Ultrafree L additive is specifically designed to improve the rate of penetration (ROP) in the M-I SWACO high-performance Ultradril water-base mud system for onshore drilling applications.

It is especially effective when run with polycrystalline diamond compact (PDC) bits. Ultrafree L ROP enhancer employs a special blend of surface-active agents to keep the bit free of solids. The chemical makeup of the Ultrafree L additive assists in removing buildup of drill solids below the bit, allowing the cutters to make continuous contact with new formation. Ultrafree L 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**: 215.6°F (102°C)

**Applications**

Ultrafree L enhancer is designed to improve 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 L 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 before drilling out 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 varies according to hole size, pump rate, dilution rate, and ROP.

Typically, addition rates 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 to precisely control addition rates. Ultrafree L additive concentrations of up to 5 to 7% by volume do 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 filter cake 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
- Does not induce foaming or aeration of the mud system

**Limitations**

- High-solids and weighted fluids above 14 lb/gal (1,678 kg/m³) can 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 is possible at high product concentrations
- Some materials containing gilsonite or asphalts can partially solubilize in the presence of the Ultrafree L additive, which can 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 described in the Material Safety Data Sheet (MSDS).

**Packaging and Storage**

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

Store in a dry, well-ventilated area. Keep container closed. Keep away from heat, sparks and flames. Store away from incompatibles. Follow safe warehousing practices regarding palletizing, banding, shrink-wrapping and/or stacking.