Safety Data Sheet

LOCTITE EA 3478 B

SDS No. : 157255
V001.14
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Section 1. Identification of the substance/preparation and of the company/undertaking

Product name:
LOCTITE EA 3478 B

Other means of identification:
LOCTITE EA 3478 B

Product code:
IDH702243

Recommended use of the chemical and restrictions on use

Intended use:
Epoxy Hardener

Manufacturer/Importer/Distributor Representative Company

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Emergency Telephone for Chemical Accidents:
FOR EMERGENCIES ONLY (Spill, major leak, Fire, Exposure, or Accident). Call CHEMTREC: +1 703-741-5970

Section 2. Hazards identification

GHS Classification:

Hazard Class	Hazard Category	Route of Exposure
Acute toxicity	Category 4	Oral
Acute toxicity	Category 3	Inhalation
Skin corrosion/irritation	Category 1B	
Serious eye damage/eye irritation	Category 1	
Skin sensitizer	Category 1	
Acute hazards to the aquatic environment	Category 1	
Chronic hazards to the aquatic environment	Category 1	

GHS label elements:

Hazard pictogram:

Signal word:
Danger

Hazard statement:
H302 Harmful if swallowed.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H331 Toxic if inhaled.
H410 Very toxic to aquatic life with long lasting effects.

Precaution:

Prevention:
P261 Avoid breathing dust/fume/gas/mist/vapours/spray.
P264 Wash hands thoroughly after handling.
P270 Do not eat, drink or smoke when using this product.
P272 Contaminated work clothing should not be allowed out of the workplace.
P273 Avoid release to the environment.
P280 Wear protective gloves/protective clothing/eye protection/face protection.

Response:
P301+P310+P330 IF SWALLOWED: Immediately call a POISON CENTER or doctor/ physician. Rinse mouth.
P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower].
P304+P340+P310 IF INHALED: Remove victim to fresh air and keep at rest in a position comfortable for breathing. Immediately call a POISON CENTER or physician.
P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313 If skin irritation or rash occurs: Get medical advice/attention.
P363 Wash contaminated clothing before reuse.
P391 Collect spillage.

Storage:
P403+P233 Store in a well-ventilated place. Keep container tightly closed.

Disposal:
P501 Dispose of contents/container to an appropriate treatment and disposal facility in accordance with applicable laws and regulations, and product characteristics at time of disposal.

Section 3. Composition / information on ingredients

Substance or Mixture:
Mixture

Declaration of hazardous chemical:

Hazard component CAS-No.	Content	GHS Classification
Calcium carbonate 471-34-1	30- 60 %	
1,2-Ethanediamine, N-(2-aminoethyl)-, reaction products with bisphenol A diglycidyl ether homopolymer 68411-71-2	10- 30 %	Acute toxicity 4; Oral H302
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	10- 30 %	Skin corrosion/irritation 2 H315 Serious eye damage/eye irritation 1 H318 Skin sensitizer 1 H317 Acute hazards to the aquatic environment 2 H401 Chronic hazards to the aquatic environment 2 H411
2,2'-iminodiethylamine 111-40-0	1- 10 %	Acute toxicity 4; Oral H302 Acute toxicity 2; Inhalation H330 Acute toxicity 4; Dermal H312 Skin corrosion/irritation 1 H314 Serious eye damage/eye irritation 1 H318 Skin sensitizer 1B H317 Specific target organ toxicity - single exposure 3 H335 Acute hazards to the aquatic environment 3 H402
3,6-diazaoctanethylenediamine 112-24-3	1- 10 %	Acute toxicity 4; Oral H302 Acute toxicity 4; Dermal H312 Skin corrosion/irritation 1 H314 Skin sensitizer 1 H317 Acute hazards to the aquatic environment 3 H402 Chronic hazards to the aquatic environment 3 H412
Silica Filler 112926-00-8	1- 10 %	
4-nonylphenol, branched 84852-15-3	1- 10 %	Acute toxicity 4; Oral H302 Skin corrosion/irritation 1 H314 Toxic to reproduction 2 H361 Acute hazards to the aquatic environment 1 H400 Chronic hazards to the aquatic environment 1 H410
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	1- 10 %	
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	1- 10 %	Acute toxicity 4; Oral H302 Acute toxicity 4; Dermal H312 Skin corrosion/irritation 1 H314 Serious eye damage/eye irritation 1 H318 Skin sensitizer 1

		H317 Acute hazards to the aquatic environment 3 H402 Chronic hazards to the aquatic environment 3 H412
1,2-Ethanediamine, N1,N1-bis(2-aminoethyl)- 4097-89-6	1- 10 %	Acute toxicity 3; Oral H301 Acute toxicity 2; Dermal H310 Skin corrosion/irritation 1 H314 Serious eye damage/eye irritation 1 H318 Acute hazards to the aquatic environment 3 H402
2-Ethyl-4-methylimidazole 931-36-2	0.1- 1 %	Acute toxicity 4; Oral H302 Skin corrosion/irritation 2 H315 Serious eye damage/eye irritation 1 H318 Skin sensitizer 1B H317 Acute hazards to the aquatic environment 3 H402
Phenol, 2-nonyl-, branched 91672-41-2	0.1- 1 %	Acute toxicity 4; Oral H302 Skin corrosion/irritation 1 H314 Toxic to reproduction 2 H361 Acute hazards to the aquatic environment 1 H400 Chronic hazards to the aquatic environment 1 H410
2-(2-aminoethylamino)ethanol 111-41-1	0.1- 1 %	Acute toxicity 5; Oral H303 Skin corrosion/irritation 1 H314 Skin sensitizer 1 H317 Toxic to reproduction 1B H360 Acute hazards to the aquatic environment 3 H402
4-Methylimidazole 822-36-6	0.1- 1 %	Acute toxicity 4; Oral H302 Acute toxicity 3; Dermal H311 Skin corrosion/irritation 1 H314 Serious eye damage/eye irritation 1 H318 Carcinogenicity 2 H351 Acute hazards to the aquatic environment 3 H402
2-piperazin-1-ylethylamine 140-31-8	0.1- 1 %	Acute toxicity 4; Oral H302 Acute toxicity 3; Dermal H311 Skin corrosion/irritation 1 H314 Skin sensitizer 1B H317 Toxic to reproduction 2 H361 Acute hazards to the aquatic environment 3 H402 Chronic hazards to the aquatic environment 3 H412
Dinonylphenol 1323-65-5	< 0.1 %	Acute toxicity 4; Oral H302 Skin corrosion/irritation 1

		H314 Serious eye damage/eye irritation 1 H318 Toxic to reproduction 2 H361 Acute hazards to the aquatic environment 1 H400 Chronic hazards to the aquatic environment 1 H410

Section 4. First aid measures

Inhalation:
Move to fresh air. If symptoms persist, seek medical advice.

