



# FRICTION REDUCER

ALPHA-PS24D

## Description

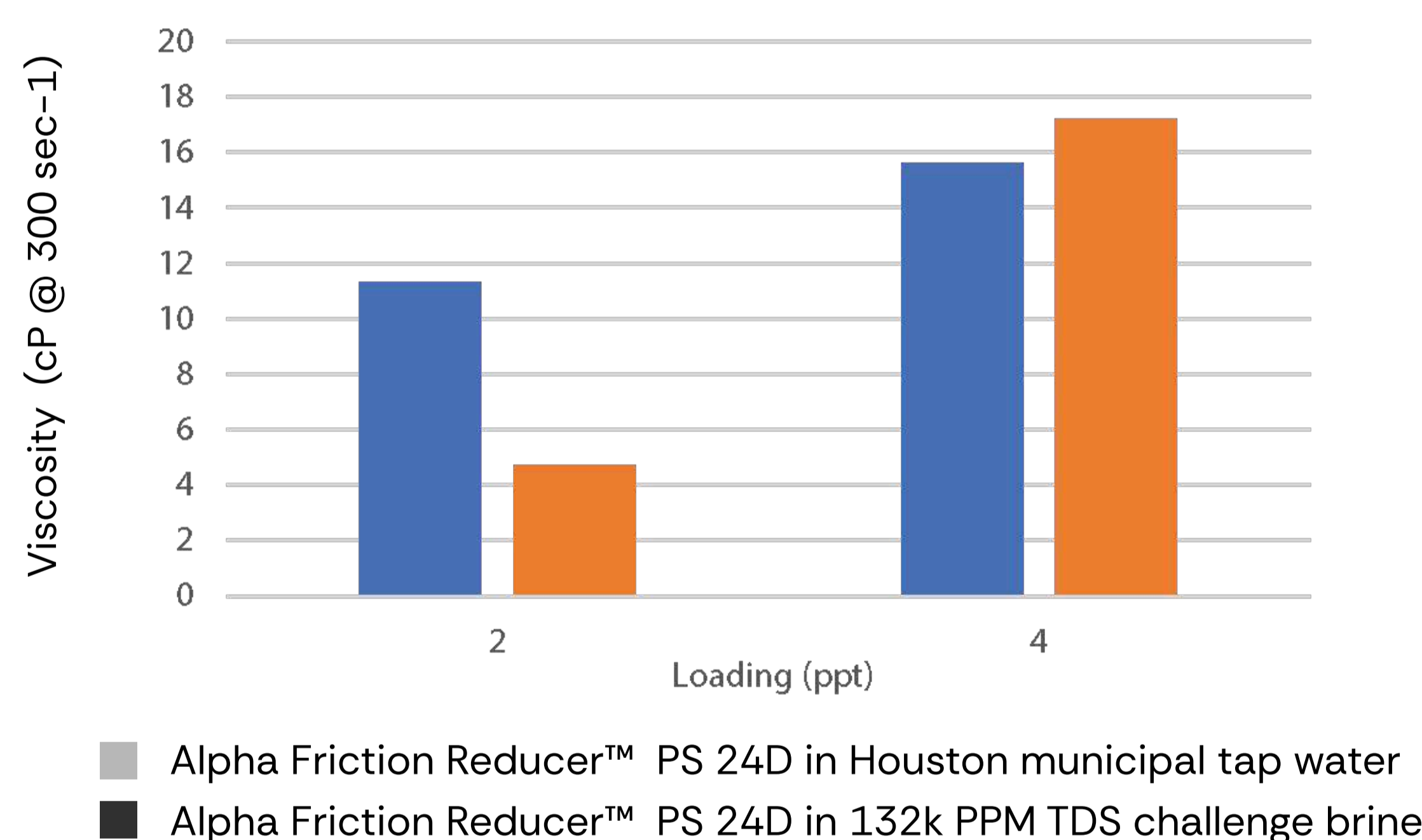
Alpha Friction Reducer PS 24D is a fast drying, low- to high-brine-tolerant anionic dry friction reducer with anti-wear properties designed for use in hydraulic fracturing. Alpha Friction Reducer generates high viscosity in all water sources, with improved viscosity relative to most commercially available sources. This allows hydraulic fracturing operations to place sand with much more aggressive increases in proppant loading and complete stages faster. Alpha Friction Reducer PS 24D reaches 90% of hydration capacity within 60 seconds in waters up to 150,000 TDS.

## Application

Spikes in pressure during hydraulic fracturing is a costly issue. Problems include:

1. Screenouts and necessary flushing out proppant from the well to continue
2. Failure to place proppant according to design, reducing increased designed reservoir stimulation
3. Safety retesting on surface and downhole equipment for pressure resilience
4. Increased wear on surface pumping equipment

High rates of abrasive sand and water flowing through fluid ends on-site rapidly causes fluid ends to wear out and need replacing, at a rate such that most service companies plan on obsolescence and require personnel and backup pump trucks to be on location for standard operations. Alpha Friction Reducer PS 24D is designed to reduce the rate of degradation with additives designed to prevent crack propagation and improve fluid lubricity—two major sources of wear that are difficult to address through permanent coatings inside the fluid ends or through localized additives which have to rapidly disperse in water, yet coat metal surfaces at a meaningful concentration.

