



Texan Minerals and Chemicals LLC

14090 Southwest Freeway, Suite 310, Sugar Land, TX 77478

Phone: 713-294-4180 Email: Mani@TMCgreen.com



PRODUCT DATA SHEET

TEXAN CATIONIC EMULSION

HIGH BRINE FRICTION REDUCER

PRODUCT DESCRIPTION

Texan Cationic Emulsion is a premium cationic water-soluble polyacrylamide based friction reducer (FR). It offers superior performance in high salinity brines and can be effective at small dosages. TCE has very 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 high brine frac fluids can deliver friction reduction (pressure loss) of over 70% in a short period of time. Due to its rapid hydration properties, it can be pumped continuously into the stimulation fluids as supplied or by batch mixing before treatments. TCE 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

TCE has been designed as a cationic emulsion, and is specifically optimized for use as a high brine friction reducer, which can be added as supplied due to its emulsion form and excellent hydration properties. It has the ability to perform in very high TDS brines (up to 250K) and is tolerant to multitude of divalent cations including Ca^{2+} and $\text{Fe}^{2+}/\text{Fe}^{3+}$. It can achieve optimal performance at low dosages (0.25 – 1.00 gpt), reducing overall treatment costs.

INDEPENDENT LAB TESTING

Test Method(s): Friction reduction properties were tested on a custom Flow Loop at 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. Total test time was 6 minutes. Texan Cationic Emulsion was tested in Marcellus (150K TDS) brine, having the following TDS: NaCl (96.47 g/L), KCl (1.54 g/L), CaCl_2 (59.38 g/L), BaCl_2 (7.47 g/L), FeCl_3 (0.55 g/L), NaHCO_3 (0.07 g/L), MgCl_2 (11.43 g/L), SrCl_2 (17.52 g/L).

The following figures represent test results in the Marcellus brine.

PROPERTIES

Form	Opaque Liquid
Color	White / Off-White
Odor	Slight petroleum oil
Density	8.8 lbs/gal
pH	3-6
Solubility	Water Soluble
Shelf Life	6 Months (<i>It is recommended to store indoors between 5°– 30° C.</i>)



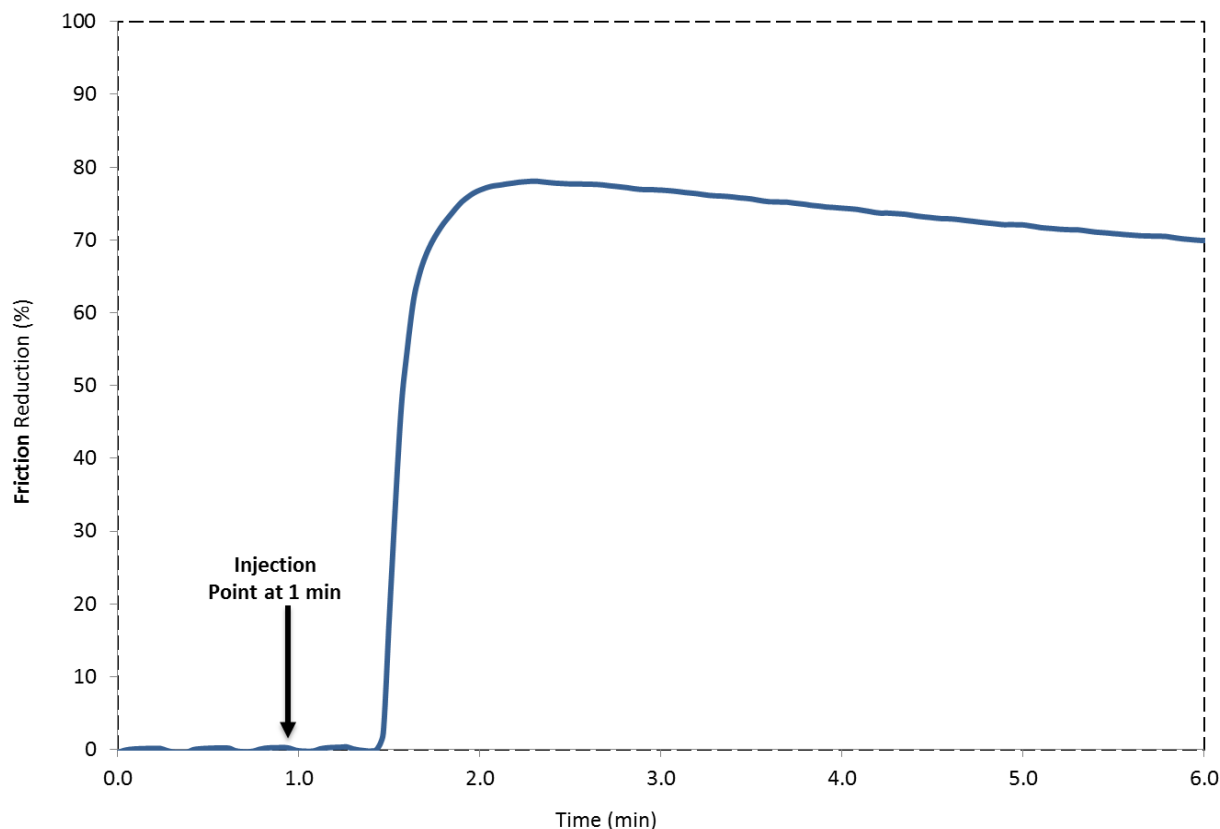
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Figure 1. FR performance of TEXAN CATIONIC EMULSION in 150K TDS Marcellus Brine



The test results show that Texan Cationic Emulsion achieves a FR value of 77.4% in Marcellus brine.

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

**Other customized packaging available upon request.*

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