



Product Information

ACUMER™ 4035

General Purpose Acrylic Homopolymer Dispersant for Scale Prevention of Reverse Osmosis Membranes in Potable Water Systems

Description

ACUMER™ 4035 is a general purpose scale inhibitor, a dispersant designed to prevent scaling and fouling of membrane surfaces. ACUMER 4035 is particularly effective on calcium sulfate, calcium carbonate, barium sulfate and other low solubility salts. This product complies with the requirements of UL classification for drinking water treatment additives in accordance with ANSI/NSF Standard 60. Also, ACUMER 4035 contains a preservative to prevent microbiological growth during storage.

Typical Properties

These properties are typical but do not constitute specifications

Property	Typical Values
Appearance	Clear to slightly hazy liquid
Type	Carboxylate homopolymer
Molecular Weight	2000
% Total Solids	35
pH	4.0

Features and Benefits

Feature

- ACUMER Polymers inhibit scale common to reverse osmosis (RO) systems such as calcium carbonate and calcium sulfate with little or no acid control required.
- ACUMER Polymers are thermally and chemically stable.

Benefit

Inhibiting scale information prolongs membrane life and lengthens the time between membrane cleanings. System efficiency is maximized by maintaining excellent permeate flow and % recovery.

Polymers are stable under most membrane water conditions and can be formulated with preservatives and other common water treatment chemicals.

Application

Scale inhibition and deposit control are essential for maintaining efficient and cost effective membrane operations such as RO systems. ACUMER™ 4035 is a general purpose scale inhibitor and dispersant used to maintain and provide longer lasting membranes in separation processes. Deposits on membranes can reduce permeate flow and increase pressure drop, greatly minimizing % recovery (yield) of the system. Hard scales can puncture membranes, allowing salt passage and microbiological contamination in the permeate. Also scale and deposits may cause channeling through membranes, thereby limiting flow to less scaled areas. Channeling reduces system efficiency and prevents effective cleaning of the scaled membranes.

RO (also called hyperfiltration) applies pressure to reverse the natural flow of pure water through a semipermeable membrane between solutions containing different salt concentrations. In order to generate pure water from salt water, the applied pressure must be greater than the difference in osmotic pressure between the two waters. RO removes all dissolved organic (non ionic) solids with molecular weight above 100 daltons as well as a high percentage of ionic materials (typically 90 to 99 %).

Nanofiltration is another membrane technology that has many of the same scale problems as RO. It is an intermediate process between RO and filtration, and has a molecular weight cut-off (MWCO) in the range between 400 to 800 daltons. Ionic rejection varies depending upon the valence of the salts. Other membrane separation techniques include ultra- and microfiltration which filter colloids and suspended solids.

The amount and quality of the produced pure water (permeate) is frequently limited by the presence of scale forming salts in the raw feed water. These salts tend to precipitate as their concentration increases at the Membrane surface during the separation process. If solubility limits are exceeded, scale forms and a cleaning cycle is required to restore membrane permeability and flux. Cleaning is costly in terms of time and chemicals.

Scale inhibitors such as ACUMER Polymers increase the critical concentration above which crystallization occurs. Since scale can form from different salts (e.g. CaCO₃, CaSO₄, silica and iron), scale inhibitors must be carefully chosen to match the scaling tendency of each specific water.

Thermal and Chemical Stability

In addition to their excellent performance properties, ACUMER Polymers are non hazardous, chlorine stable, phosphate free, and convenient to handle and meter. In the most difficult cases, ACUMER Polymers can be used in conjunction with acid as the products are stable and effective over a wide pH range.

Handling and Storage Recommendations

The products are stable for two years if kept in their original containers under normal storage conditions. When the containers are opened the products should be used within one month. Store products in tightly closed original containers at temperatures recommended on the product label.

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.

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 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.

Complementary Product Offering

Besides being a major manufacturer of membranes and other water processing technologies, Dow also offers also broad product spectrum of biocides for RO antifouling. Please refer to the corresponding technical application sheets.

Furthermore numerous industries already trust and rely on Dow for their water treatment applications. ACUMER™ Polymers of The Dow Chemical Company also prevent premature scale and deposit build-up across a wide range of water systems: Cooling Towers, Boilers and Specialty Applications such as Sugar Refining, Geothermal, Thermal Desalination, Paper Production.

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