

# G-SEAL PLUS

# G-SEAL PLUS COARSE

### ADVANTAGES

- Effective bridging and sealing agent for a wide range of formations and severity of losses
- Increases fracture propagation pressures of test samples exposed to non-aqueous fluids
- Reduces the possibility of differential sticking by controlling seepage losses
- Reduces torque and drag in all mud systems by decreasing the coefficient of friction (CoF)
- Inert material with no significant effects on mud rheology; compatible with all mud systems
- One-sack product with no other additive requirements; easily mixed and dispersed into the system
- Its particle size distribution makes it easy to maintain in the entire circulating system
- Can be pumped easily through down-hole tools at concentrations up to 285 kg/m<sup>3</sup> (100 lb/bbl)
- Temperature-stable to > 260°C (500°F)

### LIMITATIONS

- Can be removed from the circulating system by shale shakers and solids control equipment. Requires close monitoring of the shale shakers.
- Non-acid-soluble material may not be suited for open-hole completions where acid solubility is required.

**G-SEAL\*PLUS and G-SEAL PLUS COARSE\*** graphite/ industrial carbon blends are sized plugging agents used to bridge and seal porous and fractured formations in water-, oil-, and synthetic-based drilling fluid systems.

When used to drill depleted zones with high differential pressures, the products' bridging and plugging capabilities reduce differential-pressure sticking tendencies. Both products also can be used to control seepage, partial and severe lost circulation, as well as reduce torque and drag. G-SEAL PLUS and G-SEAL PLUS COARSE blends are chemically inert and will not affect the rheological properties of drilling fluid systems when used at the recommended concentrations.

### Typical Physical Properties

Physical appearance .....	Gray-to-black powder
Specific gravity.....	1.9 - 2.1
Solubility in water @ 20° C.....	Insoluble

Product Name	Median Particle Size d <sub>50</sub> (µm)**	Recommended Test Procedure
G-SEAL PLUS	100 - 300	Dry sieve analysis
G-SEAL PLUS COARSE	500 - 800	Dry sieve analysis

\*\* Median Particle Size (d<sub>50</sub>) 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 with the appropriate Recommended Test Procedure using samples that are representative of those expected to be used in that operation. Nominal d<sub>10</sub> and d<sub>90</sub> values are available from Houston Technical Services upon request.

## Applications

G-SEAL PLUS and G-SEAL PLUS COARSE are carbon-based blends designed to stop losses in porous and fractured formations while drilling with non-aqueous fluids. They also are effective in water-based fluids, reducing the possibility of differential sticking and lost circulation, as well as minimizing torque and drag by decreasing the coefficient of friction (CoF).

Both of these products, when used alone or in blends with other lost circulation materials, facilitate fracture bridging, effectively dissipating fracture energy and preventing fracture propagation. The products deform under compression, thus providing resistance to fracture re-opening.

The recommended treatment for seepage losses (up to 1.6 m<sup>3</sup>/hr or 10 bbl/hr) is 43 to 57 kg/m<sup>3</sup> (15 to 20 lb/bbl) of G-SEAL PLUS / G-SEAL PLUS COARSE in spotted pills. The pills can be incorporated into the entire system for a total concentration of 10 to 20 lb/bbl (29 to 58 kg/m<sup>3</sup>), but close monitoring of the shakers is required.

The recommended treatment for partial losses (1.6 to 16 m<sup>3</sup>/hr or 10 to 100 bbl/hr) is 57 to 143 kg/m<sup>3</sup> (20 to 50 lb/bbl) of G-SEAL PLUS / G-SEAL PLUS COARSE in spotted pills. Very high-permeability formations such as fractured carbonates and conglomerates may require higher concentrations of G-SEAL PLUS or G-SEAL PLUS COARSE in conjunction with other lost circulation materials of varied appropriate size distribution.

G-SEAL PLUS / G-SEAL PLUS COARSE can also be used dry-blended with cement to effectively seal off induced fractures and inhibit further propagation while cementing casing.

Torque and drag may be reduced by incorporating sweeps of G-SEAL PLUS or G-SEAL PLUS COARSE into the active system up to a total concentration of 57 kg/m<sup>3</sup> (20 lb/bbl). Initial treatments for the active system may be added in 11.4 kg/m<sup>3</sup> (4 lb/bbl) increments while monitoring torque and drag.

G-SEAL PLUS or G-SEAL PLUS COARSE may require additional wetting agent when used in an oil- or synthetic-based drilling fluid system.

## 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

G-SEAL PLUS and G-SEAL PLUS COARSE are packaged in 11.3 kg (25 lb), multi-wall, paper sacks.

Store in dry, well-ventilated area. Keep container closed. Store away from incompatibles.

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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