



## Safety Data Sheet

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### Section 1. Identification of the substance/mixture and of the company/undertaking

Product identifier:

Product name: Triethylenetetramine

SDS No. : 8022E-3

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

Research and Development

Details of the supplier of the safety data sheet

Manufacturer/Supplier: KISHIDA CHEMICAL CO., LTD.

Address: 3-1, Honmachibashi, Chuo-ku, Osaka, JAPAN

Division: Chemical Safety Management Department

Telephone number: +81-6-6946-8061

FAX: +81-6-6946-1607

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### Section 2. Hazards identification

GHS classification and label elements of the product

Classification of the substance or mixture

#### HEALTH HAZARDS

Acute toxicity (Dermal): Category 3

Skin corrosion/irritation: Category 1

Serious eye damage/eye irritation: Category 1

Respiratory sensitization: Category 1

Skin sensitization: Category 1

Reproductive toxicity: Category 1B

Specific target organ toxicity – single exposure: Category 3 (Respiratory tract irritation)

#### ENVIRONMENT HAZARDS

Hazardous to the aquatic environment, short-term (acute): Category 3

Hazardous to the aquatic environment, long-term (chronic): Category 2

(Note) GHS classification without description: Not classified/Classification not possible

Label elements



Signal word: Danger

#### HAZARD STATEMENT

Toxic in contact with skin

Causes severe skin burns and eye damage

May cause allergy or asthma symptoms or breathing difficulties if inhaled

May cause an allergic skin reaction

May damage fertility or the unborn child

May cause respiratory irritation

Harmful to aquatic life

Toxic to aquatic life with long lasting effects

#### PRECAUTIONARY STATEMENT

Prevention

Avoid release to the environment.

Do not breathe dust/fume/gas/mist/vapors/spray.

In case of inadequate ventilation wear respiratory protection.



Use only outdoors or in a well-ventilated area.  
Wash contaminated parts thoroughly after handling.  
Contaminated work clothing should not be allowed out of the workplace.  
Wear protective gloves, protective clothing or face protection.  
Wear eye protection/face protection.

**Response**

Collect spillage.  
IF exposed or concerned: Get medical advice/attention.  
Call a POISON CENTER/doctor/physician if you feel unwell.  
If experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician.  
IF INHALED: Remove person to fresh air and keep comfortable for breathing.  
IF ON SKIN: Wash with plenty of soap and water.  
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.  
If skin irritation or rash occurs: Get medical advice/attention.  
Take off immediately all contaminated clothing and wash it before reuse.  
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.  
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.

**Storage**

Store in a well-ventilated place. Keep container tightly closed.

**Disposal**

Dispose of contents/container in accordance with local/national regulation.

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**Section 3. Composition/information on ingredients****Mixture/Substance selection:****Substance**

Ingredient name:Amines, polyethylenepoly-, triethylenetetramine fraction  
Content (%):90(min)  
Chemicals No, Japan:2-163, 7-5  
CAS No.:90640-67-8  
ECNO:292-588-2

Ingredient name:As (linear)Triethylenetetramine  
Content (%):70  
Chemical formula:C6H18N4  
Chemicals No, Japan:2-163; 7-5  
CAS No.:112-24-3  
MW:146.3  
ECNO:203-950-6

Note : The figures shown above are not the specifications of the product.

**Impurities**

Diethylenetriamine  $\leq 1.0\%$  (CAS No.111-40-0)

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**Section 4. First-aid measures****Descriptions of first-aid measures****General measures**

IF exposed or concerned: Get medical advice/attention.

**IF INHALED**

Remove person to fresh air and keep comfortable for breathing.  
If experiencing respiratory symptoms: Call a POISON CENTER/doctor/physician.  
Call a POISON CENTER/doctor/physician if you feel unwell.

**IF ON SKIN (or hair)**

Take off immediately all contaminated clothing. Rinse skin with water or shower.

Wash with plenty of soap and water.

If skin irritation or rash occurs: Get medical advice/attention.

**IF IN EYES**

Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.

If eye irritation persists: Get medical advice/attention.

**IF SWALLOWED**

Rinse mouth. Do NOT induce vomiting.

