

## GPS Safety Summary

**Substance Name:**

**N, N, N', N'-tetramethyltrimethylenediamine**

### 1. General Statement

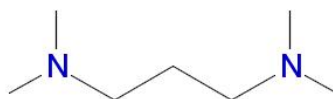
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N, N, N', N'-tetramethyltrimethylenediamine is a colourless liquid miscible in water. It is an amine commonly called TMPDA. It is a flammable liquid and a corrosive product.

### 2. Chemical Identity

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<b>Name:</b>	N, N, N', N'-tetramethyltrimethylenediamine
<b>Brand name:</b>	TMPDA
<b>Chemical name (IUPAC):</b>	N,N,N',N'-tetramethylpropane-1,3-diamine
<b>CAS number(s):</b>	110-95-2
<b>EC number:</b>	203-818-8
<b>Molecular formula:</b>	C <sub>7</sub> H <sub>18</sub> N <sub>2</sub>
<b>Structure:</b>	



### 3. Use and applications

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The main use of N, N, N', N'-tetramethyltrimethylenediamine is as monomer in crosslinked polyamino-polyamide polymer for the manufacture of cosmetic product.

### 4. Physical / Chemical properties

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N, N, N', N'-tetramethyltrimethylenediamine is a flammable liquid organic substance having the following characteristics and physico-chemical properties:

Property	Value
Physical state	liquid at 20°C and 1013 hPa
Colour	colourless
Odour	ammoniacal
Molecular weight	130.23 g/mol
Density	0.7783 at 20°C
Vapour pressure	8.41 hPa at 25°C
Boiling point	141.5°C at 1013 hPa
Flammability	Flammable liquid and vapour

Flash point	31°C (closed cup)
Self-ignition temperature	176°C at 1013 hPa
Explosive / oxidizing properties	Not relevant based on its structure
Water solubility	598 g/L at 25°C
Dissociation constant (pK <sub>a</sub> )	9.8 at 20°C
Octanol-water partition coefficient (Log K <sub>ow</sub> )	0.36

## 5. Health Effects

Effect Assessment	Result
Acute Toxicity Oral / inhalation / dermal	Harmful by oral and dermal routes. Toxic by inhalation exposure
Irritation / corrosion Skin / eye / respiratory tract	Corrosive to the skin. Severely irritating to the eyes. Irritant for the respiratory tract
Sensitisation	Not a skin sensitizer
Toxicity after repeated exposure Oral / inhalation / dermal	An oral study on an analogue substance did not suggest a specific organ toxicity following repeated exposure
Genotoxicity / Mutagenicity	No evidence of genetic toxicity
Carcinogenicity	Not anticipated to cause cancer under conditions of normal use
Reproductive / Developmental Toxicity	A study on an analogue substance did not suggest toxic effects on the fertility and the development

## 6. Environmental Effects

The potential of N, N, N',N'-tetramethyltrimethylenediamine for bioaccumulation is low. This product may however persist in the environment. It is toxic to aquatic life with long lasting effects.

Effect Assessment	Result
Aquatic Toxicity	Toxic to aquatic life with long lasting effects.

Fate and behaviour	Result
Biodegradation	Not readily biodegradable
Other degradation	Not hydrolysable
Bioaccumulation potential	Not expected to bioaccumulate
PBT / vPvB conclusion	Not considered as PBT* or vPvB**

\*: Persistent, Bioaccumulative and Toxic (PBT)

\*\* : very Persistent and very Bioaccumulative (vPvB)

## 7. Exposure

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### 7.1 Human health

N, N, N', N'-tetramethyltrimethylenediamine (TMPDA) is manufactured, used and formulated within industrial settings.

The primary routes of industrial exposure of TMPDA are skin contact and inhalation, ingestion is not an anticipated route of exposure. Workers may be exposed during cleaning, maintenance, transfer, sampling and analysis.

Based on the risk assessment, the exposure can be kept at a safe level (strictly below occupational exposure limits, when applied) when activities are carried out under conditions recommended in the Extended Safety Data Sheet (see Chap. 8 and Exposure Scenarios).

Procedures, controls, suitable collective and personal risk management measures, good industrial hygiene practices and risk communication through appropriate training of workers should be implemented.

In case of exposure to the substance, workers should follow the first aid measures recommended in the Safety Data Sheet.

### 7.2 Environment

The assessment of the environmental exposure was made for all the uses and resulted life cycle stages of the substance from the manufacture to the waste stage.

