

SAFETY DATA SHEET

Section 1: Identification

1.1 Product identifier:

WANNAMINE® IPDA

Other means of Identification: Isophorone diamine (IPDA), 5-amino-1,3,3-trimethyl-Cyclohexanemethanamine

1.2 Recommended use:

Identified uses: Curing agent in epoxies, coatings, polyamine resins. Raw material for Isophorone diisocyanate (IPDI).

Restrictions on use: Industrial uses only, not intended for consumer and domestic (household) uses

1.3 Supplier:

Wanhua Chemical (America) Co., Ltd.
3803 West Chester Pike, Suite 240
Newtown Square, PA 19073
Tel: 613-796-1606 Customer service: 610-566-5297
www.whchem.com

Telephone in Canada: 613-796-1606

1.4 Emergency telephone number:

North America: Chemtrec 800-424-9300 (domestic)
+1-703-527-3887 (international, collect calls accepted)
Europe: +31 20 20 65132/65130 (08:30-17:30) +44 780 183 7343

Section 2: Hazard Identification

2.1 Classification:

Classified according to US Hazard Communication Standard (29 CFR 1910.1200) and Canada Hazardous Products Regulations (WHMIS 2015).

Skin corrosion Cat. 1B; H314
Eye damage Cat. 1; H318
Acute toxicity (oral) Cat. 4; H302
Skin sensitization Cat. 1A; H317

2.2 Label elements:



Danger
Causes severe skin burns and eye damage.
Harmful if swallowed.
May cause an allergic skin reaction.

Prevention
Do not breathe dusts, mists, vapors or fumes.
Wash hands and exposed skin thoroughly after handling
Do not eat, drink or smoke when using this product.
Contaminated work clothing should not be allowed out of the workplace.
Wear protective gloves, protective clothing and eye protection or face protection.

Response
IF SWALLOWED: Rinse mouth. Do NOT induce vomiting.
IF ON SKIN (or hair): Take off immediately all contaminated clothing. Rinse skin with water or shower.
Wash contaminated clothing before reuse. If skin irritation or rash occurs: Get medical attention.
IF INHALED: Remove person to fresh air and keep comfortable for breathing.
Immediately call a POISON CENTER or doctor.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. Immediately call a POISON CENTER or doctor.

Storage
Store locked up.

Disposal
Dispose of contents and container in accordance with local, regional, national and international regulations.

2.3 Other hazards:

May be toxic to aquatic organisms with long lasting effects. Avoid releases to the environment. Collect spillage.

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Section 3: Composition/Information on Ingredients

<u>Chemical Name</u>	<u>CAS RN®</u>	<u>Wt.%</u>	<u>GHS Classification</u>
Cyclohexanemethanamine,5-amino-1,3,3-trimethyl- Common name: Isophorone diamine, IPDA EC no. 220-666-8	2855-13-2	99.7 - 100	Acute tox. (oral) 4; H302 Skin corrosion 1B; H314 Eye damage 1; H318 Skin sens. 1A; H317

Section 4: First-Aid Measures

4.1 Description of first-aid measures:

Inhalation: Take precautions to ensure your own safety before attempting rescue (e.g. wear appropriate protective equipment, use the buddy system). Remove source of exposure or move person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor.

Skin contact: Avoid direct contact. Wear chemical protective clothing, if necessary. Take off immediately all contaminated clothing, shoes and leather goods (e.g. watchbands, belts). Rinse skin with lukewarm, gently flowing water or shower for several minutes. Immediately call a POISON CENTER or doctor.

Eye contact: Avoid direct contact. Wear chemical protective clothing, if necessary. Remove source of exposure or move person to fresh air and keep comfortable for breathing. Immediately call a POISON CENTER or doctor. Rinse the contaminated eye(s) with lukewarm, gently flowing water for several minutes, while holding the eyelid(s) open. Remove contact lenses, if present and easy to do. Continue rinsing. Take care not to rinse contaminated water into the unaffected eye or onto the face.