Call a POISON CENTER/doctor/physician if you feel unwell.

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**Section 5. Fire-fighting measures****Extinguishing media****Suitable extinguishing media**

In case of fire, use water mist, foam, dry powder, CO<sub>2</sub> to extinguish.

**Unsuitable extinguishing media**

Indoor firefighting equipment or outdoor firefighting equipment

Sprinkler equipment

Dry-powder firefighting equipment – other (except for phosphate etc.,hydrogen carbonate etc.)

Straight stream water extinguisher

Water mist extinguisher

Reinforcing liquid jet extinguisher

Dry-powder extinguisher – other (except for phosphate etc.,hydrogen carbonate etc.)

Bucket of water or tank of water

**Specific hazards arising from the substance or mixture**

Containers may explode when heated.

Fire may produce irritating, corrosive and/or toxic gases.

**Advice for firefighters****Specific fire-fighting measures**

Evacuate non-essential personnel to safe area.

**Special protective equipment and precautions for fire-fighters**

Wear fire resistant or flame retardant clothing.

Wear protective gloves/protective clothing/eye protection/face protection.

Firefighters should wear self-contained breathing apparatus with full face piece operated positive pressure mode.

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**Section 6. Accidental release measures****Personnel precautions, protective equipment and emergency procedures**

Ventilate area until material pick up is complete.

Wear proper protective equipment.

**Environmental precautions**

Prevent spills from entering sewers, watercourses or low areas.

**Methods and materials for containment and cleaning up**

Absorb spill with inert material (dry sand, earth, et al), then place in a chemical waste container.

**Preventive measures for secondary accident**

Collect spillage.



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**Section 7. Handling and storage****Precautions for safe handling****Preventive measures**

(Exposure Control for handling personnel)

Do not breathe dust/fume/gas/mist/vapors/spray.

(Protective measures against fire and explosion)

Keep away from heat, hot surfaces, sparks, open flames and other ignition sources. No smoking.

(Exhaust/ventilator)

Exhaust/ventilator should be available.

(Safety treatments)

Avoid contact with skin.

Avoid contact with eyes.

**Safety Measures**

Use only outdoors or in a well-ventilated area.

Wear protective gloves, protective clothing or face protection.

Wear eye protection/face protection.

When using do not eat, drink or smoke.

**Any incompatibilities**

See "10.Stability and Reactivity"

**Advice on general occupational hygiene**

Wash contaminated parts thoroughly after handling.

Contaminated work clothing should not be allowed out of the workplace.

Take off immediately all contaminated clothing and wash it before reuse.

**Storage****Conditions for safe storage**

Keep container tightly closed.

Store in a cool, dry place. Do not store in direct sunlight.

Keep under lock and key.

**Container and packaging materials for safe handling**

Glass

Stainless steel

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**Section 8. Exposure controls/personal protection****Control parameters****Adopted value**

(Diethylenetriamine)

ACGIH(1985) TWA: 1ppm (URT & eye irr)

**Notation**

(Diethylenetriamine)

Skin

**Exposure controls****Appropriate engineering controls**

Do not use in areas without adequate ventilation.

Eye wash station should be available.

Washing facilities should be available.

**Individual protection measures****Respiratory protection**

Wear respiratory protection.

**Hand protection**

Wear protective gloves.

**Eye protection**



Wear eye/face protection.

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## Section 9. Physical and Chemical Properties

Information on basic physical and chemical properties

Physical state: Liquid

Color: Light yellow

Odor: Characteristic odor

Melting point/Freezing point:  $-35^{\circ}\text{C}$

Boiling point or initial boiling point data is not available.

Boiling range data is not available.

Flammability (gases, liquids and solids) data is not available.

Lower and upper explosion limit/flammability limit data is not available.

Flash point:  $137^{\circ}\text{C}$

Auto-ignition temperature data is not available.

Decomposition temperature data is not available.

pH: 12.4(25% solution, $25^{\circ}\text{C}$ )

Kinematic viscosity data is not available.

Solubility:

Solubility in water: Soluble

n-Octanol/water partition coefficient data is not available.

Vapor pressure data is not available.