Skin contact:
Rinse with running water and soap.
Obtain medical attention if irritation persists.

Eye contact:
Rinse immediately with plenty of running water (for 10 minutes). Seek medical attention if necessary.

Ingestion:
Rinse out mouth, drink 1-2 glasses of water, do not induce vomiting.

Section 5. Fire fighting measures

Suitable extinguishing media:
Carbon dioxide, foam, powder

Specific hazards arising from the chemical:
In the event of a fire, carbon monoxide (CO), carbon dioxide (CO2) and nitrogen oxides (NOx) can be released.

Special protection equipment and precautions for firefighters:
Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.

Hazardous combustion products:
Sulphur oxides

Additional fire fighting advice:
In case of fire, keep containers cool with water spray.

Section 6. Accidental release measures

Personal precautions:
Avoid contact with skin and eyes.
Wear protective equipment.
Ensure adequate ventilation.
See advice in section 8

Environmental precautions:
Do not empty into drains / surface water / ground water.

Clean-up methods:
For small spills wipe up with paper towel and place in container for disposal.
For large spills absorb onto inert absorbent material and place in sealed container for disposal.
Dispose of contaminated material as waste according to Section 13.

Section 7. Handling and storage

Handling:
Avoid skin and eye contact.
See advice in section 8

Storage:
Refer to Technical Data Sheet.

Section 8. Exposure controls / personal protection

Components with specific control parameters for workplace:

Calcium carbonate, respirable dust 471-34-1	**Value type**	Time Weighted Average (TWA):
	mg/m³	5
	Remarks	TH OEL
Calcium carbonate 471-34-1	**Value type**	Time Weighted Average (TWA):
	mg/m³	10
Particles (insoluble or poorly soluble) not otherwise specified, respirable particles 471-34-1	**Value type**	Time Weighted Average (TWA):
	mg/m³	3
	Remarks	ACGIH
Particles (insoluble or poorly soluble) not otherwise specified, inhalable particles 471-34-1	**Value type**	Time Weighted Average (TWA):
	mg/m³	10
	Remarks	ACGIH
Calcium carbonate, inhalable dust 471-34-1	**Value type**	Time Weighted Average (TWA):
	mg/m³	15
	Remarks	TH OEL
DIETHYLENE TRIAMINE 111-40-0	**Value type**	Time Weighted Average (TWA):
	ppm	1
	Remarks	ACGIH
DIETHYLENE TRIAMINE 111-40-0	**Value type**	Time Weighted Average (TWA):
	ppm	1
	Remarks	TH OEL
DIETHYLENE TRIAMINE 111-40-0	**Value type**	Skin designation:
	Remarks	ACGIH Danger of cutaneous absorption
Particles (insoluble or poorly soluble) not otherwise specified, inhalable particles 112926-00-8	**Value type**	Time Weighted Average (TWA):
	mg/m³	10
	Remarks	ACGIH
Particles (insoluble or poorly soluble) not otherwise specified, respirable particles 112926-00-8	**Value type**	Time Weighted Average (TWA):
	mg/m³	3
	Remarks	ACGIH
Silica Filler 112926-00-8	**Value type**	Time Weighted Average (TWA):
	mg/m³	6
Titanium dioxide, nanoscale particles, respirable fraction 13463-67-7	**Value type**	Time Weighted Average (TWA):
	mg/m³	0.2
	Remarks	ACGIH
Titanium dioxide, finescale particles, respirable fraction 13463-67-7	**Value type**	Time Weighted Average (TWA):
	mg/m³	2.5
	Remarks	ACGIH

Respiratory protection:
Ensure adequate ventilation.
An approved mask or respirator fitted with an organic vapour cartridge should be worn if the product is used in a poorly ventilated area
Filter type: A (EN 14387)

Hand protection:
Chemical-resistant protective gloves (EN 374).
Suitable materials for short-term contact or splashes (recommended: at least protection index 2, corresponding to > 30 minutes

permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
Suitable materials for longer, direct contact (recommended: protection index 6, corresponding to > 480 minutes permeation time as per EN 374):
nitrile rubber (NBR; >= 0.4 mm thickness)
This information is based on literature references and on information provided by glove manufacturers, or is derived by analogy with similar substances. Please note that in practice the working life of chemical-resistant protective gloves may be considerably shorter than the permeation time determined in accordance with EN 374 as a result of the many influencing factors (e.g. temperature). If signs of wear and tear are noticed then the gloves should be replaced.

Eye protection:
Safety glasses with sideshields or chemical safety goggles should be worn if there is a risk of splashing.
Protective eye equipment should conform to EN166.

Body protection:
Wear suitable protective clothing.
Protective clothing should conform to EN 14605 for liquid splashes or to EN 13982 for dusts.

Engineering controls:
Provide local and general exhaust ventilation to effectively remove and prevent buildup of any vapors or mists generated from the handling of this product.

General protection and hygiene measures:
The workplace should be equipped with an emergency shower and eye-rinsing facility.

Hygienic measures:
Wash hands before work breaks and after finishing work.
Do not eat, drink or smoke while working.
Take off contaminated clothing and wash before reuse.

