TECHNICAL BULLETIN

BIODRILL RC300 series

Environmentally friendly cement retarders for the oil & gas industry

Borregaard's BioDrill RC product family includes a wide range of lignin-based speciality cement retarders and dispersants. The variation in well conditions dictates the need for specialised retarders to fulfil the requirements of proper zonal isolation.

BioDrill RC300 series additives are used in a broad spectrum of cements and drilling temperatures to retard setting, extend pump times and allowing the cement to reach the desired location in the production string. Additionally, several BioDrill RC300 series retarders provide the valuable dual functions of retarder and cement dispersant.

The BioDrill RC300 series of cement retarders are designed for moderate to high circulating temperatures in the region of 125°F to 212°F [52°C to 100°C].

The BioDrill RC products are part of the OSPAR List of Substances Used and Discharged Offshore which Are Considered to Pose Little or No Risk to the Environment (PLONOR)

THICKENING TIME AS A FUNCTION OF RETARDER DOSAGE AND TEMPERATURE

Retarders inhibit hydration and delay set, thereby enabling adequate time for placement of the slurry in deep and hot wells.

Our products are derived from lignosulfonates. They are thought to adsorb on to the initial layer of the calcium-silicate-hydrate gel thereby delaying further hydration. They are added in concentrations ranging from 0.1% to about 1.5%.

The thickening time response varies depending on the class of cement, the cement's composition, temperature and the particular retarder and its dosage. Therefore, it is necessary to test each cement design due to variability in cement composition and quality from source to source and even from a particular supplier.

For illustration purposes, we present thickening time response as a function of retarder, dosage and bottom hole circulating temperatures (BHCT) in class H and class G cements. The overall trends indicate a region of nearly linear increase in thickening time at low dosages. The trend gradually transitions to a region of practically exponential increases with increase in retarder.

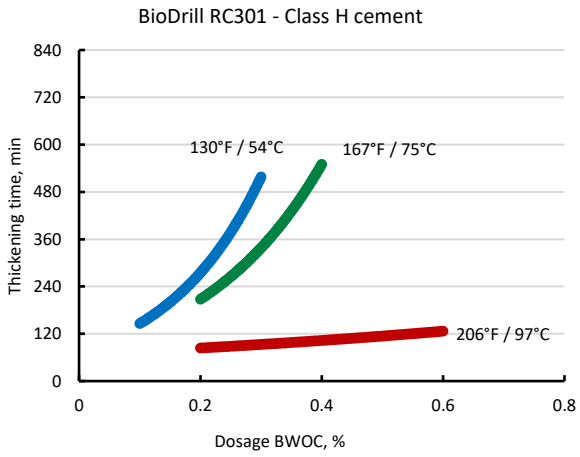
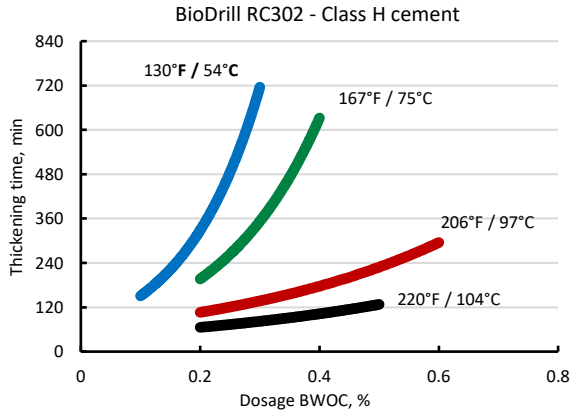
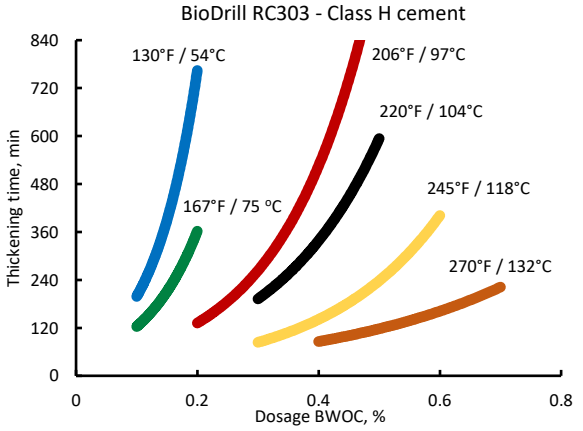


Figure 1. Thickening time of BioDrill RC301 at different temperatures in class H cement





Figures 2. and 3: Thickening time at different temperatures in class H cement

Figures 1. 2. and 3. show the thickening times for the RC 300 series of products at different bottom hole circulating temperatures (BHCT). A class H cement was used with a w/c of 0.38 for temperatures of 220°F [104°C] and below. Measurements performed at 245°F [118°C] and above were performed in class H cement with w/c ratio of 0.5 and silica/cement ratio of 0.35.

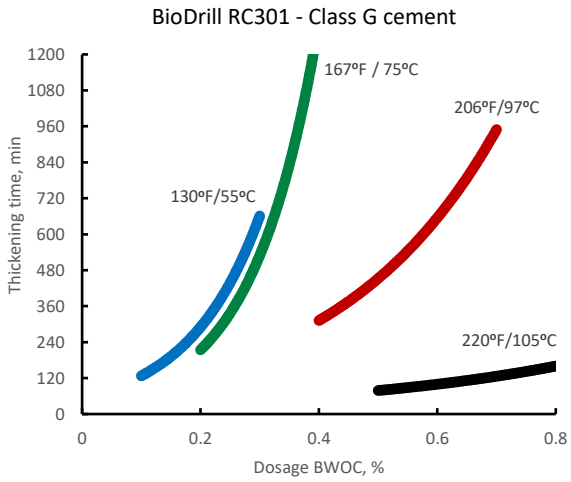


Figure 4. Thickening time of BioDrill RC301 at different temperatures in class G cement

For the tests presented in Figure 4. For RC301 a class G cement was used with a w/c of 0.44 for temperatures of 220°F [104°C] and below.

Contact: www.borregaard.com
Borregaard AS
Hjalmar Wessels Vei 10,
1721 Sarpsborg

Contact: www.borregaard.com
Borregaard AS
Hjalmar Wessels Vei 10,
1721 Sarpsborg