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Safety Data Sheet according to (EC) No 1907/2006 as amended

SDS No. : 403541
V002.0

LOCTITE CAT 43

Revision: 16.09.2025
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Replaces version from: 24.07.2024

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

1.1. Product identifier

LOCTITE CAT 43
UFI: U0T1-6X3Q-2207-9GN1

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

Intended use:
Catalyst

1.3. Details of the supplier of the safety data sheet

Henkel Ireland
Operations and Research Limited
Tallaght Business Park, Whitestown
24 Dublin

Ireland

Phone: +353 (0353) 1 404 6444

SDSinfo.Adhesive@henkel.com
For Safety Data Sheet updates please visit our website www.mysds.henkel.com or www.henkel-adhesives.com.

1.4. Emergency telephone number

00353 14046280

National Poisons Information Centre: Members of Public: +353 (1) 809 2166. (8.00 a.m. to 10.00 p.m. 7 days a week)
Healthcare Professionals: +353 (1) 809 2566 (24-hour service)

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SECTION 2: Hazards identification

2.1. Classification of the substance or mixture

Classification (CLP):

Acute toxicity	Category 4
H302 Harmful if swallowed.	
Route of Exposure: Oral	
Acute toxicity	Category 4
H312 Harmful in contact with skin.	
Route of Exposure: Dermal	
Skin corrosion	Sub-category 1B
H314 Causes severe skin burns and eye damage.	
Serious eye damage	Category 1
H318 Causes serious eye damage.	
Skin sensitizer	Category 1
H317 May cause an allergic skin reaction.	
Chronic hazards to the aquatic environment	Category 2
H411 Toxic to aquatic life with long lasting effects.	
Toxic to reproduction	Category 1B
H360D May damage the unborn child.	
Specific target organ toxicity - repeated exposure	Category 1
H372 Causes damage to organs through prolonged or repeated exposure.	

2.2. Label elements

Label elements (CLP):

Hazard pictogram:



Contains Amines, polyethylenepoly-, tetraethylenepentamine fraction

2-piperazin-1-ylethylamine

imidazole

Amines, polyethylenepoly-, triethylenetetramine fraction

3,6,9,12-tetraazatetradecamethylenediamine

amines, polyethylenepoly-

Diethylenetriamine
2-(2-aminoethylamino)ethanol

3,6-diazaoctanethylenediamine

Signal word: Danger

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Hazard statement:	H302+H312 Harmful if swallowed or in contact with skin. H314 Causes severe skin burns and eye damage. H317 May cause an allergic skin reaction. H360D May damage the unborn child. H372 Causes damage to organs through prolonged or repeated exposure. H411 Toxic to aquatic life with long lasting effects.
Supplemental information	Restricted to professional users.
Precautionary statement: Prevention	P201 Obtain special instructions before use. P273 Avoid release to the environment. P280 Wear protective gloves/protective clothing/eye protection/face protection.
Precautionary statement: Response	P302+P352 IF ON SKIN: Wash with plenty of soap and water. P303+P361+P353 IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water [or shower]. P305+P351+P338 IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P308+P313 IF exposed or concerned: Get medical advice/attention. P310 Immediately call a POISON CENTER or doctor.

2.3. Other hazards

None if used properly.

Following substances are present in a concentration ≥ the concentration limit for depiction in Section 3 and fulfill the criteria for PBT/vPvB, or were identified as endocrine disruptor (ED):

This mixture does not contain any substances in a concentration ≥ the concentration limit for depiction in Section 3 that are assessed to be a PBT, vPvB or ED.

SECTION 3: Composition/information on ingredients

3.2. Mixtures

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Declaration of the ingredients according to CLP (EC) No 1272/2008:

Hazardous components CAS No. EC No. REACH-Reg. No.	Concentration	Classification	Specific Conc. Limits, M-factors and ATEs	Add. Information
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7 292-587-7 01-2119487290-37	50- < 100 %	Acute Tox. 4, Dermal, H312 Skin Corr. 1B, H314 Skin Sens. 1, H317 Aquatic Chronic 2, H411 Eye Dam. 1, H318		
2-piperazin-1-ylethylamine 140-31-8 205-411-0 01-2119471486-30	10- < 20 %	Acute Tox. 4, Oral, H302 Acute Tox. 3, Dermal, H311 Skin Corr. 1B, H314 Skin Sens. 1, H317 Eye Dam. 1, H318 STOT RE 1, Inhalation, H372 Aquatic Chronic 3, H412	inhalation:ATE = > 10 mg/l;dust/mist	
imidazole 288-32-4 206-019-2 01-2119485825-24	10- < 20 %	Repr. 1B, H360D Acute Tox. 4, Oral, H302 Skin Corr. 1C, H314		
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8 292-588-2 01-2119487919-13	5- < 10 %	Acute Tox. 4, Oral, H302 Acute Tox. 4, Dermal, H312 Skin Corr. 1B, H314 Skin Sens. 1, H317 Eye Dam. 1, H318 Aquatic Chronic 3, H412		
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7 223-775-9 01-2119485826-22	1- < 5 %	Skin Corr. 1B, H314 Skin Sens. 1, H317 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 Acute Tox. 4, Oral, H302 Acute Tox. 4, Dermal, H312	M acute = 1 M chronic = 1	
amines, polyethylenepoly- 68131-73-7 268-626-9 01-2119485823-28	1- < 3 %	Acute Tox. 4, Dermal, H312 Skin Corr. 1B, H314 Skin Sens. 1, H317 Aquatic Acute 1, H400 Aquatic Chronic 1, H410 Acute Tox. 4, Oral, H302	M acute = 1 M chronic = 1	
Diethylenetriamine 111-40-0 203-865-4 01-2119473793-27	0,1- < 1 %	Acute Tox. 4, Oral, H302 Acute Tox. 4, Dermal, H312 Skin Corr. 1B, H314 Skin Sens. 1, H317 Acute Tox. 2, Inhalation, H330 STOT SE 3, H335 Eye Dam. 1, H318	inhalation:ATE = 0,071 mg/l;dust/mist	
2-(2-aminoethylamino)ethanol 111-41-1 203-867-5 01-2119456894-24	0,1- < 0,3 %	Repr. 1B, H360Df Skin Sens. 1, H317 Skin Corr. 1B, H314	STOT SE 3; H335; C >= 5 %	
3,6-diazaoctanethylenediamine 112-24-3 203-950-6 01-2119487919-13	0,1- < 1 %	Acute Tox. 4, Oral, H302 Acute Tox. 4, Dermal, H312 Skin Sens. 1, H317 Skin Corr. 1B, H314 Aquatic Chronic 3, H412		

If no ATE values are displayed, please refer to LD/LC50 values in Section 11.
For full text of the H - statements and other abbreviations see section 16 "Other information".

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SECTION 4: First aid measures

4.1. Description of 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 from a specialist.

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

4.2. Most important symptoms and effects, both acute and delayed
SKIN: Rash, Urticaria.

INGESTION: Nausea, vomiting, diarrhea, abdominal pain.

