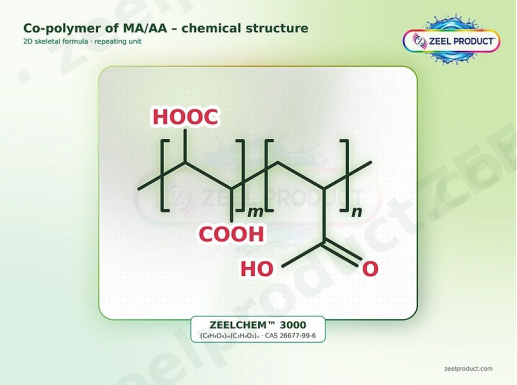
TECHNICAL DATA SHEET (TDS)

Maleic Acid / Acrylic Acid Copolymer (MA/AA) — ZEELCHEM™ 3000

Maleic–acrylic copolymer for high-hardness, high-alkalinity water: calcium carbonate inhibition plus dispersion.



Product code	ZEELCHEM™ 3000
Chemical type	Co-polymer of MA/AA
CAS No.	26677-99-6
HS Code	3906 90 90

1. Product description

ZEELCHEM™ 3000 is a copolymer of maleic acid and acrylic acid (MA/AA). The maleic units add charge density and temperature tolerance, much like HPMA. The acrylic units add chain length and dispersing power, much like PAA. The result is a balanced polymer that controls calcium carbonate scale in hard, high-alkalinity water and keeps suspended solids moving.

MA/AA is a favourite base for cooling water programs that run at high pH without acid, for boiler and evaporator treatment, and, as the neutralised sodium salt, as a phosphate-free builder and anti-redeposition agent in detergents. ZEEL PRODUCT manufactures ZEELCHEM™ 3000 in Vadodara, Gujarat, for supply across India.

2. Typical properties

Parameter	Typical value
Appearance	Light yellow to amber, clear liquid
Chemical name	Copolymer of maleic acid and acrylic acid
Solid content	≥ 48.0 %
Free monomer (as maleic acid)	≤ 1.0 %
pH (1 % aqueous solution)	2.0 – 3.0
Density at 20 °C	≥ 1.18 g/cm³
Average molecular weight	3,000 – 5,000
Calcium tolerance	Excellent; stable in high-hardness water
CAS No.	26677-99-6
HS Code	3906 90 90

Values are typical and not a specification for any particular batch. Each dispatch is supplied with a batch Certificate of Analysis (COA).

3. Chemical identity & synonyms

Chemical name	Copolymer of maleic acid and acrylic acid
Formula / structure	$(C_4H_4O_4)_m(C_3H_4O_2)_n$
Molecular weight (Mw)	3,000 – 5,000
CAS No.	26677-99-6
Also known as	MA/AA copolymer; maleic acid–acrylic acid copolymer; maleic-acrylic copolymer; 2-butenedioic acid, polymer with 2-propenoic acid

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4. Mechanism of action

- Maleic segments place two carboxyl groups close together. These bind strongly to calcium sites on carbonate nuclei and hold their activity at higher temperature and pH.
- Acrylic segments give a longer, flexible backbone. It adsorbs on particles and spreads negative charge for electrostatic dispersion.
- High calcium tolerance. In very hard water, a pure polyacrylate can form an insoluble calcium–polymer salt and lose efficiency. The copolymer structure resists this "polymer precipitation", so performance holds at high calcium.

5. Applications

Application	Function
High-alkalinity cooling towers	Alkaline/non-acid programs at high pH and hardness; base polymer with HEDP/PBTC.
Boilers & evaporators	Scale and sludge control with good thermal stability.
Detergent powders & liquids	Phosphate-free builder co-agent, anti-redeposition and anti-encrustation polymer (after neutralisation).
Textile pre-treatment	Sequestrant and dispersant in scouring and bleaching to prevent Ca/Mg deposits.
RO antiscalant blends	Polymer partner for $CaCO_3$ control in high-hardness feed water.
Industrial & CIP cleaning	Anti-scaling aid in alkaline cleaners.

6. Recommended dosage

Application	Typical dosage
Cooling tower (continuous)	2 – 15 mg/L as product
Phosphonate–copolymer blend	20 – 40 % of formulation
Boiler / evaporator	3 – 10 mg/L
Detergent powder (as Na salt)	1 – 5 % of formulation
Textile bath	0.5 – 2 g/L

Optimum dosage depends on water analysis, temperature, cycles of concentration and system design. Contact ZEEL PRODUCT for a program recommendation.

7. Benefits

- Excellent $CaCO_3$ inhibition in hard, alkaline water
- High calcium tolerance; no polymer drop-out
- Good dispersion of suspended solids
- Phosphate-free detergent builder co-agent
- Good thermal stability for boilers
- Fully compatible with phosphonates and zinc

8. Compatibility & formulation

ZEELCHEM™ 3000 is compatible with other ZEELCHEM™ polymers, phosphonates (HEDP, ATMP, PBTC), zinc salts, molybdate, azoles (BTA, TTA) and common oxidising and non-oxidising biocides at use concentrations. Always run a compatibility test before blending concentrated products.

9. Handling, storage & shelf life

Store at 5 °C – 40 °C in closed HDPE containers, away from direct sunlight. The acid form is corrosive to mild steel and copper, so use HDPE, PP or SS316 equipment. Shelf life is 12 months in original sealed packing.

Safety: Acidic (pH 2–3); eye and skin irritant. Use goggles, gloves and protective clothing. Flush exposed skin or eyes with water for 15 minutes. See the ZEELCHEM™ 3000 MSDS for details.

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10. Packing

Standard packs	60 kg HDPE carboy · 240 kg HDPE barrel
Documents	TDS, GHS MSDS and batch COA with every order
Supply	Pan-India dispatch from Vadodara, Gujarat

11. Quality & disclaimer

Manufactured under ISO 9001:2015, ISO 14001:2015 and ISO 22000:2018 certified management systems.

The information in this data sheet is based on our present knowledge and laboratory experience and is given in good faith. It does not constitute a warranty of properties for a specific application. Users must determine the suitability of the product for their own use and comply with applicable laws and regulations.

Prepared by: Technical Department

Approved by: QC Manager / Authorised Signatory

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