Ingestion: Rinse mouth. Do NOT induce vomiting. Immediately call a POISON CENTER or doctor. If vomiting occurs naturally, have person lie on their side, in the recovery position.

4.2 Most important symptoms and effects, acute and delayed:

See Section 11 of this SDS where additional symptoms and important health effects are described.

Inhalation: Symptoms of exposure to vapors or mists from heating or spraying include labored breathing, respiratory irritation, coughing, sore throat and chest pain. May cause symptoms chest tightness and wheezing symptoms similar to a cold, flu or asthma.

Skin contact: Corrosive to skin. Liquid and mist cause severe burns. Repeated skin contact can cause an allergic skin reaction; symptoms include redness, itching, rash and swelling of the skin.

Eye Contact: Causes severe eye irritation including burns. Damage may be permanent and may cause blindness. Vapors may cause temporary visual disturbance known as halo vision or blue haze.

Ingestion: Swallowing causes severe pain and irritation or burns to the lips, mouth, throat and digestive tract. Acute oral toxicity in rats LD₅₀ reported to be 1030 mg/kg. Symptoms of toxicity include inflammation of tissues, ulceration, weakness, tremors, salivation, severe diarrhea collapse and difficulty breathing; death may be delayed as a result of corrosive injury.

4.3 Indication of any immediate medical attention and special treatment needed:

If swallowed, if in eyes or in case of difficulty breathing, urgent medical treatment is necessary.

Section 5: Fire-fighting Measures

5.1 Extinguishing media:

Water fog or fine spray, alcohol-resistant foam, carbon dioxide or dry chemical (BC powder).
Use water spray to cool fire-exposed containers.

Unsuitable extinguishing media: High pressure water streams may scatter hot liquid and may spread the fire.

5.2 Special hazards arising from the chemical:

Product can burn if heated; Flash point 112°C (233.6°F)
Product will burn if involved in a fire.
Burning may release corrosive and toxic aerosols.
Combustion products may include nitrogen oxides, volatile amines, carbon monoxide and carbon dioxide.

5.3 Special protective equipment and precautions for firefighters:

As for any fire, evacuate the area and fight the fire from a safe distance.
Firefighters must wear full protective equipment including self-contained breathing apparatus with chemical protection clothing when firefighters are exposed to decomposition products from this material.

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Section 6: Accidental Release Measures

6.1 Personal precautions, protective equipment and emergency procedures:

Isolate the area; keep all unprotected people away from the spill area.
Wear protective gloves/protective clothing/eye protection/face protection (See Section 8).
Do not breathe dust, mists or vapors.
Ensure clean-up is conducted by trained personnel only.
Ventilate the area. Extinguish or remove all ignition sources.
Do not touch or walk through the spilled material. Spilled material may pose a slipping hazard.

6.2 Environmental precautions:

Avoid releases to the environment and prevent material from entering confined areas, domestic sewers, natural waterways, or storm water management systems.

6.3 Methods and material for containment and cleaning up:

Stop the spill if it is safe to do so. Contain the spill with earth, sand or other suitable non-combustible absorbent.
Clean up spills immediately.

Small spills: Cover spilled liquid with a non-combustible absorbent (e.g. dry sand). Scoop up spilled product and any contaminated absorbents into appropriate, labeled containers. Contaminated absorbent may pose the same hazards as the spilled product.

Large liquid spills: Pump spilled liquid into suitable containers or allow product to solidify and sweep or scoop up. Keep containers closed and label with the hazard information.

Flush the area with water and detergents. Collect wash-water for proper disposal.
Do not discharge to drains, surface waters or groundwater.

6.4 Reference to other sections:

See Section 8 for information on selection of personal protective equipment.
See Section 13 for information on disposal of spilled product and contaminated absorbents.

