Overview

Risks associated with lost circulation increase when fractured, vugular, cavernous, or highly porous formations are present. Unplanned severe losses during drilling or running casing can lead to poor zonal isolation, decreased production, well abandonment, or costly remediation. To overcome challenges associated with lost circulation during well construction, Halliburton engineered the SentinelCem™ Pro cement system. The next generation of our SentinelCem™ system, SentinelCem Pro cement exhibits improved properties to cure severe to total losses in a single-sack formulation that simplifies mixing operations and enables proactive rig-site deployment. Because of its thixotropic nature, this solution is ideal for zones where particulates lost-circulation materials have limited success curing losses.

Simplified mixing operation for proactive deployment

SentinelCem Pro is a single-sack lightweight system that easily blends with a wide range of cement types, reducing turnaround time between laboratory testing and rig-site application. This unique lost-circulation solution enables proactive storage at the rig site and deployment using “on-the-fly” or batch mixing techniques, without the need for pre-hydration of the slurry design or high-purity water sources. This low-abrasive product pumps safely through the bottomhole assembly (BHA). Enhanced acid solubility of the system is ideal for sensitive production zones. SentinelCem Pro cement allows operators to quickly address lost-circulation events to reduce nonproductive time (NPT) and continue drilling operations.

Thixotropic cement system stabilizes loss zones

The thixotropic nature of SentinelCem Pro cement enables the system to remain fluid while pumped into lost-circulation zones. Once the product is placed in the loss zone and pumping ceases, the SentinelCem Pro cement rapidly gels with the shear rate reduction and then gains early compressive strength. This feature helps cure losses when the slurry enters fractures and vugular zones and it mitigates costly drilling fluid loss to the formation.
Laboratory-proven performance results

Laboratory results show controllable gel-strength development, thickening time, and early compressive strength over a range of slurry densities (10 to 12 lb/gal) and temperatures (110 to 210°F). SentinelCem Pro cement exhibits significant tolerance to different cement types and local water sources with high sodium, calcium, magnesium, chloride, and sulphate. Additionally, cements with preblended potassium chloride and seawater exhibit good performance.

On-off-on testing indicates SentinelCem™ Pro cement achieves rapid gel strength when shear is removed and regains fluidity for circulation when shear is reapplied.

Field-proven success

Boasting a lengthy success record, SentinelCem cement has cured severe to total losses in over 300 operations globally, in 31 countries. Our next generation SentinelCem Pro system provides continued success addressing lost circulation challenges in a single-sack, easy-to-blend formulation for proactive rigsite deployment.