ACUMER™ 1850
Scale Inhibitor and Dispersant

Typical Properties
These properties are typical but do not constitute specifications.

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>Clear solution*</td>
</tr>
<tr>
<td>Chemical nature</td>
<td>Polycarboxylate</td>
</tr>
<tr>
<td>Grade</td>
<td>Na salt</td>
</tr>
<tr>
<td>Average molecular weight (Mw)</td>
<td>30000</td>
</tr>
<tr>
<td>Total solids (%)</td>
<td>30</td>
</tr>
<tr>
<td>pH as is (at 25°C)</td>
<td>10</td>
</tr>
<tr>
<td>Bulk density (at 25°C)</td>
<td>1.19</td>
</tr>
<tr>
<td>Brookfield Viscosity (mPa.s/cps at 25°C)</td>
<td>225</td>
</tr>
</tbody>
</table>

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

Chemistry and Mode of Action

ACUMER 1850 is a low molecular weight polycarboxylate with a selected molecular weight around 30000 to optimize the dispersant performance. It acts through at least three mechanisms:

- Solubility enhancement by threshold effect, which reduces precipitation of low solubility inorganic salts (calcium carbonate in particular).
- Crystal modification, which deforms the growing inorganic salt crystal to give small, irregular, readily fractured crystals that do not adhere well to surfaces and can be easily removed during cleaning operations.
- Dispersing activity, which prevents precipitated crystals or other inorganic particles from agglomerating and depositing on surfaces.

Performance

ACUMER 1850 is a general purpose scale inhibitor and dispersant. It is effective to inhibit scale deposition on equipment surfaces. It acts against precipitation and deposition of calcium carbonate, calcium sulphate and other sparingly soluble salts.

ACUMER 1850 is thermally very stable. There is no weight loss up to 450°C (thermogravimetric analysis). It is particularly recommended to use ACUMER 1850 as sludge dispersant and scale control polymer in boiler, even in high pressure boilers.

Applications

- Industrial water treatment:
  - Scale inhibition in open recirculating cooling circuits
  - Dispersant for all types of cooling circuits
  - Dispersant for boiler sludge control

Benefits of ACUMER 1850

- Contains no phosphorus, making its use acceptable where legislation requires that discharge waters contain no or low phosphorous.
- Exhibits exceptional stability in the presence of hypochlorite.
- Shows good anti-scaling efficiency at low dosage over a wide range of pH, water hardness and temperature conditions.
- Exhibits a very good thermal stability.
- Offers a very strong dispersant activity.
Storage Recommendation

Freezing or long term cold storage of ACUMER 1850 may cause some separation of the components. Although product performance is not impaired as long as the whole container is heated and well mixed, it is recommended to keep ACUMER 1850 from freezing.

FDA Clearance

ACUMER 1850 complies with the FDA Food Additives regulations indicated below, provided that the final formulation meets the limitations and other conditions prescribed by the regulation.

21 CFR 173.310 Boiler water additives.
21 CFR 175.105 Adhesives.
21 CFR 175.300 Resinous and polymeric coatings.
21 CFR 176.170 Components of paper, paperboard in contact with aqueous and fatty food.
21 CFR 176.180 Components of paper, paperboard in contact with dry food.

- ACUMER 1850 may be used as coating adjuvant for controlling viscosity when used at level not to exceed 0.3% by weight of coating solids.

Material Safety Data Sheets

Rohm and Haas Company maintains Material Safety Data Sheets (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.

ACUMER is a trademark of Rohm and Haas Company or of its subsidiaries or affiliates.

These suggestions and data are based on information we believe to be reliable. They are offered in good faith, but without guarantee, as conditions and methods of use of our products are beyond our control. We recommend that the prospective user determines the suitability of our materials and suggestions before adopting them on a commercial scale.

Suggestions for uses of our products or the inclusion of descriptive material from patents and the citation of specific patents in this publication should not be understood as recommending the use of our products in violation of any patent or as permission or license to use any patents of the Rohm and Haas Company.