



Texan Shale Chemicals

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



PRODUCT DATA SHEET

FRICITION REDUCER **TS-MB**

Anionic Mid Brine Emulsion

PRODUCT DESCRIPTION

TS-MB is a premium anionic water soluble polyacrylamide based friction reducer (FR) that is highly effective in Mid brine conditions. It has high molecular weight and is manufactured as a liquid-emulsion. Addition of small amounts, typically 0.25 – 1.00 gpt (gallons per thousand gallons), to water based frac fluids can deliver friction reduction (pressure loss) of over 70% in a short period of time. Due to its rapid hydration properties, TS-MB can be pumped continuously into the stimulation fluids as supplied or by batch mixing before treatments. TS-MB 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-MB has been specifically optimized for use as a Mid 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-MB can achieve optimal performance at low dosages (0.25 – 1.00 gpt), reducing overall treatment costs.

TEST METHODS

Test Method(s): Friction reduction properties were tested on a custom Flow Loop at a flow rate of 6 gpm generating 80,000 Reynold's number. The test section of the loop consisted of pipe having 3/8" O.D. Typical dosage of 0.25 gpt was used and the polymer was injected on the fly through the suction header of the mono-pump. TS-MB was tested in city tap water (fresh water), Bakken SPF-14 (light brine) brine, having the following TDS: Na₂SO₄ (0.53 g/L), NaHCO₃ (0.62 g/L), CaCl₂ (0.89 g/L) and MgCl₂ (0.33 g/L) and Sea Water 33 K having the following TDS: NaCl- (34 g/L).



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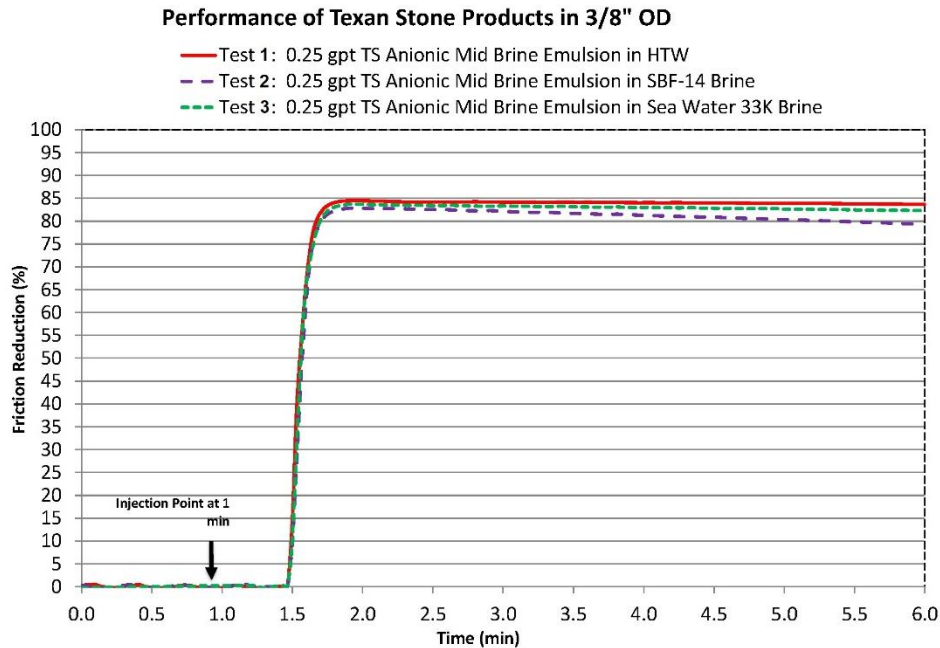


PERFORMANCE & RESULTS

The following figures represent test results in three brines in 3/8" OD.

Figure 1. FR performance of TEXAN STONE TS-MB in 3/8 " OD in city Tap Water, SBF-14 Brine and Sea Water 33K Brine at room temperature

The test results illustrate that TEXAN STONE TS-MB in 3/8 " OD achieves a FR value of 84.53% in City Tap Water, 82.88% in SBF-14 Brine and 83.72% in Sea Water 33K Brine.



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	6 Months (It is recommended to store indoors between 5 – 30 C.)

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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