



Material Safety Data Sheet

Meta-Toluenediamine

1. Identification

Product name:Meta-Toluenediamine

Product Use Description:Chemical intermediate.

Company:Nanjing Xiangshengtai Industry Co., Ltd.

Room 206, Building 2, Xincheng Fazhan Center, East Tianyuan Road, Nanjing, China

Telephone:025-84801979

Emergency telephone number:01-610-481-7711 International

2.Composition/Information On Ingredients

Components	CAS Number	Concentration
Diaminotoluene, 2,4-	95-80-7	> 79%
Diaminotoluene, 2,6-	823-40-5	> 19%
Toluenediamine isomers	25376-45-8	< 0.8 %

Chemical Family: Aromatic Amine

3. Hazards Identification

Emergency Overview

- Toxic if swallowed.
- Note:This material is commonly transported in the molten state.Inadvertent contact may cause thermal burns.
- Investigated as a human carcinogen.
- Reproductive toxin.
- Mild skin irritant.
- Irritating to eyes.

Potential Health Effects

Inhalation:In general, toxic concentrations are most readily attained through inhalation of dust (which includes indirect ingestion) or directly through oral exposure.

Eye contact:Contact with eyes may cause irritation.

Skin contact:Contact with hot product will cause thermal burns. Mild skin irritation.

Ingestion:May be fatal if swallowed. Toxic if swallowed.Chronic Health Hazard:This product contains listed carcinogen(s) according to IARC, AC GIH, NTP and/or OSHA in concentrations of 0.1 percent or greater. Investigated as a human carcinogen. Reproductive toxin. Repeated and/or prolonged exposures may result in: Liver disorders (such as jaundice



Room 206, Building 2, Xincheng Fazhan Center, East Tianyuan Road, Nanjing, China
or liver enlargement). Blood chemistry changes (such as methemoglobinemia leading to cyanosis or loss of consciousness). Reproductive disorders (such as birth defects or sterility).

Exposure Guidelines

Target Organs

- Liver
- disorders
- Eyes.
- Liver.
- Blood.
- Reproductive hazard.

Aggravated Medical Condition

Liver disorders Eye disease

4. First Aid Measures

General advice:

Seek medical advice. If breathing has stopped or is labored, give assisted respirations. Supplemental oxygen may be indicated. If the heart has stopped, trained personnel should begin cardiopulmonary resuscitation immediately.

Eye contact

“Rinse immediately with plenty of water also under the eyelids for at least 20 minutes. Remove contact lenses.

Skin contact

Avoid washing with hot water to minimize absorption. General contamination of the body or limbs requires a full body shower with special attention to hair and fingernails. Discard contaminated shoes and clothing. Wash off immediately with plenty of water for at least 20 minutes. Wash off with soap and water. Immediately remove contaminated clothing, and any extraneous chemical, if possible to do so without delay.

Ingestion

Never give anything by mouth to an unconscious person. Prevent aspiration of vomit. Turn victim's head to the side.

Inhalation

Move to fresh air

5. Fire-Fighting Measures

Suitable extinguishing media

- Alcohol-resistant foam.
- Carbon dioxide (C O2).



- Dry chemical.
- Dry sand.
- Limestone powder.

Specific hazards

May generate ammonia gas. May generate toxic nitrogen oxide gases. Use of water may result in the formation of very toxic aqueous solutions. Do not allow run-off from fire fighting to enter drains or water courses. Incomplete combustion may form carbon monoxide. Ammonia gas may be liberated at high temperatures. In case of incomplete combustion an increased formation of oxides of nitrogen (NO_x) is to be expected. Downwind personnel must be evacuated. Burning produces obnoxious and toxic fumes.

Special protective equipment for fire-fighters:

Avoid contact with the skin. A face shield should be worn. Use personal protective equipment. Wear self contained breathing apparatus for fire fighting if necessary.

Further information:

Do not allow run-off from fire fighting to enter drains or water courses.

6. Accidental Release Measures

Personal precautions: Use self-contained breathing apparatus and chemically protective clothing. Wear suitable protective clothing, gloves and eye/face protection. Evacuate personnel to safe areas.