Section 9. Physical and chemical properties

Appearance:	white paste, solid
Odor:	amine-like
Odor threshold (CA):	No data available.
pH:	Not applicable
Melting point / freezing point:	No data available.
Specific gravity:	1.57
Boiling point:	No data available.
Flash point: (Tagliabue closed cup)	> 93 °C (> 199.4 °F)
Evaporation rate:	No data available.
Flammability (solid, gas):	No data available.
Lower explosive limit:	No data available.
Upper explosive limit:	No data available.
Vapor pressure:	No data available.
Vapor density:	No data available.
Density:	1.57 g/cm3
Solubility:	Slightly soluble
Partition coefficient: n-octanol/water:	No data available.
Auto ignition:	No data available.
Decomposition temperature:	No data available.
Viscosity:	No data available.
VOC content: (2010/75/EC)	< 3 %

Section 10. Stability and reactivity

Reactivity/Incompatible materials:
Reaction with strong acids.
Reacts with strong oxidants.
Chemical stability:
Stable under recommended storage conditions.
Conditions to avoid:
Keep away from heat, ignition sources and incompatible materials.
Hazardous decomposition products:
carbon oxides.

Section 11. Toxicological information

Oral toxicity:	Acute toxicity estimate (ATE) : 1,830 mg/kg Method: Calculation method
Inhalative toxicity:	Acute toxicity estimate (ATE) : 0.87 mg/l Exposure time: 4 h Test atmosphere: dust/mist Method: Calculation method
Dermal toxicity:	Acute toxicity estimate (ATE) : > 2,000 mg/kg Method: Calculation method

Health Effects:

Ingestion:	Harmful if swallowed.
Skin:	Causes skin burns.
	May cause an allergic skin reaction.
Eyes:	Causes serious eye damage.
Inhalation:	Toxic by inhalation.
Symptoms of Overexposure**:**	None known.

Acute oral toxicity:

Calcium carbonate 471-34-1	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rat
	Method	OECD Guideline 420 (Acute Oral Toxicity)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rat
	Method	OECD Guideline 423 (Acute Oral toxicity)
2,2'-iminodiethylamine 111-40-0	Value type	LD50
	Value	1,553 mg/kg
	Species	rat
	Method	OECD Guideline 401 (Acute Oral Toxicity)
3,6-diazaoctanethylenediamine 112-24-3	Value type	LD50
	Value	1,591 mg/kg
	Species	rat
	Method	OECD Guideline 401 (Acute Oral Toxicity)
Silica Filler 112926-00-8	Value type	LD50
	Value	> 5,000 mg/kg
	Species	rat
	Method	OECD Guideline 401 (Acute Oral Toxicity)
4-nonylphenol, branched 84852-15-3	Value type	LD50
	Value	1,412 mg/kg
	Species	rat
	Method	not specified
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Value type	LD50
	Value	> 5,000 mg/kg
	Species	rat
	Method	OECD Guideline 425 (Acute Oral Toxicity: Up-and-Down Procedure)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Value type	LD50
	Value	1,716 mg/kg
	Species	rat
	Method	equivalent or similar to OECD Guideline 401 (Acute Oral Toxicity)
1,2-Ethanediamine, N1,N1-bis(2-aminoethyl)- 4097-89-6	Value type	LD50
	Value	246 mg/kg
	Species	rat
	Method	not specified
2-Ethyl-4-methylimidazole 931-36-2	Value type	LD50
	Value	622 mg/kg
	Species	rat
	Method	not specified
2-(2-aminoethylamino)ethanol 111-41-1	Value type	LD50
	Value	2,150 mg/kg
	Species	rat
	Method	BASF Test
4-Methylimidazole 822-36-6	Value type	LD50
	Value	350 - 751 mg/kg
	Species	rat
	Method	not specified
4-Methylimidazole 822-36-6	Value type	Acute toxicity estimate (ATE)
	Value	350 mg/kg
	Species	
	Method	Expert judgement
Dinonylphenol 1323-65-5	Value type	LD50
	Value	1,412 mg/kg
	Species	rat
	Method	not specified

Acute inhalative toxicity:

Calcium carbonate 471-34-1	Value type	LC50
	Value	> 3 mg/l
	Exposure time	4 h
	Species	rat
	Method	OECD Guideline 403 (Acute Inhalation Toxicity)
2,2'-iminodiethylamine 111-40-0	Value type	LD 50
	Value	> 0.07 - < 0.30 mg/l
	Exposure time	4 h
	Species	rat
	Method	OECD Guideline 403 (Acute Inhalation Toxicity)
2,2'-iminodiethylamine 111-40-0	Value type	Acute toxicity estimate (ATE)
	Value	0.071 mg/l
	Exposure time	
	Species	
	Method	Expert judgement
Silica Filler 112926-00-8	Value type	LC50
	Value	> 58.8 mg/l
	Exposure time	4 h
	Species	rat
	Method	OECD Guideline 403 (Acute Inhalation Toxicity)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Value type	LC50
	Value	> 6.82 mg/l
	Exposure time	4 h
	Species	rat
	Method	not specified
2-piperazin-1-ylethylamine 140-31-8	Value type	Acute toxicity estimate (ATE)
	Value	> 10 mg/l
	Exposure time	4 h
	Species	
	Method	Expert judgement

Acute dermal toxicity:

Calcium carbonate 471-34-1	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rat
	Method	OECD Guideline 402 (Acute Dermal Toxicity)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rat
	Method	OECD Guideline 402 (Acute Dermal Toxicity)
2,2'-iminodiethylamine 111-40-0	Value type	LD50
	Value	1,045 mg/kg
	Species	rabbit
	Method	not specified
3,6-diazaoctanethylenediamine 112-24-3	Value type	LD50
	Value	1,465 mg/kg
	Species	rabbit
	Method	OECD Guideline 402 (Acute Dermal Toxicity)
Silica Filler 112926-00-8	Value type	LD50
	Value	> 5,000 mg/kg
	Species	rabbit
	Method	not specified
4-nonylphenol, branched 84852-15-3	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rabbit
	Method	not specified
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Value type	LD50
	Value	>= 10,000 mg/kg
	Species	hamster
	Method	not specified
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Value type	LD50
	Value	1,465 mg/kg
	Species	rabbit
	Method	OECD Guideline 402 (Acute Dermal Toxicity)

