

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

HUNTSMAN

Enriching lives through innovation

ARALDITE® 2012 HARDENER

Version	Revision Date:	SDS Number:	Date of last issue: 12.06.2023
2.1	20.10.2025	400001009176	Date of first issue: 28.05.2015

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

1.1 Product identifier

Trade name : ARALDITE® 2012 HARDENER

Unique Formula Identifier (UFI) : TX9J-H06T-300A-SG7T

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

Use of the Substance/Mixture : Adhesives

1.3 Details of the supplier of the safety data sheet

Company : Huntsman Advanced Materials (Europe) BV
Address : Grijpenlaan 18
3300 Tienen
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

Emergency telephone : 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)

Eye irritation, Category 2 H319: Causes serious eye irritation.

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Skin sensitisation, Category 1
Long-term (chronic) aquatic hazard,
Category 2

H317: May cause an allergic skin reaction.
H411: Toxic to aquatic life with long lasting effects.

2.2 Label elements

Labeling (REGULATION (EC) No 1272/2008)

Hazard pictograms :



Signal Word : Warning

Hazard Statements	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 vapors.
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.
P337 + P313	If eye irritation persists: Get medical advice/ attention.
P391	Collect spillage.

Hazardous ingredients which must be listed on the label:

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

2.3 Other hazards

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

Ecological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

Toxicological information: The substance/mixture does not contain components considered to have endocrine disrupting properties according to REACH Article 57(f) or Commission Delegated regulation (EU) 2017/2100 or Commission Regulation (EU) 2018/605 at levels of 0.1% or higher

SECTION 3: Composition/information on ingredients

3.2 Mixtures

Hazardous ingredients

Chemical name	CAS-No. EC-No. Index-No.	Classification	Concentration

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	Registration number		(% w/w)
2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol)	14970-87-7 239-044-2 01-2120768482-47	Acute Tox. 3; H301 Aquatic Acute 1; H400 Aquatic Chronic 1; H410 M-Factor (Acute aquatic toxicity): 1 M-Factor (Chronic aquatic toxicity): 1 Acute toxicity estimate Acute oral toxicity: 50,005 mg/kg	>= 2,5 - < 10
N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine	10563-29-8 234-148-4 01-2119970376-29	Acute Tox. 4; H302 Skin Corr. 1A; H314 Eye Dam. 1; H318 Skin Sens. 1B; H317 specific concentration limit Skin Corr. 1A; H314 >= 29,85 % Skin Corr. 1B; H314 9,65 - < 29,85 % Skin Corr. 1C; H314 5 - < 9,65 %	>= 1 - < 3
2,4,6-tris(dimethylaminomethyl)phenol	90-72-2 202-013-9 603-069-00-0 01-2119560597-27	Acute Tox. 4; H302 Skin Corr. 1C; H314 Eye Dam. 1; H318	>= 1 - < 3
N,N,4-trimethylpiperazine-1-ethylamine	104-19-8 203-183-7 01-2120785093-51	Acute Tox. 3; H301 Acute Tox. 4; H312 Skin Corr. 1A; H314 Eye Dam. 1; H318 Aquatic Chronic 3; H412	>= 1 - < 2,5
n-butyl acetate	123-86-4 204-658-1 607-025-00-1	Flam. Liq. 3; H226 STOT SE 3; H336 (Central nervous system) EUH066	>= 1 - < 10

For explanation of abbreviations see section 16.

SECTION 4: First aid measures

4.1 Description of first-aid measures

General advice : Move out of dangerous area.
Show this material safety data sheet to the doctor in

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attendance.
Treat symptomatically.
Get medical attention if symptoms occur.

- Protection of first-aiders : First Aid responders should pay attention to self-protection and use the recommended protective clothing
If potential for exposure exists refer to Section 8 for specific personal protective equipment.
Avoid inhalation, ingestion and contact with skin and eyes.
No action shall be taken involving any personal risk or without suitable training.
It may be dangerous to the person providing aid to give mouth-to-mouth resuscitation.
- If inhaled : If inhaled, remove to fresh air.
Get medical attention if symptoms occur.
- In case of skin contact : If on skin, rinse well with water.
- In case of eye contact : Immediately flush eye(s) with plenty of water.
Remove contact lenses.
Keep eye wide open while rinsing.
If eye irritation persists, consult a specialist.
- If swallowed : Keep respiratory tract clear.
Never give anything by mouth to an unconscious person.
If symptoms persist, call a physician.