TMPDA is manufactured and used in continuous or batch processes within industrial settings.

Based on the risk assessment, environmental exposure can be kept at a safe level when activities are carried out under conditions recommended in the extended Safety Data Sheet (see Chap. 6, and Exposure Scenarios).

All industrial aqueous releases that may contain the substance must be treated to avoid any exposure to the environment.

Disposal, treatment or recycling of industrial waste must comply with chap. 13 of the Safety Data Sheet and applicable regulations to preserve the environment.

Procedures, controls and risk management measures should be implemented on industrial manufacturing and application sites; effluents that may contain the substance must be treated to avoid any exposure to the environment.

## 8. Risk Management recommendations

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Human health protective measures	
<b>Organizational</b>	Collect the latest available Safety Data Sheet. Implement good basic standards of occupational health. Ensure operatives are well informed of the hazards and trained to minimise exposures. Handle and store according to the indications of the Safety Data Sheet.
<b>Engineering controls</b>	Provide appropriate local exhaust ventilation at points of emission. Ensure that eye- and handwash stations and safety showers are close to workstation locations.

<b>Personal protective equipment</b>	<b>Eye/Face protection:</b>	Safety glasses with side-shields
	<b>Skin protection:</b>	At the workplace : Protective clothing (cotton). Intervention at incident: Waterproof suit.
	<b>Hand protection:</b>	Gloves (PVC, neoprene). According to permeation index EN 374: 1 (time elapsed > 10 mins).
	<b>Respiratory protection:</b>	Low concentrations or short activity: Mask with specific cartridge (Recommended Filter type: A2B2E2K2P3). High concentrations or prolonged activity: Self contained Breathing Apparatus.
<b>Environmental protective measures</b>		
Do not release into the environment. Do not let product enter drains. Use waste water treatment systems. Do not spread sludge to soil. Neutralize with a sodium bisulphate solution. Destroy the product by incineration (in accordance with local and national regulations) (see chap. 13 of the Safety Data Sheet).		

## 9. Regulatory Information / Classification and Labelling

### 9.1 Regulatory Information

This substance has been registered under:


- EU Regulation EC 1907/2006 (REACH)

### 9.2 Classification and labelling


Under GHS (Globally Harmonized System of classification and labelling of chemicals), substances are classified according to their physical, health, and environmental hazards. The hazards are communicated via specific labels and safety data sheets. GHS attempts to standardize hazard communication so that the intended audience (workers, consumers, transport workers, and emergency responders) can better understand the hazards of the chemicals in use. Substances registered for REACH are classified according to Regulation (EC) 1272/2008, implementation of the GHS in the European Union.

#### **Classification and labelling according to Regulation (EC) n° 1272/2008:**

Classification
– Flammable liquids: Category 3
– Acute toxicity – Oral: Category 4
– Acute toxicity – Inhalation: Category 3
– Acute toxicity – Dermal: Category 4
– Skin corrosion: Category 1B
– Serious eye damage: Category 1
– Specific target organ toxicity - single exposure (inhalation): Category 3
– Chronic aquatic toxicity: Category 2

Labelling	
Hazard pictogram(s)	
	
Signal word	
– Danger	
Hazard statement(s)	
<ul style="list-style-type: none"> <li>– H226: Flammable liquid and vapour.</li> <li>– H302: Harmful if swallowed.</li> <li>– H312: Harmful in contact with skin.</li> <li>– H331: Toxic if inhaled.</li> <li>– H314: Causes severe skin burns and eye damage.</li> <li>– H335: May cause respiratory irritation.</li> <li>– H411: Toxic to aquatic life with long lasting effects.</li> </ul>	

**Classification and labelling according to GHS:**

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Labelling	
Hazard pictogram(s)	
	
Signal word	
– Danger	
Hazard statement(s)	
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## 10. Contact Information within Company

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For further information on this substance or product safety summary in general, please contact:

- arkema-thiochem-reach-uses@arkema.com
- **ICCA portal where the GPS Safety Summary is posted:**  
<http://www.icca-chem.org/en/Home/ICCA-initiatives/global-product-strategy/>

## 11. Date of Issues / Revision

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- Date of issue: 2014/11/30
- Date of revision:

## 12. Disclaimer

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The information contained in this paper is intended as advice only and whilst the information is provided in utmost good faith and has been based on the best information currently available, is to be relied upon at the user's own risk.

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