

CemFIT Heal flexible self-healing cement system

Provides emissions reduction by reducing hydrocarbon leaks

Emissions Reduction:
Reduces hydrocarbon leaks.
Lowers CO₂ footprint during well construction due to significantly reduced usage of portland cement.

Applications

- Wells with potential risk of
 - Hydrocarbon migration
 - Sustained casing pressure (SCP)
 - Postplacement pressure and temperature variations (e.g., due to injection, hydraulic fracturing, underground gas storage)
- Oil and gas wells in environmentally sensitive areas
- Primary cementing, plug and abandonment cementing, or both

Benefits

- Improves long-term well integrity by resisting set-cement-sheath failure
- Reduces risk of
 - Annular pressure buildup
 - Mechanical well damage
 - Collapsed casing
 - Cement tensile cracks
 - Cement debonding
 - Costly remedial cementing jobs and lost production
- Extends production life of the well by autorepairing cement cracks and microannuli that cause hydrocarbon leaks
- Minimizes or eliminates the need to monitor wells after decommissioning

Features

- Low Young's modulus for greater flexibility
- Ability to autorepair on contact with hydrocarbons, even in dry gas
- Standard designs for a wide range of densities and temperatures
- Suitability for both batch mixing and mixing on the fly, using conventional equipment

Achieve zonal isolation for the life of the well

CemFIT Heal* flexible self-healing cement system helps ensure well integrity from drilling to abandonment, providing a competent annular pressure seal and protecting against hydrocarbon leaks and SCP at the wellhead. This versatile, advanced product is the only cement system in the industry that not only has the mechanical properties to withstand wellbore stresses, but should any isolation defects appear, it repairs itself on contact with oil or gas irrespective of methane content.

Unlike conventional cement systems, the CemFIT Heal system expands after setting, improving cement bonding and sealing microannuli that can cause unwanted gas migration. A low Young's modulus enables it to withstand cement sheath stresses due to

- perforating
- well completion
- stimulation treatments
- plug and abandonment
- temperature changes
- pressure changes
- drilling.

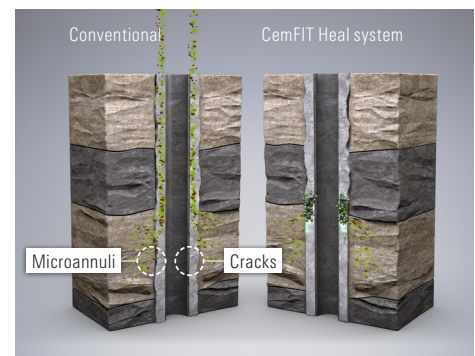
In the event of a hydrocarbon leak due to cement sheath failure (crack or microannulus), the set cement responds on contact with hydrocarbons and autorepairs the pathways, restoring the hydraulic integrity of the well. The self-healing action is repeatable if annular integrity is again compromised during the life of the well.

These properties have been conclusively demonstrated in the laboratory and during field testing.

For well decommissioning, CemFIT Heal system delivers a robust, long-term barrier after abandonment with set cement properties favoring flexibility and durability along with the inherent ability to self seal should any isolation defects occur.

Deploy with ease

The cement job is simple to design, with one standardized concentration of the self-sealing additives for an oil environment and another for gas. Blend, solid volume fraction, and slurry properties can be easily adjusted for optimal results to accommodate changes to cement designs and job programs. The CemFIT Heal system is also easy to blend and mix using conventional equipment, making it suitable for large-scale use. The increased efficiency and higher reliability reduce NPT.



Conventional cement barriers (left) can develop cracks and microannuli caused by pressure changes and other stresses, allowing fluids to flow between zones and rise to the surface. The CemFIT Heal system (right) responds to any contact with oil or gas by automatically repairing and sealing itself.

CemFIT Heal System Specifications

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|------------------------|---|
| Density range | 11–16.2 lbm/galUS [1,320–1,940 kg/m ³] |
| Temperature range | 70–280 degF [21–138 degC] |
| Hydrocarbon activation | Oil Any type of gas, even dry gas |