

M&D Industries of Louisiana

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Lafayette, La. 70508
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Ultra Set® RAS Jakarta Testing Observations

Prepared for: Wayne Rogers

Date: December 22, 2014

Prepared by:

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LAB REPORT	Ultra Set RAS	TEST DATE	12/5/2014
CUSTOMER NAME		JOB TYPE	Confirmation
RIG NAME	-	WELL FLUID WEIGHT	-
WELL NAME	Pilot	WELL FLUID TYPE	-
LOCATION (FIELD)	Lemigas	HOLE SIZE	-
LOADOUT LOCATION	Jakarta, Indonesia	CASING SIZE (in)	-
REQUESTED BY	Wayne Rogers	PIPE SIZE (in)	-

12/05/2014

Test Conditions for Thickening Time Test

All testing was completed at 270°F BHCT and 300°F BHST. Testing was conducted with pressures ranging from 1,500 PSI to 5,000 PSI.

Slurry Information

Material	Percent by Ultra Set	Lab Weigh out
Ultra Set LT Base Resin	100%	438.86 grams
Ultra Set Suspending Agent	1.5%	6.58 grams
3M Beads	13%	57.05 grams
Time to BHCT	1:00	270°F
Time to BHST	2:00	300°F
Time to final Pressure	1:00	5,000 psi

Results

Temp – F	Resin System	Suspending Agent	Weighing Agent	Density	40 Bc	70 BC	100 Bc
300 (270 BHCT)	Ultra Set RAS	1.5%	13%	7.01	1:29 hr	1:30 hr	1:31 hr

Comments:	According to the chart, there was a thermal runaway and the sample was heated to 290°F much sooner than programmed. This caused the sample to react much sooner than the supporting test data.
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Ultra Set RAS After Mixing

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Ultra Set RAS After TTT testing

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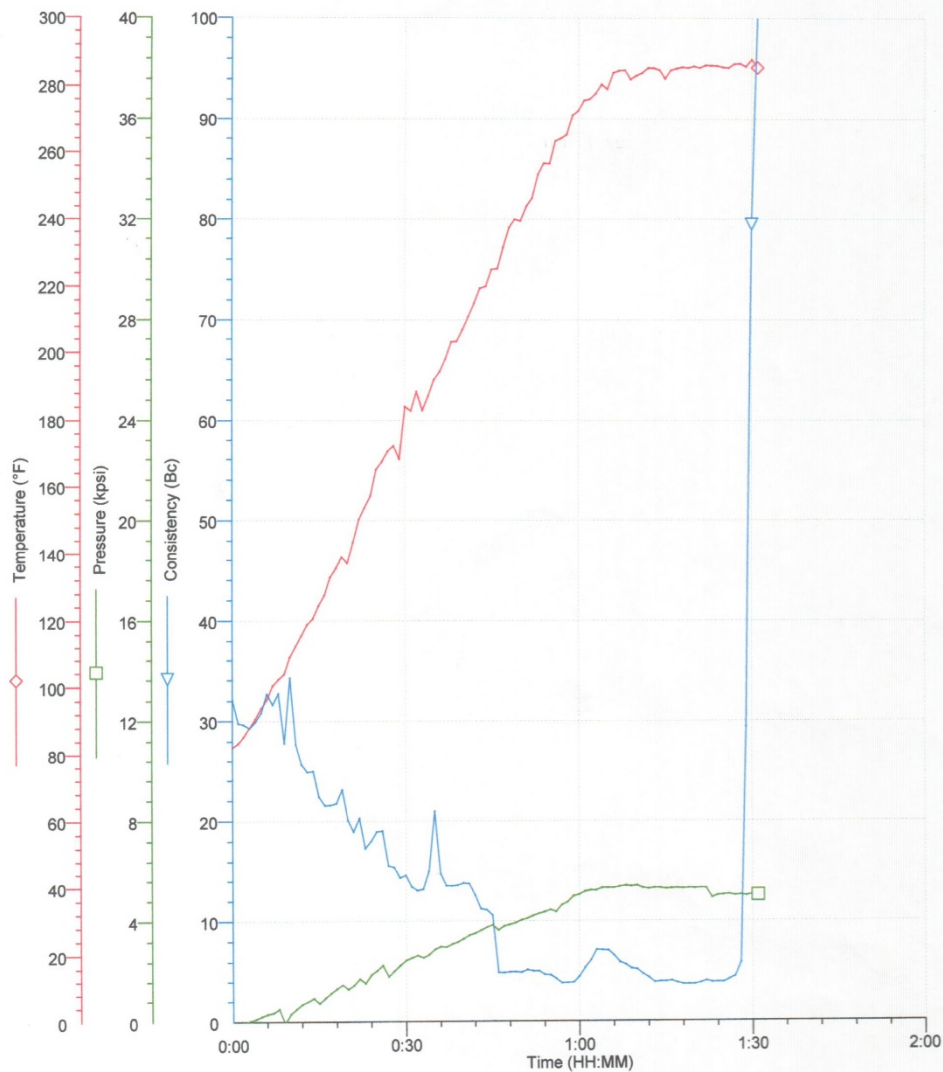
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12/5/14 Jaka-da, Lemigras
Chemt.

Instrument: 8040D10 #Right 1003R
Test Start : 12/5/2014 11:05:06 AM
Test Stop : 12/5/2014 12:37:05 PM

BHCT : 138 C
BHST : 149 C

70 Bc @ 1:30:00
100 Bc @ N/A



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Test Conditions for Compressive Strength Test

All testing was completed at 270°F BHCT and 300°F BHST. Testing was conducted with pressures ranging from 1,500 PSI to 5,000 PSI. The sample was cured for 4 hours.

