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POLYMER REDUCTION LEADS TO INCREASED SUCCESS: A COMPARATIVE STUDY

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ABSTRACT

Recent advances in guar and crosslinker technologies have resulted in the development of high-viscosity crosslinked borate-fracturing fluids without increasing polymer loadings. These low polymer (LP) borate fracturing fluids are being used successfully in various formations previously believed to be too hot and or too deep for LP fracturing fluids.

Historically, polymer loadings of 3.6 to 4.2 kg/m³ (30 to 35 lbm/1,000 gal) were commonly pumped in the Western Canadian Sedimentary basin (WCSB) for formations deeper than 2500 m and bottomhole temperatures greater than 80°C. These same formations are now fracture stimulated using the LP fluids with loadings as low as 1.8 kg/m³ (15 lbm/1,000 gal) with exceptional results.

This paper demonstrates that LP fracture fluids can be used in place of fluids requiring higher polymer loadings with minimal changes to the overall design of the fracture treatment. The new fluid can be pumped on-the-fly at conventional pump rates and proppant concentrations because of the fluid’s improved shear and temperature stability.

The advantages of using a reduced-polymer fracturing fluid include increased production, lower treatment costs, and lower frictional pressure loss.

This paper illustrates these advantages as it compares the LP fracture fluid with HP fracture fluids in more than 200 wells in the WCSB. The formations where LP fluids were used have depths of up to 3250 m and reservoir temperatures reaching over 100°C.

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