

## FlexCem LVD

# Lightweight Variable Density Cement

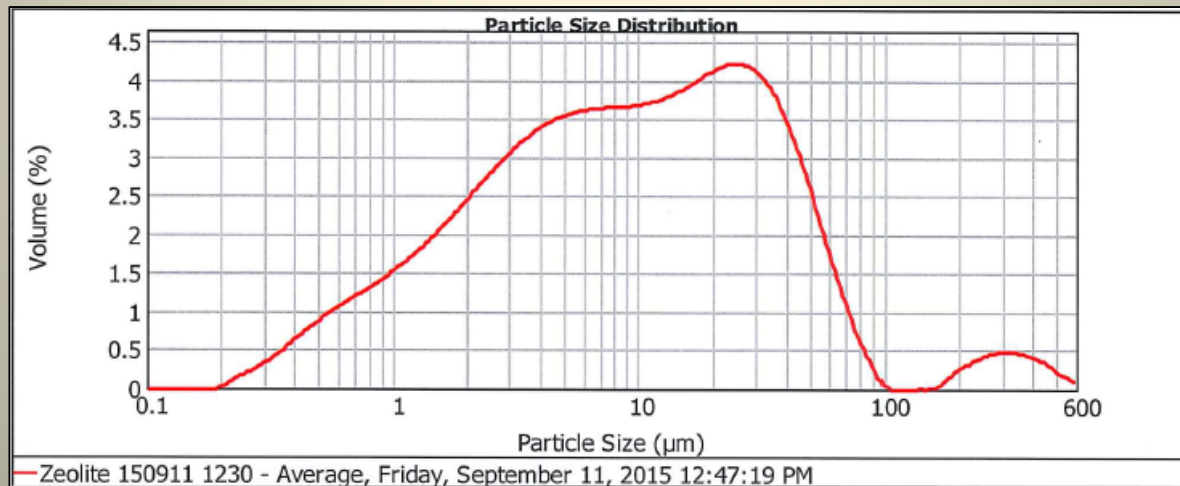
## Patented Technology

- Lower Cost
- Improved Strength
- Low Permeability
- Carbonation Resistance
- Earth Friendly



# Properties

- Optimum density – 13.00 ppg
- Water requirement – 8.22 gal/sack
- Yield – 1.58 ft<sup>3</sup>/sack
- Bulk density - 85 lb/sack (calculated)
- Blaine = 7700 cm<sup>2</sup>/g



Mean Particle Size 24 µm

# Performance

<b>DENSITY MEASUREMENT RESULTS</b>				
#	Measured Specific Gravity (S.G.)	Calculated Bulk Density (lb/sk)	Calculated Absolute Density (lb/ft <sup>3</sup> )	Calculated Absolute Volume (gal/lb)
1	2.85	85	177	0.042

<b>FREE FLUID RESULTS</b>								
#	Static Period: Heat/Amb.	Static Period (hr)	Cylinder Ratio (H:W)	Cylinder Angle (Inclination)	Total Volume (mL)	Free Fluid Volume (mL)	% FF	Settling?
1A	Ambient	2	6:1	0°	250	Trace	<b>0.00</b>	No

**Note: The slurry was mixed and tested for Free Fluid right after API mixing, without any prior slurry pre-conditioning. 13.0 ppg was the final density at which no Free Fluid was measurable, after the two-hour static test period. That final density was used for all subsequent testing thereafter.**

#	Test Type	Composition
1	SG, Optimum Den-FF, Rh, TT, UCA	13.00 ppg FlexCem Blend

# Performance

<b>RHEOLOGICAL RESULTS</b>						
<i>(Dial Readings with rotor/bob/spring combination of R1/B1/F1)</i>						
<b>Fluid#</b>	<b>#1 (80°F)</b>			<b>#1A (125°F)</b>		
<i>rpm</i>	<i>up</i>	<i>down</i>	<i>up</i>	<i>down</i>	<i>up</i>	<i>down</i>
300	37	37	1.00	83	83	1.00
200	33	34	0.97	79	75	1.05
100	28	29	0.96	71	66	1.08
60	24	26	0.92	66	60	1.10
30	21	24	0.88	59	54	1.09
6	16	19	0.84	24	26	0.92
3	12	11	1.09	18	17	1.06
3	10s GS, DR:		N/A	10s GS, DR:		15
3	10m GS, DR:		N/A	10m GS, DR:		99

<b>THICKENING TIME RESULTS</b>								
<i>(Indicated Thickening Times do not include batch mix time)</i>								
<b>#</b>	<b>Test Temp (°F)</b>	<b>Test Press (psi)</b>	<b>Batch Mix (min)*</b>	<b>Initial Bc</b>	<b>30 Bc at hh:mm</b>	<b>50 Bc at hh:mm</b>	<b>70 Bc at hh:mm</b>	<b>100 Bc at hh:mm</b>
1B	125	5,160	N/A	31	00:00	01:31	01:40	01:44

<b>"SONIC" TEST RESULTS</b>									
<b>#</b>	<b>ram p i.d.</b>	<b>Test Temp (°F)</b>	<b>Test Pressure (psi)</b>	<b>50 psi at hh:mm</b>	<b>500 psi at hh:mm</b>	<b>psi at 12:00</b>	<b>psi at 24:00</b>	<b>psi at 48:00</b>	<b>psi at 72:00</b>
1C	a	125	5,000	02:01	07:34	700	1209	2072	2391

## FlexCem LVD

- Allows for density adjustments within a single blend without adversely affecting slurry properties.
- Eliminates the need for separate blends for lead and tail slurries.
- Extends water-absorption capacity without retaining free water.
- Provides resistance to carbonation to maintain compressive strength and low permeability.
- Economic gain of replacing a higher cost clinker with a lower cost proprietary zeolite.
- Lower environmental impact associated with greenhouse gas emissions during Portland manufacture.