4.2 Most important symptoms and effects, both acute and delayed

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

4.3 Indication of any immediate medical attention and special treatment needed

- Treatment : Treat symptomatically.

SECTION 5: Firefighting measures

5.1 Extinguishing media

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

5.2 Special hazards arising from the substance or mixture

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

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Hazardous combustion products : No hazardous combustion products are known

5.3 Advice for firefighters

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

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

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

SECTION 6: Accidental release measures

6.1 Personal precautions, protective equipment and emergency procedures

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

6.2 Environmental precautions

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

6.3 Methods and material for containment and cleaning up

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

6.4 Reference to other sections

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

SECTION 7: Handling and storage

7.1 Precautions for safe handling

Advice on safe handling : Repeated or prolonged skin contact may cause skin irritation and/or dermatitis and sensitization of susceptible persons.
Persons suffering from asthma, eczema or skin problems should avoid contact, including dermal contact, with this product.
Do not breathe vapors/dust.
Avoid exposure - obtain special instructions before use.
Avoid contact with skin and eyes.
For personal protection see section 8.

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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 : When using do not eat or drink. When using do not smoke. Wash hands before breaks and at the end of workday.

7.2 Conditions for safe storage, including any incompatibilities

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

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

Storage class (TRGS 510) : 10

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
n-butyl acetate	123-86-4	AGW	62 ppm 300 mg/m ³	DE TRGS 900
	Peak-limit category: 2;(I)			
	Further information: When there is compliance with the OEL and biological tolerance values, there is no risk of harming the unborn child			
		STEL	150 ppm 723 mg/m ³	2019/1831/E U
	Further information: Indicative			
		TWA	50 ppm 241 mg/m ³	2019/1831/E U
	Further information: Indicative			
		MAK	100 ppm 480 mg/m ³	DE DFG MAK
	Peak-limit category: 2; I			
	Further information: Damage to the embryo or foetus is unlikely when the			

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MAK value or the BAT value is observed

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

Substance name	End Use	Exposure routes	Potential health effects	Value
N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine	Workers	Inhalation	Long-term systemic effects	3,7 mg/m3
	Workers	Inhalation	Acute systemic effects	7,5 mg/m3
	Workers	Inhalation	Long-term local effects	3,7 mg/m3
	Workers	Inhalation	Acute local effects	7,5 mg/m3
	Workers	Dermal	Long-term systemic effects	0,67 mg/kg
	Consumers	Inhalation	Long-term systemic effects	0,65 mg/m3
	Consumers	Inhalation	Long-term local effects	0,65 mg/m3
	Consumers	Oral	Long-term systemic effects	0,2 mg/kg
N,N,4-trimethylpiperazine-1-ethylamine	Workers	Inhalation	Long-term systemic effects	0,59 mg/m3
	Workers	Dermal	Long-term systemic effects	0,167 mg/kg
2,4,6-tris(dimethylaminomethyl)phenol	Workers	Inhalation	Long-term systemic effects	0,53 mg/m3
	Workers	Inhalation	Acute systemic effects	2,1 mg/m3
	Workers	Dermal	Long-term systemic effects	0,150 mg/kg
	Workers	Dermal	Acute systemic effects	0,600 mg/kg
	Consumers	Inhalation	Long-term systemic effects	0,130 mg/m3
	Consumers	Inhalation	Acute systemic effects	0,130 mg/m3
	Consumers	Dermal	Long-term systemic effects	0,075 mg/kg
	Consumers	Dermal	Acute systemic effects	0,075 mg/kg
	Consumers	Oral	Long-term systemic effects	0,075 mg/kg

