

# Micro Motion® Density Meters Replace Nuclear Devices to Control Well-Cementing Properties

## BENEFITS

- Improved safety and reduced costs through non-nuclear devices
- Ensured dependable and accurate cement program through improved cement quality



## APPLICATION

### Oilfield Services – Cementing

Part of the well completion process involves cementing. Cementing supports the casing and keeps it in place, protects the casing from corrosion, and isolates formations from each other and from the production zone.

On-site cementing operations typically use a circulating blender to provide a constant cement slurry density. This ensures the proper hydration of the cement. The cement is pumped down through the casing, where it flows up into the annulus (the space between the well bore and the casing). The cement is then allowed to cure.

## CHALLENGE

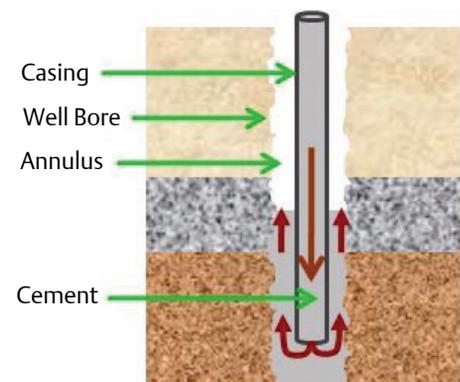
During well construction, the cement properties must be adjusted to the specific well type, well conditions, and application. If the cement does not have the correct adhering properties and the correct volumes, remedial work may be required.

Achieving the correct cement slurry density is critical to the cementing operation. If the cement is too wet, its strength will be reduced when it sets, and there will be voids in the cement column. If the cement is too dry, the slurry can be too viscous to pump, and there can be voids of dry cement in the column.

In addition to density, cement slurries can vary due to the additives used to control liquid loss, curing time, viscosity, and expansion characteristics.

*Traditional operating costs associated with nuclear safety, licensing, storage, record keeping, and disposal are eliminated.*

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Service companies often use nuclear densitometers to monitor and report cement quality (density). The time and costs associated with licensing, transporting, and disposing of nuclear resources adds greatly to the operational costs of the cementing operation.

### SOLUTION

Replacing nuclear densitometers with Micro Motion Coriolis sensors has proven to be viable technology for achieving accurate, robust, and repeatable measurement of cement density.

Relevant Micro Motion Coriolis technology benefits include:

- Accurate density measurements of dense slurries.
- A wide range of sensor sizes to maintain flow velocities below 15 ft/s.
- Limited or no repairs in the field.
- Advanced diagnostics.
- No requirement for field calibration.

One oil field service company has over 1,000 units installed worldwide and has not experienced any problems with reliability or measurement performance over the past 10 years. This contributed to the quality of cementing operation and minimized the potential for costly remedial work.

Because Micro Motion meters are non-radioactive, traditional operating costs associated with nuclear safety, licensing, storage, record keeping, and disposal were eliminated. In addition to an accurate density measurement, Micro Motion Coriolis sensors provided mass and volume flow rate—data that nuclear densitometers cannot provide. The flow rate provided added assurance that a representative density measurement was obtained. Confirming the flow rate through the slip stream confirmed readings were based on a “live” sample and provided a general indication of “mixing energy.”

