call a physician.

In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Seek medical advice.

If swallowed : Rinse mouth with water.
Do NOT induce vomiting.
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.
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.

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.

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/m3	FR VLE
Further information	Risk for sensitisation of the skin, Indicative exposure limits			
4,4'-isopropylidenediphenol	80-05-7	VME (Dust, inhalable fraction)	10 mg/m3	FR VLE
Further information	Possibly reprotoxic to humans, Regulatory binding exposure limits			
		TWA (inhalable dust)	10 mg/m3	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/m3	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/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,	15,4 mg/m3

			Long-term exposure	
	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
2,2'-dimethyl-4,4'methylenebis(cyclohexylamine)	Workers	Inhalation	Long-term systemic effects	0,6 mg/m3
	Workers	Inhalation	Long-term local effects	0,96 mg/m3
	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/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
Diaminopolypropylene glycol	Workers	Dermal	Long-term systemic effects	2,5 mg/kg
	Workers	Inhalation	Long-term systemic effects	1,36 mg/m3
2,2'-dimethyl-4,4'-methylenebis(cyclohexylamine)	Workers	Inhalation	Long-term systemic effects	0,6 mg/m3
	Workers	Inhalation	Long-term local effects	0,96 mg/m3
	Workers	Dermal	Long-term systemic effects	0,06 mg/kg
2,2'-iminodi(ethylamine)	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
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

	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

		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

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.

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/cm3 (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

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.

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

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

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

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

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 hNumber of exposures: 5 d
Method: Subchronic toxicity

Species: Rat, male and female
NOAEL: 239
Application Route: Ingestion
Exposure time: 744 hMethod: 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 hNumber 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 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

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

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

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

(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

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**:**

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)

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..

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

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.

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

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.

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:		**Classification procedure:**
Acute Tox. 4	H332	Calculation method
Skin Corr. 1A	H314	Calculation method
Eye Dam. 1	H318	Calculation method
Skin Sens. 1	H317	Calculation method
Repr. 1B	H360F	Calculation method
Aquatic Chronic 3	H412	Calculation method

The information and recommendations in this publication are to the best of our knowledge, information and belief accurate at the date of publication, NOTHING HEREIN IS TO BE CONSTRUED AS A WARRANTY, EXPRESS OR OTHERWISE.

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

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

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