



























































## Section 11. Toxicological information

**Ingestion** : Adverse symptoms may include the following:  
stomach pains

### Delayed and immediate effects and also chronic effects from short and long term exposure

#### Short term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

#### Long term exposure

**Potential immediate effects** : Not available.

**Potential delayed effects** : Not available.

### Potential chronic health effects

Product/ingredient name	Test	Endpoint	Species	Result
4,4'-methylenebis (cyclohexylamine)	OECD 422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Sub-acute NOAEL Oral	Rat - Male, Female	15 mg/kg
	OECD 413 Subchronic Inhalation Toxicity: 90-day Study	Sub-chronic NOEC Inhalation Dusts and mists	Rat - Male, Female	12.2 mg/m <sup>3</sup>
triethylenetetramine	OECD 408 Repeated Dose 90-Day Oral Toxicity Study in Rodents	Sub-chronic NOAEL Oral	Rat - Male, Female	50 mg/kg/d
Polyoxypropylenediamine	OECD 411 Subchronic Dermal Toxicity: 90-day Study	Sub-chronic NOAEL Dermal	Rat - Male, Female	250 mg/kg/d
	OECD 407 Repeated Dose 28-day Oral Toxicity Study in Rodents	Sub-chronic NOAEL Oral	Rat - Male, Female	239 mg/kg/d
Aminoethylpiperazine	OECD 422 Combined Repeated Dose Toxicity Study with the Reproduction/ Developmental Toxicity Screening Test	Sub-acute NOAEL Oral	Rat - Male, Female	151 to 285 mg/kg/d
	OECD 410 Repeated Dose Dermal Toxicity: 21/28-day Study	Sub-acute NOAEL Dermal	Rat - Male, Female	>1000 mg/kg/d

**General** : May cause damage to organs through prolonged or repeated exposure if swallowed. Once sensitized, a severe allergic reaction may occur when subsequently exposed to very low levels.

**Carcinogenicity** : No known significant effects or critical hazards.

**Mutagenicity** : No known significant effects or critical hazards.

## Section 11. Toxicological information

- Teratogenicity** : No known significant effects or critical hazards.  
**Developmental effects** : No known significant effects or critical hazards.  
**Fertility effects** : No known significant effects or critical hazards.

### Numerical measures of toxicity

#### Acute toxicity estimates

Route	ATE value
Oral	496.2 mg/kg
Dermal	3923.3 mg/kg

**Other information** : Not available.

## Section 12. Ecological information

### Toxicity

Product/ingredient name	Test	Endpoint	Exposure	Species	Result
4,4'-methylenebis (cyclohexylamine)	DIN DIN 38412 Part 27	Acute EC50	30 minutes	Bacteria	156 mg/l
	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test	Acute EC50	48 hours Static	Daphnia	6.84 mg/l
	DIN DIN 38412 part 9	Acute ErC50 (growth rate)	72 hours Static	Algae	141 to 200 mg/l
	DIN DIN 38412 Part 15	Acute LC50	96 hours Static	Fish	67.8 mg/l
triethylenetetramine	DIN DIN 38412 part 9	Chronic LOAEL	72 hours Static	Algae	100 mg/l
	No official guidelines	Acute EC50	30 minutes Static	Bacteria	800 mg/l
	EU EC C.2 Acute Toxicity for <i>Daphnia</i>	Acute EC50	48 hours Static	Daphnia	31.1 mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute ErC50 (growth rate)	72 hours Semi-static	Algae	20 mg/l
	EPA OPPTS EPA OTS 797.1400	Acute LC50	96 hours Static	Fish	330 mg/l
	No official guidelines	Chronic EC10	30 minutes Static	Bacteria	42.5 mg/l
	OECD OECD 202: Part II ( <i>Daphnia</i> sp., Reproduction Test	Chronic EC10	21 days Semi-static	Daphnia	1.9 mg/l
2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[2-(1-piperazinyl)ethyl]amino butyl-terminated	OECD 201 Alga, Growth Inhibition Test	Chronic NOECr	72 hours Semi-static	Algae	<2.5 mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute EC50	72 hours	Algae	>1000 mg/l
	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test	Acute EC50	48 hours	Daphnia	<1000 mg/l

