

KLA-GARD

KLA-GARD shale stabilizer reduces the swelling of sensitive shales and drill cuttings exposed to water-base drilling fluids. It inhibits shale hydration, reducing the effect of drill solids on viscosity and it works to minimize problems such as excessive dilution rates, increased torque and drag, high surge and swab pressures and bottomhole assembly balling. This high-quality, concentrated product has applications in a wide variety of mud systems and has such low toxicity characteristics it can be considered for offshore applications.*

Typical Physical Properties

Physical appearance.....	Clear, blue liquid
Specific gravity	1.1
pH (1% solution)	6.5-8.5
Solubility in water @ 68°F (20°C)	100%
Flash point.....	>210°F (99°C) (PMCC)

Applications

KLA-GARD stabilizer should be specified for applications where additional inhibition is needed as an alternative to gyp, lime and potassium systems. It can improve the inhibition of water-base fluids to a level that competes with oil-base muds for many applications.

Due to the powerful effect KLA-GARD stabilizer has on active solids, it should only be added to: mud systems containing low concentrations of active solids, bentonite-free systems or freshly prepared low-solids systems containing a minimum amount of prehydrated bentonite. These systems should have a methylene blue capacity of less than 12.5 lb/bbl (35.6 kg/m³) with 2 to 5 lb/bbl (5.7 to 14.3 kg/m³) of prehydrated bentonite for filtration control.

KLA-GARD stabilizer is compatible with most drilling fluid additives, and is especially suited for use in freshly prepared, low-solids polymer systems such as the POLY-PLUS* system. It is most effective when the use of organic thinners, such as SPERSENE* lignosulfonate, is minimized.

Normal concentrations of KLA-GARD stabilizer range from 4 to 8 lb/bbl (11.4 to 22.8 kg/m³) depending on hole size, rate of penetration, interval length and reactivity of the shale. A minimum concentration of 4 lb/bbl (11.4 kg/m³) is required for the product to be effective. One lb/bbl of KLA-GARD stabilizer contributes 508 mg/L chlorides; KLA-GARD B stabilizer, a chloride-free formulation, is available. To prevent bacterial attack, a biocide should be used.

KLA-GARD stabilizer works by being adsorbed onto active solids, thereby reducing their sensitivity to water. This action causes the product to be depleted from the mud system at a rate dependent on the reactivity of the formation, cuttings size and amount of hole volume drilled. A test procedure is available to monitor the approximate concentration of excess KLA-GARD stabilizer. See the table on the back of this page for an estimate of the depletion rate.

Advantages

- Highly effective shale stabilizer
- Effective at all pH levels
- Environmentally acceptable
- Stable at temperatures in excess of 400°F (204°C)
- Reduces potential for bit balling
- Reduces the amount of dilution required and the associated treatment costs
- Unaffected by contaminants such as hard water, cement or CO₂

Limitations

- Should not be added to systems containing high concentrations of active solids; flocculates muds with high Methylene Blue Test (MBT) values, causing excessive viscosity
- Limits the hydration of all clay materials, therefore bentonite additions must be prehydrated in freshwater
- Due to the interaction of KLA-GARD stabilizer with active solids and bentonite, increased attention must be given to filtration control
- Product is biodegradable and requires a biocide

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

KLA-GARD stabilizer is packaged in 55-gal (208-L) drums and 5-gal (18.9-L) cans.

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.

	Hole Size (in.)					
	6 $\frac{1}{8}$	8 $\frac{1}{2}$	9 $\frac{7}{8}$	12 $\frac{1}{4}$	14 $\frac{3}{4}$	17 $\frac{1}{2}$
KLA-GARD, lb/100 ft	107	205	277	426	617	869
KLA-GARD, kg/30 m	48	92	124	190	276	388

Estimated depletion rate is based on a highly reactive shale. This table is based on 5.2 lb KLA-GARD stabilizer per cubic foot of gumbo shale drilled. Actual depletion rates can be lower, depending on the reactivity of the shale and the cuttings size.