

# ULTRAFREE

The ULTRAFREE\* additive is specifically designed to improve the rate of penetration (ROP) in the M-I SWACO high-performance ULTRADRIL\* water-base mud system, especially when run with polycrystalline diamond compact (PDC) bits. ULTRAFREE ROP enhancer employs a special blend of surface-active agents to keep the bit free of solids. The chemical makeup of the ULTRAFREE additive assists in removing any buildup of drill solids below the bit, allowing the cutters to make continuous contact with new formation. ULTRAFREE ROP enhancer not only reduces bit and/or bottomhole assembly (BHA) balling, but also lowers torque and drag.

## ***Typical Physical Properties***

Physical appearance.....	Yellow to brown liquid
Odor .....	Very mild hydrocarbon
Specific gravity .....	0.78 – 0.85
Solubility in water .....	Insoluble
Flash point.....	>201°F (>94°C) (ShCC)

## ***Applications***

ULTRAFREE ROP enhancer is designed to enhance the ROP performance of the ULTRADRIL system. It is especially applicable when drilling medium to hard shales in both onshore and offshore operations.

For ROP enhancement, 1 to 2% by volume of the ULTRAFREE additive should be added directly to the mud system at or near the pump suction over one circulation period. Ideally, the initial treatment should be made prior to drilling out of the casing shoe or after a trip before entering the hole while the bit and BHA are clean. After the initial treatment, the product should be continually added or injected into the mud stream at the pump suction while the bit is drilling. The injection rate will vary according to hole size, pump rate, dilution rates, and ROP.

Typically, addition rates may range from 15 to 30 gal (57 to 114 L) per hour of drilling. An injection pump attached to the low-pressure side of the mud pump helps control addition rates precisely. ULTRAFREE additive concentrations of up to 5 to 7% by volume will not affect drilling fluid properties or environmental toxicity.



### ***Advantages***

- Effectively increases ROP while drilling all shales
- Improves bit life, reducing the number of trips
- Reduces torque and drag
- Improves mud filtercake quality and lowers fluid-loss values
- Works well with high-performance PDC bits
- Contains surface-active, metal-wetting agents that reduce the potential for bit and BHA balling
- Will not induce foaming or aeration of the mud system

### ***Limitations***

- High-solids and weighted fluids above 14 lb/gal (1,678 kg/m<sup>3</sup>) may develop slightly higher viscosities and gels.
- Optimum performance may not be realized if the material is not added continuously in sufficient concentration while drilling.
- Some mud fluorescence may be noted at high product concentrations.
- Some materials containing gilsonite or asphalts may partially solubilize in the presence of the ULTRAFREE additive, which may promote sheening of offshore discharges.

### ***Toxicity and Handling***

Bioassay information is available upon request.

Handle as an industrial chemical, wearing protective equipment and observing the precautions as described in the Material Safety Data Sheet (MSDS).

### ***Packaging and Storage***

The ULTRAFREE additive is packaged in 55-gal (208-L) drums and is available in bulk.

Store in dry, well-ventilated area. Keep container closed. Keep away from heat, sparks and flames. Store away from incompatibles.

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