

OPTISEAL I, II, III & IV

ADVANTAGES

- "One-sack blends" of specifically sized WSM for a wide range of formations and severity of losses
- Consistency of grind size, composition and physical properties
- Essentially inert materials, that have a minimum effect on fluid properties and compatible with all mud systems
- Hard, tough granular materials resist degradation of particle size

LIMITATIONS

- Bypassed shaker screens or screens with larger openings allow drill cuttings to remain in circulation, resulting in higher fluid rheology, wear on pump liners, and wear on LWD tools and risk of plugging LWD tools.
- Continuous additions can generate large volumes of waste material and more inventories required on the rigsite.
- Non-acid-soluble material in the OPTISEAL I, II and III blends may not be suited for openhole completions where acid treatment is required.
- The OPTISEAL I blend is not recommended for use in operations where WSM recovered from the shaker screens is milled and re-injected with slop and cuttings. Components of the OPTISEAL I blend can cause clogging of the cyclones used to mill/crush the solids.

THE OPTISEAL* product family consists of four blends of Lost Circulation Materials that can function as Wellbore Strengthening Materials (WSM).

The four WSM blends are designed to plug fracture apertures up to at least 1,200 µm, as well as provide fluid-loss control in moderate-to-high-permeability formations. Laboratory testing has confirmed fracture sealing and fluid-loss-control performance.

Typical Physical Properties

Physical appearance	White to gray or tan
Specific gravity.....	1.6 - 2.8
Solubility in water @ 68°F (20°C)	Insoluble
Nominal Median Particle Size (d ₅₀)**	500 – 600 µm

OptiSeal I	OPTISEAL II	OPTISEAL III	OPTISEAL IV
Graphitic material	Graphitic material	Graphitic material	Sized Marble
Ground Nut Shells	Sized Marble	Sized Marble & Cellulosic Material	

Applications

The OPTISEAL blends I, II, III and IV are designed as fracture sealing and Wellbore Strengthening Materials (WSM) for porous and fractured formations while drilling with either aqueous or non-aqueous fluids. The OptiSeal I and II blends are designed specifically for water-based mud applications. The OPTISEAL III blend is designed for Non-Aqueous Fluid (NAF) applications. The OPTISEAL IV blend comprises acid-soluble marble for use in reservoir drill-in fluids. All four blends are designed for loss zones with maximum openings of at least 1,200 µm and can effectively reduce the potential for differential sticking, lost circulation and torque and drag through improved sealing of problem zones.

** Nominal Median Particle Size (d₅₀) is reported as a size range due to variations in the manufacturing and grinding process. If a precise size distribution of a product is critical to a drilling operation, it should be measured via Dry Sieve Analysis using samples that are representative of those expected to be used in that operation. Nominal d₁₀ and d₉₀ values are available from Houston Technical Services upon request.

Applications (Cont)

OPTISEAL treatments can be applied to stop losses using squeeze treatments, or spot applications. To prevent losses, OPTISEAL can be added continuously to the circulating drilling fluid or through regular, repetitive sweeps. The former constitutes the majority of cases where lost circulation has occurred; the latter can be deployed when drilling through a formation with a known history of losses.

Remedial Lost Circulation Treatments: The basis of design for the treatment is a low-fluid-loss Wellbore Strengthening Material (WSM) formulation. The four OPTISEAL formulations are designed to plug fracture widths up to at least 1,200 µm in addition to providing good fluid-loss control in moderate-to-high-permeability formations. Particle Size Distribution (PSD) for the OPTISEAL formulations is based on laboratory fracture sealing tests. The blends can be slurrified at the rigsite from sacks/big bags. An alternative is to pre-mix the WSM at a liquid mud plant in a high-volume, high-density slurry before shipping to a rig. The WSM slurry uses the same base fluid as the drilling fluid but is unweighted. The slurry provides greater flexibility, improved logistics and reduced hazards associated with sacked materials. Typical final concentrations range from 30 – 70 lb/bbl (85 – 200 kg/m³) depending on severity of losses.

Preventative Treatments: The basis of design for the treatment is continuous particle addition to the circulating drilling fluid when drilling a formation known to have losses. The main challenge is to maintain a required PSD and concentration in the drilling fluid. This may be measured at the rigsite using Wet Sieve Analysis or Laser Reflectance. Typical concentrations range from 12 to 20 lb/bbl (35 – 57 kg/m³). The method of treatment will depend on length of interval to be drilled:

- When drilling short intervals, the WSM is added to the active pit or spotted at the bit. When drilling ahead, the shaker screens are either bypassed entirely or all but the top screens are removed. This allows the WSM to be directly recycled and retained in the drilling fluid. Another option is to utilize a MANAGED PARTICLE SIZE RECOVERY SYSTEM* (MPSRS) to recover the WSM while discarding drilled cuttings and fines.
- When drilling extended intervals (> 300 ft or 91.4 m), it is recommended to use a MPSRS or MD-3 (triple deck) shaker to recover the WSM. By managing the particles in circulation, the rheology of the fluid is more easily controlled, resulting in improved Equivalent Circulating Density (ESD) management.

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

The OPTISEAL I, II, III and IV additives are packaged in 55-lb (25-kg) multi-wall, paper sacks.

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



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