Methods for cleaning up: Flush area with hot water spray. Approach suspected leak areas with caution. Contact Air Products' Emergency Response Center for advice. Place in appropriate chemical waste container.

Additional advice: If possible, stop flow of product.

7. Handling And Storage

Handling

Avoid use of glass wool insulation due to rapid oxidation of product resulting in possible spontaneous ignition. Emergency showers and eye wash stations should be readily accessible. Adhere to work practice rules established by government regulations. Avoid contact with eyes. Melt should be transferred in leak-free systems (pumps, pipe and coupling). Use personal protective equipment. When using, do not eat, drink or smoke.

Storage

Do not store near acids. Keep containers tightly closed in a dry, cool and well-ventilated place.

Technical measures/Precautions

Do not store in reactive metal containers.



8. Exposure Controls / Personal Protection

Engineering measures

Provide readily accessible eye wash stations and safety showers. Provide natural or explosion-proof ventilation adequate to ensure concentrations are kept below exposure limits.

Personal protective equipment

Respiratory protection: Not required for properly ventilated areas.

Hand protection:

- Neoprene gloves.
- PVC disposable gloves
- Nitrile rubber.
- Loose fitting thermal insulated or leather gloves.
- The breakthrough time of the selected glove(s) must be greater than the intended use period.

Air Products and Chemicals, Inc

Eye protection

- Full face shield with goggles underneath when molten material is being handled.
- Chemical resistant goggles must be worn.

Skin and body protection

- Long sleeve shirts and trousers without cuffs.
- Rubber or plastic boots.
- Slicker Suit.

Special instructions for protection and hygiene

Provide readily accessible eye wash stations and safety showers. Wash at the end of each workshift and before eating, smoking or using the toilet. Change work clothing daily before leaving the work place. Discard contaminated Clothing.

Exposure limit(s)

Diaminotoluene, 2,4-	Time Weighted Average (TWA): WEEL	0.005 ppm	0.025 mg/m ³
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Physical And Chemical Properties

Form	Solid.
Color	Yellow. Deep violet or black upon extended storage or when exposed to air.
Odor	Ammoniacal.
Relative density	1.04 (water = 1)
Vapor pressure	0.01 mmHg at 70 °F (21 °C)
Density	64.925 lb/ft ³ (1.04 g/cm ³) at 70 °F (21 °C)
Boiling point/range	541 °F (283 °C)
Melting point/range	205 °F (96 °C)



Flash point 140 °C
Autoignition temperature 842 °F (450 °C)
Water solubility 0.65 g/l

10. Stability And Reactivity

Stability: Stable under normal conditions.

Materials to avoid: Sodium hypochlorite.

Organic acids (i.e. acetic acid, citric acid etc.).

Mineral acids.

Reaction with peroxides may result in violent decomposition of peroxide possibly creating an explosion. Oxidizing agents.

Stability: The product is stable and does not undergo spontaneous polymerization. This product undergoes oxidation when exposed to air with the production of color bodies and tars. This reaction proceeds most rapidly at high temperature, for example, when in the molten state. Oxidation products have not been fully characterized and should be treated as toxic materials. This product is weakly basic and reacts with mineral acids to form water soluble amine salts. These salts are more stable to oxidation than the basic amine. Glass wool insulation.

Hazardous decomposition products

- In case of fire hazardous decomposition products may be produced such as:
- Carbon monoxide.
- Carbon dioxide (CO₂).
- Nitrogen oxides (NO_x).
- Nitrogen oxide can react with water vapors to form corrosive nitric acid.
- Ammonia.

11. Toxicological Information

Acute Health Hazard

Ingestion:

LD₅₀ : 212 mg/kg

Species: Rat.

Inhalation

LC₅₀ (4 h) : > 181 ppm

Species : Rat.

Skin.

LD₅₀ : > 5,750 mg/kg

Species : Rabbit.

Eye irritation/corrosion

Eye irritation.

Acute dermal irritation/corrosion

Mild skin irritation.



Sensitization

Dermal sensitization to this product or component has been seen in some humans.

Chronic Health Hazard

AMES TEST: Positive (activated and nonactivated). Reproductive effects, methemoglobinemia, hepatotoxicity, thyroid, and bone marrow hyperplasia have been reported in exposed laboratory animals.

