

OIL AID-WE-30

HIGH TEMPERATURE GEL STABILIZER

DESCRIPTION

OIL AID-WE-30 is an inorganic chemical in crystalline form. The product is partially soluble in water.

APPLICATION

OIL AID-WE-30 is added to selected aqueous frac fluids to extend the thermal stability of the gellant system. OIL AID-WE-30 retards oxidative and hydrolytic depolymerization of the gellant polymer, enabling the gellant to function at higher temperatures than normally possible.

RECOMMENDED TREATMENT

Typical dosage of OIL AID-WE-30 is 20 lb per 1000 gal of fluid (2.39 kg/m³). The product is usually added to the fluid on the surface, after the gellant has been dispersed into the fluid. OIL AID-WE-30 may be mixed through a hopper at about 5 minutes per sack. Consult a Messina technical service representative for specific recommendations.

PACKAGING

OIL AID-WE-30 is normally packaged in 50 lb or 25 kg bags. Other package sizes are used in some areas.

MISCELLANEOUS

OIL AID-WE-30 is a proprietary inorganic crystalline chemical that is used to stabilize polysaccharide and polysaccharide derivitized polymeric fracturing systems at higher temperatures. The normal loading rate of OIL AID-WE-30 is 2.39 kg/m³, however, there have been instances where higher loadings of up to 3.6 kg/m³ were used to help stabilize the fracturing fluid.

The major degradation of a polymeric fracturing fluid system comes about as a result of oxidative attack at high temperature, often due to entrained oxygen in the base fluid that becomes considerably more reactive as temperatures climb. In order to combat this oxidative degradation at elevated temperatures, an anti-oxidant is often incorporated. While the incorporation of an anti-oxidant does not fully combat all of the degrading mechanisms that occur downhole, it is by far the most effective, inexpensive way to help preserve the polysaccharide polymers at elevated temperatures. OIL AID-WE-30 is an additive that effectively combats the oxidative attack upon the polymer in a fracturing system.



There are other anti-oxidants that have been used to combat the high temperature oxidation of polymers, but few meet the necessary criteria of having low enough reactivity to be safely handled, have a long shelf life, and are cost effective. OIL AID WE-30 meets all of the previously mentioned criteria. An example of temperature stability enhancement properties of OIL AID WE-30 in a crosslinked fracturing fluid is the following:

Temperature: 120° C

Polymer Loading: 4.8 kg/cu m OIL AID WG-41

Time at Temperature: 3 hours

Shear Rate: 170 sec⁻¹

Apparent Viscosity: 1. Without OIL AID WE-30,
approximately 48 cp
2. With 1.2 kg/cu m OIL AID WE-30, approximately 320 cp

As may be seen by the results above, the use of OIL AID WE-30 in the example resulted in a great increase in fluid efficiency at temperature. The alternatives to using OIL AID WE-30 to help maintain gel viscosity at temperature are the expensive alternatives of the inclusion of a higher polymer loading in the base gel, or the addition of a secondary gelling agent. In addition to the use of a high temperature stabilizer such as OIL AID WE-30, the use of a delayed crosslinker will greatly aid the gel in maintaining the viscosity at temperature by reducing the shear history of the crosslinked gel.

OIL AID WE-30 should not be batch mixed because the anti-oxidative activity will be reduced during residence time in the oxygen laden gel, as well as possibly reducing iron from storage tank walls, which will detrimentally affect the gel. The residence time of OIL AID WE-30 in the fracturing gel system should be minimized in order to maintain maximum effectiveness, therefore, it is recommended that OIL AID WE-30 be added on-the-fly.