Causes burns.

4.3. Indication of any immediate medical attention and special treatment needed
See section: Description of first aid measures

SECTION 5: Firefighting measures

5.1. Extinguishing media
Suitable extinguishing media:
water, carbon dioxide, foam, powder

Extinguishing media which must not be used for safety reasons:
High pressure waterjet

5.2. Special hazards arising from the substance or mixture
In the event of a fire, carbon monoxide (CO), carbon dioxide (CO2) and nitrogen oxides (NOx) can be released.

5.3. Advice for firefighters
Wear self-contained breathing apparatus and full protective clothing, such as turn-out gear.

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

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures
Avoid contact with skin and eyes.
Wear protective equipment.
Ensure adequate ventilation.
Keep away from sources of ignition.

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

6.3. Methods and material for containment and cleaning up
Dispose of contaminated material as waste according to Section 13.
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.

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6.4. Reference to other sections
See advice in section 8

SECTION 7: Handling and storage

7.1. Precautions for safe handling
Avoid skin and eye contact.
See advice in section 8

Hygiene measures:
Wash hands before work breaks and after finishing work.
Do not eat, drink or smoke while working.
Good industrial hygiene practices should be observed.

7.2. Conditions for safe storage, including any incompatibilities
Ensure good ventilation/extraction.
Keep container tightly sealed.
Refer to Technical Data Sheet.

7.3. Specific end use(s)
Catalyst

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

Occupational Exposure Limits

Valid for
Ireland

Ingredient [Regulated substance]	ppm	mg/m³	Value type	Short term exposure limit category / Remarks	Regulatory list
2,2'-Iminodi(ethylamine) 111-40-0 [DIETHYLENE TRIAMINE]	1	4	Time Weighted Average (TWA):		IR_OEL
2,2'-Iminodi(ethylamine) 111-40-0 [DIETHYLENE TRIAMINE]			Skin designation:	Can be absorbed through the skin.	IR_OEL

Occupational Exposure Limits

Valid for
Great Britain

Ingredient [Regulated substance]	ppm	mg/m³	Value type	Short term exposure limit category / Remarks	Regulatory list
2,2'-iminodiethylamine 111-40-0 [2,2'-IMINODI(ETHYLAMINE)]			Skin designation:	Can be absorbed through the skin.	EH40 WEL
2,2'-iminodiethylamine 111-40-0 [2,2'-IMINODI(ETHYLAMINE)]	1	4,3	Time Weighted Average (TWA):		EH40 WEL

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Predicted No-Effect Concentration (PNEC):

Name on list	Environmental Compartment	Exposure period	Value				Remarks
			mg/l	ppm	mg/kg	others	
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	aqua (freshwater)		0,01 mg/l				
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	aqua (marine water)		0,001 mg/l				
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	aqua (intermittent releases)		0,068 mg/l				
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	sediment (freshwater)				3,198 mg/kg		
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	sediment (marine water)				0,32 mg/kg		
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	Soil				2,5 mg/kg		
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	sewage treatment plant (STP)		4,6 mg/l				
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	Air						no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	Predator						no potential for bioaccumulation
2-piperazin-1-ylethylamine 140-31-8	aqua (freshwater)		0,058 mg/l				
2-piperazin-1-ylethylamine 140-31-8	aqua (marine water)		0,006 mg/l				
2-piperazin-1-ylethylamine 140-31-8	sediment (freshwater)				215 mg/kg		
2-piperazin-1-ylethylamine 140-31-8	sediment (marine water)				21,5 mg/kg		
2-piperazin-1-ylethylamine 140-31-8	sewage treatment plant (STP)		250 mg/l				
2-piperazin-1-ylethylamine 140-31-8	Freshwater - intermittent		0,58 mg/l				
2-piperazin-1-ylethylamine 140-31-8	Soil				1 mg/kg		
imidazole 288-32-4	aqua (freshwater)		0,13 mg/l				
imidazole 288-32-4	aqua (marine water)		0,013 mg/l				
imidazole 288-32-4	aqua (intermittent releases)		1,3 mg/l				
imidazole 288-32-4	sediment (freshwater)				0,336 mg/kg		
imidazole 288-32-4	sediment (marine water)				0,0336 mg/kg		
imidazole 288-32-4	Soil				0,0425 mg/kg		
imidazole 288-32-4	sewage treatment plant (STP)		10 mg/l				
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	aqua (intermittent releases)		0,2 mg/l				
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	aqua (freshwater)		0,027 mg/l				
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	aqua (marine water)		0,003 mg/l				

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Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	sediment (freshwater)				8,572 mg/kg		
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	sediment (marine water)				0,857 mg/kg		
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Soil				1,25 mg/kg		
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	sewage treatment plant (STP)		0,13 mg/l				
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	oral						no potential for bioaccumulation
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	aqua (freshwater)		0,005 mg/l				
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	aqua (marine water)		0,001 mg/l				
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	sewage treatment plant (STP)		4,2 mg/l				
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	sediment (freshwater)				1,59 mg/kg		
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	sediment (marine water)				0,159 mg/kg		
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	Soil				3,4 mg/kg		
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	Freshwater - intermittent		0,017 mg/l				
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	Marine water - intermittent		0,002 mg/l				
amines, polyethylenepoly- 68131-73-7	aqua (freshwater)		0,0016 mg/l				
amines, polyethylenepoly- 68131-73-7	aqua (marine water)		0,0016 mg/l				
amines, polyethylenepoly- 68131-73-7	aqua (intermittent releases)		0,016 mg/l				
amines, polyethylenepoly- 68131-73-7	sewage treatment plant (STP)		3,19 mg/l				
amines, polyethylenepoly- 68131-73-7	sediment (freshwater)				0,14 mg/kg		
amines, polyethylenepoly- 68131-73-7	sediment (marine water)				0,14 mg/kg		
amines, polyethylenepoly- 68131-73-7	Air						no hazard identified
amines, polyethylenepoly- 68131-73-7	Soil				10 mg/kg		
amines, polyethylenepoly- 68131-73-7	oral				0,29 mg/kg		
2,2'-iminodiethylamine 111-40-0	aqua (freshwater)		0,56 mg/l				
2,2'-iminodiethylamine 111-40-0	aqua (marine water)		0,056 mg/l				
2,2'-iminodiethylamine 111-40-0	aqua (intermittent releases)		0,32 mg/l				
2,2'-iminodiethylamine 111-40-0	sediment (freshwater)				1072 mg/kg		
2,2'-iminodiethylamine 111-40-0	sediment (marine water)				107,2 mg/kg		
2,2'-iminodiethylamine 111-40-0	sewage treatment plant (STP)		6 mg/l				
2,2'-iminodiethylamine 111-40-0	Soil				7,97 mg/kg		
2,2'-iminodiethylamine 111-40-0	Air						no hazard identified
2-(2-Aminoethylamino)ethanol 111-41-1	aqua (freshwater)		0,022 mg/l				
2-(2-Aminoethylamino)ethanol	aqua		0,22 mg/l				

