

STEP-SW slick water systems are a suite of friction reducers capable of exceptional friction reduction from fresh water to high total dissolved solids (TDS) brines. High treating pressures are seen when pumping water and high rates which cause turbulent flow. Using the correct friction reducer for the treatment can significantly drop surface treating pressures, thus reducing the horse power required. This also allows for increased rates which improve the complex fracture network desired with a slick water treatment.

The friction reduction additives include liquid anionic (SFR-100's), liquid cationic (SFR-200's) and dry-add polymers (SFR-300's). Liquid additives are typically pumped between 0.5 - 1.0 L/m<sup>3</sup>, whereas the dry add friction reducers are added between 0.15 - 0.5 kg/m<sup>3</sup>. The liquid friction reducers display a rapid inversion and hydration time, allowing on-the-fly addition. A water temperature of 10°C is recommended before the start of the treatment.

**Properties:**

- Liquid friction reducers can be run on-the-fly
- Rapid inversion and hydration times
- A selection of systems which can be adjusted specifically for different source waters
- Great thermal stability, up to 100°C

**Technical Data:**

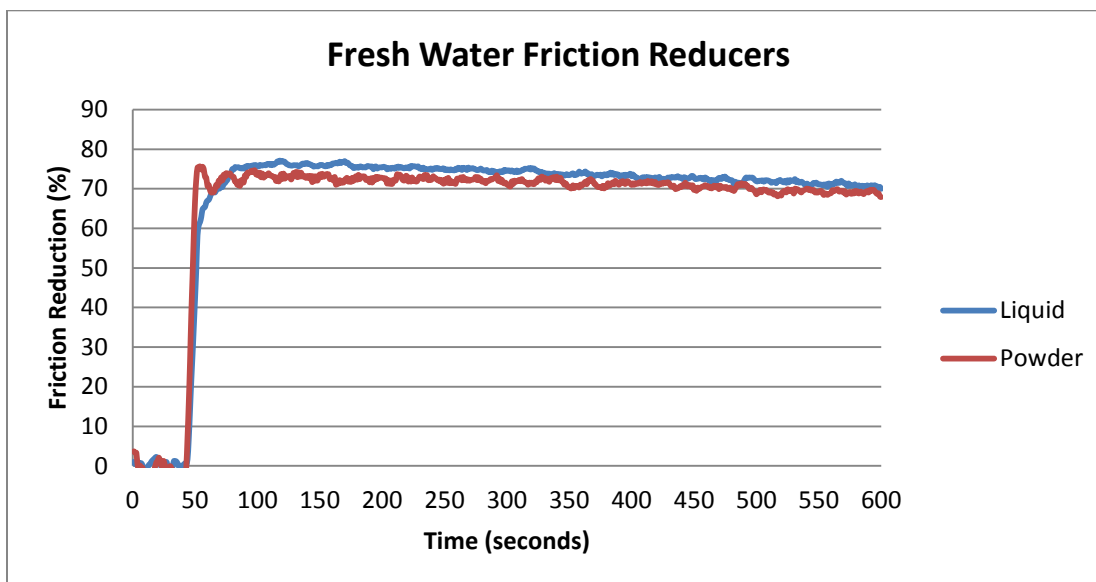


Figure 1: Friction reduction in fresh water at a loading of 0.1 L/m<sup>3</sup> and the powder at 0.05 kg/m<sup>3</sup>

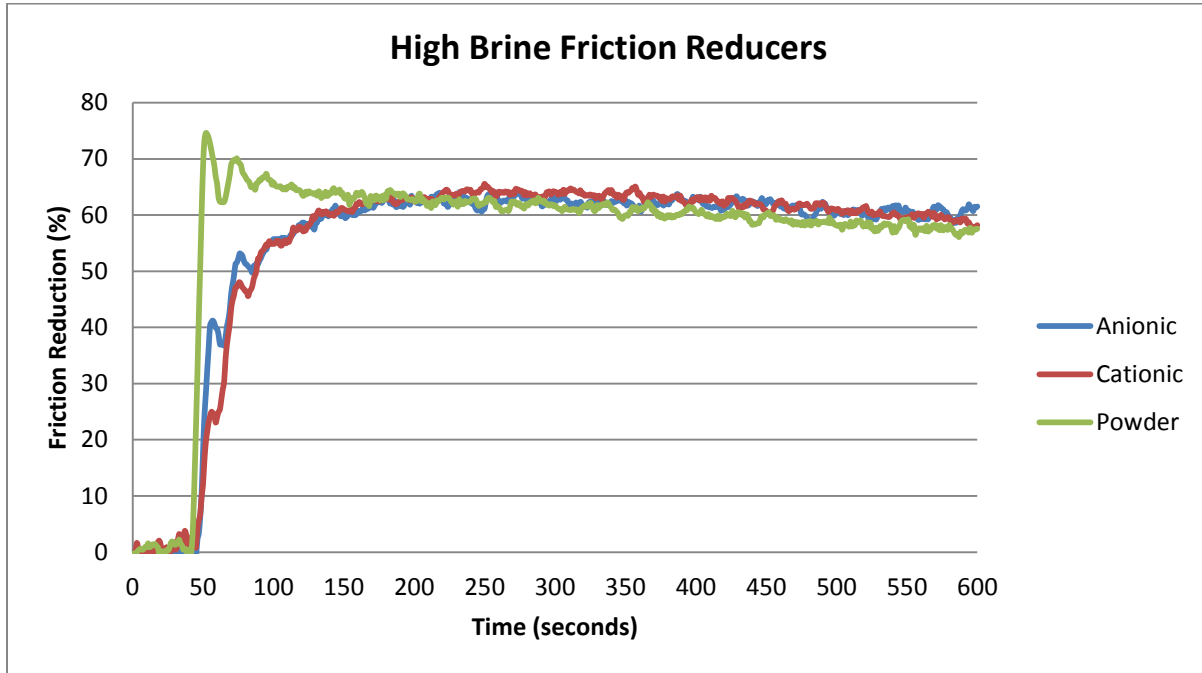


Figure 2: Friction Reduction in Brine (8% NaCl, 2% CaCl<sub>2</sub>). The liquid additive was tested at a loading of 0.1 L/m<sup>3</sup> and the powder at 0.05 kg/m<sup>3</sup>