TECHNICAL DATA SHEET

CARBONRT

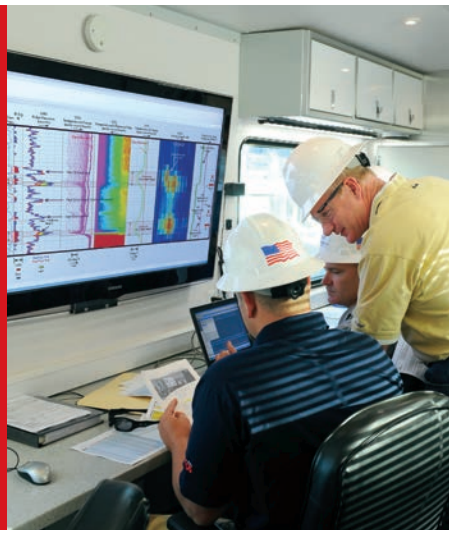
Inert tracer technology for cementing operations

Features

- Inert, permanent tracer that is safe and environmentally friendly—no special equipment, handling, permits or licenses required
- Uniform distribution of tracer within each proppant grain that can be pre-mixed with dry cement or added on the fly as the cement is loaded.
- Can be delivered in Pellet (40/70 mesh) or powder (~325 mesh) form to the bulk plant for mixing similar to other cement dry additives
- Detection is performed using standard neutron logging tools run at standard speeds

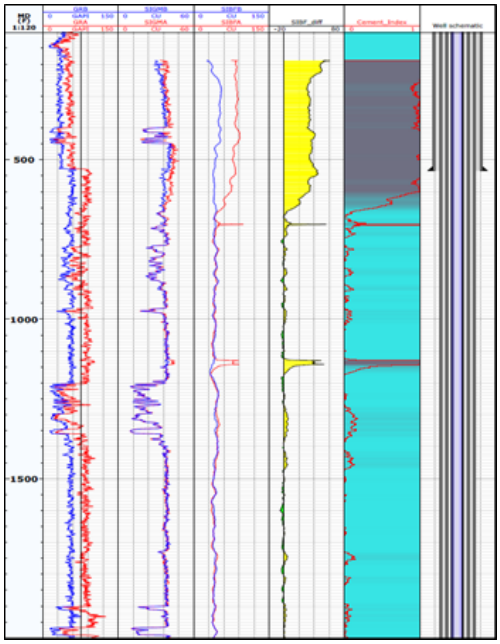
Benefits

- Cost-effective cement evaluation in vertical and horizontal wells
- Identifies the cement coverage through multiple pipe strings
- Provides a direct measurement of the cement regardless of cement recipe or type
- Enables evaluation of top of cement as well as coverage along a horizontal lateral or in the build, allowing for mitigation measures prior to completing the well
- Does not impact cement integrity



Evaluate cement quality with high definition measurement

CARBONRT® inert tracer technology enables the evaluation of the cement coverage in most cemented applications. Our unique tracer technology enables the direct detection of the cement using our CEMENTVISION™ evaluation service. The accurate measurements from the service allow the evaluation of the top of cement, as well as cement coverage in all segments of a well, including the lateral in a horizontal well. This allows for evaluation of mitigation efforts at any time during the completion or life of the well.



CARBONRT cement detection technology provides a cost-effect method to perform cement evaluation in most cased and cemented well applications

Uniform tracer distribution for accurate measurements

CARBONRT technology is manufactured with a proprietary tracer uniformly distributed throughout each grain, which can then be blended into the dry cement before pumping. This assures consistent distribution of the tracer throughout the cement, enabling more accurate measurement of cement coverage.

High quality measurements anytime with standard tools

Our unique technology features an inert traceable material that has a high neutron capture cross section which is detectable with a standard, cost-effective neutron logging tool run. This makes the result a direct measurement of where cement is located, rather than an interpretation of cement bonding through indirect sonic measurements.

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Inert tracer technology for cementing operations

Detectable for the life of the well

With field-proven CARBONRT technology, there is no half-life deterioration of the detectable properties. Since the tracer is permanently identifiable, an operator has the flexibility of conducting cement evaluation whenever convenient or most cost-effective in the operation. Since it does not require good cement across all strings, it can also be detected through tubing if necessary.

CARBONRT cement detection technology can be used to evaluate primary cement at the initial drilling and completion of the well. Logging tools can be run when convenient to the operation. In addition, adding the tracer to squeeze cement during remedial operations allows for detection and evaluation of the success of these operations, and logging results can be submitted to regulatory authorities for approval.

Since the logging tools are directly detecting the traced cement, evaluation can be performed through multiple strings of pipe, whether cemented or not, reducing the costs of the operation.

Identify problem cement before you stimulate

CARBONRT cement detection technology can be used to evaluate the cement in the vertical, lateral and curve in horizontal wells. Placing it in specific stages can allow for detection of particular cement designs and allow for optimization of cement blends. Cement density does not impact the detection.

Problems can be identified before they become integrity problems during the fracture stimulation or other completion operations. Or it can also be detected after the fact to diagnose problems.

No Impact on cement performance or physical properties

Cement testing has confirmed that the inert tracer does not adversely impact cement properties. It effectively acts as an “aggregate”. If necessary, we will work with your cementing company by supplying samples for prejob testing of the cement recipe. CARBONRT is available both in powder (~325 mesh) or pellet form (40/70 mesh). It can be delivered dry to the cement bulk plant for blending prior to delivery at the wellsite.

Cement Plug with fully suspended 40/70 CARBONRT

Talk to CARBO to find out how we can help you enhance your completions.

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