1,2-Ethanediamine, N1,N1-bis(2-aminoethyl)- 4097-89-6	Value type	LD50
	Value	117 mg/kg
	Species	rabbit
	Method	not specified
2-(2-aminoethylamino)ethanol 111-41-1	Value type	LD50
	Value	> 2,000 mg/kg
	Species	rabbit
	Method	BASF Test
4-Methylimidazole 822-36-6	Value type	LD50
	Value	440 mg/kg
	Species	rabbit
	Method	not specified
2-piperazin-1-ylethylamine 140-31-8	Value type	LD50
	Value	866 mg/kg
	Species	rabbit
	Method	Draize Test

Skin corrosion/irritation:

Calcium carbonate 471-34-1	Result	not irritating
	Exposure time	4 h
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Result	irritating or corrosive
	Exposure time	
	Species	Human, EpiDermTM SIT (EPI-200), Reconstructed Human Epidermis (RHE)
	Method	OECD Guideline 439 (In Vitro Skin Irritation: Reconstructed Human Epidermis (RHE) Test Method)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Result	not corrosive
	Exposure time	
	Species	Human, in vitro skin model
	Method	OECD Guideline 431 (In Vitro Skin Corrosion: Reconstructed Human Epidermis (RHE) Test Method)
2,2'-iminodiethylamine 111-40-0	Result	corrosive
	Exposure time	15 min
	Species	rabbit
	Method	BASF Test
3,6-diazaoctanethylenediamine 112-24-3	Result	corrosive
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
Silica Filler 112926-00-8	Result	not irritating
	Exposure time	4 h
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
4-nonylphenol, branched 84852-15-3	Result	Category 1B (corrosive)
	Exposure time	4 h
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Result	not irritating
	Exposure time	4 h
	Species	rabbit
	Method	equivalent or similar to OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Result	corrosive
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
2-Ethyl-4-methylimidazole 931-36-2	Result	not irritating
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
2-(2-aminoethylamino)ethanol 111-41-1	Result	corrosive
	Exposure time	
	Species	rabbit
	Method	BASF Test
2-piperazin-1-ylethylamine 140-31-8	Result	corrosive
	Exposure time	20 min
	Species	rabbit

	Method	not specified

Serious eye damage/irritation:

Calcium carbonate 471-34-1	Result	not irritating
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Result	Category 1 (irreversible effects on the eye)
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
2,2'-iminodiethylamine 111-40-0	Result	corrosive
	Exposure time	30 s
	Species	rabbit
	Method	not specified
Silica Filler 112926-00-8	Result	not irritating
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Result	not irritating
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Result	Category 1 (irreversible effects on the eye)
	Exposure time	
	Species	rabbit
	Method	equivalent or similar to OECD Guideline 405 (Acute Eye Irritation / Corrosion)
2-Ethyl-4-methylimidazole 931-36-2	Result	highly irritating
	Exposure time	
	Species	rabbit
	Method	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
2-(2-aminoethylamino)ethanol 111-41-1	Result	irritating
	Exposure time	
	Species	rabbit
	Method	BASF Test

Respiratory or skin sensitization:

Calcium carbonate 471-34-1	Result	not sensitising
	Test type	Mouse local lymphnode assay (LLNA)
	Species	mouse
	Method	OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Result	sensitising
	Test type	Mouse local lymphnode assay (LLNA)
	Species	mouse
	Method	OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Result	sensitising
	Test type	Guinea pig maximisation test
	Species	guinea pig
	Method	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)
2,2'-iminodiethylamine 111-40-0	Result	sensitising
	Test type	Mouse local lymphnode assay (LLNA)
	Species	mouse
	Method	OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)
3,6-diazaoctanethylenediamine 112-24-3	Result	sensitising
	Test type	Guinea pig maximisation test
	Species	guinea pig
	Method	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)
Silica Filler 112926-00-8	Result	not sensitising
	Test type	
	Species	human
	Method	not specified
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Result	not sensitising
	Test type	Mouse local lymphnode assay (LLNA)
	Species	mouse
	Method	equivalent or similar to OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Result	Sensitizing
	Test type	Buehler test
	Species	guinea pig
	Method	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)
2-(2-aminoethylamino)ethanol 111-41-1	Result	sensitising
	Test type	Patch-Test
	Species	guinea pig
	Method	Patch Test
2-piperazin-1-ylethylamine 140-31-8	Result	sensitising
	Test type	Guinea pig maximisation test
	Species	guinea pig
	Method	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)

Germ cell mutagenicity:

Calcium carbonate 471-34-1	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Calcium carbonate 471-34-1	Result	negative
	Type of study / Route of administration	in vitro mammalian chromosome aberration test
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
Calcium carbonate 471-34-1	Result	negative
	Type of study / Route of administration	mammalian cell gene mutation assay
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Result	negative
	Type of study / Route of administration	mammalian cell gene mutation assay
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
2,2'-iminodiethylamine 111-40-0	Result	positive
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
2,2'-iminodiethylamine 111-40-0	Result	negative
	Type of study / Route of administration	in vitro mammalian chromosome aberration test
	Metabolic activation / Exposure time	with and without
	Method	Chromosome Aberration Test
2,2'-iminodiethylamine 111-40-0	Result	negative
	Type of study / Route of administration	oral: gavage
	Metabolic activation / Exposure time	
	Species	mouse
	Method	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
2,2'-iminodiethylamine 111-40-0	Result	negative
	Type of study / Route of administration	oral: gavage
	Metabolic activation / Exposure time	
	Species	mouse
	Method	not specified
3,6-diazaoctanethylenediamine 112-24-3	Result	positive
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
3,6-diazaoctanethylenediamine 112-24-3	Result	negative
	Type of study / Route of administration	DNA damage and repair assay, unscheduled DNA synthesis in mammalian cells in vitro
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 482 (Genetic Toxicology: DNA Damage and Repair, Unscheduled DNA Synthesis in Mammalian Cells In Vitro)
3,6-diazaoctanethylenediamine 112-24-3	Result	negative
	Type of study / Route of administration	intraperitoneal
	Metabolic activation / Exposure time	
	Species	mouse
	Method	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
Silica Filler 112926-00-8	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Silica Filler 112926-00-8	Result	negative
	Type of study / Route of administration	in vitro mammalian chromosome aberration test
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 473 (In vitro Mammalian Chromosome

