



## Liquid Casing® Fine and Coarse Product Data and Usage Sheet

### Product Description

Liquid Casing® Fine and / or Coarse is a fine micro-crystalline and organic cellulose fiber product specially processed to produce a minimally invasive seepage and lost circulation material which can be used in both water and oil-based muds. The key feature of the product is the wide range of fine particle sizes. The sizes are approximately in the range of 1 – 500 microns. The wide range and distribution of fine particle sizes ensures that all fractures or pore throats are sealed, decreasing the permeability of the wall-cake in all drilling fluid types. Additionally, the product is compatible in oil and water-based muds and can be used through any configuration of drilling or coring string without interfering with pumping equipment or downhole tools. It may be added to the mud or completion brine and used in the circulating system.

### Mode of Action

Liquid Casing® Fine and Coarse are each pressed into the pore spaces to be blocked by the application of pressure to the calculated ECD. The fluid loss function of a normal drilling additive further enhances the almost absolute seal that is formed. Migration of formation damaging fines from wellbore fluids is virtually eliminated.

Reversal of the pressure, as when the well is brought on stream, blows the filter-cake off easily due to the high-pressure gradient generated because of the products minimally invasive characteristic virtually no filtrate invasion ensues. This ensures rapid clean up and minimizes formation damage.

The fine size and relatively large surface area can be exploited to provide a means of chemically removing the particles from the formation.

### General Applications / Functions:

- Prevents and halts fluid invasion
- Helps prevent differential sticking
- Reduces wall cake permeability
- Seals off depleted sands and microfractures

- Prevents seepage loss
- Compatible in water and oil-based muds
- Helps logging and casing run smoothly
- Biodegradable and nontoxic
- Temperature stable 400+ F (204 C)
- Does not affect rheology of the mud
- Reduces torque and drag

### Specific Applications

- Use in under and over-pressured formations
- Use while cementing where known mud and cement losses occur
- Use to drill through unconsolidated surface sands
- Use to drill into depleted sandstone reservoirs
- Use during logging

### Advantages

- Compatible in oil and water-based muds
- Has no adverse effects on rheological and filtration control properties of drilling fluids
- Does not plug drilling equipment and downhole tools
- Biodegradable and nontoxic

### Properties / Characteristics

Appearance	Tan-brown powder
Shape and Size	Coarse or fine granulated material
Bulk Density	31lb/ft <sup>3</sup>
Bulk Density	497kg/m <sup>3</sup>
pH (1% aqueous solution)	5.0
Specific Gravity	0.74-0.76
Flash Point	183°C
Boiling Point	229°C
Melting Point	197°C
Solubility in Water	Not Soluble

### Special Instructions

Water-based fluids treated with Liquid Casing® Fine and / or Coarse should be supplemented with a biocide such as ALDACIDE® G biocide to control or eliminate potential bacterial contamination.

## Field Usage of Fine and Coarse Product:

Hole Section	Loss Rate, bph	Formula Guidelines		Remarks
		Non-reservoir	Reservoir	
26.0"	20 - 50	10 ppb Liquid Casing F 10-20 ppb Liquid Casing C 15 ppb Bentonite	-	Adjust Bentonite conc if drilling through reactive clays formation to prevent excessive rheological properties.
17½"	50 - 150	20 ppb Liquid Casing F 20-40 ppb Liquid Casing C 15 ppb Bentonite	-	
12¼"	150 - TLC	15-20 ppb Liquid Casing F 40-50 ppb Liquid Casing C 15 ppb Bentonite	-	
8½"	20 - 50	-	10 ppb Liquid Casing F 10-20 ppb Liquid Casing C	
	50 - 150	-	10 ppb Liquid Casing F 20-40 ppb Liquid Casing C 15 ppb Bentonite	
	150 - TLC	-	15-20 ppb Liquid Casing F 40-50 ppb Liquid Casing C	Alt. #1
		-	20 ppb Liquid Casing F 40-60 ppb Liquid Casing C 15 ppb Bentonite	Alt. #2
Remarks	<ol style="list-style-type: none"> <li>Precautionary treatment: <ul style="list-style-type: none"> <li>If formation losses are anticipated, pre-treat active volume with 3-5 ppb Liquid Casing F (in WBM) or 6-8 ppb (in SOBM) when start drilling.</li> <li>Pump 20-25 bbl pill of a mixture of 10 ppb Liquid Casing F, 10 ppb Liquid Casing C and 5-10 ppb Bentonite in WBM and SOBM. Bentonite concentration will depend on clays reactivity of formation being drilled.</li> </ul> </li> <li>Maintain its presence in active volume by adding 1-2 sacks (in WBM) or 3-5 sacks (in SOBM) @ 25 lbs/sx Liquid Casing F every 100 ft drilled.</li> <li>When losses, dress shale shakers with 50-80 mesh screens to accommodate its return into active system; once losses recovered, redress to required finer sizes.</li> <li>For effective sealing performance, mix LCM pills (a mixture of Liquid Casing F and Liquid Casing C) within 2-3 hours before using.</li> <li>It is not advisable to mix Liquid Casing products with other LCMs.</li> <li>If mud system does not contain any salinity, add bactericide to prevent degradation.</li> </ol>			