The MAX-LOCK™ lost circulation material (LCM) from Baker Hughes, a GE company (BHGE), is a magnesia-based material designed to mitigate severe or total loss of circulation. It is especially effective in vugular or cavernous formations, plug and abandonment operations, and in establishing sustained casing pressure.

Lost circulation is one of the major contributors to drilling nonproductive time nonproductive time (NPT). Conventional bridging materials are designed to cure seepage and partial losses, but these systems are often not enough to counteract severe or totally lost circulation incidents. Increased concentrations of conventional bridging

**Applications**
- Operations with a potential for severe or total loss of circulation
- Applications where acid solubility is critical
- Areas where gas migration is a concern
- Plug and abandonment operations
- Zonal isolation, casing repair, or other environmentally-sensitive operations

**Features and benefits**
- Thixotropic shear thinning gels
  - Easy to pump through bit
  - Prevents gas migration
  - Resists flow through loss zones before setting
- Strengthens loss zones
  - Enables drilling to section target depth
- Can function as an isolation plug
  - High acid solubility, 90% or greater
  - Safe to use in production zone
- Rapid deployment
  - Can be pumped from slug tank
  - Eliminates unnecessary trips
  - Reduces NPT
- Customizable setting time
  - Avoid pumping more than necessary
  - Minimizes risk associated with flash setting
  - Increases chances of bridging across loss zone
- High tolerance to contamination
  - Allows variation with mix water
  - Negligible deviation with setting time and strength with contamination
agents to reduce extreme losses has long been a challenge, because the pressure requirements to pump could actually cause losses to increase. Combating severe or total losses by using cement plugs, while common, has also has caused problems such as increased NPT, difficulty obtaining the desired thixotropic fluids behavior, and poor cement bond. MAX-LOCK LCM can set in and seal flowpaths that are many times larger than what conventional LCMs are capable of. This prevents the downtime that cement jobs would require, and its thixotropic properties enable it to seal loss zones that cement cannot reach.

**Environmental information**

The MAX-LOCK LCM has been evaluated in the BHGE drilling fluids’ bioassay program. The US EPA Drilling Fluids Toxicity Test resulted in minimal toxicity for 5.0 lb/bbl of the MAX-LOCK LCM in a generic #7 mud system. It also passes static sheen and oil and grease standards for offshore Gulf of Mexico use. For additional information concerning environmental regulations applicable to BHGE drilling fluids’ products, contact the Health, Safety, and Environmental Department.

**Safe handling recommendations**

Use normal precautions for employee protection when handling products. Read safety data sheet prior to use.

**Packaging**

The MAX-LOCK LCM includes up to seven components, packaged in 25-lbm or 50-lbm sacks or in 55-gal drums.

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**Measurement Specifications**

<table>
<thead>
<tr>
<th>Property</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Appearance</strong></td>
<td>White liquid</td>
</tr>
<tr>
<td><strong>Maximum BHT</strong></td>
<td>250°F (121°C)</td>
</tr>
<tr>
<td><strong>Density range</strong></td>
<td>Up to 16.0 ppg</td>
</tr>
<tr>
<td><strong>Acid solubility</strong></td>
<td>&gt; 90%</td>
</tr>
</tbody>
</table>

MAX-LOCK lost circulation material is shear thinning, does not settle after mixing, becomes cross-linked with temperature, and sets to a solid plug after 2 hours of curing.