



Texan Shale Chemicals

11806 Wilcrest Drive, Suite 202, Houston, TX 77031
Phone: 281-741-0226 Email: Mani@Texanstone.com



TEXAN DRY FRESH SUSPENSION TS-FS

TS-FS is a premium fine powder based Anionic Polyacrylamide friction reducer (FR) suspension that is highly effective in fresh water and light-brine conditions. It has a high molecular weight and is manufactured as a liquid- suspension form in robust loadings ranging from (1.5 lb.- 4lb.)/gallon. Typically 2.5 lb./gallon is used for most applications. Addition of small amounts, typically 0.25 – 1.00 gpt (gallons per thousand gallons) in a typical a 2.5 lb. loading slurry can deliver friction reduction (pressure loss) of over 70% in a short period of time. Due to its rapid hydration properties, TS-FS can be pumped continuously into the stimulation fluids as supplied or by batch mixing before treatments. TS-FS is APE (alkyl phenol ethoxylates) and NPE (nonyl phenol ethoxylates) free, thus making it environmentally friendly. It is a field tested and proven product in oil field operations.

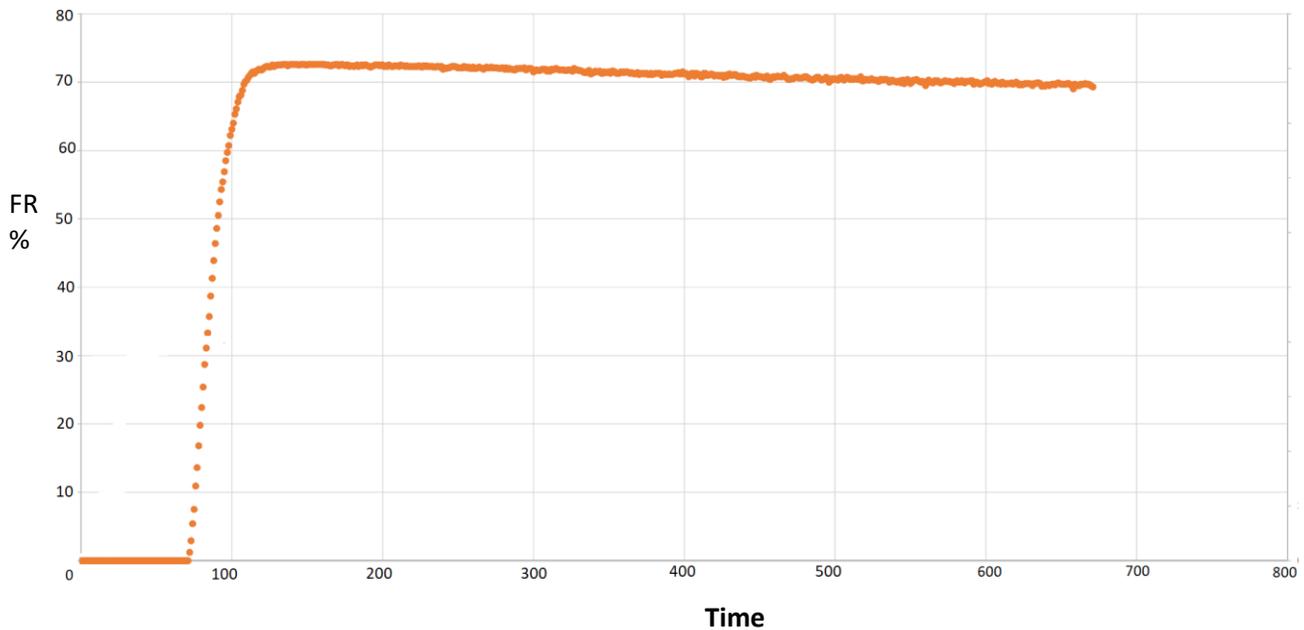
APPLICATIONS

TS-FS has been specifically optimized for use as a fresh water-to-light brine friction reducer, which can be added as supplied due to its emulsion form and excellent hydration properties. It is compatible with common non-ionic and anionic stimulation additives such as surfactants, scale inhibitors, biocides, etc., and can be used with low to moderate salt concentrations. TS-FS can achieve optimal performance at low dosages reducing overall treatment costs.

TEST METHODS

Test Method(s): Friction reduction properties were tested on a custom Flow Loop in Midland tap water. Texan Dry Fresh Slurry 1.5 lb. loading was used. The test section of the loop consisted of pipe having 3/8" O.D. Typical dosage of 0.22 GPT or 0.33 PPTG powder equivalent was used. The Midland Tap water contained 53 mg/lit of Chloride, 90 ppm of Sulfate, 57 ppm of Bicarbonate and 125 ppm of Acetates.

TEXAN DRY FRESH 1.5 # SUSPENSION @ 0.22 GPT in Midland Tap Water





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PROPERTIES

| | |
|-----------------------------|---|
| Form | Opaque Liquid |
| Flash Point | > 140 F (60.0 C). Method used: ASTM D Closed Cup |
| Freeze Point | -40 F (-40 C) |
| Viscosity (cps)@Temp | No data available |
| Color | White / Off-White |
| Odor | Slight petroleum oil |
| Density | 8.8 lbs/gal |
| pH | 5-8 (1% solution) |
| Solubility | Water Soluble |
| Shelf Life | 30 Days <i>(It is recommended to store indoors between 5 – 30 C.)</i> |
| | |

PACKAGING (customized packaging available upon request.)

| Size | Packaging | Weight |
|-----------|-----------|------------|
| 55 gal. | Drum | 475 lbs |
| 275 gal. | Tote | 2,300 lbs |
| 330 gal. | Tote | 2,800 lbs |
| 5000 gal. | Bulk/ISO | 45,500 lbs |

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