CASE HISTORY

Kol-Seal® Carbon-Based Cement Additive Improves High-Temperature Slurry Performance in Oklahoma Well

Location: Oklahoma, USA
Application: High-temperature cement slurry design
Product: Kol-Seal® Lost Circulation Material / Cement Extender

Challenge

- Carbon-based additive required for high-temperature stability
- Low-density slurry design needed for formation compatibility
- Required compatibility with existing cement additives
- Broader particle size distribution required for improved bridging
- Existing additive systems failed to meet performance target

Solution

- Implemented Kol-Seal carbon-based cement extender technology
- Broader particle size distribution improved bridging capability
- Compatible with existing cement additive systems
- Maintained low-density slurry design requirements
- Easy blending and mixing for field use

Results

- Carbon-based additive maintained stability at elevated temperatures
- Low-density slurry achieved with strong compressive strength performance
- Broader particle size distribution improved sealing capability
- Slurry maintained compatibility with other cement additives
- Kol-Seal outperformed previously used additive systems in testing

CHALLENGE

A major service company operating in Oklahoma required a specialized cement slurry design capable of performing under elevated downhole temperatures while maintaining reliable placement characteristics.

The cement system needed to meet several critical operational requirements. The slurry had to remain carbon-based and thermally stable, while also maintaining a low-density profile suitable for the formation conditions. In addition, the additive needed to be compatible with commonly used cement additives, easy to blend and mix at the rig site, and capable of delivering strong mechanical performance after set.

The operator also required an additive with a broader particle size distribution than the material currently in use, allowing improved bridging capability and more effective control across variable formation apertures. Existing solutions failed to meet the full range of performance criteria required for the application.

SOLUTION

Following extensive laboratory testing and evaluation, the service company selected Kol-Seal® lost circulation material and cement extender as the preferred additive for the cement slurry design.

Kol-Seal is a lightweight granular additive engineered with a controlled particle size distribution that provides efficient mechanical bridging while maintaining slurry pumpability and placement integrity. The additive's carbon-based composition provided the thermal stability required for high-temperature environments, while its engineered particle distribution offered a broader PSD range that improved bridging capability across permeable formations.

Laboratory testing demonstrated that Kol-Seal could be easily blended into the cement system while remaining compatible with other additives in the slurry design. The additive also enabled the development oflower-density cement systems without significantly altering slurry behavior, allowing the service company to maintain predictable placement characteristics.

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RESULTS

Field testing confirmed that the Kol-Seal-enhanced cement slurry met all operational performance requirements.

The slurry maintained stable rheological behavior during mixing and pumping while delivering strong mechanical properties after set. The additive provided the desired balance of low density, high compressive strength performance, and thermal stability, ensuring reliable cement placement and long-term zonal isolation.

Compared with previously used additives, Kol-Seal demonstrated superior performance during both laboratory and field evaluations. Based on these results, the service company adopted Kol-Seal as the preferred additive for the slurry design.

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