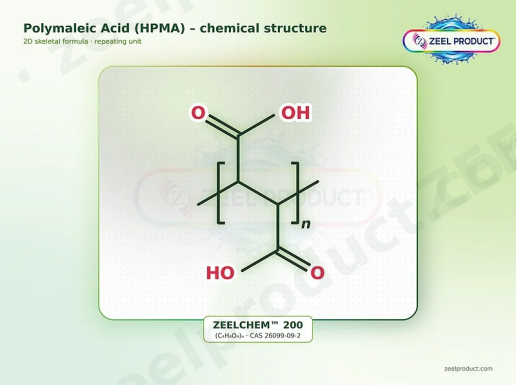
TECHNICAL DATA SHEET (TDS)

Hydrolysed Polymaleic Anhydride / Polymaleic Acid — ZEELCHEM™ 200

High-temperature scale inhibitor for boilers, evaporators, desalination and high-alkalinity water, effective up to 300 °C.



Product code	ZEELCHEM™ 200
Chemical type	Polymaleic Acid (HPMA)
CAS No.	26099-09-2
HS Code	3911 90 90

1. Product description

ZEELCHEM™ 200 is hydrolysed polymaleic anhydride (HPMA), also called polymaleic acid. It is a very low molecular weight polymer with two carboxylic groups on every repeat unit, so its charge density is about twice that of polyacrylic acid. HPMA is the polymer of choice when water is hot, highly alkaline or highly concentrated. It keeps its threshold effect for calcium carbonate and calcium sulphate at temperatures where most other polymers lose efficiency.

Typical users are low and medium pressure boilers, MSF and MED thermal desalination, sugar and paper mill evaporators, crude oil dehydration and oilfield injection water, and cooling systems running at high cycles with high alkalinity. ZEELCHEM™ 200 is manufactured by ZEEL PRODUCT in Vadodara and supplied pan-India in carboys, drums and IBCs.

2. Typical properties

Parameter	Typical value
Appearance	Light yellow to amber, clear liquid
Chemical name	Hydrolysed polymaleic anhydride (polymaleic acid)
Solid content	≥ 48.0 %
Bromine value	≤ 80 mg/g
pH (1 % aqueous solution)	2.0 – 3.0
Density at 20 °C	≥ 1.18 g/cm³
Average molecular weight	400 – 800
Thermal stability	Threshold activity retained up to ~300 °C
CAS No.	26099-09-2
HS Code	3911 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	Hydrolysed polymaleic anhydride (polymaleic acid)
Formula / structure	$(C_4H_4O_4)_n$
Molecular weight (Mw)	400 – 800 (very low molecular weight)
CAS No.	26099-09-2
Also known as	HPMA; hydrolysed polymaleic anhydride; polymaleic acid; maleic acid homopolymer; PMA scale inhibitor

© ZEEL PRODUCT, Vadodara – controlled document. Copying, editing or re-use of this content without written permission is prohibited.

4. Mechanism of action

- Strong lattice poisoning. The dense negative charge binds strongly to Ca^{2+} sites on calcite and gypsum nuclei, so crystal growth stops at the micro-crystal stage, even at high supersaturation.
- Thermal resistance. The polymer backbone resists hydrolytic and thermal breakdown. It stays effective in boiler water, on evaporator tubes and in brine heaters where polyacrylates start to degrade.
- Tolerance of alkalinity. HPMA keeps working above pH 8.5 and at high M-alkalinity, which suits alkaline cooling programs that run without acid feed.

5. Applications

Application	Function
Low & medium pressure boilers	Scale inhibitor in internal treatment; keeps hardness from depositing on hot tube surfaces.
MSF / MED thermal desalination	Controls alkaline scale ($CaCO_3$, $Mg(OH)_2$) in brine heaters and evaporator stages.
Sugar mill & paper mill evaporators	Reduces calcium salt deposits on evaporator tubes, extending the time between cleanings.
Oilfield & crude oil dehydration	Scale inhibitor for injection water, produced water and heater treaters.
High-alkalinity cooling towers	Runs alkaline programs at higher cycles without sulphuric acid feed.
Detergents & dyeing	Builder/sequestrant and anti-scaling aid in high-temperature textile baths.

6. Recommended dosage

Application	Typical dosage
Boiler internal treatment	2 – 8 mg/L in feed water
Cooling tower (alkaline program)	3 – 12 mg/L as product
MSF/MED desalination	2 – 6 mg/L in make-up seawater
Sugar evaporator	3 – 10 mg/L on juice (ppm on juice weight)
Oilfield injection water	5 – 30 mg/L, based on scaling tendency

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

7. Benefits

- Stays active at high temperature (up to ~300 °C)
- Excellent in high pH and high alkalinity water
- Strong calcium carbonate and sulphate inhibition
- Synergy with phosphonates and other polymers
- Low dosage, which lowers program cost
- Phosphorus-free, so it fits low-P programs

8. Compatibility & formulation

ZEELCHEM™ 200 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.

A-23, Reva Duplex, Near Shyamal Greens, Behind Bharat Petrol Pump, Ankhol, New Waghodia Road, Vadodara, Gujarat – 390019, India
Tel: +91 97245 93964 / +91 97238 59512 · Email: zeelproduct@gmail.com · www.zeelproduct.com · www.zeelproduct.net
© ZEEL PRODUCT, Vadodara – controlled document. Copying, editing or re-use of this content without written permission is prohibited.

9. Handling, storage & shelf life

Store in HDPE containers in a cool, shaded, ventilated place (5 °C – 40 °C). Keep containers tightly closed. Acidic, so avoid unlined mild steel and copper. Handle with PP, PVDF or SS316 dosing equipment. Shelf life is 12 months in unopened original packing.

Safety: Acidic liquid (pH 2–3). Irritating to eyes and skin. Wear goggles, gloves and protective clothing. In case of eye contact, rinse immediately with water for at least 15 minutes and seek medical advice. Refer to the ZEELCHEM™ 200 MSDS.

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

A-23, Reva Duplex, Near Shyamal Greens, Behind Bharat Petrol Pump, Ankhol, New Waghodia Road, Vadodara, Gujarat – 390019, India
Tel: +91 97245 93964 / +91 97238 59512 · Email: zeelproduct@gmail.com · www.zeelproduct.com · www.zeelproduct.net
© ZEEL PRODUCT, Vadodara – controlled document. Copying, editing or re-use of this content without written permission is prohibited.