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

Substance name	Environmental Compartment	Value
2,4,6-tris(dimethylaminomethyl)phenol	Fresh water	0,046 mg/l
	Sea water	0,005 mg/l
	Remarks:Assessment Factors	
	Sewage treatment plant	0,262 mg/l
	Remarks:Assessment Factors	

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	Freshwater - intermittent	0,46 mg/l
	Soil	0,025 mg/kg
N'-(3-aminopropyl)-N,N-dimethylpropane-1,3-diamine	Fresh water	9,2 µg/l
	Remarks:Assessment Factors	
	Sea water	0,92 µg/l
	Remarks:Assessment Factors	
	Freshwater - intermittent	92 µg/l
	Remarks:Assessment Factors	
	Sewage treatment plant	18,1 mg/l
	Remarks:Assessment Factors	
	Fresh water sediment	0,0641 mg/kg dry weight (d.w.)
	Sea sediment	0,000006 mg/kg dry weight (d.w.)
	Soil	0,0074 mg/kg dry weight (d.w.)
N,N,4-trimethylpiperazine-1-ethylamine	Fresh water	0,029 mg/l
	Remarks:Assessment Factors	
	Sea water	0,0029 mg/l
	Remarks:Assessment Factors	
	Fresh water sediment	0,3132 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Sea sediment	0,03132 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Sewage treatment plant	100 mg/l
	Remarks:Assessment Factors	
	Soil	0,0455 mg/kg dry weight (d.w.)
	Remarks:Equilibrium method	
	Fresh water sediment	0,290 mg/l
	Remarks:Assessment Factors	
	Secondary Poisoning	3,33 mg/kg
	Remarks:Assessment Factors	

8.2 Exposure controls

Personal protective equipment

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

Hand protection

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

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

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

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Remarks	:	Gloves should be discarded and replaced if there is any indication of degradation or chemical breakthrough. Take note of the information given by the producer concerning permeability and break through times, and of special workplace conditions (mechanical strain, duration of contact). The selected protective gloves have to satisfy the specifications of Regulation (EU) 2016/425 and the standard EN 374 derived from it.
Skin and body protection	:	Impervious clothing Choose body protection according to the amount and concentration of the dangerous substance at the work place.
Respiratory protection	:	Use respiratory protection unless adequate local exhaust ventilation is provided or exposure assessment demonstrates that exposures are within recommended exposure guidelines Equipment should conform to EN 14387
Filter type	:	Combined particulates, inorganic and acidic gas/vapor, ammonia/amines and organic vapor type (ABEK-P)

SECTION 9: Physical and chemical properties

9.1 Information on basic physical and chemical properties

Physical state	:	liquid
Form	:	liquid
Color	:	light yellow
Odor	:	unpleasant
Odor Threshold	:	No data is available on the product itself.
Melting point/freezing point	:	No data is available on the product itself.
Boiling point	:	> 200 °C
Flammability	:	No data is available on the product itself.
Lower explosion limit / Lower flammability limit	:	No data is available on the product itself.
Upper explosion limit / Upper flammability limit	:	No data is available on the product itself.
Flash point	:	> 100 °C Method: Pensky-Martens closed cup, closed cup 102 °C Method: Cleveland open cup
Autoignition temperature	:	No data is available on the product itself.
Decomposition temperature	:	> 200 °C

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pH : substance/mixture is non-soluble (in water)

Viscosity
Viscosity, dynamic : 20 000 - 40 000 mPa.s (25 °C)

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

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

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

Vapor pressure : < 0,01 hPa (20 °C)

Density : 1,165 g/cm³ (25 °C)

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

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

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

9.2 Other information

No data is available on the product itself.

SECTION 10: Stability and reactivity

10.1 Reactivity

No dangerous reaction known under conditions of normal use.

10.2 Chemical stability

Stable under normal conditions.

10.3 Possibility of hazardous reactions

Hazardous reactions : No hazards to be specially mentioned.

10.4 Conditions to avoid

Conditions to avoid : None known.

10.5 Incompatible materials

Materials to avoid : None known.

10.6 Hazardous decomposition products

No hazardous decomposition products are known.

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SECTION 11: Toxicological information

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

Acute toxicity

Not classified due to lack of data.