Carcinogenicity

Diaminotoluene, 2,4-	IAR :	2B - Possible carcinogen.
NTP CARC		

12. Ecological Information

Ecotoxicity effects

Aquatic toxicity

The LC 50 of TDA to various fish species ranges from 0.161 to 1420 mg/L and is isomer and species dependent. Based on microtox screening the ranking from most to least toxic is as follows: 2,5>2,4>commercial m-TDA>3,4>2,3>2,6.

Toxicity to other organisms

No data available.

Persistence and degradability

Mobility

No data available.

Bioaccumulation

No data is available on the product itself.

Further information

The sorption of 2,4-Toluenediamine (2,4-TDA), 2,6-TDA, and 4,4'-Methylenedianiline (4,4'-MDA) onto soils and biodegradation under both aerobic and anaerobic conditions has been studied. The diamines are readily sorbed by soils; little of the sorbed diamine could be removed from the soil, even with strong acid or base. The carbon-14 labeled TDA isomers and MDA started to biodegrade immediately after mixing with aerobic soil with the recovery of 2 or 3% ¹⁴CO₂ after only 3 days. Under anaerobic methanogenic conditions no ¹⁴CH₄ or ¹⁴CO₂ was recovered from any of the diamines after 73 days incubation. The strong binding to soil combined with the apparently rapid aerobic biodegradation of available TDA and MDA suggest minimal risk to the environment due to emissions of the diamines incidental to their manufacture and use.

13. Disposal Considerations

Waste from residues / unused products

TDA is listed in 40CFR261.33f as Hazardous Waste No. U221 with CAS number 25376-45-8 which covers all TDA isomers. Contact supplier if guidance is required.

Contaminated packaging



14. Transport Information

CFR

- **Proper shipping name** :2,4-TOLUYLENEDIAMINE, SOLID
- **Class**:6.1
- **UN/ID No.:**UN1709
- **Packing group**:III

IATA

- **Proper shipping name** :2,4-TOLUYLENEDIAMINE, SOLID
- **Class**:6.1
- **UN/ID No.:**UN1709
- **Packing group**:III

IMDG

- **Proper shipping name** :2,4-TOLUYLENEDIAMINE, SOLID
- **Class**:6.1
- **UN/ID No.:**UN1709
- **Packing group**:III

CTC

- **Proper shipping name** :2,4-TOLUYLENEDIAMINE, SOLID
- **Class**:6.1
- **UN/ID No.:**UN1709
- **Packing group**:III

Further Information

Not classified as dangerous in the meaning of transport regulations.

15. Regulatory Information

OSHA Hazard Communication Standard (29 CFR 1910.1200) Hazard Class(es)

Carcinogen. Reproductive toxin. Toxic

Country	Regulatory list	Notification
USA	TSCA	Included on Inventory.
EU	EINECS	Included on EINECS inventory or polymer substance, monomers included on EINECS inventory or no longer polymer.
Australia	AICS	Included on Inventory.
Japan	ENC S	Included on Inventory.
South Korea	ECL	Included on Inventory.
China	SEPA	Included on Inventory.



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Philippines	PICCS	Not on Inventory.
Canada	DSL	Included on Inventory.

EPA SARA Title III Section 312 (40 CFR 370) Hazard Classification:

Chronic Health Hazard

EPA SARA Title III Section 313 (40 CFR 372) Component(s) above 'de minimus' level

Diaminotoluene, 2,4-

Diaminotoluene, 2,6-

Diaminotoluene, 2,5-

US. California Safe Drinking Water & Toxic Enforcement Act (Proposition 65)

WARNING! This product contains a chemical known in the State of California to cause birth defects or other reproductive harm., WARNING! This product contains a chemical known in the State of California to cause cancer.

Diaminotoluene, 2,4-

Dinitrotoluene isomers

WHMIS Hazard Classification

Toxic Material Causing Immediate and Serious Toxic Effects, Very Toxic Material Causing Other Toxic Effects, Toxic Material Causing Other Toxic Effects

16. OTHER INFORMATION

HMIS Rating

Health:3

Flammability:1

Physical hazard:0