Thermatek™ Service

Thermatek™ rigid setting fluids are a new generation of chemical treatments used to provide engineered solutions for a wide range of problems encountered when drilling or producing fractured, unconsolidated or watered out formations. These fluids are the basis of Thermatek™ service. This new service is also an ideal solution for plugging or temporarily isolating specific zones.

Combined with Halliburton’s engineering capability and specialized equipment, Thermatek service is part of a total package that provides operators a step-change advancement in achieving successful interventions. Following are the primary applications for Thermatek service:

- Water and gas shutoff in deviated and horizontal wells.
- Gravel pack selective isolations.
- Annular casing plugs (including horizontal wells).
- Severe lost circulation control treatment.

Thermatek service can be implemented via work string, coiled tubing or dump bailer, depending on the application requirements.

Thermatek Fluid Sets Up at a Prescribed Temperature

Thermatek fluid is engineered to remain as a low viscosity fluid during placement. It then sets rapidly at a given formation temperature. The transition from fluid state to solid state is almost immediate, resulting in essentially zero gas migration or channeling (see figure 3). This “right angle set” occurs because Thermatek fluid is an exothermic material. When the material enters the near wellbore area it starts to spread out into the formation matrix; however, the exothermic reaction is exponentially accelerated due to increased surface area and temperature transfer. This triggers the setting process and the Thermatek material “locks up” before penetrating into the formation.

Figure 1 – Thermatek material test cube with 11,000 psi compressive strength. The material is acid soluble and can be removed from the wellbore when desired.

Figure 2 – Typical compressive strength vs time curve. In this example, set up has been delayed 4 hr. Buildup of compressive strength is extremely fast, in this case, over 4000 psi in less than 3 hr.

Figure 3 – Typical temperature vs viscosity curve. In this example, set up has been delayed about 60 minutes. Note that when set up begins, it is almost instantaneous.
Thermatek™ Service – Proven, Cost Effective and Efficient

Whether it is for water shutoff or a treatment to help control lost circulation, Thermatek service integrates the full capability of Halliburton’s experienced applications engineering services with a full suite of wellbore simulation software, mixing and placement equipment and field service experts.

Halliburton’s processes help assure that every aspect of a proposed intervention is reviewed and engineered to help achieve success. In many cases, the savings in rig time or intervention time more than cover the cost of the Thermatek service.

This product is protected by U.S. Patent No. 6,664,215, Iranian Patent No. 3800033 and Nigerian Patent No. RP 14,497, additional U.S. and international applications pending. The trademark THERMATEK is used pursuant to license.

Thermatek Service Key Features

- Predictable and controllable right angle set.
- Zero shrinkage helps provide gas-tight seal.
- Zero static gel helps achieve zero gas migration.
- Rapid build of compressive strength up to 11,000 psi.
- Easy to remove by drilling, milling, or acid.
- 100% acid soluble with 99% regained permeability.
- Used safely in producing formations with virtually no invasion damage.
- Tolerates up to 50% contamination.
- 4-5 micron median particle size.
- Easily mixed and pumped with conventional equipment and techniques.

Case History

Thermatek™ service used to shut off all flow from a watered-out horizontal well section to enable reperforating into the migrated oil rim.

North Sea – Operator needed to seal a 4-in. x 7-in. casing annulus in a horizontal well section located immediately above 3000 ft of 4-in. sand screens in order to prevent preferential production from the watered out horizontal. Halliburton designed an intervention for coiled tubing deployment of a special formulation of Thermatek-ZI (zonal isolation) material designed not to flow through the screens. An inflatable bridge plug was set at a desired depth and holes punched in the 4-in. tubing to allow a calculated volume of Thermatek fluid to be squeezed between the bridge plug and a cement retainer into the 4-in. x 7-in. annulus. Potential slumping of the fluid in the horizontal was minimized through the use of proprietary gel spacers ahead of and behind the Thermatek fluid pill. Results: The entire treatment was mixed, placed and pressure tested within a single 12 hr shift. The isolation was completely successful with 1,000 psi held on the plug for 15 minutes to prove 100% isolation of the annulus. Ten months after the intervention the well was still producing 2,000 bopd with minimal water cut.

For more information about how Thermatek service can help you meet the challenges of severe lost circulation, near wellbore water shutoffs and plugging operations, contact your local Halliburton representative or email stimulation@halliburton.com.