		Aberration Test)
Silica Filler 112926-00-8	Result	negative
	Type of study / Route of administration	mammalian cell gene mutation assay
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
Silica Filler 112926-00-8	Result	negative
	Type of study / Route of administration	oral: gavage
	Metabolic activation / Exposure time	
	Species	rat
	Method	OECD Guideline 475 (Mammalian Bone Marrow Chromosome Aberration Test)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Result	negative
	Type of study / Route of administration	in vitro mammalian chromosome aberration test
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 473 (In vitro Mammalian Chromosome Aberration Test)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Result	negative
	Type of study / Route of administration	mammalian cell gene mutation assay
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Result	negative
	Type of study / Route of administration	oral: gavage
	Metabolic activation / Exposure time	
	Species	mouse
	Method	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Result	positive
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Result	negative
	Type of study / Route of administration	in vitro mammalian cell micronucleus test
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 487 (In vitro Mammalian Cell Micronucleus Test)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Result	negative
	Type of study / Route of administration	intraperitoneal
	Metabolic activation / Exposure time	
	Species	mouse
	Method	equivalent or similar to OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
2-(2-aminoethylamino)ethanol 111-41-1	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
2-piperazin-1-ylethylamine 140-31-8	Result	negative
	Type of study / Route of administration	bacterial reverse mutation assay (e.g Ames test)
	Metabolic activation / Exposure time	with and without
	Method	OECD Guideline 471 (Bacterial Reverse Mutation Assay)
2-piperazin-1-ylethylamine 140-31-8	Result	negative
	Type of study / Route of administration	DNA damage and repair assay, unscheduled DNA synthesis in mammalian cells in vitro
	Metabolic activation / Exposure time	with and without
	Method	not specified
2-piperazin-1-ylethylamine 140-31-8	Result	negative
	Type of study / Route of administration	mammalian cell gene mutation assay
	Metabolic activation / Exposure time	with and without
	Method	not specified
2-piperazin-1-ylethylamine 140-31-8	Result	negative
	Type of study / Route of administration	intraperitoneal
	Metabolic activation / Exposure time	
	Species	mouse
	Method	not specified

Repeated dose toxicity:

Calcium carbonate 471-34-1	Result	NOAEL=1,000 mg/kg
	Route of application	oral: gavage
	Exposure time / Frequency of treatment	48 ddaily
	Species	rat
	Method	OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)
2,2'-iminodiethylamine 111-40-0	Result	NOAEL=70 - 80 mg/kg
	Route of application	oral: feed
	Exposure time / Frequency of treatment	90 ddaily
	Species	rat
	Method	not specified
2,2'-iminodiethylamine 111-40-0	Result	NOAEL=0.55 mg/l
	Route of application	inhalation: vapour
	Exposure time / Frequency of treatment	15 d6 h/d
	Species	rat
	Method	not specified
3,6-diazaoctanethylenediamine 112-24-3	Result	LOAEL=50 mg/kg
	Route of application	oral: gavage
	Exposure time / Frequency of treatment	26 wdaily
	Species	rat
	Method	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
3,6-diazaoctanethylenediamine 112-24-3	Result	NOAEL=50 mg/kg
	Route of application	oral: gavage
	Exposure time / Frequency of treatment	26 wdaily
	Species	rat
	Method	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
Silica Filler 112926-00-8	Result	NOAEL=>= 7,950 mg/kg
	Route of application	oral: feed
	Exposure time / Frequency of treatment	6 mdaily
	Species	rat
	Method	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
Silica Filler 112926-00-8	Result	
	Route of application	inhalation
	Exposure time / Frequency of treatment	13 w6 h/d, 5d/w
	Species	rat
	Method	OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Result	NOAEL=1,000 mg/kg
	Route of application	oral: gavage
	Exposure time / Frequency of treatment	90 ddaily
	Species	rat
	Method	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Result	LOAEL=50 mg/kg
	Route of application	oral: gavage
	Exposure time / Frequency of treatment	26 wdaily
	Species	rat
	Method	equivalent or similar to OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
2-(2-aminoethylamino)ethanol 111-41-1	Result	LOAEL=>= 250 mg/kg
	Route of application	oral: gavage
	Exposure time / Frequency of treatment	28 daysdaily
	Species	rat
	Method	Guidelines for 28-Day Repeat Dose Toxicity Test (Japan)
2-(2-aminoethylamino)ethanol 111-41-1	Result	NOAEL=1,000 mg/kg
	Route of application	
	Exposure time / Frequency of treatment	4 weeks6 hours/day, 5 days/week
	Species	rat
	Method	EPA Guideline
2-piperazin-1-ylethylamine 140-31-8	Result	NOAEL=2000 ppm
	Route of application	oral: drinking water
	Exposure time / Frequency of treatment	>= 28 ddaily
	Species	rat
	Method	OECD Guideline 422 (Combined Repeated Dose Toxicity

		Study with the Reproduction / Developmental Toxicity Screening Test)

Section 12. Ecological information

General ecological information: Do not empty into drains / surface water / ground water.

Ecotoxicity: H410 Very toxic to aquatic life with long lasting effects.

