STARGLIDE
ROP-enhancing lubricant

ADVANTAGES
- Highly effective downhole lubricant for reducing torque and drag
- Reduces the potential for, and the severity of, differential sticking
- Compatible with most water-based fluids

LIMITATIONS
- Applications above 200 degF may destabilize the lubricant in fresh water
- May grease or emulsify in divalent brines; pilot test before use
- May inhibit breaker system access to filtercake; pilot test before use

STARGLIDE* ROP-enhancing lubricant reduces torque, drag, and the potential for differential sticking by reducing the coefficient of friction of water-based mud. Typical friction coefficient reductions of 25–35% have been observed.

Applications
STARGLIDE lubricant is designed to be used for those situations where torque, drag, and the potential for differential sticking are likely, such as when drilling highly deviated or high-differential-pressure wells. STARGLIDE lubricant is an effective additive in water-based drilling and reservoir drill-in fluids.

Normal concentrations of STARGLIDE lubricant range from 1 to 3% by volume, or 9.26 to 29.1 kg/m³ [3.25 to 10.2 lb/bbl], depending on the fluid density, desired reduction in coefficient of friction, and the mud system.

After the initial treatment, periodic treatments should be made to maintain the desired concentration. Higher concentrations may be needed for pills and special applications. Treatment levels and product usage will depend on the ROP, solids-control equipment, and dilution rates. Prior to adding STARGLIDE lubricant to the active system, it is recommended to pretreat the drilling fluid with sodium bicarbonate or soda ash as a precautionary measure against unplanned hardness contamination.

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 MSDS.

Shipping/Handling Instructions
STARGLIDE lubricant is packaged in a standard pack unit: 55-galUS (208-L) drums or in bulk; other pack units available on request.

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 stacking.

Typical Physical Properties

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Physical appearance</td>
<td>Golden</td>
</tr>
<tr>
<td>Specific gravity</td>
<td>0.93 - 0.97 [20°C/68°F]</td>
</tr>
<tr>
<td>Flash point</td>
<td>&gt;100°C [&gt;212°F]</td>
</tr>
<tr>
<td>Freezing/melting/pour point</td>
<td>&lt;-10°C [14°F]</td>
</tr>
</tbody>
</table>