Section 7: Handling and Storage

7.1 Precautions for safe handling:

Before handling, it is important that engineering controls are operating; protective equipment requirements and personal hygiene measures are being followed.
People working with this chemical should be properly trained regarding its hazards and its safe use.
Store in a place accessible by authorized persons only.
Keep container tightly closed when not in use.
Wear eye protection, protective gloves, clothing and other equipment required for the workplace.
Wash exposed skin thoroughly, immediately after exposure to product and at the end of the work-shift.
Keep away from heat and incompatible materials (isocyanates, strong acids, strong oxidizers).
Do not eat, drink or smoke when using this product.
Do not breathe dusts, mists or fumes.
Contaminated work clothing should not be allowed out of the workplace.
Assume that empty containers contain residues which are hazardous.
Keep away from food and drink.

7.2 Conditions for safe storage:

Keep containers tightly closed when not in use.
Store in the original containers at controlled temperature, in a dry and well-ventilated place protected from direct sunlight.
Store in a secure area suitable for corrosives.
Prevent water and moisture from contaminating closed containers.
Store away from heat and ignition sources.
Store away from isocyanates, strong oxidants, acids and other incompatible materials (see Section 10).

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Section 8: Exposure Controls / Personal Protection

8.1 Control parameters:

Occupational Exposure Limits: Consult local authorities for acceptable exposure limits.

Ingredient	ACGIH® TLV®	U.S. OSHA PEL	Other Exposure Limits
Cyclohexanemethanamine,5-amino-1,3,3-trimethyl-(Isophorone diamine, IPDA)	Not established	Not established	Not available

8.2 Exposure controls:

Engineering Controls: Facilities utilizing or storing this material should be equipped with local exhaust ventilation or handle in a chemical fume hood or other closed system with appropriate exhaust ventilation.

If engineering controls and work practices are not effective in controlling exposure to this material, then wear suitable personal protective equipment including approved respiratory protection.

Have equipment available for use in emergencies such as spills or fire.

8.3 Individual protection measures:

Eye/Face protection: Wear chemical safety goggles. Wear a face-shield or full-face respirator when needed to prevent exposure to liquid, mist, vapor or fume.

Skin protection: Wear chemical protective gloves and boots. Wear a chemical protection suit to prevent skin exposure. An apron may be required where splashes are possible.

Evaluate resistance under conditions of use and maintain protective clothing carefully.

Take off contaminated clothing and wash it before reuse.

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

Materials for protective clothing include nitrile rubber, butyl rubber; contact safety supplier for specifications.

Respiratory protection: Respiratory protection may be necessary when dusts are formed and if the product is heated to release fume or if a mist is created. If airborne dust, fume or mist exposure is likely wear an approved air purifying respirator with organic vapor cartridges and HEPA particulate filter or self-contained breathing apparatus (SCBA) or supplied air respirator.

A respiratory protection program that meets the regulatory requirement, such as OSHA's 29 CFR 1910.134 or Canadian Standards Association (CSA) Standard Z94.4, must be followed whenever workplace conditions warrant a respirator's use.

Other protection: Safety shower, hand-wash station and eye-wash fountain readily available in the immediate work area.

Section 9: Physical and Chemical Properties

9.1 Information on basic physical and chemical properties:

Appearance:	Liquid. Colorless to light yellow.
Odor:	Odor of amine, or ammonia-like odor.
Odor threshold:	Not available
pH:	11.6 (1% solution in water) 13.3 (saturated solution in water 492 g/L)
Melting point/freezing point:	10 °C (50 °F)
Initial boiling point and boiling range:	247°C (476.6°F) @ 101.3 kPa
Flash point:	112°C (233.6°F)
Flammability:	Not available
Auto-ignition temperature:	Not available
Upper/lower flammability or explosive limits:	1.2% (lower)
Evaporation rate:	Not available
Vapor pressure:	1.6 – 2.0 Pa @ 20°C
Vapor density:	5.9 (air = 1)
Relative density:	0.92 @ 20°C (water = 1)
Solubility (ies):	492 g/L @ 20°C in water
Partition coefficient (n-octanol/water):	0.99 @ 23°C
Decomposition temperature:	250 – 300°C (482 – 572°F)
Viscosity:	19 mm ² /s @ 20 °C (Kinematic)

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Section 10: Stability and Reactivity

10.1 Reactivity:

Not reactive under prescribed conditions of use. Reactive in contact with acids and strong oxidizing agents, halogenated compounds resulting in a violent exothermic reaction.