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111-41-1	(intermittent releases)						
2-(2-Aminoethylamino)ethanol 111-41-1	sewage treatment plant (STP)		82,2 mg/l				
2-(2-Aminoethylamino)ethanol 111-41-1	sediment (freshwater)				0,172 mg/kg		
2-(2-Aminoethylamino)ethanol 111-41-1	sediment (marine water)				0,0172 mg/kg		
2-(2-Aminoethylamino)ethanol 111-41-1	Soil				0,0189 mg/kg		
3,6-diazaoctanethylenediamine 112-24-3	aqua (freshwater)		0,027 mg/l				
3,6-diazaoctanethylenediamine 112-24-3	aqua (marine water)		0,003 mg/l				
3,6-diazaoctanethylenediamine 112-24-3	Sewage treatment plant		0,13 mg/l				
3,6-diazaoctanethylenediamine 112-24-3	sediment (freshwater)				8,572 mg/kg		
3,6-diazaoctanethylenediamine 112-24-3	sediment (marine water)				0,857 mg/kg		
3,6-diazaoctanethylenediamine 112-24-3	Soil				1,25 mg/kg		
3,6-diazaoctanethylenediamine 112-24-3	Freshwater - intermittent		0,2 mg/l				
3,6-diazaoctanethylenediamine 112-24-3	Marine water - intermittent		0,02 mg/l				

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Derived No-Effect Level (DNEL):

Name on list	Application Area	Route of Exposure	Health Effect	Exposure Time	Value	Remarks
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	Workers	inhalation	Long term exposure - systemic effects		1,29 mg/m3	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	Workers	inhalation	Acute/short term exposure - systemic effects		6940 mg/m3	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	Workers	dermal	Long term exposure - systemic effects		0,74 mg/kg	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	Workers	dermal	Long term exposure - local effects		0,036 mg/cm2	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	General population	inhalation	Long term exposure - systemic effects		0,38 mg/m3	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	General population	inhalation	Acute/short term exposure - systemic effects		2071 mg/m3	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	General population	dermal	Long term exposure - systemic effects		0,32 mg/kg	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	General population	dermal	Acute/short term exposure - systemic effects		10 mg/kg	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	General population	dermal	Long term exposure - local effects		0,56 mg/cm2	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	General population	dermal	Acute/short term exposure - local effects		1,29 mg/cm2	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	General population	oral	Long term exposure - systemic effects		0,53 mg/kg	no hazard identified
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	General population	oral	Acute/short term exposure - systemic effects		26 mg/kg	no hazard identified
2-piperazin-1-ylethylamine 140-31-8	Workers	inhalation	Acute/short term exposure - local effects			
2-piperazin-1-ylethylamine 140-31-8	Workers	inhalation	Long term exposure - local effects		0,14 mg/m3	
2-piperazin-1-ylethylamine 140-31-8	Workers	dermal	Acute/short term exposure - systemic effects			
2-piperazin-1-ylethylamine 140-31-8	Workers	dermal	Long term exposure - local effects			
2-piperazin-1-ylethylamine 140-31-8	Workers	dermal	Long term exposure - systemic effects			
2-piperazin-1-ylethylamine 140-31-8	General population	inhalation	Acute/short term exposure - local effects			
2-piperazin-1-ylethylamine 140-31-8	General population	inhalation	Long term exposure - local effects		0,068 mg/m3	
2-piperazin-1-ylethylamine 140-31-8	General population	oral	Long term exposure - systemic effects		0,208 mg/kg	
2-piperazin-1-ylethylamine 140-31-8	General population	dermal	Acute/short term exposure - systemic effects			
2-piperazin-1-ylethylamine 140-31-8	General population	dermal	Long term exposure - local effects			
2-piperazin-1-ylethylamine 140-31-8	General population	dermal	Long term exposure -			

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			systemic effects			
imidazole 288-32-4	Workers	Inhalation	Long term exposure - systemic effects		10,6 mg/m3	
imidazole 288-32-4	Workers	dermal	Long term exposure - systemic effects		1,5 mg/kg	
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Workers	Inhalation	Long term exposure - systemic effects		0,54 mg/m3	no potential for bioaccumulation
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	General population	Inhalation	Long term exposure - systemic effects		0,096 mg/m3	no potential for bioaccumulation
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	General population	oral	Long term exposure - systemic effects		0,14 mg/kg	no potential for bioaccumulation
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	General population	oral	Long term exposure - systemic effects		0,21 mg/kg	
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	General population	inhalation	Long term exposure - systemic effects		0,14 mg/m3	
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	Workers	inhalation	Long term exposure - systemic effects		0,82 mg/m3	
amines, polyethylenepoly- 68131-73-7	Workers	inhalation	Long term exposure - systemic effects		1,59 mg/m3	no hazard identified
amines, polyethylenepoly- 68131-73-7	Workers	inhalation	Acute/short term exposure - systemic effects		8550 mg/m3	no hazard identified
amines, polyethylenepoly- 68131-73-7	Workers	dermal	Long term exposure - systemic effects		0,91 mg/kg	no hazard identified
amines, polyethylenepoly- 68131-73-7	Workers	dermal	Long term exposure - local effects		44 µg/cm2/day	no hazard identified
amines, polyethylenepoly- 68131-73-7	General population	inhalation	Long term exposure - systemic effects		0,46 mg/m3	no hazard identified
amines, polyethylenepoly- 68131-73-7	General population	inhalation	Acute/short term exposure - systemic effects		2542 mg/m3	no hazard identified
amines, polyethylenepoly- 68131-73-7	General population	dermal	Long term exposure - systemic effects		0,4 mg/kg	no hazard identified
amines, polyethylenepoly- 68131-73-7	General population	dermal	Acute/short term exposure - systemic effects		13 mg/kg	no hazard identified
amines, polyethylenepoly- 68131-73-7	General population	dermal	Long term exposure - local effects		0,68 mg/cm2	no hazard identified
amines, polyethylenepoly- 68131-73-7	General population	dermal	Acute/short term exposure - local effects		1,59 mg/cm2	no hazard identified
amines, polyethylenepoly- 68131-73-7	General population	oral	Long term exposure - systemic effects		0,65 mg/kg	no hazard identified
amines, polyethylenepoly- 68131-73-7	General population	oral	Acute/short term exposure - systemic effects		32 mg/kg	no hazard identified
2,2'-iminodiethylamine 111-40-0	Workers	dermal	Long term exposure - systemic effects		11,4 mg/kg	no hazard identified
2,2'-iminodiethylamine 111-40-0	Workers	dermal	Long term exposure - local effects		1,1 mg/kg	no hazard identified
2,2'-iminodiethylamine 111-40-0	Workers	Inhalation	Acute/short term exposure - systemic effects		92,1 mg/m3	no hazard identified
2,2'-iminodiethylamine 111-40-0	Workers	Inhalation	Acute/short term exposure - local effects		2,6 mg/m3	no hazard identified

