

## ECO-SYN STABLE CONTROLS ECD SO IT DOESN'T CONTROL YOU

Imagine, a deepwater, environmentally friendly drilling fluid that practically operates on autopilot, freeing you from the hassles of having to constantly adjust rheologies to compensate for ever-changing temperatures and pressures. That's precisely what you get from FluidControl's ECO-SYN STABLE flat rheology synthetic-based drilling fluid system.

Fueled by our proprietary and ground-breaking COLDFLOW™ rheology modifier, ECO-SYN STABLE fluids are less sensitive to large temperature fluctuations typically experienced when drilling in deepwater, keeping rheology changes flat in response to those temperature extremes. The flat rheology of ECO-SYN STABLE fluids gives you stress-free management of equivalent circulating densities (ECD) in the extremely narrow fracture gradients intrinsic to the deep and ultra-deepwater. In the most fragile formations, our distinctively-formulated ECO-SYN STABLE system sustains consistent and reliable rheologies, no matter if the temperature is 34°F or 300°F or if the pressure is 15 psi or 25,000 psi, allowing you to push casing seats deeper and keep firm control over ECD.

In narrow drilling windows, a stable rheological profile translates into a stable wellbore and that's exactly what ECO-SYN STABLE delivers. Of course, our ECO-SYN STABLE system produces the high rates of penetration (ROP) you expect from

a high-performance synthetic-based drilling fluid. But, unlike conventional synthetic fluids, ECO-SYN STABLE functions very effectively, regardless of the temperature, allowing you to drill with comparably lower ECD. In thin fracture gradients this means dramatically reduced chances of differential sticking, severe loss of premium drilling fluid and the other wellbore instability problems that, considering the daily spread sheets for deepwater operations, can send the costs of non-productive time (NPT) through the stratosphere.

The flexibility of ECO-SYN STABLE even allows us to formulate systems up to 17 lb/gal that maintain the persistent properties necessary, including 300°F-plus temperature stability, to successfully drill ultra-deepwater wells to more than 30,000 ft TD, making them ideal options for the Lower Tertiary and other frontier, ultra-deepwater plays. What's more, ECO-SYN STABLE requires no special treatment, exhibiting the very same maintenance and solids-loading characteristics of a conventional synthetic-based drilling fluid.

### Applications

- Deep and ultra-deepwater
- Sub-salt wells
- Narrow fracture gradients

#### Features

- Powerful proprietary rheology modifier
- IO 16/18 synthetic
- Consistent rheological profile
- Activates, deactivates with temperature
- Flat gel strengths
- Reduced pressure spikes
- Functions independent of temperature, pressure
- Requires less viscosifying clay
- Temperature stable to 300°F
- SBM solids loading
- Non-temperature reactive

#### Benefits

- Optimizes ECD management
- Reduces formation fracturing
- Promotes wellbore stability
- Allows for deeper casing seats
- Reduces whole mud losses
- Improves drilling efficiency
- Minimizes fluid-related NPT
- Delivers high ROP
- Complies with GOM discharge regulations
- Eliminates adverse impact of temperature
- Reduces instability-related costs
- Requires no special maintenance
- Enhances environmental performance

### ECO-SYN STABLE also meets offshore discharge regs

As an internal olefin (IO) 16/18 synthetic, ECO-SYN STABLE is fully compliant with Gulf of Mexico National Pollutant Discharge Elimination System (NPDES) regulations, thereby making it permissible for on-site discharge. In addition, ECO-SYN STABLE requires less dilution than a standard invert emulsion further enhancing its environmental, and economic, advantages. *All this is why deepwater operators continually look to ECO-SYN STABLE – the one flat-rheology synthetic-based drilling that truly operates independent of temperature and pressure to give you the ECD you can count on, every time.*

### Typical rheological properties, 14 lb/gal ECO-SYN STABLE flat rheology synthetic-based drilling fluid

DENSITY	14 LB/GAL
Synthetic/water ratio	86/14
PV/YP @ 150°F	20/11
PV/YP @ 40°F	73/14
HTHP fluid loss @250°F	5.8
POM	1.25
WPS	279,874
Electrical Stability	1648

