**EverCRETE**

**CO₂-resistant cement system**

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### CO₂ isolation challenges
Portland cement systems are used conventionally for zonal isolation in oil or gas production wells. However, portland cement is thermodynamically unstable in CO₂-rich environments and can degrade rapidly upon exposure to CO₂ in the presence of water.

As CO₂-laden water diffuses into the cement matrix, the dissociated acid ($H_2CO_3$) reacts with the free calcium hydroxide and the calcium silicate hydrate (C-S-H) gel. The reaction products are soluble and migrate out of the cement matrix. Eventually, the compressive strength of the set cement decreases and the permeability and porosity increase, leading to loss of zonal isolation.

### CO₂-resistant isolation solution
With the EverCRETE system, Schlumberger has developed

- CO₂-resistant cement system to extend the duration of zonal isolation
- testing methodology using a computer-controlled titanium reactor to assess the long-term durability of cement cores under well CO₂ conditions.

In laboratory tests, the EverCRETE system has proved to be highly resistant to CO₂ attack from wet supercritical CO₂ and CO₂ water saturation.

EverCRETE system can be prepared locally using the standard bulk plant. The density can be tailored to well requirements, providing operational flexibility.

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### APPLICATIONS
- Carbon capture and storage injection wells
- Enhanced oil recovery CO₂ injection wells

### BENEFITS
Longer-lasting zonal isolation in CO₂ underground storage and injection because the EverCRETE® CO₂-resistant cement system is resistant to degradation when exposed to a CO₂ environment

### FEATURES
- Temperature up to 230 degF [110 degC]
- Wide density range of 12.5 to 16 lbm/USgal [1,497 to 1,917 kg/m³]
- Mixing and pumping with standard equipment
- Compatibility with portland cement

![CO₂ durability test reactor: Cement cores are tested simultaneously in supercritical CO₂ that is saturated with water and in CO₂ water saturation under downhole temperature and pressure conditions.](image-url)
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