Density and/or relative density: 0.98

Relative vapor density (Air=1) data is not available.

Particle characteristics data is not available.

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## Section 10. Stability and Reactivity

Reactivity

Not available.

Chemical stability

Stable under normal storage/handling conditions.

Possibility of hazardous reactions

((linear)Triethylenetetramine)

Decomposes on heating. This produces toxic fumes including nitrogen oxides. The substance is a strong base. It reacts violently with acid and is corrosive to aluminium, copper and zinc. Reacts violently with strong oxidants. This generates fire and explosion hazard. This produces toxic fumes. Attacks some coatings, some forms of plastic and rubber. (ICSC 1123)

Conditions to avoid

Contact with incompatible materials.

Contact with fire source.

Incompatible materials

Acids, Strong oxidizing agents

Hazardous decomposition products

Carbon oxides, Nitrogen oxides

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## Section 11. Toxicological Information

Information on toxicological effects

Acute toxicity

Acute toxicity (Oral)

[Data for components of the product]

[GHS Cat. Japan, base data]

(Diethylenetriamine)



rat LD50=1080mg/kg (MOE risk assessment vol.11, 2013)

Acute toxicity (Dermal)

[Data for components of the product]

[GHS Cat. Japan, base data]

((linear)Triethylenetetramine)

rabbit LD50=550mg/kg (SIDS, 1998)

(Diethylenetriamine)

rabbit LD50=1090mg/kg (MOE risk assessment vol.11, 2013)

Irritant properties

Skin corrosion/irritation

[Data for components of the product]

[GHS Cat. Japan, base data]

((linear)Triethylenetetramine)

rabbit necrosis (SIDS, 1998)

(Diethylenetriamine)

human/rabbit corrosive (NITE Initial Risk Assessment Report, 2005)

Serious eye damage/irritation

[Data for components of the product]

[GHS Cat. Japan, base data]

((linear)Triethylenetetramine)

rabbit corrosive (SIDS, 1998)

(Diethylenetriamine)

human/rabbit corrosive (NITE Initial Risk Assessment Report, 2005)

Sensitization

Respiratory sensitization

[Data for components of the product]

[GHS Cat. Japan, base data]

(Diethylenetriamine)

cat. 1; NITE Initial Risk Assessment Report, 2005

Skin sensitization

[Data for components of the product]

[GHS Cat. Japan, base data]

((linear)Triethylenetetramine)

cat. 1; guinea pig : sensitizing, SIDS, 1998

(Diethylenetriamine)

cat. 1; NITE Initial Risk Assessment Report, 2005

Mutagenic effects data is not available.

Carcinogenic effects data is not available.

Reproductive toxicity

[Data for components of the product]

[GHS Cat. Japan, base data]

(Diethylenetriamine)

cat. 1B; NITE Initial Risk Assessment Report, 2005

Specific target organ toxicity (STOT)

STOT-single exposure

[Data for components of the product]

[cat.3 (respiratory tract irritation)]

[GHS Cat. Japan, base data]

((linear)Triethylenetetramine)

respiratory tract irritation (SIDS, 1998)

STOT-repeated exposure data is not available.

Aspiration hazard data is not available.



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**Section 12. Ecological Information****Toxicity****Aquatic toxicity**

[Data for components of the product]

Hazardous to the aquatic environment, short-term (acute)

[GHS Cat. Japan, base data]

((linear)Triethylenetetramine)

Algae (*Raphidocelis subcapitata*) ErC50=27mg/L/72hr; Fish (*Oryzias latipes*)

LC50&gt;110mg/L/96hr (MOE Results of Eco-toxicity tests of chemicals, 2002)

(Diethylenetriamine)

Crustacea (*Daphnia magna*) EC50=16mg/L/48hr (SIDS, 2002)

Hazardous to the aquatic environment, long-term (chronic)

[GHS Cat. Japan, base data]

((linear)Triethylenetetramine)

Algae (*Raphidocelis subcapitata*) NOErC=0.468mg/L/72hr (MOE Results of Eco-toxicity tests of chemicals, 2002)

(Diethylenetriamine)