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2,2'-iminodiethylamine 111-40-0	Workers	Inhalation	Long term exposure - systemic effects		15,4 mg/m3	no hazard identified
2,2'-iminodiethylamine 111-40-0	Workers	Inhalation	Long term exposure - local effects		0,87 mg/m3	no hazard identified
2,2'-iminodiethylamine 111-40-0	General population	dermal	Acute/short term exposure - systemic effects		4,88 mg/kg	no hazard identified
2,2'-iminodiethylamine 111-40-0	General population	Inhalation	Acute/short term exposure - systemic effects		27,5 mg/m3	no hazard identified
2,2'-iminodiethylamine 111-40-0	General population	dermal	Long term exposure - systemic effects		4,88 mg/kg	no hazard identified
2,2'-iminodiethylamine 111-40-0	General population	Inhalation	Long term exposure - systemic effects		4,6 mg/m3	no hazard identified
3,6-diazaoctanethylenediamine 112-24-3	Workers	inhalation	Long term exposure - systemic effects		0,54 mg/m3	
3,6-diazaoctanethylenediamine 112-24-3	General population	inhalation	Long term exposure - systemic effects		0,096 mg/m3	
3,6-diazaoctanethylenediamine 112-24-3	General population	oral	Long term exposure - systemic effects		0,14 mg/kg	
3,6-diazaoctanethylenediamine 112-24-3	Workers	inhalation	Acute/short term exposure - local effects			
3,6-diazaoctanethylenediamine 112-24-3	Workers	inhalation	Long term exposure - local effects			
3,6-diazaoctanethylenediamine 112-24-3	Workers	dermal	Acute/short term exposure - systemic effects			
3,6-diazaoctanethylenediamine 112-24-3	Workers	dermal	Acute/short term exposure - local effects			
3,6-diazaoctanethylenediamine 112-24-3	Workers	dermal	Long term exposure - local effects			
3,6-diazaoctanethylenediamine 112-24-3	Workers	dermal	Long term exposure - systemic effects			
3,6-diazaoctanethylenediamine 112-24-3	General population	inhalation	Acute/short term exposure - local effects			
3,6-diazaoctanethylenediamine 112-24-3	General population	inhalation	Long term exposure - local effects			
3,6-diazaoctanethylenediamine 112-24-3	General population	oral	Acute/short term exposure - systemic effects			
3,6-diazaoctanethylenediamine 112-24-3	General population	dermal	Acute/short term exposure - systemic effects			
3,6-diazaoctanethylenediamine 112-24-3	General population	dermal	Acute/short term exposure - local effects			
3,6-diazaoctanethylenediamine 112-24-3	General population	dermal	Long term exposure - local effects			
3,6-diazaoctanethylenediamine 112-24-3	General population	dermal	Long term exposure - systemic effects			

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Biological Exposure Indices:
None

8.2. Exposure controls:

Engineering controls:
Ensure good ventilation/extraction.

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.

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

Advices to personal protection equipment:
The information provided on personal protective equipment is for guidance purposes only. A full risk assessment should be conducted prior to using this product to determine the appropriate personal protective equipment to suit local conditions.
Personal protective equipment should conform to the relevant EN standard.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Delivery form	liquid
Colour	Yellow
Odor	Amine
Physical state	liquid
Melting point	Not applicable, Product is a liquid
Solidification temperature	< 10 °C (< 50 °F)
Initial boiling point	318 °C (604.4 °F)
Flammability	The product is not flammable.
Explosive limits	Not applicable, The product is not flammable.
Flash point	> 93,3 °C (> 199.94 °F); Closed cup
Auto-ignition temperature	Not applicable, The product is not flammable.
Decomposition temperature	Not applicable, Substance/mixture is not self-reactive, no organic peroxide and does not decompose under foreseen conditions of use
pH (20 °C (68 °F); Conc.: 10 g/l; Solvent: Water)	10 - 11
Viscosity (kinematic) (20 °C (68 °F);)	> 20 mm2/s
Solubility (qualitative) (20 °C (68 °F); Solvent: Water)	Soluble

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Partition coefficient: n-octanol/water	Not applicable Mixture
Vapour pressure (25 °C (77 °F))	< 0,01 mm hg
Density (20 °C (68 °F))	0,99 g/cm3 None
Relative vapour density: (20 °C)	> 1
Particle characteristics	Not applicable Product is a liquid

9.2. Other information

Other information not applicable for this product

SECTION 10: Stability and reactivity

10.1. Reactivity
Reacts with strong oxidants.
Acids.
Reaction with strong acids.
Strong bases.

10.2. Chemical stability
Stable under recommended storage conditions.

10.3. Possibility of hazardous reactions
See section reactivity

10.4. Conditions to avoid
Stable under normal conditions of storage and use.

10.5. Incompatible materials
See section reactivity.

10.6. Hazardous decomposition products
carbon oxides.
Rapid polymerisation may generate excessive heat and pressure.
May produce fumes when heated to decomposition. Fumes may contain carbon monoxide and other toxic fumes.

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SECTION 11: Toxicological information

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

Acute oral toxicity:

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	LD50	3.221 mg/kg	rat	not specified
imidazole 288-32-4	LD50	970 mg/kg	rat	not specified
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	LD50	1.716 mg/kg	rat	equivalent or similar to OECD Guideline 401 (Acute Oral Toxicity)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	LD50	1.716,2 mg/kg	rat	OECD Guideline 401 (Acute Oral Toxicity)
amines, polyethylenepoly- 68131-73-7	LD50	1.716,2 mg/kg	rat	OECD Guideline 401 (Acute Oral Toxicity)
Diethylenetriamine 111-40-0	LD50	1.553 mg/kg	rat	OECD Guideline 401 (Acute Oral Toxicity)
2-(2-aminoethylamino)ethanol 111-41-1	LD50	2.150 mg/kg	rat	BASF Test
3,6-diazaoctanethylenediamine 112-24-3	LD50	1.591 mg/kg	rat	OECD Guideline 401 (Acute Oral Toxicity)

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Acute dermal toxicity:

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	LD50	1.260 mg/kg	rabbit	not specified
2-piperazin-1-ylethylamine 140-31-8	LD50	866 mg/kg	rabbit	Draize Test
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	LD50	1.465 mg/kg	rabbit	OECD Guideline 402 (Acute Dermal Toxicity)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	LD50	1.465,4 mg/kg	rabbit	OECD Guideline 402 (Acute Dermal Toxicity)
amines, polyethylenepoly- 68131-73-7	LD50	1.465,4 mg/kg	rabbit	OECD Guideline 402 (Acute Dermal Toxicity)
Diethylenetriamine 111-40-0	LD50	1.045 mg/kg	rabbit	not specified
2-(2-aminoethylamino)ethanol 111-41-1	LD50	> 2.000 mg/kg	rabbit	BASF Test
3,6-diazaoctanethylenediamine 112-24-3	LD50	1.465 mg/kg	rabbit	OECD Guideline 402 (Acute Dermal Toxicity)

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Acute inhalative toxicity:

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

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

Hazardous substances CAS-No.	Value type	Value	Test atmosphere	Exposure time	Species	Method
2-piperazin-1-ylethylamine 140-31-8	Acute toxicity estimate (ATE)	> 10 mg/l	dust/mist	4 h		Expert judgement
Diethylenetriamine 111-40-0	LD 50	> 0,07 - < 0,30 mg/l		4 h	rat	OECD Guideline 403 (Acute Inhalation Toxicity)
Diethylenetriamine 111-40-0	Acute toxicity estimate (ATE)	0,071 mg/l	dust/mist			Expert judgement

Skin corrosion/irritation:

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result	Exposure time	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	corrosive		Corrositex Biobarrier Membrane (reconstituted collagen matrix)	OECD Guideline 435 (In Vitro Membrane Barrier Test Method for Skin Corrosion)
2-piperazin-1-ylethylamine 140-31-8	corrosive	20 min	rabbit	not specified
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	corrosive		rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)
amines, polyethylenepoly- 68131-73-7	Category 1B (corrosive)			OECD Guideline 435 (In Vitro Membrane Barrier Test Method for Skin Corrosion)
Diethylenetriamine 111-40-0	corrosive	15 min	rabbit	BASF Test
2-(2-aminoethylamino)ethanol 111-41-1	corrosive		rabbit	BASF Test
3,6-diazaoctanethylenediamine 112-24-3	corrosive		rabbit	OECD Guideline 404 (Acute Dermal Irritation / Corrosion)

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Serious eye damage/irritation:

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result	Exposure time	Species	Method
2-piperazin-1-ylethylamine 140-31-8	Category 1 (irreversible effects on the eye)		rabbit	not specified
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Category 1 (irreversible effects on the eye)		rabbit	equivalent or similar to OECD Guideline 405 (Acute Eye Irritation / Corrosion)
amines, polyethylenepoly- 68131-73-7	Category 1 (irreversible effects on the eye)		rabbit	OECD Guideline 405 (Acute Eye Irritation / Corrosion)
Diethylenetriamine 111-40-0	corrosive	30 s	rabbit	not specified
2-(2-aminoethylamino)ethanol 111-41-1	irritating		rabbit	BASF Test

Respiratory or skin sensitization:

The mixture is classified based on threshold limits referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result	Test type	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	Sensitizing	Guinea pig maximisation test	guinea pig	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)
2-piperazin-1-ylethylamine 140-31-8	sensitising	Guinea pig maximisation test	guinea pig	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	Sensitizing	Buehler test	guinea pig	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)
amines, polyethylenepoly- 68131-73-7	sensitising	Buehler test	guinea pig	OECD Guideline 406 (Skin Sensitisation)
Diethylenetriamine 111-40-0	sensitising	Mouse local lymphnode assay (LLNA)	mouse	OECD Guideline 429 (Skin Sensitisation: Local Lymph Node Assay)
2-(2-aminoethylamino)ethanol 111-41-1	sensitising	Patch-Test	guinea pig	Patch Test
3,6-diazaoctanethylenediamine 112-24-3	sensitising	Guinea pig maximisation test	guinea pig	equivalent or similar to OECD Guideline 406 (Skin Sensitisation)

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Germ cell mutagenicity:

The mixture is classified based on threshold limits referring to the classified substances present in the mixture.

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

Hazardous substances CAS-No.	Result	Type of study / Route of administration	Metabolic activation / Exposure time	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	positive	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	positive	mammalian cell gene mutation assay	with and without		equivalent or similar to OECD Guideline 476 (In vitro Mammalian Cell Gene Mutation Test)
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	positive	sister chromatid exchange assay in mammalian cells	with and without		equivalent or similar to OECD Guideline 479 (Genetic Toxicology: In Vitro Sister Chromatid Exchange Assay in Mammalian Cells)
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	negative	in vitro mammalian cell micronucleus test	with and without		OECD Guideline 487 (In vitro Mammalian Cell Micronucleus Test)
2-piperazin-1-ylethylamine 140-31-8	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		equivalent or similar to OECD Guideline 471 (Bacterial Reverse Mutation Assay)
2-piperazin-1-ylethylamine 140-31-8	negative	mammalian cell gene mutation assay	with and without		OECD Guideline 490 (In Vitro Mammalian Cell Gene Mutation Tests Using the Thymidine Kinase Gene)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	positive	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	negative	in vitro mammalian cell micronucleus test	with and without		OECD Guideline 487 (In vitro Mammalian Cell Micronucleus Test)
amines, polyethylenepoly- 68131-73-7	positive	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Diethylenetriamine 111-40-0	positive	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
Diethylenetriamine 111-40-0	negative	in vitro mammalian chromosome aberration test	with and without		Chromosome Aberration Test
2-(2-aminoethylamino)ethanol 111-41-1	negative	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
3,6-diazaoctanethylenediamine 112-24-3	positive	bacterial reverse mutation assay (e.g Ames test)	with and without		OECD Guideline 471 (Bacterial Reverse Mutation Assay)
3,6-diazaoctanethylenediamine 112-24-3	negative	DNA damage and repair assay, unscheduled DNA synthesis in mammalian cells in vitro	with and without		OECD Guideline 482 (Genetic Toxicology: DNA Damage and Repair, Unscheduled DNA Synthesis in Mammalian Cells In Vitro)
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	negative	intraperitoneal		mouse	equivalent or similar to OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)

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2-piperazin-1-ylethylamine 140-31-8	negative	intraperitoneal		mouse	not specified
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	negative	intraperitoneal		mouse	equivalent or similar to OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
amines, polyethylenepoly- 68131-73-7	negative	intraperitoneal		mouse	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
Diethylenetriamine 111-40-0	negative	oral: gavage		mouse	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)
Diethylenetriamine 111-40-0	negative	oral: gavage		mouse	not specified
3,6-diazaoctanethylenediamine 112-24-3	negative	intraperitoneal		mouse	OECD Guideline 474 (Mammalian Erythrocyte Micronucleus Test)

Carcinogenicity

The mixture is classified based on threshold limits referring to the classified substances present in the mixture.

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

Hazardous components CAS-No.	**Result**	**Route of application**	**Exposure time / Frequency of treatment**	**Species**	**Sex**	**Method**
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	not carcinogenic	dermal	lifetime three times/w	mouse	male	equivalent or similar OECD Guideline 451 (Carcinogenicity Studies)
Diethylenetriamine 111-40-0	not carcinogenic	dermal	lifetime (appr. 587 d) 3 d/w	mouse	male	OECD Guideline 453 (Combined Chronic Toxicity / Carcinogenicity Studies)

Reproductive toxicity:

The mixture is classified based on threshold limits referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	**Result / Value**	**Test type**	**Route of application**	**Species**	**Method**
2-piperazin-1-ylethylamine 140-31-8	NOAEL P 2000 ppm NOAEL F1 >= 8000 ppm	screening	oral: drinking water	rat	OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)
2-piperazin-1-ylethylamine 140-31-8	NOAEL P >= 750 mg/kg NOAEL F1 >= 750 mg/kg NOAEL F2 >= 750 mg/kg	one-generation study	oral: gavage	rat	OECD Guideline 443 (Extended One-Generation Reproductive Toxicity Study)
Diethylenetriamine 111-40-0	NOAEL P 100 mg/kg NOAEL F1 30 mg/kg	screening	oral: gavage	rat	OECD Guideline 421 (Reproduction / Developmental Toxicity Screening Test)

STOT-single exposure:

No data available.