10.2 Chemical stability:

Stable under prescribed conditions of use. Amines may absorb carbon dioxide from the air forming carbamate salts.

10.3 Possibility of hazardous reactions:

Heating may release toxic and corrosive fumes which may include nitrogen oxide and ammonia.

May react violently with strong oxidizing agents, strong acids, halogens and halogenated compounds with evolution of heat.

Contact with nitromethane forms sensitive explosive mixture

10.4 Conditions to avoid:

Avoid high temperatures and contact with sources of ignition. Avoid exposing product to air.

10.5 Incompatible materials:

Incompatible with isocyanates, strong acids, strong oxidizers, halogens and halogenated compounds.

Corrosive to copper, zinc and tin alloys.

10.6 Hazardous decomposition products:

Thermal decomposition and combustion produces oxides of carbon, nitrogen oxides and ammonia.

Section 11: Toxicological Information

11.1 Likely routes of exposure:

Inhalation of aerosols or fumes. Skin contact. Eye contact. Ingestion.

11.2 Information on acute health effects:

Inhalation: Substance has low volatility therefore inhalation is unlikely unless a mist is formed or fumes from high temperatures.

Acute toxicity data from animal studies demonstrated that mists may be harmful if inhaled and may cause respiratory tract irritation.

Skin: Corrosive damage to skin and eyes; causes severe burns.

Ingestion: Harmful if swallowed.

Skin corrosion / irritation

Corrosive damage to skin; causes severe burns. OECD Guideline 404 (Acute Dermal Irritation / Corrosion).

Serious eye damage / irritation

Causes damage to eyes with irreversible effects on the eye. OECD Guideline 405 (Acute Eye Irritation / Corrosion).

Acute Toxicity Data

<u>Ingredient</u>	<u>LD₅₀ Oral</u>	<u>LD₅₀ Dermal</u>	<u>LC₅₀ Inhalation</u> <u>4-hour</u>
Cyclohexanemethanamine,5-amino-1,3,3-trimethyl- (Isophorone diamine, IPDA)	1030 mg/kg (rat)	>2000 mg/kg (rat)	>5 mg/L aerosol (rat)

STOT (Specific Target Organ Toxicity) – Single exposure: In acute toxicity animal tests with rats, IPDA aerosol at 5 mg/L caused respiratory irritation.

Aspiration hazard: Data not available.

11.3 Information on delayed and chronic health effects:

STOT (Specific Target Organ Toxicity) – Repeated exposure: Data not available.

Based on information for related substances, IDPA may cause damage to liver and kidneys following repeated oral doses. Repeated exposures by inhalation may cause damage to the respiratory tract and lungs.

Sensitization - respiratory and/or skin: Isophorone diamine was found to be sensitizing to skin when tested according to OECD Guideline 406 in guinea pigs. There is evidence in humans that frequent occupation exposure to Isophorone diamine may lead to the development of allergic contact dermatitis.

Not known to be a respiratory sensitizer.

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11.3 Information on delayed and chronic health effects:

Carcinogenicity: Data not available.

No ingredients of this product have been evaluated for carcinogenicity by the International Agency for Research on Cancer (IARC), the American Conference of Governmental Industrial Hygienists (ACGIH®) or the US National Toxicology Program (NTP).

Reproductive toxicity: OECD Guideline 422 (28-day repeated dose toxicity/reproductive toxicity screening) results:

Embryonic development NOAEL \geq 250 mg/kg bw/day in rats

Maternal toxicity NOEL = 50 mg/kg bw/day in rats

Germ cell mutagenicity: Isophorone diamine was negative for genetic toxicity *in vitro* (Ames test according to Directive 84/449/EEC B.14 and OECD guideline 476 and 471).