Product:

Acute oral toxicity : LD50 (Rat, male and female): 2 631 mg/kg
Method: OECD Test Guideline 401

Acute dermal toxicity : LD50 (Rat, male and female): > 4 000 mg/kg
Method: OECD Test Guideline 402

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Acute oral toxicity : LD50 (Rat, female): > 50 - 300 mg/kg
Method: OECD Test Guideline 423

Acute toxicity estimate: 50,005 mg/kg
Method: Calculation method

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

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

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

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

Acute oral toxicity : LD50 (Rat, male and female): 2 169 mg/kg
Method: OECD Test Guideline 401
Assessment: The component/mixture is low toxic after single ingestion.

Acute dermal toxicity : LD50 (Rat, male): > 1 ml/kg
Assessment: The substance or mixture has no acute dermal toxicity

N,N,4-trimethylpiperazine-1-ethylamine:

Acute oral toxicity : LD50 (Rat, female): 200 - 2 000 mg/kg
Method: OECD Test Guideline 423
GLP: yes
Assessment: The component/mixture is toxic after single ingestion.

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Acute dermal toxicity : LD50 (Rabbit, male): 0.51 mL/kg bw
Assessment: The component/mixture is moderately toxic after single contact with skin.

n-butyl acetate:

Acute oral toxicity : LD50 (Rat): > 8 800 mg/kg
LD50 (Mouse): 7 060 mg/kg
LD50 (Rabbit): 7 437 mg/kg
LD50 (Guinea pig): 4 700 mg/kg
LD50 (Rat, female): 10 760 mg/kg
Method: OECD Test Guideline 423

Acute dermal toxicity : LD50 (Rabbit): > 17 600 mg/kg
LD50 (Rabbit, male and female): 14 112 mg/kg

Skin corrosion/irritation

Based on available data, the classification criteria are not met.

Product:

Species : Rabbit
Result : No skin irritation
Remarks : Moderate skin irritation

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Species : human skin
Method : OECD Test Guideline 439
Result : No skin irritation

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

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

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

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

Species : synthetic macromolecular bio-barrier
Method : OECD Test Guideline 435
Result : Corrosive after 1 to 4 hours of exposure

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N,N,4-trimethylpiperazine-1-ethylamine:

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

Serious eye damage/eye irritation

Causes serious eye irritation.

Product:

Species	:	Rabbit
Result	:	Mild eye irritation
Remarks	:	Mild eye irritation

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Species	:	Bovine cornea
Method	:	OECD Test Guideline 437
Result	:	No eye irritation

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

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

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

Species	:	Rabbit
Assessment	:	Corrosive
Method	:	Other guidelines
Result	:	Corrosive

N,N,4-trimethylpiperazine-1-ethylamine:

Result	:	Corrosive
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Respiratory or skin sensitisation

Skin sensitisation

May cause an allergic skin reaction.

Respiratory sensitisation

Not classified due to lack of data.

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Test Type	:	Maximisation Test
Exposure routes	:	Skin
Species	:	Guinea pig
Method	:	OECD Test Guideline 406
Result	:	Does not cause skin sensitisation.

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

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

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

Exposure routes	: Skin
Species	: Guinea pig
Method	: OECD Test Guideline 406
Result	: Does not cause skin sensitisation.

n-butyl acetate:

Exposure routes	: Skin
Species	: Guinea pig
Result	: Does not cause skin sensitisation.

Germ cell mutagenicity

Not classified due to lack of data.

Product:

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

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Genotoxicity in vitro	: Test Type: Ames test
	Test system: Salmonella tryphimurium and E. coli
	Metabolic activation: with and without metabolic activation
	Method: OECD Test Guideline 471
	Result: negative
	GLP: yes
	Test Type: gene mutation test
	Test system: mouse lymphoma cells
	Metabolic activation: with and without metabolic activation
	Method: OECD Test Guideline 490
	Result: negative
	Test system: Human lymphocytes
	Metabolic activation: with and without metabolic activation
	Method: OECD Test Guideline 487
	Result: negative

