

# CalVisc™ CS-2 Slurried Friction Reducer

US Division

## OVERVIEW

Calfrac's laboratory services continuously evaluates friction reducers to provide customers with quality products for pumping operations. CalVisc CS-2™ has been developed to work in a wide range of friction reduction applications and can be used in both slickwater and high viscosity friction reducer (HVFR) applications.

## CHALLENGE

Common emulsified friction reducers are an industry standard. Polymer in an emulsion state can lead to increased inversion time versus slurried friction reducer, which leads to delayed friction reduction for slickwater applications. In HVFR situations, additional product is required on location as there is less polymer per gallon than in slurried friction reducer. Finally, treated emulsified friction reducer has a higher cost per gallon of treated fluid when compared to slurried friction reducer.

In order to address these challenges, Calfrac needed to develop a flexible friction reducer for low to medium TDS water quality that could be used in both slickwater and HVFR applications.

| SOLUTION  | RESULTS   |
|---|---|
| <p>In an effort to overcome these challenges, Calfrac's engineers and expert laboratory services team developed a slurried friction reducer suitable for use in both slickwater and HVFR applications. Calfrac's solution provides:</p> <ul style="list-style-type: none"> <li>• More active polymer than emulsified friction reducers</li> <li>• The ability to run lower loadings on an HVFR design when compared to emulsified friction reducers while maintaining the same apparent viscosity</li> <li>• Increased friction reduction performance if running equivalent loadings in a slickwater application</li> </ul> | <p>Calfrac has pumped CalVisc CS-2 friction reducer for several different operators. Operators have replaced their emulsified friction reducers with the CalVisc CS-2 product.</p> <ul style="list-style-type: none"> <li>• Over 1,000 stages have been pumped with CalVisc CS-2 with reduced screenouts due to the flexibility of the product</li> <li>• Viscosities were observed with half the loading of product</li> <li>• Ability to use ISO tanks improves product handling and reduces product costs</li> </ul> |

## ILLUSTRATION OF RESULTS

Viscosity vs Friction Reducer Loading

