ACUSOL™ 588D
Polyphosphate and Silicate Scale Inhibitor for Laundry and Automatic Dishwashing Detergents, Powders, and Tablets

Description

ACUSOL 588D is a unique copolymer specifically designed for phosphate and reduced/no phosphate containing formulations in powder or tablet form. Its chemical structure and molecular weight are optimized to provide calcium polyphosphate and magnesium silicate inhibition properties, resulting in reduced filming on glasses and dishes in automatic dishwashing.

Processing Benefits

The benefits of this new polymer granule quality are numerous, compared with classical spray dried polymers:

- **Optimized mixing:** high bulk density, low fine level, minimized segregation
- **Easier processing:** improved powder processability, good flowability, better air elimination during compaction, less tablet breakage and improved tablet productivity due to a lower compaction pressure requirement
- **Improved tablet properties:** better tablet integrity, better dissolution during the washing process
- **Easier product handling and storage:** low dust generation, lower hygroscopicity leading to less storage constraints and easier unloading (no caking)

This granulation unit has been built to match on an industrial scale the specifications required for high density polymers adapted to modern formulations of detergent tablets and powders desired by the consumers.

Typical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appearance</td>
<td>White granules</td>
</tr>
<tr>
<td>Chemical nature</td>
<td>Acrylic/sulphonic copolymer</td>
</tr>
<tr>
<td>Average molecular weight</td>
<td>12,000</td>
</tr>
<tr>
<td>Form</td>
<td>Partially neutralized, Na form</td>
</tr>
<tr>
<td>Solids (%)</td>
<td>~ 93</td>
</tr>
<tr>
<td>Average particle size (µm)</td>
<td>650</td>
</tr>
<tr>
<td>Bulk density (g/l)</td>
<td>650</td>
</tr>
<tr>
<td>Granulometry &gt; 1180 µm</td>
<td>&lt; 0.5%</td>
</tr>
<tr>
<td>Granulometry &lt; 200 µm</td>
<td>&lt; 2%</td>
</tr>
</tbody>
</table>

Chemistry and Mode of Action

ACUSOL 588D is a copolymer of acrylic and sulphonic acids with a molecular weight around 12,000 in order to optimize the following features:

- **Anti-precipitation:** ACUSOL 588D will prevent precipitation of calcium polyphosphate and magnesium silicate insoluble salts in the wash bath due to adsorption properties on seeds and growing particles. The controlled precipitation of these sparingly soluble salts will reduce the phenomenon of filming, which is due to deposition of precipitating builders on the various surfaces encountered in automatic dishwashing: stainless steel, ceramics, and more particularly glass.
Dispersing properties: ACUSOL 588D is an excellent dispersant for calcium polyphosphate and magnesium silicate based scales. It will contribute to keep them dispersed in the wash bath and avoid their deposition and buildup that would cause filming on surfaces.

ACUSOL 588D can be combined with acrylic polymers such as ACUSOL 445 G, ACUSOL 445NG, ACUSOL 420NG, ACUSOL 425N, and ACUSOL 441 in order to boost the filming inhibition performance due to specific calcium carbonate inhibition properties. This combination is particularly recommended for the "all-in-one" tablets to alleviate the heavy precipitating conditions arising from higher calcium and magnesium levels in the washing bath.

Characteristics of the Product

- Effective dispersant for a wide choice of formulations
- Very good filming inhibition performance on glasses and dishes
- Excellent tableting ability as well as dry powder mixability
- Optimized characteristics for particle size distribution and bulk density
- Easy handling thanks to low hygroscopicity and no dust generation

Dose Rates

To obtain an optimal efficiency, ACUSOL 588D polymer should be used at levels between 50 and 500 ppm in the wash bath, for household or industrial purposes.

This will correspond to 1 to 8% of ACUSOL 588D in the washing powders and tablets (expressed as dry product). ACUSOL 588D is suitable for P-containing detergents and can be advantageously combined with ACUSOL 445 G, ACUSOL 445NG, ACUSOL 420NG, ACUSOL 425N, and ACUSOL 441, depending on the carbonate level in the formulation.

Storage Recommendation

As ACUSOL 588D polymer is sensitive to ambient water, it is recommended to keep open bags under appropriate storage conditions and avoid wet environments.

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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