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STOT-repeated exposure:

The mixture is classified based on threshold limits referring to the classified substances present in the mixture.

Hazardous substances CAS-No.	Result / Value	Route of application	Exposure time / Frequency of treatment	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	LOAEL 50 mg/kg	oral: gavage	26 w daily	rat	equivalent or similar to OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	NOAEL 200 mg/kg	dermal	20 d 6 h/d, 5 d/w	rabbit	OECD Guideline 410 (Repeated Dose Dermal Toxicity: 21/28-Day Study)
2-piperazin-1-ylethylamine 140-31-8	NOAEL 2000 ppm	oral: drinking water	>= 28 d daily	rat	OECD Guideline 422 (Combined Repeated Dose Toxicity Study with the Reproduction / Developmental Toxicity Screening Test)
2-piperazin-1-ylethylamine 140-31-8	NOAEL 50 mg/m3	inhalation	13 w 6 h/d, 5 d/w	rat	OECD Guideline 413 (Subchronic Inhalation Toxicity: 90-Day)
2-piperazin-1-ylethylamine 140-31-8	NOAEL > 1.000 mg/kg	dermal	29 d 6 h/d, 5 d/w	rat	OECD Guideline 410 (Repeated Dose Dermal Toxicity: 21/28-Day Study)
imidazole 288-32-4	NOAEL 62,5 mg/kg	oral: gavage	28 days once daily, 5 d/w	rat	not specified
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	LOAEL 50 mg/kg	oral: gavage	26 w daily	rat	equivalent or similar to OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
amines, polyethylenepoly- 68131-73-7	NOAEL 350 mg/kg	oral: gavage	4 and 8 weeks daily	rat	OECD Guideline 407 (Repeated Dose 28-Day Oral Toxicity in Rodents)
Diethylenetriamine 111-40-0	NOAEL 70 - 80 mg/kg	oral: feed	90 d daily	rat	not specified
Diethylenetriamine 111-40-0	NOAEL 0,55 mg/l	inhalation: vapour	15 d 6 h/d	rat	not specified
2-(2-aminoethylamino)ethanol 111-41-1	LOAEL >= 250 mg/kg	oral: gavage	28 days daily	rat	Guidelines for 28-Day Repeat Dose Toxicity Test (Japan)
2-(2-aminoethylamino)ethanol 111-41-1	NOAEL 1.000 mg/kg		4 weeks 6 hours/day, 5 days/week	rat	EPA Guideline
3,6-diazaoctanethylenediamine 112-24-3	LOAEL 50 mg/kg	oral: gavage	26 w daily	rat	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)
3,6-diazaoctanethylenediamine 112-24-3	NOAEL 50 mg/kg	oral: gavage	26 w daily	rat	OECD Guideline 408 (Repeated Dose 90-Day Oral Toxicity in Rodents)

Aspiration hazard:

No data available.

11.2 Information on other hazards

not applicable

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SECTION 12: Ecological information

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

12.1. Toxicity

Toxicity (Fish):

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

The table below presents the data of the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Exposure time	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	LC50	420 mg/l	96 h	Poecilia reticulata	OECD Guideline 203 (Fish, Acute Toxicity Test)
2-piperazin-1-ylethylamine 140-31-8	LC50	2.190 mg/l	96 h	Pimephales promelas	other guideline:
imidazole 288-32-4	LC50	280 mg/l	48 h	Leuciscus idus	OECD Guideline 203 (Fish, Acute Toxicity Test)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	LC50	330 mg/l	96 h	Pimephales promelas	other guideline:
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	LC50	180 mg/l	96 h	Poecilia reticulata	EU Method C.1 (Acute Toxicity for Fish)
amines, polyethylenepoly- 68131-73-7	LC50	100 mg/l	96 h	Poecilia reticulata	EU Method C.1 (Acute Toxicity for Fish)
Diethylenetriamine 111-40-0	LC50	430 mg/l	96 h	Poecilia reticulata	EU Method C.1 (Acute Toxicity for Fish)
Diethylenetriamine 111-40-0	NOEC	> 10 mg/l	28 d	Gasterosteus aculeatus	OECD Guideline 210 (fish early lite stage toxicity test)
2-(2-aminoethylamino)ethanol 111-41-1	LC50	> 243 mg/l	48 h	Leuciscus idus	DIN 38412-15
3,6-diazaoctanethylenediamine 112-24-3	LC50	570 mg/l	96 h	Poecilia reticulata	OECD Guideline 203 (Fish, Acute Toxicity Test)

Toxicity (aquatic invertebrates):

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

The table below presents the data of the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Exposure time	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	EC50	24,1 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
2-piperazin-1-ylethylamine 140-31-8	EC50	58 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
imidazole 288-32-4	EC50	341,5 mg/l	48 h	Daphnia magna	EU Method C.2 (Acute Toxicity for Daphnia)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	EC50	31 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	EC50	17,5 mg/l	48 h	Daphnia magna	EU Method C.2 (Acute Toxicity for Daphnia)
amines, polyethylenepoly- 68131-73-7	EC50	2,2 mg/l	48 h	Daphnia magna	EU Method C.2 (Acute Toxicity for Daphnia)
Diethylenetriamine	EC50	64,6 mg/l	48 h	Daphnia magna	EU Method C.2 (Acute

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111-40-0					Toxicity for Daphnia)
2-(2-aminoethylamino)ethanol 111-41-1	EC50	22 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)
3,6-diazaoctanethylenediamine 112-24-3	EC50	31 mg/l	48 h	Daphnia magna	OECD Guideline 202 (Daphnia sp. Acute Immobilisation Test)

Chronic toxicity (aquatic invertebrates):

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

The table below presents the data of the classified substances present in the mixture.

Hazardous substances **CAS-No.**	**Value type**	**Value**	**Exposure time**	**Species**	**Method**
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	EC10	1,9 mg/l	21 d	Daphnia magna	OECD Guideline 202 (Daphnia sp. Chronic Immobilisation Test)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	EC10	1,9 mg/l	21 day	Daphnia magna	OECD Guideline 202 (Daphnia sp. Chronic Immobilisation Test)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	EC10	1,9 mg/l	21 d	Daphnia magna	OECD Guideline 202 (Daphnia sp. Chronic Immobilisation Test)
Diethylenetriamine 111-40-0	NOEC	5,6 mg/l	21 d	Daphnia magna	EU Method C.20 (Daphnia magna Reproduction Test)

Toxicity (Algae):

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The mixture is classified based on calculation method referring to the classified substances present in the mixture.