Toxicity:

Calcium carbonate 471-34-1	Value type	LC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Oncorhynchus mykiss
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
Calcium carbonate 471-34-1	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Calcium carbonate 471-34-1	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	NOEC
	Value	14 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
Calcium carbonate 471-34-1	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Bacteria
	Exposure time	3 h
	Species	activated sludge of a predominantly domestic sewage
	Method	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Value type	LC50
	Value	7.07 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Danio rerio
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Value type	EC50
	Value	7.07 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Value type	EC50
	Value	4.34 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	NOEC
	Value	0.5 mg/l
	Acute Toxicity Study	Algae

	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Value type	EC10
	Value	130 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	3 h
	Species	activated sludge of a predominantly domestic sewage
	Method	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
2,2'-iminodiethylamine 111-40-0	Value type	LC50
	Value	430 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Poecilia reticulata
	Method	EU Method C.1 (Acute Toxicity for Fish)
	Value type	NOEC
	Value	> 10 mg/l
	Acute Toxicity Study	Fish
	Exposure time	28 d
	Species	Gasterosteus aculeatus
	Method	OECD Guideline 210 (fish early lite stage toxicity test)
2,2'-iminodiethylamine 111-40-0	Value type	EC50
	Value	64.6 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	EU Method C.2 (Acute Toxicity for Daphnia)
2,2'-iminodiethylamine 111-40-0	Value type	EC50
	Value	1,164 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	NOEC
	Value	10 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
2,2'-iminodiethylamine 111-40-0	Value type	NOEC
	Value	6 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	3 h
	Species	anaerobic bacteria
	Method	not specified
3,6-diazaoctanethylenediamine 112-24-3	Value type	LC50
	Value	570 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Poecilia reticulata
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
3,6-diazaoctanethylenediamine 112-24-3	Value type	EC50
	Value	31 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
3,6-diazaoctanethylenediamine 112-24-3	Value type	EC50
	Value	20 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
3,6-diazaoctanethylenediamine 112-24-3	Value type	EC0
	Value	137 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	30 min
	Species	Pseudomonas putida
	Method	DIN 38412, part 27 (Bacterial oxygen consumption test)
Silica Filler 112926-00-8	Value type	LC50
	Value	> 10,000 mg/l

	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Brachydanio rerio (new name: Danio rerio)
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
Silica Filler 112926-00-8	Value type	EL50
	Value	> 1,000 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	24 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Silica Filler 112926-00-8	Value type	NOELR
	Value	10,000 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	EL50
	Value	> 10,000 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
Silica Filler 112926-00-8	Value type	EC0
	Value	10,000 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	30 min
	Species	Pseudomonas putida
	Method	DIN 38412, part 27 (Bacterial oxygen consumption test)
4-nonylphenol, branched 84852-15-3	Value type	LC50
	Value	0.135 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Pimephales promelas
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
	Value type	NOEC
	Value	0.25 mg/l
	Acute Toxicity Study	Fish
	Exposure time	14 d
	Species	Leuciscus idus
	Method	OECD Guideline 204 (Fish, Prolonged Toxicity Test: 14-day Study)
	Value type	NOEC
	Value	0.006 mg/l
	Acute Toxicity Study	Fish
	Exposure time	91 d
	Species	Oncorhynchus mykiss
	Method	OECD Guideline 210 (fish early lite stage toxicity test)
4-nonylphenol, branched 84852-15-3	Value type	EC50
	Value	0.035 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
4-nonylphenol, branched 84852-15-3	Value type	EC50
	Value	0.0563 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	not specified
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
4-nonylphenol, branched 84852-15-3	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Bacteria
	Exposure time	3 h
	Species	activated sludge of a predominantly domestic sewage
	Method	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Value type	LC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Fish
	Exposure time	48 h
	Species	Danio rerio
	Method	other guideline:

	Value type	NOEC
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Fish
	Exposure time	8 d
	Species	Danio rerio
	Method	OECD Guideline 212 (Fish, Short-term Toxicity Test on Embryo and Sac-Fry Stages)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	NOEC
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
Titanium dioxide < 1% particles with diameter ≤ 10 µm 13463-67-7	Value type	EC50
	Value	Toxicity > Water solubility
	Acute Toxicity Study	Bacteria
	Exposure time	3 h
	Species	activated sludge
	Method	ISO 8192 (Test for Inhibition of Oxygen Consumption by Activated Sludge)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Value type	LC50
	Value	330 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Pimephales promelas
	Method	other guideline:
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Value type	EC50
	Value	31 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Value type	EC50
	Value	20 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	EC10
	Value	1.34 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata (reported as Raphidocelis subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
1,2-Ethanediamine, N1,N1-bis(2-aminoethyl)- 4097-89-6	Value type	LC50
	Value	330 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Pimephales promelas
	Method	EPA OTS 797.1400 (Fish Acute Toxicity Test)
1,2-Ethanediamine, N1,N1-bis(2-aminoethyl)- 4097-89-6	Value type	EC50
	Value	31.1 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	EU Method C.2 (Acute Toxicity for Daphnia)
1,2-Ethanediamine, N1,N1-bis(2-aminoethyl)- 4097-89-6	Value type	EC50
	Value	20 mg/l
	Acute Toxicity Study	Algae

	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	EC10
	Value	1.34 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-Ethyl-4-methylimidazole 931-36-2	Value type	LC50
	Value	68.1 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Leuciscus idus
	Method	DIN 38412-15
Phenol, 2-nonyl-, branched 91672-41-2	Value type	LC50
	Value	0.128 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Pimephales promelas
	Method	other guideline:
	Value type	NOEC
	Value	0.006 mg/l
	Acute Toxicity Study	Fish
	Exposure time	91 d
	Species	Oncorhynchus mykiss
	Method	other guideline:
Phenol, 2-nonyl-, branched 91672-41-2	Value type	EC50
	Value	0.14 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	EU Method C.2 (Acute Toxicity for Daphnia)
Phenol, 2-nonyl-, branched 91672-41-2	Value type	EC50
	Value	0.53 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Pseudokirchneriella subcapitata
	Method	ISO 8692 (Water Quality)
Phenol, 2-nonyl-, branched 91672-41-2	Value type	EC50
	Value	950 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	3 h
	Species	activated sludge of a predominantly domestic sewage
	Method	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
2-(2-aminoethylamino)ethanol 111-41-1	Value type	LC50
	Value	> 243 mg/l
	Acute Toxicity Study	Fish
	Exposure time	48 h
	Species	Leuciscus idus
	Method	DIN 38412-15
2-(2-aminoethylamino)ethanol 111-41-1	Value type	EC50
	Value	22 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
2-(2-aminoethylamino)ethanol 111-41-1	Value type	EC50
	Value	358 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus
	Method	DIN 38412-09
	Value type	EC10
	Value	156 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Desmodesmus subspicatus
	Method	DIN 38412-09
2-(2-aminoethylamino)ethanol 111-41-1	Value type	EC10
	Value	82.2 mg/l

