

Italy

Tailored cement solution helps ensure integrity for CCUS well in Adriatic Sea

CorrosaCem™ cement system provides long-term isolation in CO₂ storage environment

CHALLENGE

- Isolate casing string with corrosion-resistant barrier
- Manage ECD in depleted zones
- Maintain cement integrity under CO₂ exposure

SOLUTION

- Deploy CorrosaCem™ cement system
- Use WellLife® and iCem® software for design and simulation
- Validate properties through lab testing

RESULT

- Achieved complete isolation
- Confirmed cement coverage with ultrasonic logs
- Supported future CO₂ storage expansion



Tailored CorrosaCem™ cement system design improved resistance to cyclic loading.

Overview

European operators are accelerating CCUS strategies to meet stringent emissions targets. The EU's Net-Zero Industry Act mandates at least 50 million tons of CO₂ injection capacity annually by 2030. This mandate drives demand for reliable well integrity solutions that can withstand corrosive CO₂ environments and support long-term storage objectives.

Challenge

An Italian operator required a corrosion-resistant barrier and complete casing isolation for a CO₂ injection well in the Adriatic Sea. Carbonic acid, formed by

CO₂ and water, can degrade Portland cement and corrode casing. Depleted zones increased lost circulation risk and required a design that controlled equivalent circulating density (ECD), optimized slurry properties, and helped ensure long-term integrity under operational loads.

Solution

Halliburton deployed the CorrosaCem™ cement system to isolate the injection zones and resist CO₂-induced corrosion. The blend incorporated additives to reduce permeability and improve mechanical strength. WellLife® software performed finite element stress analysis to determine the cement properties required for long-term integrity under expected operational loads. iCem® cementing service 3D hydraulics software simulated and optimized displacement efficiency throughout the entire cemented interval to help ensure complete radial cement coverage. Laboratory tests validated the cement's mechanical properties, integrity, and permeability before and after CO₂ exposure.

Result

The operation placed 60 bbl of CorrosaCem slurry across the liner. Pressure tests validated isolation, and ultrasonic logs confirmed full cement coverage behind the 7-in. liner. This achievement supports future CO₂ storage expansion in the region and demonstrates proven integrity in corrosive environments.

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