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

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

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

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

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

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

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

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

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

N,N,4-trimethylpiperazine-1-ethylamine:

Genotoxicity in vitro : Test Type: In vitro mammalian cell gene mutation test
Test system: Chinese hamster ovary cells
Metabolic activation: with and without metabolic activation
Method: OECD Test Guideline 476
Result: negative
GLP: yes

Test Type: reverse mutation assay
Test system: Salmonella tryphimurium and E. coli

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

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
GLP: yes

Metabolic activation: with and without metabolic activation
Result: negative

Genotoxicity in vivo : Test Type: In vivo micronucleus test
Species: Mouse (male and female)
Cell type: Bone marrow
Application Route: Intraperitoneal injection
Dose: 175/350/560 mg/kg bw /day
Result: negative

Carcinogenicity

Not classified due to lack of data.

Components:

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

Species	: Mouse, male
Application Route	: Dermal
Exposure time	: 20 month(s)
Dose	: 1.25/56.3 mg/animal
Frequency of Treatment	: 3 daily
NOAEL	: >= 56,3 mg/kg body weight
Result	: negative
Remarks	: Information given is based on data obtained from similar substances.

Reproductive toxicity

Not classified due to lack of data.

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Effects on fertility	: Species: Rat, male and female
	Dose: 50, 100, 150 mg/kg
	General Toxicity Parent: NOAEL: 50 mg/kg body weight
	General Toxicity F1: NOAEL: 50 mg/kg body weight
	Method: OECD Test Guideline 421

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

Effects on fertility	: Test Type: Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test
	Species: Rat, male and female

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Application Route: Oral
Dose: 5, 15 and 50 mg/kg bw/d
General Toxicity Parent: NOAEL: 15 mg/kg body weight
General Toxicity F1: NOAEL: 15 mg/kg body weight
Method: OECD Test Guideline 422
Result: Animal testing did not show any effects on fertility.
GLP: yes

Test Type: Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test
Species: Rat, male and female
Application Route: Oral
Dose: 0, 100, 200 and 400 milligram per kilogram
Frequency of Treatment: 7 days/week
General Toxicity Parent: NOAEL: > 400 mg/kg body weight
General Toxicity F1: NOAEL: 400 mg/kg body weight
Method: OECD Test Guideline 422

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

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

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

Effects on fertility : Species: Rat, male and female
Application Route: Oral
Method: OECD Test Guideline 422
Remarks: No significant adverse effects were reported

N,N,4-trimethylpiperazine-1-ethylamine:

Effects on fertility : Test Type: Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test
Species: Rat, male and female
Dose: 0, 10, 25, 50 mg/kg
Frequency of Treatment: 7 days/week
General Toxicity Parent: NOAEL: 50 mg/kg body weight
General Toxicity F1: NOAEL: 50 mg/kg body weight
Method: OECD Test Guideline 422
Result: negative

n-butyl acetate:

Effects on fertility : Species: Rat, male and female

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Fertility: NOAEC Mating/Fertility: 2 000 ppm
Method: OECD Test Guideline 416

Effects on fetal development : Species: Rat, male and female
Strain: Sprague-Dawley
Application Route: Inhalation
Developmental Toxicity: NOAEC Parent: 1 500 ppm
Method: OECD Test Guideline 414
Result: No effects on fertility and early embryonic development were detected.

STOT-single exposure

Not classified due to lack of data.

Components:

n-butyl acetate:

Exposure routes : Inhalation
Target Organs : Narcotic effects
Assessment : May cause drowsiness or dizziness.

STOT-repeated exposure

Not classified due to lack of data.

