**STOPPIT® Engineered, Composite Lost Circulation Material**

**Challenge**
Lost circulation continues to be one of the most prevalent operational issues our customers face today and is a leading contributor to drilling non-productive time. The solutions we use to combat these global challenges are optimized according to formation types, drilling fluid loss rates and the fluids in which the technologies are deployed. Not all lost circulation events may be prevented and often require the use of specialty applications, provided in the form of a lost circulation “pill.” Once a lost circulation event occurs, it is essential to apply the appropriate fluid solution as quickly as possible to minimize non-productive time and maximize wellbore value.

**Overview**
STOPPIT® lost circulation material is a particulate-based, “engineered, composite” solution that is designed to mitigate partial to severe drilling fluid loss rates. The composition of STOPPIT lost circulation material is optimized to comprise specific materials with precise sizes at a unique engineered concentration. This saves the operator from incurring more non-productive time while mixing the individual components of the blend. The multi-modal composition is designed to provide superior sealing performance in loss zones with severe losses.

STOPPIT lost circulation material works by isolating the tip of the fracture and sealing it with its unique composition designed to increase the materials “toughness.” The “toughness” of a material is its ability to resist pressure fluctuations commonly exhibited downhole, such as swab/surge pressures or wellbore breathing after the material has formed a seal. It is designed to plug a wide range of fracture sizes which cause mild to severe lost circulation. It is optimized to be compatible with all fluid types. Pils with concentrations up to 80 ppb have been successfully applied in the field.

While the formula for STOPPIT lost circulation material is proprietary, the components are common in the industry. This allows for the material to be priced at a competitive cost, while supplying superior fracture sealing. It has been field and lab tested to provide an optimized multi-modal solution to lost circulation that is able to seal fractures and manage fluctuations of downhole pressure.

**Features**
- “Engineered, Composite Multi-Modal PSD” LCM
- Increased material “toughness” to resist changes in downhole pressure caused by swab/surge pressures, wellbore breathing/ballooning/bit reaming, etc
- Plugs fractures over a wide range of fracture widths
- Effective in aqueous- and non-aqueous fluids
- Stable in temperatures up to 500° F
- Applied as “pill” treatment as high as 80 pounds per barrel (230 kilograms per cubic meter)
- Pumped through drill strings equipped with:
  - Positive pulser
  - Bit nozzles as small as 11/32”

**Benefits**
STOPPIT engineered, composite lost circulation material’s unique formulation, gives the material increased “toughness” allowing it to resist changes in downhole pressure without any adverse effect to sealing performance, bringing benefit to the customer.

- **Cost Effective**
- **Reduces Non-Productive Time**
- **Cure for Wide Range of Lost Circulation Rates**
- **Easily Used Within Common Drilling Systems**
Applications
STOPPIT® lost circulation material is compatible with all aqueous and non-aqueous-based fluids. It can be used as a stand-alone treatment or in combination with other Baroid lost circulation materials. If it is believed that there is a high possibility of severe lost circulation, STOPPIT® lost circulation material can be kept on location as a contingency plan if high fluid losses are seen.

Conclusion
Lost circulation is one of the leading contributing factors to drilling non-productive time. An effective lost circulation strategy, and the ability to respond quickly, is essential to lower the cost of lost circulation should a problem occur. STOPPIT lost circulation material is an “engineered, composite” lost circulation material that gives operators a cost effective solution to mitigate partial to severe drilling fluid loss rates, preventing non-productive time and saving money.

STOPPIT®
Engineered, Composite Lost Circulation Material

Permeability Plugging Apparatus Comparative Analysis #1
(Measurement of Total Fluid Loss – in grams)

STOPPIT® outperformed Competitive Product A...even at a higher differential pressure!

<table>
<thead>
<tr>
<th>Base Fluid</th>
<th>Temperature</th>
<th>Differential Pressure Applied During Test:</th>
</tr>
</thead>
<tbody>
<tr>
<td>12ppg Water-Based Mud (Non-Dispersed)</td>
<td>250°F</td>
<td>STOPPIT™ = 1,000psi</td>
</tr>
<tr>
<td>Competitive Product A = 500psi</td>
<td></td>
<td></td>
</tr>
<tr>
<td>STOPPIT™</td>
<td>1.46</td>
<td>2.53</td>
</tr>
<tr>
<td>Competitive Product A (50 lb/bbl)</td>
<td>26.21</td>
<td>119.24</td>
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<tr>
<td>1016 micron slot</td>
<td>2032 micron slot</td>
<td>2540 micron slot</td>
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</tbody>
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