

## VERSAMOD™

*VERSAMOD organic gelling agent is a liquid rheology modifier used in VERSADRIL® and VERSACLEAN® oil-base mud systems. It increases Low-Shear-Rate Viscosities (LSRV) and gel strengths for improved hole cleaning. The primary application for VERSAMOD is in large-diameter, high-angle, horizontal and extended-reach wells to increase cuttings-carrying capacity. This permits higher rates of penetration while maintaining wellbore stability. VERSAMOD, when used at proper concentrations, produces the highly shear-thinning rheological profile found in VERSAPORT™ oil mud systems.*

### TYPICAL PHYSICAL PROPERTIES

Physical appearance	Amber viscous liquid
Specific gravity	0.908
Flash point	175°F (79.4°C) (PMCC)
Pour point	35°F (1.7°C)

### APPLICATIONS

VERSAMOD is used to improve cuttings transport in large-diameter or directional wells, especially wells with diameters greater than 8½ in. or deviations greater than 25°. It modifies the rheological profile of oil-base muds, increasing their shear-thinning and thixotropic characteristics without using additional clay-base additives.

VERSAMOD can be used in existing VERSADRIL and VERSACLEAN systems, as well as in freshly prepared mud, to increase LSRV and gel strengths. Sufficient shear is required to develop this increase in rheology, especially in freshly prepared muds.

Normal concentrations range from 1 to 4 lb/bbl (2.85 to 11.4 kg/m<sup>3</sup>), depending on the brine content. Less VERSAMOD is needed in muds

with higher brine contents. Typical initial treatments are 1 to 2 lb/bbl (2.85 to 5.7 kg/m<sup>3</sup>) for muds with oil:water ratios in the 75:25 to 85:15 range; above 85:15 the effectiveness is diminished. Pilot testing is recommended to determine the actual treatment required to obtain the desired result.

VERSAMOD is activated by calcium, shear and temperature. Generally, 1 lb/bbl (2.85 kg/m<sup>3</sup>) lime should be added and maintained for every 1 lb/bbl (2.85 kg/m<sup>3</sup>) VERSAMOD used in a system. VERSAMOD will not be fully activated by the shear and temperature exposure in a mixing plant or mud pit, care should be taken not to overtreat with VERSAMOD until the fluid is actually circulated through the well.



## ADVANTAGES

- Improves the rheological profile and hole cleaning capacity of VERSADRIL and VERSACLEAN systems.
- Produces a more shear-thinning rheology profile as compared to alternative oil mud gelling agents.
- Increases LSRV and gel strengths with minimal yield point and plastic viscosity changes; gels tend to be fragile and non-progressive.
- Can be used in existing systems or in freshly prepared mud.
- Rheological modifications achieved with VERSAMOD are reversible with treatments of VERSATHIN® in all systems, or with VERSACOAT® in VERSACLEAN systems.
- After initial VERSAMOD additions, daily maintenance treatments are very low.

## LIMITATIONS

- Becomes less effective as the oil:water ratio rises above 85:15. Above this level, increased concentrations of VERSAMOD will be needed for the desired rheological properties. Low-brine-content muds which use high concentrations of VERSAMOD will become extremely viscous if the water content is increased, as with a saltwater flow.
- VERSAMOD is activated by shear and temperature. It does not generate significant viscosity at the mixing plant or mud pits until the fluid is actually circulated through the well. VERSA-HRP® should be used to viscosify fluids at mixing plants for transportation to the wellsite.

## TOXICITY AND HANDLING

Bioassay information is available upon request.

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

Environmental restrictions concerning the use of oils and oil-base

fluids should be considered, since VERSAMOD is used in conjunction with oil.

*CAUTION! Avoid exposure. VERSAMOD contains mineral oil which is an irritant to eyes, skin and respiratory system.*

## PACKAGING AND STORAGE

VERSAMOD is packaged in 55-gal (208.2-l) drums and 5-gal (18.9-l) cans.

Store in a location away from sources of heat or ignition. Keep containers closed and tightly sealed.

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