Repeated dose toxicity

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Species : Rat, male and female
NOAEL : 60 mg/kg
Application Route : Oral
Dose : 20, 60, 180 mg/kg
Method : OECD Test Guideline 407

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

Species : Rat, male and female
 : 500 mg/m³
Application Route : Inhalation
Test atmosphere : vapor
Exposure time : 21 d 6 h
Number of exposures : 5 days/week
Dose : 550 mg/m³
Method : Subchronic toxicity
Remarks : Based on data from similar materials

Species : Mouse, male
NOAEL : >= 56,3 mg/kg/d
Application Route : Skin contact
Number of exposures : 3 d
Method : Chronic toxicity
Remarks : Based on data from similar materials

Species : Rat, male and female
NOAEL : 41 mg/kg

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

Species : Rat, male and female
NOAEL : 200 mg/kg
Application Route : Oral
Exposure time : 51 d
Number of exposures : 7 days/week
Dose : 0, 100, 200 mg/kg bw/day
Method : OECD Test Guideline 422

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

Species : Rat, male and female
NOEL : 15 mg/kg
Application Route : Ingestion
Exposure time : 1 032 h
Number of exposures : 7 d
Method : Subacute toxicity

N,N,4-trimethylpiperazine-1-ethylamine:

Species : Rat, male and female
NOAEL : 50 mg/kg
Application Route : Oral
Exposure time : 6 - 10 weeks
Number of exposures : 7 days/week
Dose : 0, 10, 25, 50mg/kg bw/day
Method : OECD Test Guideline 422
GLP : yes

n-butyl acetate:

Species : Rat, male and female
NOAEL : 2,4 mg/l
Application Route : Inhalation
Test atmosphere : vapor

Aspiration toxicity

Not classified due to lack of data.

11.2 Information on other hazards

Endocrine disrupting properties

Not classified due to lack of data.

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Assessment : Does not have endocrine disrupting properties.

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

Assessment : Does not have endocrine disrupting properties.

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

Assessment : Does not have endocrine disrupting properties.

N,N,4-trimethylpiperazine-1-ethylamine:

Assessment : Does not have endocrine disrupting properties.

n-butyl acetate:

Assessment : Does not have endocrine disrupting properties.

Experience with human exposure

No data available

Toxicology, Metabolism, Distribution

No data available

Neurological effects

No data available

Further information

No data available

SECTION 12: Ecological information

12.1 Toxicity

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Toxicity to fish : LC50 (Danio rerio (zebra fish)): 5,7 mg/l
Exposure time: 96 h
Test Type: semi-static test
Method: OECD Test Guideline 203

Toxicity to daphnia and other : EC50 (Daphnia magna (Water flea)): 0,76 mg/l
aquatic invertebrates
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202

Toxicity to algae/aquatic : EC50 (Pseudokirchneriella subcapitata (green algae)): 3,11
plants
mg/l
Exposure time: 96 h
Test Type: static test
Method: OECD Test Guideline 201
GLP: yes

M-Factor (Acute aquatic : 1
toxicity)

M-Factor (Chronic aquatic : 1
toxicity)

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

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

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 9,2 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Analytical monitoring: no
Test substance: Fresh water
Method: OECD Test Guideline 202
GLP: yes

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

NOEC (Selenastrum capricornutum (green algae)): 5,7 mg/l
Exposure time: 72 h
Test Type: static test
Analytical monitoring: yes
Test substance: Fresh water
Method: OECD Test Guideline 201
GLP: yes

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

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

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

Toxicity to daphnia and other aquatic invertebrates : LC50 (Palaeomonetes vulgaris (Grass shrimp)): 718 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Analytical monitoring: no

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Test substance: Sea water

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

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

N,N,4-trimethylpiperazine-1-ethylamine:

Toxicity to fish : LC50 (Oncorhynchus mykiss (rainbow trout)): > 29 mg/l
End point: mortality
Exposure time: 96 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 203

Toxicity to daphnia and other aquatic invertebrates : EC50 (Daphnia magna (Water flea)): 66 mg/l
End point: Immobilization
Exposure time: 48 h
Test Type: static test
Method: OECD Test Guideline 202

Toxicity to algae/aquatic plants : EC50 (Pseudokirchneriella subcapitata (algae)): 29 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: OECD Test Guideline 201

NOEC (Pseudokirchneriella subcapitata (algae)): 3,2 mg/l
Exposure time: 72 h
Test substance: Fresh water
Method: OECD Test Guideline 201

Toxicity to microorganisms : EC50 (activated sludge): > 1 000 mg/l
Exposure time: 3 h
Test Type: static test
Test substance: Fresh water
Method: OECD Test Guideline 209
GLP: yes