The table below presents the data of the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Exposure time	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	EC50	6,8 mg/l	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	NOEC	0,5 mg/l	72 h	Pseudokirchneriella subcapitata	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-piperazin-1-ylethylamine 140-31-8	EC50	> 1.000 mg/l	72 h	Raphidocelis subcapitata (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
imidazole 288-32-4	EC50	130 mg/l	72 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	DIN 38412-09
imidazole 288-32-4	EC10	59 mg/l	72 h	Scenedesmus subspicatus (new name: Desmodesmus subspicatus)	DIN 38412-09
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	EC50	20 mg/l	72 h	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	EC10	1,34 mg/l	72 h	Pseudokirchneriella subcapitata (reported as Raphidocelis subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	EC50	1,7 mg/l	72 h	Raphidocelis subcapitata (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	NOEC	0,25 mg/l	72 h	Raphidocelis subcapitata (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
amines, polyethylenepoly- 68131-73-7	EC50	0,5 mg/l	72 h	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
amines, polyethylenepoly- 68131-73-7	NOEC	0,16 mg/l	72 h	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
Diethylenetriamine 111-40-0	EC50	1.164 mg/l	72 h	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
Diethylenetriamine 111-40-0	NOEC	10 mg/l	72 h	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)
2-(2-aminoethylamino)ethanol 111-41-1	EC50	358 mg/l	72 h	Desmodesmus subspicatus	DIN 38412-09
2-(2-aminoethylamino)ethanol 111-41-1	EC10	156 mg/l	72 h	Desmodesmus subspicatus	DIN 38412-09
3,6-diazaoctanethylenediamine 112-24-3	EC50	20 mg/l	72 h	Selenastrum capricornutum (new name: Pseudokirchneriella subcapitata)	OECD Guideline 201 (Alga, Growth Inhibition Test)

Toxicity (microorganisms):

The mixture is classified based on calculation method referring to the classified substances present in the mixture.

The table below presents the data of the classified substances present in the mixture.

Hazardous substances CAS-No.	Value type	Value	Exposure time	Species	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	EC50	97,3 mg/l	2 h	other:	other guideline:
2-piperazin-1-ylethylamine 140-31-8	EC50	511 mg/l	2 h	other:	ISO DIS 9509 (Assessing the Inhibition of Nitrification of Activated Sludge Microorganisms by

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					Chemicals and Waste Waters)
imidazole 288-32-4	EC50	> 45 mg/l	30 min		OECD Guideline 209 (Activated Sludge, Respiration Inhibition Test)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	EC50	164 mg/l	2 h	other:	other guideline:
Diethylenetriamine 111-40-0	NOEC	6 mg/l	3 h	anaerobic bacteria	not specified
2-(2-aminoethylamino)ethanol 111-41-1	EC10	82,2 mg/l	17 h	Pseudomonas putida	DIN 38412, part 8 (Pseudomonas Zellvermehrungshemm-Test)
3,6-diazaoctanethylenediamine 112-24-3	EC0	137 mg/l	30 min	Pseudomonas putida	DIN 38412, part 27 (Bacterial oxygen consumption test)

12.2. Persistence and degradability

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The table below presents the data of the classified substances present in the mixture.

Hazardous substances CAS-No.	Result	Test type	Degradability	Exposure time	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	not readily biodegradable.	aerobic	0 %	162 d	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	not inherently biodegradable	aerobic	17 %	84 d	OECD Guideline 302 A (Inherent Biodegradability: Modified SCAS Test)
2-piperazin-1-ylethylamine 140-31-8	not readily biodegradable.	aerobic	0 %	28 d	OECD Guideline 301 F (Ready Biodegradability: Manometric Respirometry Test)
imidazole 288-32-4	readily biodegradable	aerobic	90 - 100 %	18 d	OECD Guideline 301 A (new version) (Ready Biodegradability: DOC Die Away Test)
imidazole 288-32-4	inherently biodegradable	aerobic	83 %	8 d	OECD Guideline 302 B (Inherent biodegradability: Zahn-Wellens/EMPA Test)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	not readily biodegradable.	aerobic	0 %	162 d	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	not inherently biodegradable	aerobic	20 %	84 d	OECD Guideline 302 A (Inherent Biodegradability: Modified SCAS Test)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	not readily biodegradable.	aerobic	0 %	162 d	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	not inherently biodegradable	aerobic	18 %	84 d	OECD Guideline 302 A (Inherent Biodegradability: Modified SCAS Test)
amines, polyethylenepoly- 68131-73-7	not readily biodegradable.	aerobic	0 %	162 d	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
amines, polyethylenepoly- 68131-73-7	not inherently biodegradable	aerobic	16 %	84 day	OECD Guideline 302 A (Inherent Biodegradability: Modified SCAS Test)
Diethylenetriamine 111-40-0	inherently biodegradable	aerobic	83 %	28 d	EU Method C.9 (Biodegradation: Zahn-Wellens Test)
Diethylenetriamine 111-40-0	readily biodegradable	aerobic	87 %	21 d	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)
2-(2-aminoethylamino)ethanol 111-41-1	readily biodegradable	aerobic	> 60 %	28 d	OECD Guideline 301 F (Ready Biodegradability: Manometric Respirometry Test)
3,6-diazaoctanethylenediamine 112-24-3	not inherently biodegradable	aerobic	0 %	28 d	OECD Guideline 302 B (Inherent biodegradability: Zahn-Wellens/EMPA Test)
3,6-diazaoctanethylenediamine 112-24-3	not readily biodegradable.	aerobic	0 %	162 d	OECD Guideline 301 D (Ready Biodegradability: Closed Bottle Test)

12.3. Bioaccumulative potential

The table below presents the data of the classified substances present in the mixture.

Hazardous substances CAS-No.	Bioconcentration factor (BCF)	Exposure time	Temperature	Species	Method
Diethylenetriamine 111-40-0	> 0,3 - < 6,3	42 d		Cyprinus carpio	OECD Guideline 305 C (Bioaccumulation: Test for the Degree of Bioconcentration in Fish)
2-(2-aminoethylamino)ethanol 111-41-1	2,1 - 3,7	42 d	25 °C	Cyprinus carpio	OECD Guideline 305 C (Bioaccumulation: Test for the Degree of Bioconcentration in Fish)

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12.4. Mobility in soil

The table below presents the data of the classified substances present in the mixture.

Hazardous substances CAS-No.	LogPow	Temperature	Method
Amines, polyethylenepoly-, tetraethylenepentamine fraction 90640-66-7	-3,16		QSAR (Quantitative Structure Activity Relationship)
2-piperazin-1-ylethylamine 140-31-8	-1,48	20 °C	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
imidazole 288-32-4	-0,02		OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
Amines, polyethylenepoly-, triethylenetetramine fraction 90640-67-8	-2,65		OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
3,6,9,12-tetraazatetradecamethylenediamine 4067-16-7	< 1		not specified
amines, polyethylenepoly- 68131-73-7	-3,67		QSAR (Quantitative Structure Activity Relationship)
Diethylenetriamine 111-40-0	-1,58	20 °C	QSAR (Quantitative Structure Activity Relationship)
2-(2-aminoethylamino)ethanol 111-41-1	-1,46	25 °C	OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)
3,6-diazaoctanethylenediamine 112-24-3	-2,65		OECD Guideline 107 (Partition Coefficient (n-octanol / water), Shake Flask Method)

12.5. Results of PBT and vPvB assessment

This mixture does not contain any substances that are assessed to be a PBT or vPvB.