# ECO-SYN™ STABLE Flat Rheology Synthetic Oil-Based Drilling Fluid System

## COLDFLOW takes temperature out of the equation

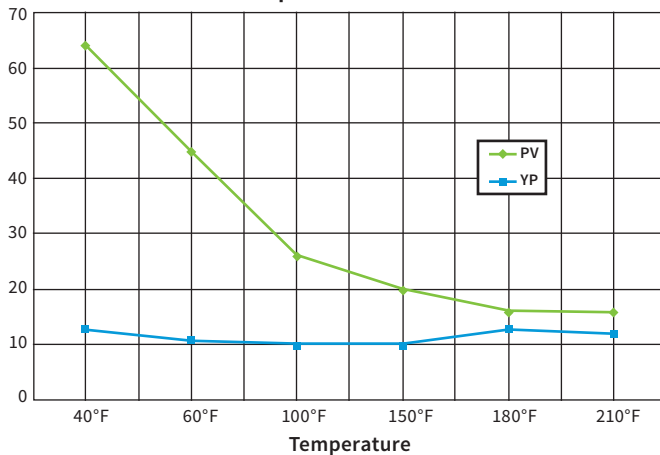
Constantly juggling rheologies in a deepwater well to offset the tremendous difference between the seafloor and bottomhole temperatures can create havoc with ECD management. For instance, increasing the rheological properties to adjust from the cold seafloor to the comparatively hot downhole temperatures all-too-often promotes excessively high ECD and gels, which in turn results in all sorts of downhole problems in these narrow and easily fractured drilling windows.

Compared to conventional synthetic-based fluids, COLDFLOW allows the ECO-SYN STABLE system to be formulated with less viscosifying clay, which is inherently reactive to cold temperature. Since ECO-SYN STABLE does not react, even when seafloor temperatures plunge to as low as 34°F, it effectively negates the subsequent adverse impact on rheology, allowing operators to push casing seats deeper.

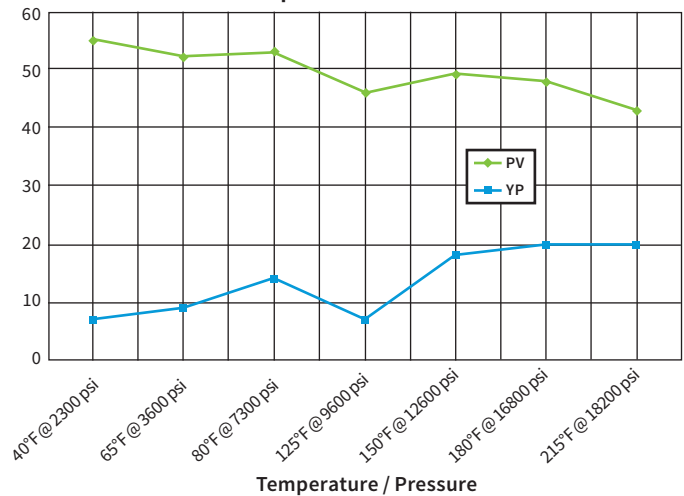
With the ECO-SYN STABLE flat rheology synthetic-based drilling fluid system you also get the identical rheologies with the same solids content as its conventional counterparts. There's no need to maintain low gravity solids 2 to 3% less than you normally would run with a synthetic fluid to achieve a flat rheological profile. And, of course, the flat gel strengths likewise reduce surge and swab during tripping.

Fann 75 data illustrate the capacity of ECO-SYN STABLE to maintain consistent rheologies even in wells as deep as 32,000 ft TD and in water depths exceeding 8,000-ft. Time and time again, ECO-SYN STABLE comes through highly impressive readings in temperatures from 40°F to 240°F and in bottomhole pressures from 2300 to well over 20,000 psi.

**Traditional Invert Emulsion Fluid PV and YP Response as a Function of Temperature PV and YP as a Function of Temperature – FANN 35**



**ECO-SYN STABLE fluid PV and YP Response as a Function of Temperature PV and YP as a Function of Temperature - FANN 75**



FluidControl provides a comprehensive portfolio of high performance, environmentally friendly drilling and completion fluid systems and additives, all engineered to optimize drilling efficiency, reduce non-productive time (NPT) and maximize production and the overall value of your asset. Our aqueous and invert emulsion drilling fluid systems in tandem with our talented and highly experienced fluid specialists ensure the delivery of cost-effective solutions for your most demanding offshore and onshore applications.

What separates FluidControl from the rest is the unequalled, solutions-driven technical expertise we bring to each project. Throughout the process, our specialists work closely with the client to define well objectives and make sure they are met. To that end, we rely on a wide range of services that include well planning and analysis, unmatched wellsite monitoring of fluid properties, office-based technical support as well as supplementary technologies such as offshore mud coolers and non-damaging reservoir drill-in fluids.

*To learn more about how the ECO-SYN STABLE Flat Rheology Synthetic-Based drilling fluid system can help you meet all your drilling environmental and economic objectives contact your nearest FluidControl representative.*