Ecotoxicology Assessment

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

n-butyl acetate:

Toxicity to fish : EC50 (Menidia beryllina (Silverside)): 185 mg/l
Exposure time: 96 h

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LC50 (Pimephales promelas (fathead minnow)): 18 mg/l
Exposure time: 96 h
Method: OECD Test Guideline 203

Toxicity to daphnia and other : EC50 : 205 mg/l
aquatic invertebrates Exposure time: 24 h

EC50 : 44 mg/l
Exposure time: 48 h
Method: OECD Test Guideline 202

Toxicity to algae/aquatic : EC50 (Desmodesmus subspicatus (green algae)): 674,7 mg/l
plants Exposure time: 72 h

Toxicity to microorganisms : IC0 : 1 200 mg/l
Exposure time: 24 h

12.2 Persistence and degradability

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Biodegradability : Test Type: aerobic
Inoculum: activated sludge
Concentration: 38,2 mg/l
Result: Not biodegradable
Biodegradation: < 10 %
Exposure time: 28 d
Method: OECD Test Guideline 301A

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

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

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

Biodegradability : Test Type: aerobic
Inoculum: activated sludge, non-adapted
Concentration: 2 mg/l
Result: Not biodegradable
Biodegradation: 4 %
Exposure time: 28 d
Method: OECD Test Guideline 301D

N,N,4-trimethylpiperazine-1-ethylamine:

Biodegradability : Test Type: aerobic
Inoculum: activated sludge

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Result: Not readily biodegradable.
Biodegradation: 0 %
Exposure time: 28 d
Method: OECD Test Guideline 301B
Test substance: Fresh water

n-butyl acetate:

Biodegradability : Result: Readily biodegradable.
Biodegradation: 98 %
Exposure time: 28 d

12.3 Bioaccumulative potential

Components:

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

Partition coefficient: n-octanol/water : log Pow: -0,56 (25 °C)
pH: 11,6
Method: OECD Test Guideline 107

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

Partition coefficient: n-octanol/water : Pow: >= 0,219 (21,5 °C)
log Pow: -0,66 (21,5 °C)
Method: OPPTS 830.7550

N,N,4-trimethylpiperazine-1-ethylamine:

Partition coefficient: n-octanol/water : log Pow: -0,591 (21 °C)
pH: 9,6

n-butyl acetate:

Bioaccumulation : Bioconcentration factor (BCF): 4 - 14

12.4 Mobility in soil

No data available

12.5 Results of PBT and vPvB assessment

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Assessment : Not persistent, bioaccumulative, and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).

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

Assessment : Not persistent, bioaccumulative, and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).

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

Assessment : Not persistent, bioaccumulative, and toxic (PBT).

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This substance is not considered to be very persistent and very bioaccumulating (vPvB).

N,N,4-trimethylpiperazine-1-ethylamine:

Assessment : Not persistent, bioaccumulative, and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).

n-butyl acetate:

Assessment : Not persistent, bioaccumulative, and toxic (PBT).
This substance is not considered to be very persistent and very bioaccumulating (vPvB).

12.6 Endocrine disrupting properties

Components:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Assessment : Does not have endocrine disrupting properties.

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

Assessment : Does not have endocrine disrupting properties.

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

Assessment : Does not have endocrine disrupting properties.

N,N,4-trimethylpiperazine-1-ethylamine:

Assessment : Does not have endocrine disrupting properties.

n-butyl acetate:

Assessment : Does not have endocrine disrupting properties.

12.7 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:

2,2'-[1,2-ethanediylbis(oxy)]bis(ethanethiol):

Assessment : Not persistent, mobile, and toxic (PMT).
Not very persistent and very mobile (vPvM).

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

Assessment : Not persistent, mobile, and toxic (PMT).
Not very persistent and very mobile (vPvM).

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

Assessment : Not persistent, mobile, and toxic (PMT).
Not very persistent and very mobile (vPvM).

