



ACUMER™ 5000 Silica and Magnesium Silicate Scale Inhibitor

Regional Product Availability North America

Typical Properties These properties are typical but do not constitute specifications

Property	Typical Values
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	0.13 g 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 exceptional silica and magnesium silicate scale inhibition.

ACUMER 5000 helps prevent silica-based scale formation by dispersing colloidal silica and by minimizing 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.

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ACUMER™ 5000 Silica and Magnesium Silicate Scale Inhibitor / Dow Coating Materials

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Applications

- Recirculating cooling circuits

ACUMER™ 5000 offers distinct 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 excellent hydrothermal stability of ACUMER 5000 makes it an ideal choice for use in 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

- Helps keep 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.

Handling
Precautions

Before using this product, consult the Material Safety Data Sheet (MSDS)/Safety Data Sheet (SDS) for details on product hazards, recommended handling precautions and product storage.

Storage

Store products in tightly closed original containers at temperatures recommended on the product label.

Disposal
Considerations

Dispose in accordance with all local, state (provincial) and federal regulations. Empty containers may contain hazardous residues. This material and its container must be disposed in a safe and legal manner.

It is the user's responsibility to verify that treatment and disposal procedures comply with local, state (provincial) and federal regulations. Contact your Dow Coating Materials Technical Representative for more information.

Product
Stewardship

Dow has a fundamental concern for all who make, distribute, and use its products, and for the environment in which we live. This concern is the basis for our product stewardship philosophy by which we assess the safety, health, and environmental information on our products and then take appropriate steps to protect employee and public health and our environment. The success of our product stewardship program rests with each and every individual involved with Dow products - from the initial concept and research, to manufacture, use, sale, disposal, and recycle of each product.

Customer Notice

Dow strongly encourages its customers to review both their manufacturing processes and their applications of Dow products from the standpoint of human health and environmental quality to ensure that Dow products are not used in ways for which they are not intended or tested. Dow personnel are available to answer your questions and to provide reasonable technical support. Dow product literature, including safety data sheets, should be consulted prior to use of Dow products. Current safety data sheets are available from Dow.

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