

UNIVERSAL FLUID SERVICES FLUID LOSS ADDITIVES

UFS-LCM100 Preventative fluid loss additive blend

UFS-LCM250 Medium-grind fluid loss additive blend

UFS-LCM2000 Coarse-grind fluid loss additive blend

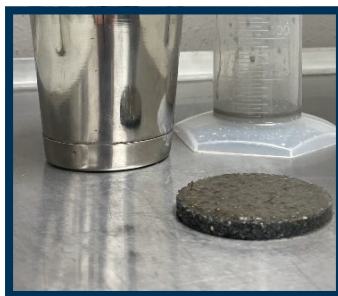
The test results shown below demonstrate UFS's lost circulation material (LCM) solutions for high to severe fluid loss scenarios, with formation porosities ranging from 250 to 2000 microns. Permeability Plugging Tests (PPTs) were performed using a water-based fluid system. PPTs were performed at room temperature and 1000 psi differential pressure using both slotted filter disks and ceramic filter disks.



160 micron ceramic disk –(Left to right) 15ppb UFS-LCM100 & 7.5ppb UFS-LCM100 in Bentonite-polymer DF

PPT Results – 160 Micron Ceramic Disk @ RT and 1000psiΔ-w/Light-weight Bentonite-Polymer Fluid

Sample Description	1 min Filtrate, ml	7.5 min Filtrate, ml	30 min Filtrate, ml	Spurt Loss, V ₁ (ml)	PPT Fluid Loss, V _{PPT} (ml)
Base Fluid 2	No Control (>350)	-	-	-	-
7.5ppb UFS-LCM100	4.0	7.0	8.0	12.0	16.0
15ppb UFS-LCM100	Trace	4.0	6.0	4.0	12.0



UFS-LCM250, 250 micron 20ppb in light-weight polymer D



UFS-LCM250, 250 micron 40ppb in light-weight polymer D

PPT Results – 250 Micron Ceramic Disk @ RT and 1000psiΔ-w/Light-weight Bentonite-Polymer Fluid

Sample Description	1 min Filtrate, ml	7.5 min Filtrate, ml	30 min Filtrate, ml	Spurt Loss, V ₁ (ml)	PPT Fluid Loss, V _{PPT} (ml)
Base Fluid 2	No Control (>350)	-	-	-	-
20ppb UFS-LCM250	Trace	7.0	8.0	12.0	16.0
40ppb UFS-LCM250	Trace	< 2.0	< 2.0	< 2.0	< 2.0
20ppb UFS-LCM2000	12.0	18.0	21.0	30.0	42.0
40ppb UFS-LCM2000	Trace	< 2.0	< 2.0	< 2.0	< 2.0



UFS-LCM2000 Alt 3 2000 micron 40ppb in light-weight polymer DF

PPT Results – 2000 Micron Slotted Disk @ RT and 1000psiΔ-w/Light-weight Bentonite-Polymer Fluid

Sample Description	1 min Filtrate, ml	7.5 min Filtrate, ml	30 min Filtrate, ml	Spurt Loss, V_1 (ml)	PPT Fluid Loss, V_{PPT} (ml)
Base Fluid 2	No Control (>350)	-	-	-	-
40ppb UFS-LCM2000	No Control (>350)	-	-	-	-
60ppb UFS-LCM2000	130.0	170.0	175.0	330.0	350.0
40ppb UFS-LCM2000 Alt-1	200.0	220.0	225.0	430.0	450.0
40ppb UFS-LCM2000 Alt-2	No Control (>350)	-	-	-	-
40ppb UFS-LCM2000 Alt-3	30.0	35.0	40.0	60.0	80.0



UniversalFluids.com

Universal Fluid Services LLC
 2950 N. Loop W. Ste. 130
 Houston, TX 77092
 877-867-5301

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 UFS # 0524-BR-007v1