

## Technical Data Sheet (TDS)

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### 1. Product Overview

- **Product Name:** 1,3-DAPDM (1,3-Diaminopropane Dimaleate)
- **Chemical Name:** 1,3-Propanediamine bis(maleate) / 1,3-Diaminopropane dimaleate
- **CAS Number:** 109-76-2 (1,3-Diaminopropane); 110-16-7 (Maleic Acid)
- **Molecular Formula:** C<sub>11</sub>H<sub>18</sub> N<sub>2</sub>O<sub>8</sub> (C<sub>3</sub>H<sub>10</sub> N<sub>2</sub> · 2C<sub>4</sub>H<sub>4</sub>O<sub>4</sub>)
- **Molecular Weight:** 306.26 g/mol
- **Chemical Source:** Synthetic high-purity industrial chemical, produced by the neutralization reaction of 1,3-diaminopropane and maleic acid under mild aqueous conditions; purified by recrystallization, filtration and vacuum drying to achieve purity ≥98.0%; low heavy metal content and moisture, meeting industrial/fine chemical grade requirements.
- **Product Trait:** White odorless crystalline powder, non-flammable, stable under normal storage and processing conditions; highly soluble in water, soluble in low alcohols; causes skin/eye/respiratory irritation, **for industrial use only**; ideal for organic synthesis intermediate and epoxy resin curing agent use.
- **Core Properties: High-purity 1,3-DAPDM** with purity ≥98.0% (dry basis), low moisture (≤0.5%) and heavy metal content; stable chemical properties under normal conditions; high water solubility (≥100 g/L); clear melting range (175-180°C, decomp.); meets industrial and fine chemical grade quality standards; excellent curing performance for epoxy resins.
- **Main Application:** Organic synthesis intermediate (for fine chemical and heterocyclic compound synthesis); epoxy resin curing agent (coating, adhesive, composite material industry); raw material for polyamide/polyurethane resins; metal ion chelating agent for industrial water treatment. **NOT FOR FOOD, COSMETIC, PHARMACEUTICAL OR MEDICAL USE.**

### 2. Technical Specifications (Industrial/Fine Chemical Grade, Complies with GB/ACGIH Standards)

Item	Specification
Appearance	White to off-white crystalline powder, no caking
Assay (1,3-DAPDM, dry basis)	98.0-101.0%
Melting Range	175-180°C (decomposes)
Loss on Drying	≤ 0.5%
Residue on Ignition	≤ 0.1%
pH Value (5% aqueous, 25°C)	4.0-6.0
Solubility (in water, 25°C)	≥ 100 g/L
Bulk Density (25°C)	0.90-0.95 g/cm <sup>3</sup>
Sieve Pass Rate (80 mesh)	≥ 99.0%
Heavy Metals (Pb)	≤ 5 ppm
Heavy Metals (As)	≤ 1 ppm
Total Bacterial Count	≤ 100 CFU/g
E. coli	Negative
Storage Stability (25°C, 12 months)	Purity retention ≥ 97.0%
Decomposition Temperature	≥180°C

### 3. Product Advantages

1. **High Purity & Consistency:** Purity ≥98.0% (dry basis), low moisture (≤0.5%) and heavy metal content; batch-to-batch purity consistency (CV ≤0.3%), ensuring stable synthesis and curing results; 24-month shelf life under recommended storage conditions.
2. **Excellent Solubility:** Highly soluble in water (≥100 g/L) and common low alcohols (methanol/ethanol); easy to prepare aqueous/organic reaction solutions; forms clear homogeneous solution without precipitation, suitable for water-based epoxy resin systems.

3. **Stable Chemical Properties:** Stable under normal storage ( $\leq 25^{\circ}\text{C}$ ) and processing ( $\leq 100^{\circ}\text{C}$ ) conditions; no decomposition or discoloration; compatible with most epoxy resin systems (bisphenol A/F type); good thermal stability for cured products.
4. **Efficient Curing Performance:** Acts as a high-efficiency curing agent for epoxy resins; moderate curing speed, low shrinkage rate of cured products; excellent adhesion, chemical resistance and mechanical properties of cured coatings/adhesives.
5. **Standardized Physical Properties:** Uniform crystalline powder with no caking; fixed bulk density and sieve pass rate ( $\geq 99.0\%$  through 80 mesh); easy to handle, weigh and feed in industrial production and laboratory operations.
6. **Customizable Processing:** Can be customized to **research grade ( $\geq 99.5\%$ )** with additional recrystallization and purification; customizable particle size (100/200 mesh) according to customer needs, meeting different synthesis and curing requirements.

## 4. Application Fields

### 4.1 Epoxy Resin Industry

- Curing agent for water-based/solvent-based epoxy resins (coatings, floor paints, anti-corrosive coatings); adhesive curing agent for wood, metal and composite materials; curing agent for epoxy resin composites (fiberglass, carbon fiber).

### 4.2 Organic Synthesis Industry

- Intermediate for the synthesis of diamine derivatives and heterocyclic compounds; raw material for the preparation of propanediamine-based organic intermediates; building block for polyamide/polyurethane resin synthesis.

### 4.3 Industrial Water Treatment

- Metal ion chelating agent for industrial wastewater (removes heavy metal ions such as  $\text{Cu}^{2+}$ ,  $\text{Zn}^{2+}$ ,  $\text{Fe}^{3+}$ ); scale inhibitor for industrial cooling water systems (mild chelating property, no secondary pollution).

### 4.4 Fine Chemical Research

- Experimental raw material for the study of amine-carboxylic acid salt reactions; reference material for chemical purity testing; raw material for university and research institute chemical research (diamine chemistry, epoxy curing chemistry).

## 5. Usage & Formulation Guidelines

Application Field	Dosage (w/w in reaction/system)
Epoxy Resin Curing Agent	15-30% (based on epoxy resin solid content)
Organic Synthesis Intermediate	5-40% (depending on reaction type)
Industrial Water Treatment (Chelating Agent)	0.05-0.5% (aqueous solution)
Fine Chemical Research	1-20% (experimental reaction system)

## 6. Packaging & Storage

- 100 g Amber glass bottle (laboratory/R&D/small-batch use, light protection + dust-proof cap)
- 500 g HDPE plastic jar (medium-batch synthesis use, inner seal + screw cap)
- 1 kg HDPE plastic jar (regular research use, large mouth + dust-proof spoon)
- 25 kg HDPE plastic drum (bulk industrial use, inner plastic lining + dust-proof cap)
- **Custom Packaging:** 50 g glass vials (research grade); 5 kg stainless steel drums (high-purity synthesis use) available upon request (all dust-proof & moisture-proof).

## 7. Safety & Protection

- The product is a Class 9 miscellaneous hazardous substance, causes **skin/eye/respiratory irritation**; **all operations must be conducted by trained professional personnel** with full specified PPE (dust respirator, chemical-resistant safety goggles, nitrile rubber gloves  $\geq 0.30\text{mm}$ , chemical-resistant lab coat/apron).
- Operate in a well-ventilated area with local exhaust ventilation; avoid generating dust during handling and mixing; do not touch eyes/mouth after handling and wash hands thoroughly with soap and water; avoid inhalation of high-concentration dust.