**Cla-Sta® FS Additive**

**Mineral Fines and Clay-Stabilizing Additive**

Cla-Sta® FS additive is a polymer that stabilizes mineral fine particles by adsorbing on formation surfaces, altering the surface properties of the fine particles, and reducing their interaction with flowing fluids even at high flow rates. Cla-Sta FS additive can provide substantial, long-term stabilization of mineral fines, such as silica, carbonates, hematite, magnetite, siderite, and migrating clays. When the concentration of swelling clays in the formation is less than 2 to 5%, the preferred stabilizing additive is Cla-Sta FS.

**Features**

Cla-Sta FS additive is supplied as a concentrated water solution. It is not shear-sensitive and can be mixed continuously in concentrations of about 1 to 10 gal/Mgal of injected fluid.

**Applications**

Cla-Sta FS additive minimizes permeability damage caused by fines migration in several situations occurring in oil, gas, and water injection wells. Specifically, it has the following uses:

- a preflush before gravel packing
- part of a sand-consolidation treatment to stabilize fines beyond the radius of the consolidated sand
- a treatment to prevent water production and reduce the possibility of future acidizing
- a treatment to prevent permeability damage caused by fines migration around the injection wellbore
- part of the ungelled prepad during fracturing treatments.

**Benefits**

Cla-Sta FS additive has the following benefits:

- It stabilizes a variety of mineral fines including silica, migrating clays, carbonate materials, hematite, magnetite, siderite, as well as water-swelling clays.
- It is applied as a low-concentration, low-viscosity solution (less than 1.5 cp).
- It can be applied by itself or in conjunction with other well treatments such as fracturing, acidizing, sand control, polymer flooding, caustic flooding, and steam injection.
- It is compatible with Halliburton's K-Trol™ service and Polyflood™ service.
- It helps provide a long-term solution to fines migration.
- It is not oil-wetting and is not dissolved by most organic fluids.
- It is usable in cold climates; it has a freezing point of 0°F.

**Cla-Sta® FS Additive—Product Specifications**

<table>
<thead>
<tr>
<th>Part No.</th>
<th>Form</th>
<th>Specific Gravity</th>
<th>Bulk Density</th>
<th>pH</th>
<th>Boiling Point</th>
<th>Freeze Point</th>
<th>Flash Point</th>
<th>Packaging</th>
</tr>
</thead>
<tbody>
<tr>
<td>100003637</td>
<td>Clear, pale-brown liquid</td>
<td>1.062</td>
<td>8.85 lb/gal</td>
<td>6.5 to 7.5</td>
<td>212°F (100°C)</td>
<td>-1°F (-18°C)</td>
<td>&gt;200°F (&gt;93°C)</td>
<td>28-gal plastic drum</td>
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</tbody>
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