**Zinc Oxide**

**ZINC OXIDE sulfide scavenger contains a high-quality ZINC OXIDE.**

The very fine particle-size of Zinc Oxide scavenger results in a maximum amount of surface area for fast, efficient sulfide scavenging. It reacts with sulfides (see APPLICATIONS below) to form ZnS. This precipitate is an insoluble, inert, fine solid that remains harmlessly in the mud system or is removed by the solids-control equipment.

**Typical Physical Properties**

- **Physical appearance**: White to off-white powder
- **Specific gravity**: 5.4 – 5.6
- **Bulk density**: 164 lb/ft³ (2627 kg/m³)

**Applications**

Under operating conditions, Zinc Oxide scavenger reacts with sulfides to form ZnS, as shown in these equations:

\[
\text{Zn}^{2+} + \text{HS}^- + \text{OH}^- \rightarrow \text{ZnS} \downarrow + \text{H}_2\text{O}
\]

\[
\text{H}_2\text{O} \cdot \text{Zn}^{2+} + \text{S}^2^- \rightarrow \text{ZnS} \downarrow
\]

Zinc Oxide scavenger is effective at the pH levels found in drilling fluids. It is recommended that a pH above 11 be maintained whenever H₂S is expected. This high alkalinity converts the dangerous H₂S gas to less toxic bisulfide (HS⁻) and sulfide (S²⁻) ions. The alkaline pH (>11) allows an extra margin of safety.

The initial treatment of Zinc Oxide scavenger is usually 1 to 2 lb/bbl (3 to 6 kg/m³). Subsequent field treatments should be based on approximately 1 lb/bbl (3 kg/m³) of Zinc Oxide scavenger per 600 mg/L of sulfides detected. On a stoichiometric basis, 1 lb/bbl (3 kg/m³) of Zinc Oxide scavenger removes 1100 mg/L of sulfides. Removal is less effective under actual field conditions. Use a Garrett Gas Train and proper Dräger tubes to measure the sulfide content. Zinc Oxide scavenger should be added through the hopper.

**Advantages**

- Has a higher percentage of zinc (>80% by weight) compared to competitive sources of zinc, such as basic zinc carbonate, zinc sulfate or zinc chromate
- Is not pH-dependent; it is effective at very alkaline pH, such as 11.5 to 12.5, whereas iron materials are less so
- Helps remove the hazard of dangerous H₂S gas escaping at the surface
- Lessens the possibility of hydrogen embrittlement occurring on downhole tubulars
- Zinc Oxide scavenger can be used in oil- and synthetic-base fluids, but pilot testing is recommended

**Limitations**

- Flocculation can occur in lightly-treated water-base mud systems
- While ZnS is inert to most drilling and completion environments, concentrated HCL can cause the release of H₂S

**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).

Zinc and other heavy metals present may impact waste disposal. Check with local environmental staff before use.
Packaging and Storage
Zinc Oxide scavenger is packaged in multi-wall, paper sacks; packing container sizes vary based on local area of purchase.

Store at moderate temperatures in a dry, well-ventilated area.