N,N,4-trimethylpiperazine-1-ethylamine:

Assessment : Not persistent, mobile, and toxic (PMT).
Based on available data, the classification criteria are not met.

n-butyl acetate:

Assessment : Not persistent, mobile, and toxic (PMT).
Not very persistent and very mobile (vPvM).

SECTION 13: Disposal considerations

13.1 Waste treatment methods

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

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

SECTION 14: Transport information

14.1 UN number or ID number

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

14.2 UN proper shipping name

ADN	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TRIETHYLENEGLYCOL-DIMERCAPTANE)
ADR	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TRIETHYLENEGLYCOL-DIMERCAPTANE)
RID	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S. (TRIETHYLENEGLYCOL-DIMERCAPTANE)
IMDG	: ENVIRONMENTALLY HAZARDOUS SUBSTANCE, LIQUID, N.O.S.

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IATA : (TRIETHYLENEGLYCOL-DIMERCAPTANE)
Environmentally hazardous substance, liquid, n.o.s.
(TRIETHYLENEGLYCOL-DIMERCAPTANE)

14.3 Transport hazard class(es)

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

14.4 Packing group

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

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

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

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

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

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

14.5 Environmental hazards

ADN
Environmentally hazardous : yes

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ADR

Environmentally hazardous : yes

RID

Environmentally hazardous : yes

IMDG

Marine pollutant : yes

IATA (Passenger)

Environmentally hazardous : yes

IATA (Cargo)

Environmentally hazardous : yes

14.6 Special precautions for user

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

14.7 Maritime transport in bulk according to IMO instruments

Not applicable for product as supplied.

SECTION 15: Regulatory information

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

REACH - List of substances subject to authorisation (Annex XIV)	:	Not applicable
REACH - Candidate List of Substances of Very High Concern for Authorization (Article 59).	:	This product does not contain substances of very high concern.
REACH - Restrictions on the manufacture, placing on the market and use of certain dangerous substances, mixtures and articles (Annex XVII)	:	Conditions of restriction for the following entries should be considered: Number on list 3 Number on list 75: If you intend to use this product as tattoo ink, please contact your vendor.
Seveso II - Directive 2003/105/EC amending Council Directive 96/82/EC on the control of major-accident hazards involving dangerous substances	:	Not applicable
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 hazard class (Germany)	:	WGK 1 slightly hazardous to water Classification according to AwSV, Annex 1 (5.2)

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ARALDITE® 2012 HARDENER

Version	Revision Date:	SDS Number:	Date of last issue: 12.06.2023
2.1	20.10.2025	400001009176	Date of first issue: 28.05.2015

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Other regulations:

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

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

H226	: Flammable liquid and vapor.
H301	: Toxic if swallowed.
H302	: Harmful if swallowed.
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.
H336	: May cause drowsiness or dizziness.
H400	: Very toxic to aquatic life.
H410	: Very toxic to aquatic life with long lasting effects.
H412	: Harmful to aquatic life with long lasting effects.
EUH066	: Repeated exposure may cause skin dryness or cracking.

Full text of other abbreviations

Acute Tox.	: Acute toxicity
Aquatic Acute	: Short-term (acute) aquatic hazard
Aquatic Chronic	: Long-term (chronic) aquatic hazard
Eye Dam.	: Serious eye damage
Flam. Liq.	: Flammable liquids
Skin Corr.	: Skin corrosion
Skin Sens.	: Skin sensitisation
STOT SE	: Specific target organ toxicity - single exposure
2019/1831/EU	: Europe. Commission Directive 2019/1831/EU establishing a fifth list of indicative occupational exposure limit values
DE DFG MAK	: Germany. MAK BAT Annex IIa
DE TRGS 900	: Germany. TRGS 900 - Occupational exposure limit values.
2019/1831/EU / TWA	: Limit Value - eight hours
2019/1831/EU / STEL	: Short term exposure limit
DE DFG MAK / MAK	: MAK value
DE TRGS 900 / AGW	: Time Weighted Average

Further information

Classification of the mixture:

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

Classification procedure:

Based on product data or assessment
Calculation method
Calculation method

SAFETY DATA SHEET

according to Regulation (EC) No. 1907/2006, as amended

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