

# DIAPLUG

## LOST CIRCULATION SQUEEZE

### DESCRIPTION

DIAPLUG is a specially formulated blend of materials designed to produce slurries with high solids content that exhibit extremely high water loss characteristics in porous or fractured formations. The rapid water loss from the slurry produces a firm, highly permeable plug that penetrates the loss zone and is quickly sealed off by mud solids.

### APPLICATION

DIAPLUG squeezes, unlike cement squeezes, have no adverse effects on drilling fluids. Slurries may be formulated with MESUCO-BAR to any required density in fresh or salt water. DIAPLUG is recommended any time lost circulation occurs to rapidly seal off the thief zone so drilling may continue. Other lost circulation materials (MESUCO-MICA, MESUCO-PLUG, and MESUCO-FLAKE) are compatible with DIAPLUG and may be used to complement the ability of DIAPLUG to stop the loss in fractured zones.

### RECOMMENDED TREATMENT

Formulas for preparing a weighted slurry can be found in TABLE I. Slurry volume should be twice that of open hole to be squeezed, or a minimum of 100 bbl to assure success in sealing permeable formations. Up to 25 ppb MESUCO-MICA, MESUCO-PLUG or MESUCO-FLAKE may be added where larger particle size is desirable as a bridging agent as in naturally fractured, non-porous formations. DIAPLUG slurries, when formulated as in TABLE I and used in sufficient quantities, will assure a successful seal in highly permeable formations and in cases where induced fractures caused by excessive mud weights or poor drilling practices are the cause of lost circulation.

### PROCEDURE FOR DIAPLUG SQUEEZE

For a squeeze to be 100% successful every time, it is recommended that a volume equal to approximately twice the open hole volume be prepared. The procedure for the squeeze operation is as follows:

1. Mix the slurry according to TABLE I. MESUCO-MICA, MESUCO-PLUG or MESUCO-FLAKE may be added to the slurry at this point if desired.
2. Bottom of drill pipe should be at suspected point of loss or far enough inside casing to displace part of slurry in open hole and part in casing if loss zone is at the shoe.
3. Displace slurry out of drill pipe with mud using rig pumps or cement pumps. When slurry starts out of drill pipe the blowout preventers should be closed. Make sure annulus is full. When slurry hits open hole, slow pumps to 1/2 to 3/4 bbl/min.
4. After the slurry clears drill pipe, stage slurry into formation a few barrels at a time, pumping at 1/4 bbl/min, hesitating intermittently for several minutes. Continue until pressure begins to build. Expect initial build-ups and bleed-offs. A final pressure of 300-900 psi is desirable.
5. Hold pressure for 1-2 hours before releasing to resume operations.



6. Ream out cake in open hole. As mud is circulated past porous zones, the highly permeable DIAPLUG cake is covered by a low permeability mud cake and penetrated by mud solids to seal off the zone completely.

Following the above procedure and using enough volume of slurry, virtually 100% success can be assured.

**TABLE I**  
**FORMULA FOR PREPARING 1 BBL DIAPLUG WEIGHTED**  
**SLURRY WITH FRESH WATER OR SEAWATER**

DENSITY (ppg)	DIAPLUG (lb) (sx)	MESUCO-BAR* (sacks)	WATER (bbl)
9	50 1.00	0	.87
10	50 1.00	.6	.84
11	47 .94	1.2	.80
12	42 .84	1.8	.77
13	38 .76	2.3	.74
14	34 .68	2.9	.70
15	31 .62	3.5	.67
16	28 .56	4.0	.63
17	25 .50	4.6	.60
18	22 .44	5.2	.56
19	17 .34	5.8	.52

\* For saturated salt water decrease MESUCO-BAR by .6 sacks per bbl.

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