	Acute Toxicity Study	Bacteria
	Exposure time	17 h
	Species	Pseudomonas putida
	Method	DIN 38412, part 8 (Pseudomonas Zellvermehrungshemm-Test)
4-Methylimidazole 822-36-6	Value type	LC50
	Value	34 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	not specified
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
4-Methylimidazole 822-36-6	Value type	EC50
	Value	180 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
2-piperazin-1-ylethylamine 140-31-8	Value type	LC50
	Value	> 100 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	Salmo gairdneri (new name: Oncorhynchus mykiss)
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
2-piperazin-1-ylethylamine 140-31-8	Value type	EC50
	Value	32 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
2-piperazin-1-ylethylamine 140-31-8	Value type	NOEC
	Value	31 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
	Value type	EC50
	Value	495 mg/l
	Acute Toxicity Study	Algae
	Exposure time	72 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-piperazin-1-ylethylamine 140-31-8	Value type	EC10
	Value	100 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	17 h
	Species	
	Method	not specified
Dinonylphenol 1323-65-5	Value type	LC50
	Value	0.23 mg/l
	Acute Toxicity Study	Fish
	Exposure time	96 h
	Species	not specified
	Method	OECD Guideline 203 (Fish, Acute Toxicity Test)
	Value type	NOEC
	Value	0.006 mg/l
	Acute Toxicity Study	Fish
	Exposure time	91 d
	Species	not specified
	Method	OECD Guideline 210 (fish early lite stage toxicity test)
Dinonylphenol 1323-65-5	Value type	EC50
	Value	0.085 mg/l
	Acute Toxicity Study	Daphnia
	Exposure time	48 h
	Species	Daphnia magna
	Method	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
Dinonylphenol 1323-65-5	Value type	EC50
	Value	0.41 mg/l
	Acute Toxicity Study	Algae
	Exposure time	96 h
	Species	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)
	Method	EPA OTS 797.1050 (Algal Toxicity, Tiers I and II)

	Value type	EC10
	Value	0.12 mg/l
	Acute Toxicity Study	Algae
	Exposure time	96 h
	Species	not specified
	Method	OECD Guideline 201 (Alga, Growth Inhibition Test)
Dinonylphenol 1323-65-5	Value type	EC10
	Value	950 mg/l
	Acute Toxicity Study	Bacteria
	Exposure time	3 h
	Species	activated sludge
	Method	OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)

Persistence and degradability:

Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	Result	not readily biodegradable.
	Route of application	no data
	Degradability	0 - 60 %
	Method	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
2,2'-iminodiethylamine 111-40-0	Result	inherently biodegradable
	Route of application	aerobic
	Degradability	83 %
	Method	EU Method C.9 (Biodegradation: Zahn-Wellens Test)
	Result	readily biodegradable
	Route of application	aerobic
	Degradability	87 %
	Method	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
3,6-diazaoctanethylenediamine 112-24-3	Result	not inherently biodegradable
	Route of application	aerobic
	Degradability	0 %
	Method	OECD Guideline 302 B (Inherent biodegradability: Zahn-Wellens/EMPA Test)
	Result	not readily biodegradable.
	Route of application	aerobic
	Degradability	0 %
	Method	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
4-nonylphenol, branched 84852-15-3	Result	not readily biodegradable.
	Route of application	aerobic
	Degradability	48.2 %
	Method	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Result	not readily biodegradable.
	Route of application	aerobic
	Degradability	0 %
	Method	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
	Result	not inherently biodegradable
	Route of application	aerobic
	Degradability	20 %
	Method	OECD Guideline 302 A (Inherent Biodegradability: Modified SCAS Test)
1,2-Ethanediamine, N1,N1-bis(2-aminoethyl)- 4097-89-6	Result	not readily biodegradable.
	Route of application	aerobic
	Degradability	0 %
	Method	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
2-Ethyl-4-methylimidazole 931-36-2	Result	readily biodegradable
	Route of application	aerobic
	Degradability	86 %
	Method	OECD Guideline 301 A (new version) (Ready Biodegradability: DOC Die Away Test)
Phenol, 2-nonyl-, branched 91672-41-2	Result	not readily biodegradable.
	Route of application	aerobic
	Degradability	48.2 %
	Method	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)
2-(2-aminoethylamino)ethanol 111-41-1	Result	readily biodegradable
	Route of application	aerobic
	Degradability	> 60 %
	Method	OECD Guideline 301 F (Ready Biodegradability: Manometric Respirometry Test)
4-Methylimidazole 822-36-6	Result	readily biodegradable
	Route of application	aerobic
	Degradability	> 60 %

	Method	OECD Guideline 301 A (new version) (Ready Biodegradability: DOC Die Away Test)
2-piperazin-1-ylethylamine 140-31-8	Result	under test conditions no biodegradation observed
	Route of application	aerobic
	Degradability	0 %
	Method	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Dinonylphenol 1323-65-5	Result	not readily biodegradable.
	Route of application	aerobic
	Degradability	48.2 %
	Method	OECD Guideline 301 B (Ready Biodegradability: CO2 Evolution Test)

Bioaccumulative potential / Mobility in soil:

