

ACUMER™ 5000 Silica and Magnesium Silicate Scale Inhibitor

Typical Properties

These properties are typical but do not constitute specifications.

Appearance	Dark yellow to brown clear solution*
Average molecular weight	5000 (Mw)
Total solids (%)	45
Active solids (%)	42
pH as is (at 25°C)	2.5
Bulk density (at 25°C)	1.20
Viscosity Brookfield (mPa.s/cps at 25°C)	400
Neutralization	0.13g of NaOH (100%) per g of ACUMER 5000

*A slight haze may appear; this does not affect the intrinsic properties of the product or its performance.

Chemistry and Mode of Action

ACUMER 5000 is a proprietary multifunctional polymer with a molecular weight of 5000 that provides outstanding silica and magnesium silicate scale inhibition.

ACUMER 5000 prevents silica-based scale formation by dispersing colloidal silica and by preventing magnesium silicate scale formation at heat transfer surfaces.

Performance

Control of silica-based scale is a complex problem due to the many forms of silica species that exist:

- Molybdate-reactive silica: frequently referred to as dissolved silica.
- Colloidal silica: polymerized silica particles of 0.1 microns or less.
- Silica scale: primarily magnesium silicate, but may also be iron or calcium silicate.

Colloidal silica can dissolve to form silicate in the high temperature/high pH environment near a corroding cathodic surface where dissolved oxygen is reduced to hydroxide ions. These freshly formed silicate anions, added to the dissolved silica already present, can then form magnesium silicate scale (MgSiO_3). In addition, colloidal silica alone can co-precipitate with magnesium hydroxide to form a scale of magnesium silicate having non-stoichiometric ratios of magnesium to silica.

Normally, if silica levels exceed about 180 ppm SiO_2 in the recirculation water of a cooling circuit, severe scaling can occur on heat transfer surfaces. Moreover, the scale that forms is frequently difficult or impossible to remove by conventional means.

ACUMER 5000 has been evaluated under field conditions, allowing up to 300 ppm silica in the recirculating water without scale. Case histories are available upon request from your local technical representative.

Applications

- Recirculating cooling circuits

ACUMER 5000 offers unique features for the treatment of silica-limited cooling waters, allowing up to at least 300 ppm silica in the recirculating water without scale or corrosion problems.

- Boilers

The superior hydrothermal stability of ACUMER 5000 enables its use for controlling magnesium silicate scale in boilers operating up to about 900 psig, although silica may carry over in steam at > 600 psig.

Benefits of ACUMER 5000

- Keeps surfaces clean for maximum heat transfer and enhances the performance of organic corrosion inhibitors.
- Has excellent thermal and chemical stability.
- Can be formulated at any pH without degradation.
- Exhibits a very good stability in the presence of hypochlorite.
- Contains no phosphorus, making its use acceptable where legislation requires that discharge waters contain low or no phosphorus.

Material Safety Data Sheets

Rohm and Haas Company maintains Material Safety Data Sheet (MSDS) on all of its products. These contain important information that you may need to protect your employees and customers against any known health and safety hazards associated with our products. We recommend you obtain copies of MSDS for our products from your local Rohm and Haas technical representative or the Rohm and Haas company. In addition, we recommend you obtain copies of MSDS from your suppliers of other raw materials used with our products.

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