It did not induce chromosomal aberrations in CHO cells *in vitro* in a test performed in accordance with OECD TG 473.

In vivo mouse micronucleus tests (one performed according to OECD TG 474 (1983) for the induction of micronucleated polychromatic erythrocytes were negative.

From all *in vitro* and *in vivo* tests performed there is no evidence that Isophorone diamine has a mutagenic or clastogenic potential.

Interactive effects: Data not available

Section 12: Ecological Information

12.1 Toxicity:

LC₅₀ Freshwater fish (96-hour) = 110 mg/L *Leusciscus idus*.

EC₅₀ Aquatic invertebrate (48-hour) = 23 mg/L *Daphnia magna*.

EC₅₀ Freshwater algae (72-hour) = 50 mg/L *Scenedesmus subspicatus*.

12.2 Persistence and degradability:

Not readily biodegradable

12.3 Bioaccumulative potential:

Log K_{ow} = 1.9023, low potential for bioaccumulation.

12.4 Mobility in soil:

Not available

Section 13: Disposal Considerations

13.1 Disposal methods:

Do NOT discard into any sewers, on the ground or into any body of water. Store material for disposal as indicated in Section 7 Handling and Storage.

Dispose of waste in accordance with relevant national, regional and local environmental control provisions.

Section 14: Transport Information

14.1 UN number:

UN2289

14.2 Shipping name:

ISOPHORONEDIAMINE

14.3 Transport hazard class(es):

Class 8

14.4 Packing group:

III

14.5 Environmental hazards:

Marine pollutant

14.6 Special precautions for user:

ERG 153

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

Not available

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Section 15: Regulatory Information

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

USA

TSCA Status: Substance listed on the TSCA inventory; (ACTIVE).

SARA Title III :

Sec. 313 Not applicable
CERCLA RQ Not applicable

Clean Air Act: Not applicable

Canada

NSNR Status: Substance is listed on the on the DSL.

International Inventories:

Australia: Substance listed on the Inventory of Chemical Substances (AICS).

China: Substance present on the Chemical Inventory (IECSC).

European Union: Substance listed on EINECS.

Japan: Substance present on the inventory Existing and New Chemical Substances (ENCS/ISHL).

Korea: Substance present on the inventory - Existing and Evaluated Chemical Substances (KECI/KECL).

Mexico: Substance present on the inventory (INSQ).

New Zealand: Substance present on the Chemical Inventory (NZIoC).

Philippines: Substance present on the Inventory of Chemicals and Chemical Substances (PICCS).

Taiwan: Substance present on the Chemical Substance Inventory (TCSI).

Vietnam: Substance present on the inventory (NCI).

Section 16: Other Information

Revision date:

April 12, 2021

Revision summary:

Revisions since previous version issued May 2016:

Section 2.1, 2.2 –classification and label elements

Section 3 –GHS classification.

Section 4.2 – Symptoms and effects of exposure

Section 9 – pH, Solubility in water, partition coefficient, viscosity

Section 11- Dermal toxicity LD₅₀, STOT SE, Dermal sensitization, Germ cell mutagenicity

References and sources for data:

CCOHS, Cheminfo

ECHA – European Chemicals Agency

HSDB® Hazardous Substances Data Bank, US National Library of Medicine

NIOSH Pocket Guide to Chemical Hazards

RTECS, Registry of Toxic Effects of Chemical Substances

Manufacturer's chemical safety profile

Legend to abbreviations:

ACGIH® – American Conference of Governmental Industrial Hygienists

GHS- Globally Harmonized System for Classification and Labeling.

LD50- Median lethal dose; the dose causing 50 % lethality

NOAEL- No observed adverse effect level

OSHA - Occupational Safety and Health Administration

TLV® - Threshold Limit Value

WHMIS – Workplace Hazardous Materials Information System.

Supplier Note:

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.