

## Technical Data Sheet (TDS)

### 1. Product Overview

- **Product Name:** Acrylic Acid
- **English Name:** Acrylic Acid
- **CAS Number:** 79-10-7
- **Formula:** C<sub>3</sub>H<sub>4</sub>O<sub>2</sub> (CH<sub>2</sub>=CHCOOH)
- **Molecular Weight:** 72.06 g/mol
- **Product Characteristics:** Colorless clear flammable liquid with pungent acrid odor; strong carboxylic acid properties, miscible with water/organic solvents; stabilized with MEHQ (200–300 ppm) to prevent spontaneous polymerization; undergoes free radical polymerization to form acrylic polymers/resins. High purity (≥99.5%) industrial grade, suitable for monomer synthesis; strong corrosivity, flammable, toxic to aquatic life – strict PPE required for handling.

### 2. Technical Specifications

Item	Specification
Appearance	Colorless to pale yellow clear liquid
Purity (C <sub>3</sub> H <sub>4</sub> O <sub>2</sub> )	≥ 99.5%
Water Content	≤ 0.1%
Acetic Acid Content	≤ 0.1%
Propionic Acid Content	≤ 0.05%
MEHQ Inhibitor Content	200–300 ppm
Color (Hazen)	≤ 10
Density (25°C)	1.050–1.055 g/cm <sup>3</sup>
Refractive Index (20°C)	1.418–1.420
Freezing Point	12.0–14.0°C
Flash Point (Closed Cup)	54°C
pH (1% aq. solution, 25°C)	2.0–2.5
Viscosity (25°C)	1.2–1.4 mPa s

### 3. Product Advantages

1. **High Purity:** ≥99.5% acrylic acid with ultra-low organic/inorganic impurities; consistent polymerization performance.
2. **Stabilized Formula:** MEHQ inhibitor (200–300 ppm) prevents spontaneous polymerization; stable storage at ≤25°C for 12 months.
3. **Reactive Monomer:** Versatile free radical polymerization; forms homopolymers/copolymers with various monomers (styrene, acrylonitrile).
4. **High Reactivity:** Rapid polymerization under heat/UV/initiators; customizable polymer properties (molecular weight, cross-linking).
5. **Industrial Versatility:** Core monomer for acrylic resins, superabsorbent polymers, adhesives – fundamental chemical for multiple industries.

### 4. Application Fields

- **Polymer Synthesis:** Acrylic acid homopolymers/copolymers (PAA), polyacrylates, superabsorbent polymers (SAP) for diapers/sanitary napkins.
- **Coatings & Paints:** Water-based acrylic coatings for wood/metal/plastic; architectural coatings, industrial anti-corrosive coatings.
- **Adhesives & Sealants:** Acrylic adhesives for packaging/construction/automotive; pressure-sensitive adhesives (PSA).



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- **Textile Industry:** Acrylic resin finishing for fabrics (wrinkle resistance, water repellency); dye-fixing agents.
- **Water Treatment:** Polyacrylic acid (PAA) as scale inhibitor/dispersant for industrial cooling water, boiler water.
- **Oil & Gas:** Acrylic polymers as friction reducers, water shut-off agents for oilfield production.
- **Other:** Personal care (thickeners for cosmetics), paper industry (surface sizing agents), concrete admixtures.

## 5. Usage Methods

- **Polymerization (General):** Use in closed reactor; remove MEHQ inhibitor (distillation) if high molecular weight polymer is needed; add free radical initiator (AIBN/BPO, 0.1–1.0% w/w); polymerize at 60–80°C for 4–8h under nitrogen protection.
- **Aqueous Polymerization:** Dilute acrylic acid to 20–50% with deionized water; add initiator (ammonium persulfate) and chain transfer agent; polymerize at 70–90°C for 3–6h (PAA for water treatment).
- **Copolymerization:** Mix with comonomers (acrylamide, styrene, acrylonitrile) in 1:1 to 4:1 ratio; polymerize under inert gas to form functional copolymers.
- **Optimal Conditions:** Strictly exclude heat/light/air during handling; use nitrogen protection for polymerization; maintain reactor temperature <90°C (prevent exothermic runaway); test MEHQ content before use.

## 6. Packaging & Storage

- **Packaging:** 20 kg HDPE plastic drums, 200 kg HDPE/steel drums (MEHQ stabilized), 1000 kg IBC totes (sealed, dark inner liner); all containers labeled with GHS hazards.
- **Storage:** Cool, dark, well-ventilated warehouse ( $\leq 25^{\circ}\text{C}$ ); store in sealed, upright drums; keep away from heat/light/flames/oxidizers/strong bases; separate from food/cosmetics/hazardous materials.
- **Shelf Life:** 12 months (unopened,  $\leq 25^{\circ}\text{C}$ , intact MEHQ inhibitor); test inhibitor content if stored beyond 6 months – discard if MEHQ <100 ppm.
- **Transportation:** UN 2218, Class 8+3, PG I; transport at  $\leq 25^{\circ}\text{C}$ ; dark container; ground/bond drums; avoid collision/heat/light; comply with hazardous chemical transport regulations.

## 7. Safety & Protection

- Wear full PPE (chemical splash goggles + face shield, nitrile gloves, chemical protective suit, SCBA for high vapor); safety shower/eyewash station must be nearby.
- Operate only in explosion-proof fume hood with gas detection alarm; eliminate all ignition sources (no open flames/sparks/static).
- Do not mix with strong bases/oxidizers/amines; avoid skin/eye contact – even a small amount causes severe burns.
- In case of contact, follow MSDS first aid measures **and seek immediate medical attention.**
- No eating/drinking/smoking in work area; wash hands/face thoroughly after handling (even with PPE).

## 8. Quality Assurance

- Manufactured under ISO 9001 quality management system; each batch tested for purity, inhibitor content, impurities.
- All products accompanied by COA; customized inhibitor content (100–500 ppm) available upon request.
- Provide technical support for polymerization process optimization (initiator selection, temperature control, molecular weight customization).
- Strict quality control for MEHQ addition – ensures storage stability and prevents spontaneous polymerization.