12.6. Endocrine disrupting properties

not applicable

12.7. Other adverse effects

No data available.

SECTION 13: Disposal considerations

13.1. Waste treatment methods

Product disposal:
Do not empty into drains / surface water / ground water.
Dispose of in accordance with local and national regulations.

Disposal of uncleaned packages:
After use, tubes, cartons and bottles containing residual product should be disposed of as chemically contaminated waste in an authorised legal land fill site or incinerated.

Waste code

08 04 09* waste adhesives and sealants containing organic solvents and other dangerous substances
The valid EWC waste code numbers are source-related. The manufacturer is therefore unable to specify EWC waste codes for the articles or products used in the various sectors. The EWC codes listed are intended as a recommendation for users. We will be happy to advise you.

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SECTION 14: Transport information

14.1. UN number or ID number

ADR	2735
RID	2735
IMDG	2735
IATA	2735

14.2. UN proper shipping name

ADR	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (Tetraethylene pentamine,N-Aminoethylpiperazine)
RID	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (Tetraethylene pentamine,N-Aminoethylpiperazine)
IMDG	POLYAMINES, LIQUID, CORROSIVE, N.O.S. (Tetraethylene pentamine,N-Aminoethylpiperazine)
IATA	Polyamines, liquid, corrosive, n.o.s. (Tetraethylene pentamine,N-Aminoethylpiperazine)

14.3. Transport hazard class(es)

ADR	8
RID	8
IMDG	8
IATA	8

14.4. Packing group

ADR	III
RID	III
IMDG	III
IATA	III

14.5. Environmental hazards

ADR	Environmentally Hazardous
RID	Environmentally Hazardous
ADN	Environmentally Hazardous
IMDG	Marine Pollutant
IATA	not applicable

14.6. Special precautions for user

ADR	not applicable Tunnelcode: (E)
RID	not applicable
ADN	not applicable
IMDG	not applicable
IATA	not applicable

14.7. Maritime transport in bulk according to IMO instruments

not applicable

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SECTION 15: Regulatory information

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

Ozone Depleting Substance (ODS) (Regulation (EC) No 2024/590):	Not applicable
Prior Informed Consent (PIC) (Regulation (EU) No 649/2012):	Not applicable
Persistent organic pollutants (Regulation (EU) 2019/1021):	Not applicable

VOC content (2010/75/EC)	< 3 %

15.2. Chemical safety assessment

A chemical safety assessment has not been carried out.

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SECTION 16: Other information

The labelling of the product is indicated in Section 2. The full text of all abbreviations indicated by codes in this safety data sheet are as follows:

H302 Harmful if swallowed.
H311 Toxic in contact with skin.
H312 Harmful in contact with skin.
H314 Causes severe skin burns and eye damage.
H317 May cause an allergic skin reaction.
H318 Causes serious eye damage.
H330 Fatal if inhaled.
H335 May cause respiratory irritation.
H360D May damage the unborn child.
H360Df May damage the unborn child. Suspected of damaging fertility.
H372 Causes damage to organs through prolonged or repeated exposure.
H400 Very toxic to aquatic life.
H410 Very toxic to aquatic life with long lasting effects.
H411 Toxic to aquatic life with long lasting effects.
H412 Harmful to aquatic life with long lasting effects.

Abbreviations and acronyms:

ADG(-Code): Australian Dangerous Goods (Code)
ADN: European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR : European Agreement concerning the International Carriage of Dangerous Goods by Road
ASTM: American Society for Testing and Materials
ATE: acute toxicity estimate
AS: Australian Standard
AwSV: Ordinance on Installations for the Handling of Substances Hazardous to Water
CAS: Chemical Abstract Service
CLP: Regulation (EC) No 1272/2008
CMR: cancerogenic, mutagenic or reprotoxic
DIN: German Institute for Standardization
ECx: Effective concentration (x% effective level)
ECHA: European Chemicals Agency
EC-Nummer: Substance number in the EU-inventories EINECS/ELINCS
ECTLV: European community threshold limit value
ED:Substance identified as having endocrine disrupting properties
EINECS: European Inventory of Existing Commercial Chemical Substances
ELINCS: European List of Notified Chemical Substances
EN : European Standard
ENCS: Japanese chemical inventory
EPA: US Environmental Protection Agency
EU: European Union
EU EXPLD1: Substance listed in Annex I, Reg (EC) No. 2019/1148
EU EXPLD2: Substance listed in Annex II, Reg (EC) No. 2019/1148
EWC: European Waste Catalogue
GHS: Globally Harmonised System for Classification and Labelling of Chemicals
GLP: Good Laboratory Practice
HSNO: Hazardous Substances and New Organisms
IARC: International Agency for Research of Cancer
IATA: International Air Transport Association
IBC-Code: International Code for the Construction and Equipment of Ships carrying Dangerous Chemicals in Bulk
IC50: half maximal inhibitory concentration
ICAO: International Civil Aviation Organization
IMDG-Code: International Maritime Code for Dangerous Goods
IMO: International Maritime Organization
ISO: International Standardization Organisation
LC50: Median lethal concentration
LD50: Median lethal dose
MARPOL: International Convention for the Prevention of Marine Pollution from Ships
n.o.s.: not otherwise specified
NO(A)EC: No (adverse) effect concentration
NO(A)EL: No (adverse) effect level
NZS: New Zealand Standard

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OECD: Organisation for Economic Co-operation and Development
OEL: Occupational Exposure Limit
OPPT: US EPA Office of Pollution Prevention and Toxics
OPPTS: US EPA Office of Prevention, Pesticides and Toxic Substances
PBT: Persistent, bioaccumulative, toxic
(Q)SAR: (Quantitative) structure–activity relationship
REACH: Regulation (EC) No. 1907/2006
RID: Regulations concerning the International Transport of Dangerous Goods by Rail
SADT: Self Accelerating Decomposition Temperature
SDS: Safety Data Sheet
STOT: Specific Target Organ Toxicity
STOT SE: Specific Target Organ Toxicity - single exposure
STOT RE: Specific Target Organ Toxicity - repeated exposure
SUSMP: Standard for the Uniform Scheduling of Medicines and Poisons
SVHC: Substance of very high concern (REACH Candidate List)
TRGS: German Technical Rules for hazardous substances
UN: United Nations
VOC: Volatile Organic Compound
814.018 VOC Reg CH: Swiss Ordinance 814.018 on the Incentive Tax on Volatile Organic Compounds
vPvB: Very persistent, very bioaccumulative
VwVwS: Administrative Regulation on Substances Hazardous to Waters
WGK: Water hazard class

Further information:

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