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Polyoxypropylenediamine	OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test ISO	Acute	EC50	48 hours Static	Daphnia	80	mg/l
		Acute	EC50	48 hours Static	Daphnia	418.34	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	EC50	96 hours Semi-static	Fish	>15	mg/l
	OECD 201 Alga, Growth Inhibition Test	Acute	ErC50 (growth rate)	72 hours Static	Algae	15	mg/l
	OECD 203 Fish, Acute Toxicity Test	Acute	LC50	96 hours Static	Fish	772.14	mg/l
	OECD 208 Seedling Emergence and Seedling Growth Test	Chronic	EC50	3 hours Static	Bacteria	750	mg/l
	OECD 201 Alga, Growth Inhibition Test	Chronic	NOEC	72 hours Static	Algae	0.32	mg/l
	OECD 209 Activated Sludge, Respiration Inhibition Test	Chronic	NOEC	3 hours Static	Bacteria	310	mg/l
	ISO 10253:2006 - Marine algal growth inhibition test with <i>Skeletonema costatum</i> and <i>Phaeodactylum tricornutum</i>	Chronic	NOECb	72 hours Static	Algae	100	mg/l
	Aminoethylpiperazine	OECD 201 Alga, Growth Inhibition Test	Acute	EC50	72 hours	Algae	>1000
OECD 202 <i>Daphnia</i> sp. Acute Immobilisation Test		Acute	EC50	48 hours Static	Daphnia	58	mg/l
-		Acute	LC50	96 hours Static	Fish	2190	mg/l
No official guidelines		Chronic	EC10	2 hours	Bacteria	250	mg/l
-		Chronic	EC20	1 hours Static	Bacteria	1600	mg/l
ISO ISO 9509:2006 - Toxicity test for assessing the inhibition of nitrification of activated sludge microorganisms		Chronic	EC50	2 hours Static	Bacteria	511	mg/l

### Persistence and degradability

## Section 12. Ecological information

Product/ingredient name	Test	Period	Result
4,4'-methylenebis (cyclohexylamine) triethylenetetramine	OECD 302B Inherent Biodegradability: Zahn-Wellens/EMPA Test	28 days	<10 %
	OECD 302A Inherent Biodegradability: Modified SCAS Test	84 days	20 %
	OECD 301D Ready Biodegradability - Closed Bottle Test	162 days	0 %
2-propenenitrile polymer with 1,3-butadiene, 1-cyano-1-methyl-4-oxo-4-[ [2-(1-piperazinyl)ethyl]amino] butyl-terminated Polyoxypropylenediamine	-	- days	- %
Aminoethylpiperazine	OECD 301B Ready Biodegradability - CO <sub>2</sub> Evolution Test	28 days	0 %
	OECD 301F Ready Biodegradability - Manometric Respirometry Test	28 days	0 %

**Conclusion/Summary** : triethylenetetramine Not biodegradable  
Polyoxypropylenediamine Not biodegradable

Product/ingredient name	Aquatic half-life	Photolysis	Biodegradability
4,4'-methylenebis (cyclohexylamine)	-	-	Not readily
Polyoxypropylenediamine	Fresh water 360 days	0.02 to 0.03 day(s)	Not readily
Aminoethylpiperazine	-	50%; 0.08 day(s)	Not readily

### Bioaccumulative potential

Product/ingredient name	LogP <sub>ow</sub>	BCF	Potential
4,4'-methylenebis (cyclohexylamine)	2.03	10.15	low
triethylenetetramine	-2.65	99	low
Polyoxypropylenediamine	1.34	-	low
Aminoethylpiperazine	-1.48	-	low

### Mobility in soil

Not available.

**Other adverse effects** : No known significant effects or critical hazards.

### Other ecological information

**BOD<sub>5</sub>** : Not determined.  
**COD** : Not determined.  
**TOC** : Not determined.

## Section 13. Disposal considerations

**Disposal methods** : The generation of waste should be avoided or minimized wherever possible. Disposal of this product, solutions and any by-products should at all times comply with the requirements of environmental protection and waste disposal legislation and any regional local authority requirements. Dispose of surplus and non-recyclable products via a licensed waste disposal contractor. Waste should not be disposed of untreated to the sewer unless fully compliant with the requirements of all authorities with jurisdiction. Waste packaging should be recycled. Incineration or landfill should only be considered when recycling is not feasible. This material and

## Section 13. Disposal considerations






its container must be disposed of in a safe way. Care should be taken when handling emptied containers that have not been cleaned or rinsed out. Empty containers or liners may retain some product residues. Avoid dispersal of spilled material and runoff and contact with soil, waterways, drains and sewers.

Disposal should be in accordance with applicable regional, national and local laws and regulations.