Crustacea (*Daphnia magna*) NOEC=5.6mg/L/21days (SIDS, 2002)**Water solubility**

((linear)Triethylenetetramine)

not poorly water-soluble (4770000 mg/L (PHYSPROP Database))

(Diethylenetriamine)

miscible (ICSC, 1996)

**Persistence and degradability**

[Data for components of the product]

(Diethylenetriamine)

Not rapidly degradable (BOD\_Degradation : 0% METI existing chemical safety inspections 1982)

**Bioaccumulative potential**

[Data for components of the product]

((linear)Triethylenetetramine)

log Kow=-2.65 (KOWWIN)

(Diethylenetriamine)

log Pow=-1.3 (ICSC, 1996)

**Mobility in soil**

Mobility in soil data is not available.

**Other adverse effects**

Ozone depleting chemical data is not available.

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**Section 13. Disposal considerations**

Description of waste residues and information on their safe handling and methods of disposal, including the disposal of any contaminated packaging

**Waste treatment methods**

Avoid release to the environment.

Dispose of contents/container in accordance with local/national regulation.

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**Section 14. Transport Information**

UN Number or ID Number : 2259

UN Proper Shipping Name :

TRIETHYLENETETRAMINE

Class or division (Transport hazard class) : 8

Packing group : II



ERG GUIDE No.: 153

IMDG Code (International Maritime Dangerous Goods Regulations)

UN Number or ID Number : 2259

UN Proper Shipping Name :

TRIETHYLENETETRAMINE

Class or division (Transport hazard class) : 8

Packing group : II

IATA (Dangerous Goods Regulations)

UN Number or ID Number : 2259

UN Proper Shipping Name :

TRIETHYLENETETRAMINE

Class or division (Transport hazard class) : 8

Hazard labels : Corrosive

Packing group : II

Environmental hazards

Marine pollutants (yes/no) : yes

Transport in bulk according to Annex II of MARPOL 73/78 and the IBC Code

Noxious Liquid Substances ; Cat. Y

Diethylenetriamine; (linear)Triethylenetetramine

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#### Section 15. Regulatory Information

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

U.S. Toxic Substances Control Act (TSCA) Inventory

Chemicals listed in TSCA Inventory

Diethylenetriamine; (linear)Triethylenetetramine

Other regulatory information

Ensure this material in compliance with federal requirements and ensure conformity to local regulations.

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#### Section 16. Other information

GHS classification and labelling

Acute toxicity, Category 3: H311 Toxic in contact with skin

Skin corrosion/irritation, Category 1: H314 Causes severe skin burns and eye damage

Serious eye damage/eye irritation, Category 1: H318 Causes serious eye damage

Respiratory sensitization, Category 1: H334 May cause allergy or asthma symptoms or breathing difficulties if inhaled

Skin sensitization, Category 1: H317 May cause an allergic skin reaction

Reproductive toxicity, Category 1B H360 May damage fertility or the unborn child

STOT – single exposure, Category 3, Respiratory tract irritation: H335 May cause respiratory irritation.

Hazardous to the aquatic environment, short-term (acute), Category 3: H402 Harmful to aquatic life

Hazardous to the aquatic environment, long-term (chronic), Category 2: H411 Toxic to aquatic life with long lasting effects

References and sources for data

Globally Harmonized System of classification and labelling of chemicals, UN

Recommendations on the TRANSPORT OF DANGEROUS GOODS 21th edit., 2019 UN

IMDG Code, 2020 Edition (Incorporating Amendment 40–20)

IATA Dangerous Goods Regulations (62nd Edition) 2021

2020 EMERGENCY RESPONSE GUIDEBOOK (US DOT)

2022 TLVs and BEIs. (ACGIH)

Supplier's data/information



**General Disclaimer**

This data sheet was created based on the information we currently have and may be revised according to new information. In addition, the precautions apply only to normal handling, and in the case of special handling, please make adequate countermeasure to maintain your safety.

The data given here is based on current knowledge and experience. The purpose of this Safety Data Sheet is to describe the products in terms of their safety requirements. The data does not signify any warranty with regard to the products' properties.

The GHS classification data given here is based on current Japan official data (NITE published in 2021).