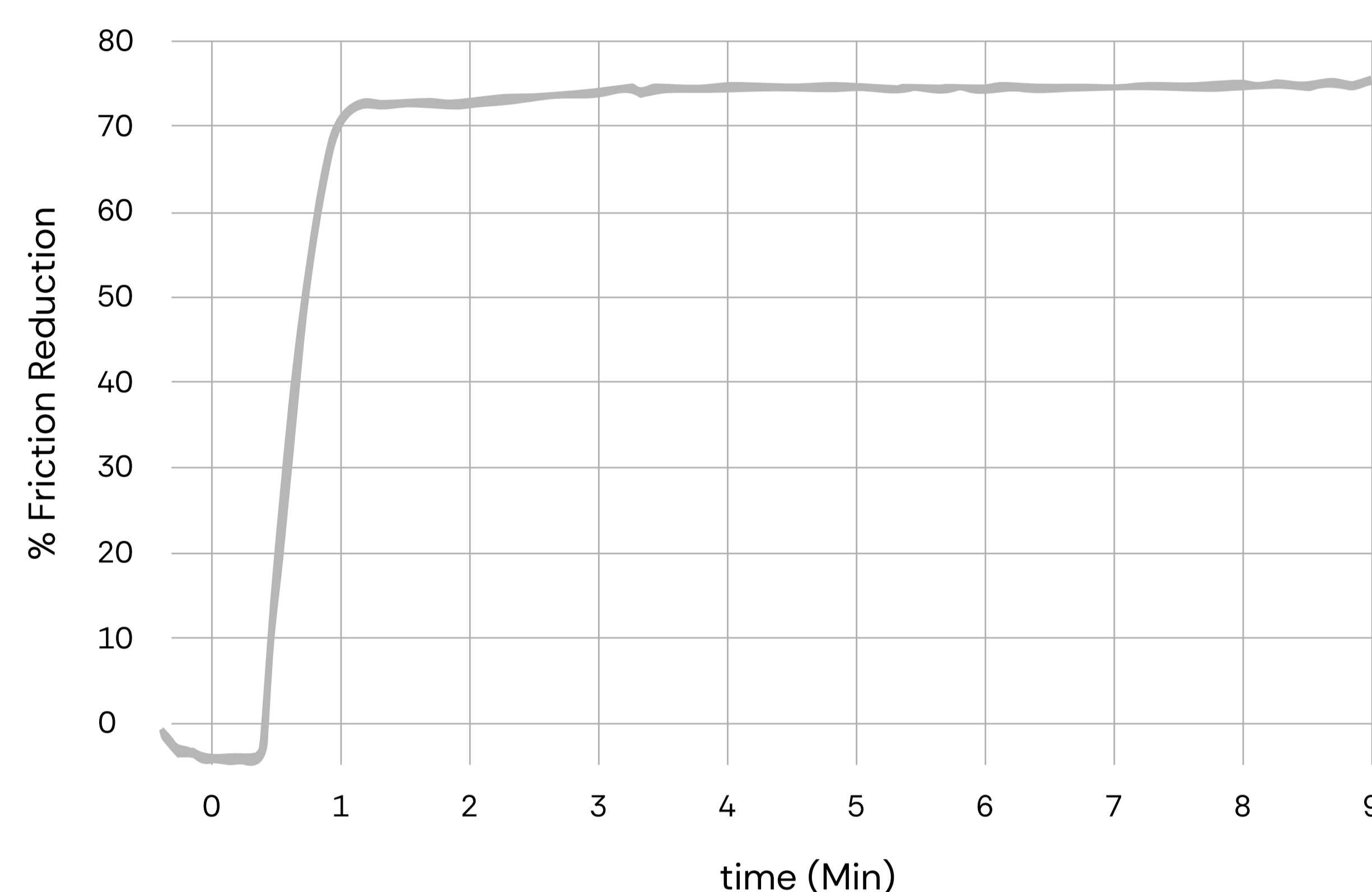


Alpha Friction Reducer PS 24D viscosity in different water sources. 132,500 TDS in blue, fresh water (500 TDS) in yellow. Measurements taken on a Fann 35 with an R1B1 configuration after 5 minutes of hydration.

## Properties

Color	White to Light Tan
Form	Opaque Solid
Bulk Density	40-48 lbs/ft <sup>3</sup>
Flash Point	>200°F
Angle of Repose	45°
Freezing Point	NA-solid
Ionic Charge	Anionic
Water Range	Fresh – 180K TDS <sup>1</sup>
Solubility	Water soluble

<sup>1</sup> Up to 132K TDS compatibility has been tested for Alpha 21D. A flow loop test using source waters and normally used additives is recommended prior to operations to ensure performance.



Friction reduction results for Alpha Friction Reducer™ PS 24D in 132,500 ppm TDS water, including 2,800 ppm of calcium, at 2.0 PPT loading.

## Additional Information

Alpha Friction Reducer PS 24D is not DOT regulated, is suitable for on-the-fly frac applications and frac applications requiring rapid hydration times, is compatible with all non-ionic, anionic, and is compatible with low-dosage cationic additives such as used for biocide applications.

Alpha Friction Reducer PS 24D has been tested in and provides higher viscosity profiles in water sources up to 132,000 ppm TDS, including high levels of calcium and divalent loadings up to 5,000 ppm, and provides reduction of friction in up to 200,000 ppm waters. High concentrations of calcium and other divalents will reduce any anionic friction reducer's performance, however, and specific water source testing is recommended.

Alpha Friction Reducer PS 24D is a dry powder friction reducer, which requires certain precautions before executing a frac job on location. Normal operations involving dry friction reducers use pre-hydration through a dry-addition, calibrated powder blender for fracturing applications for dry add units. Care must be taken to not expose Alpha PS 24D to excess water before being pumped for use. Alpha PS 24D can be delivered to location via bulk containers or super sacks. Please contact Alpha Energy Technologies for other container size options and samples.

Reach out to your AET account manager today for more information, samples, and other high-performance products.