## Section 14. Transport information

### Proper shipping name

- DOT** : Amines, liquid, corrosive, n.o.s. (CYCLOALIPHATIC AMINE, TRIETHYLENETETRAMINE). Marine pollutant (4,4'-methylenebis(cyclohexylamine), Polyoxypropylenediamine)
- TDG** : Amines, liquid, corrosive, n.o.s. (CYCLOALIPHATIC AMINE, TRIETHYLENETETRAMINE). Marine pollutant (4,4'-methylenebis(cyclohexylamine), Polyoxypropylenediamine)
- IMDG** : Amines, liquid, corrosive, n.o.s. (CYCLOALIPHATIC AMINE, TRIETHYLENETETRAMINE). Marine pollutant (4,4'-methylenebis(cyclohexylamine), Polyoxypropylenediamine)
- IATA** : Amines, liquid, corrosive, n.o.s. (CYCLOALIPHATIC AMINE, TRIETHYLENETETRAMINE)

Regulatory information	UN number	Classes	PG*	Label	Additional information
<b>DOT Classification</b>	UN2735	8	II		-
<b>TDG Classification</b>	UN2735	8	II		-
<b>IMDG Classification</b>	UN2735	8	II	 	<b>Emergency schedules (EmS)</b> F-A, S-B
<b>IATA Classification</b>	UN2735	8	II		<b>Passenger and Cargo Aircraft</b> Quantity limitation: 1 L Packaging instructions: 851 <b>Cargo Aircraft Only</b> Quantity limitation: 30 L Packaging instructions: 855

PG\* : Packing group

## Section 15. Regulatory information

### Safety, health and environmental regulations specific for the product

#### United States Regulations

- TSCA 8(b) inventory** : All components are listed or exempted.
- TSCA 5(a)2 final significant new use rule (SNUR)** : No ingredients listed.
- TSCA 5(e) substance consent order** : No ingredients listed.
- TSCA 12(b) export notification** : No ingredients listed.
- SARA 311/312** : Immediate (acute) health hazard  
Delayed (chronic) health hazard
- Clean Air Act - Ozone Depleting Substances (ODS)** : This product does not contain nor is it manufactured with ozone depleting substances.
- SARA 313** : No ingredients listed.

	<u>Ingredient name</u>	<u>%</u>	<u>Section 304 CERCLA Hazardous Substance</u>	<u>CERCLA Reportable Quantity (Lbs)</u>	<u>Product Reportable Quantity (Lbs)</u>
<b>CERCLA Hazardous substances</b>	Xylene	0.0364	Listed	100	274725
	Propylene oxide	0.000004	Listed	100	2500000000

#### State regulations

- PENNSYLVANIA - RTK** : triethylenetetramine
- California Prop 65** : **WARNING:** This product contains less than 0.1% of a chemical known to the State of California to cause cancer.

<u>Ingredient name</u>	<u>Cancer</u>	<u>Reproductive</u>
Propylene oxide	Yes.	No.

#### Canadian regulations

- CEPA DSL** : All components are listed or exempted.
- WHMIS Classes** : Class D-1B: Material causing immediate and serious toxic effects (Toxic).  
Class D-2B: Material causing other toxic effects (Toxic).  
Class E: Corrosive material

**This product has been classified in accordance with the hazard criteria of the Controlled Products Regulations and the MSDS contains all the information required by the Controlled Products Regulations.**

#### Brazil Regulations



## Section 15. Regulatory information

**Classification system used** : Norma ABNT-NBR 14725-2:2012

**International lists** :

- Australia inventory (AICS)**: All components are listed or exempted.
- China inventory (IECSC)**: All components are listed or exempted.
- Japan inventory**: All components are listed or exempted.
- Korea inventory**: All components are listed or exempted.
- Malaysia Inventory (EHS Register)**: Not determined.
- New Zealand Inventory of Chemicals (NZIoC)**: All components are listed or exempted.
- Philippines inventory (PICCS)**: All components are listed or exempted.
- Taiwan inventory (CSNN)**: Not determined.

## Section 16. Other information

<b>Hazardous Material Information System (U.S.A.)</b> :	<b>Health</b>	*	3
	<b>Flammability</b>		1
	<b>Physical hazards</b>		1
	<b>Personal protection</b>		

**The customer is responsible for determining the PPE code for this material.**

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**National Fire Protection Association (U.S.A.)** :



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▣ Indicates information that has changed from previously issued version.

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