Calcium carbonate 471-34-1	LogPow	-2.12
	Temperature	
	Method	QSAR (Quantitative Structure Activity Relationship)
Fatty acids, C18 unsaturated, dimers, polymers with tall oil fatty acids and triethylenetetramine 68082-29-1	LogPow	10.34
	Temperature	
	Method	QSAR (Quantitative Structure Activity Relationship)
2,2'-iminodiethylamine 111-40-0	Bioconcentration factor (BCF)	> 0.3 - < 6.3
	Exposure time	42 d
	Species	Cyprinus carpio
	Temperature	
	Method	OECD Guideline 305 C (Bioaccumulation: Test for the Degree of Bioconcentration in Fish)
2,2'-iminodiethylamine 111-40-0	LogPow	-1.58
	Temperature	20 °C
	Method	QSAR (Quantitative Structure Activity Relationship)
3,6-diazaoctanethylenediamine 112-24-3	LogPow	-2.65
	Temperature	
	Method	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
Silica Filler 112926-00-8	LogPow	0.53
	Temperature	
	Method	QSAR (Quantitative Structure Activity Relationship)
4-nonylphenol, branched 84852-15-3	Bioconcentration factor (BCF)	231
	Exposure time	14 d
	Species	Lepomis macrochirus
	Temperature	
	Method	other guideline:
4-nonylphenol, branched 84852-15-3	LogPow	5.4
	Temperature	23 °C
	Method	OECD Guideline 117 (Partition Coefficient (n-octanol / water), HPLC Method)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	LogPow	-2.65
	Temperature	
	Method	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
1,2-Ethanediamine, N1,N1-bis(2-aminoethyl)- 4097-89-6	LogPow	-2.9
	Temperature	
	Method	QSAR (Quantitative Structure Activity Relationship)
Phenol, 2-nonyl-, branched 91672-41-2	Bioconcentration factor (BCF)	576
	Exposure time	7 day
	Species	Cyprinus carpio
	Temperature	
	Method	OECD Guideline 305 (Bioconcentration: Flow-through Fish Test)
Phenol, 2-nonyl-, branched 91672-41-2	LogPow	5.4
	Temperature	23 °C
	Method	OECD Guideline 117 (Partition Coefficient (n-octanol / water), HPLC Method)
2-(2-aminoethylamino)ethanol 111-41-1	Bioconcentration factor (BCF)	2.1 - 3.7
	Exposure time	42 d
	Species	Cyprinus carpio
	Temperature	25 °C
	Method	OECD Guideline 305 C (Bioaccumulation: Test for the Degree of Bioconcentration in Fish)
2-(2-aminoethylamino)ethanol 111-41-1	LogPow	-1.46
	Temperature	25 °C

	Method	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
4-Methylimidazole 822-36-6	LogPow	0.23 - 0.35
	Temperature	
	Method	EU Method A.8 (Partition Coefficient)
2-piperazin-1-ylethylamine 140-31-8	LogPow	-1.48
	Temperature	
	Method	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
Dinonylphenol 1323-65-5	Bioconcentration factor (BCF)	740
	Exposure time	
	Species	Pimephales promelas
	Temperature	
	Method	OECD Guideline 305 (Bioconcentration: Flow-through Fish Test)
Dinonylphenol 1323-65-5	LogPow	5.4
	Temperature	23 °C
	Method	OECD Guideline 117 (Partition Coefficient (n-octanol / water), HPLC Method)

Section 13. Disposal considerations

Product

Method of disposal:
Dispose of in accordance with local and national regulations.

Packaging

Disposal of uncleaned packages:
Packaging that cannot be cleaned are to be disposed of in the same manner as the product.

Section 14. Transport information

Road transport ADR:

Class:	8
Packing group:	II
Classification code:	C8
Hazard ident. number:	80
UN no.:	3259
Label:	8
Technical name:	AMINES, SOLID, CORROSIVE, N.O.S. (Triethylenetetramine,Diethylenetriamine,Nonylphenol)

Railroad transport RID:

Class:	8
Packing group:	II
Classification code:	C8
Hazard ident. number:	80
UN no.:	3259
Label:	8
Technical name:	AMINES, SOLID, CORROSIVE, N.O.S. (Triethylenetetramine,Diethylenetriamine,Nonylphenol)

Inland water transport ADN:

Class:	8
Packing group:	II
Classification code:	C8
Hazard ident. number:	80
UN no.:	3259
Label:	8
Technical name:	AMINES, SOLID, CORROSIVE, N.O.S. (Triethylenetetramine,Diethylenetriamine,Nonylphenol)

Marine transport IMDG:

Class:	8
Packing group:	II
UN no.:	3259
Label:	8
EmS:	F-A ,S-B
Seawater pollutant:	Marine pollutant
Proper shipping name:	AMINES, SOLID, CORROSIVE, N.O.S. (Triethylenetetramine,Diethylenetriamine,Nonylphenol)

Air transport IATA:

Class:	8
Packing group:	II
Packaging instructions (passenger):	859
Packaging instructions (cargo):	863
UN no.:	3259
Label:	8
Proper shipping name:	Amines, solid, corrosive, n.o.s. (Triethylenetetramine,Diethylenetriamine,Nonylphenol)

Section 15. Regulatory information

Regulatory Information:
Ministry of Industry Notice. The system to classify and communicate the hazard of hazardous material, BE. 2555

Global inventory status:

Regulatory list	Notification
TSCA	yes
DSL	yes
KECI (KR)	yes
ENCS (JP)	yes
ISHL (JP)	yes
IECSC	yes
NZIOC	yes
TCSI	yes
EINECS	yes

Section 16. Other information

Disclaimer:
This Safety Data Sheet has been generated based on Ministry of Industry Notice. The system to classify and communicate the hazard of hazardous material, BE. 2555 only. No warranty or representation of any kind is given with respect to the substantive or export laws of any other jurisdiction or country. Please confirm that the information provided herein conforms to the substantive export or other law of any other jurisdiction prior to export. Please contact Henkel Product Safety and Regulatory Affairs for additional assistance.
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