Slurry Information

Material	Percent by Ultra Set	Lab Weigh out
Ultra Set LT Base Resin	100%	438.86 grams
Ultra Set Suspending Agent	1.5%	6.58 grams
3M Beads	13%	57.05 grams
Time to BHCT	1:00	270°F
Time to BHST	2:00	300°F
Time to final Pressure	1:00	3,000 psi

Results

We set the sample in a UCA and cured for a total of 4 hours. Given the time of day and the work that had already been completed, time was of the essence and we decided to try the sample at 4 hours. The sample that was removed appeared discolored and not fully set. We decided to retest on the following Monday.

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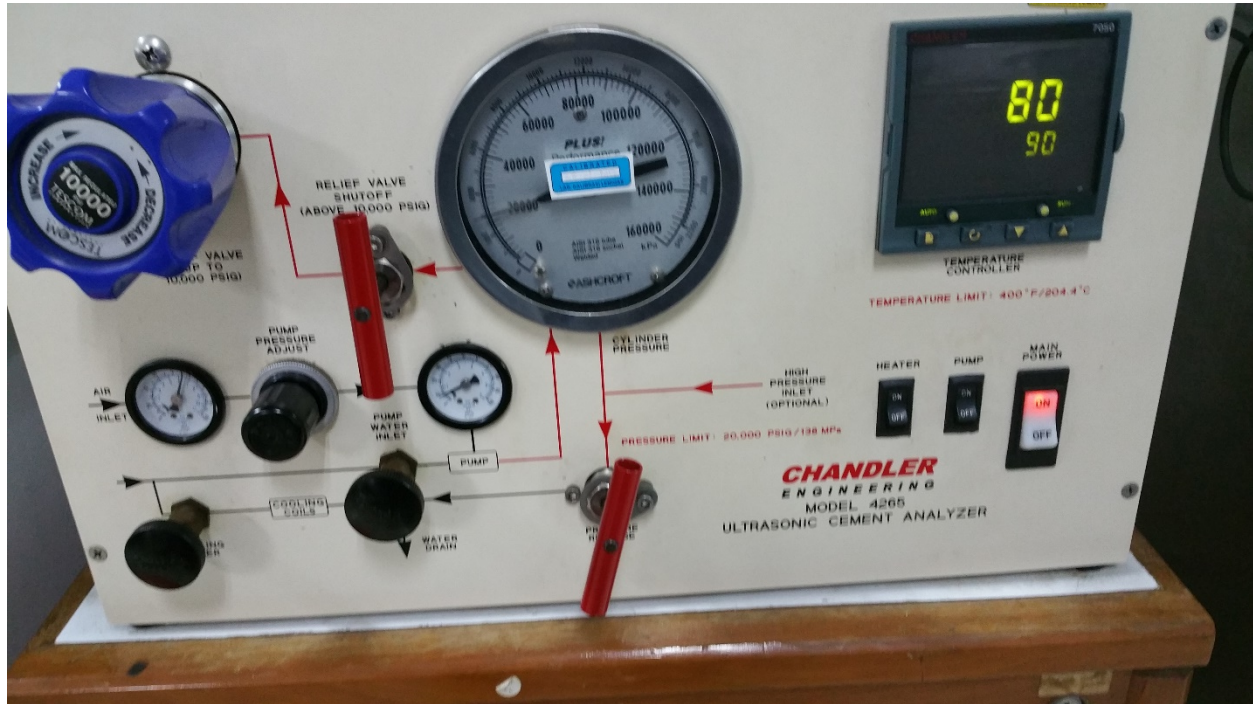
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UCA Tester that was used

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The above picture is Ultra Set RAS after curing 4 hours. Contamination was caused by water intrusion from the UCA testing method. The 3M beads seperated and floated to the top leaving the sample discolored and weakened.

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12/08/2014

Test Conditions for Compressive Strength Test

All testing was completed at 270°F BHCT and 300°F BHST. Testing was conducted with pressures ranging from 1,500 PSI to 5,000 PSI. The sample was cured for 24 hours

Slurry Information

Material	Percent by Ultra Set	Lab Weigh out
Ultra Set LT Base Resin	100%	438.86 grams
Ultra Set Suspending Agent	1.5%	6.58 grams
3M Beads	13%	57.05 grams
Time to BHCT	1:00	270°F
Time to BHST	2:00	300°F
Time to dwell at BHST	15:00	300°F
Time to atmospheric temperature	6:00	80°F
Time to final Pressure	1:00	3,000 psi

Results

BHST	300°F
Compressive Strength	2,500 psi

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After curing for 24 hours we removed the sample, only to observe the same type of effect, discoloration and not fully set. A crush test was still performed to measure the compressive strength of the contaminated slurry. The Ultra Set plug held 4,500 psi and bled back to 2,500 psi. A hydraulic load equal to 2,500 psi was held for 10 minutes. It was determined that the method of testing was not suitable as the UCA tester contaminated the slurry with approximately 75% water causing the 3m beads to separate and float. Another testing method was devised using a pressurized curing chamber to prevent contamination while maintaining temperature and pressure.

The picture to the left is Ultra Set RAS after 24 hour cure. Contamination is also very apparent. The sample was contaminated with water from the UCA testing method, causing the 3M beads to separate and float to the top. Discoloration and stability were greatly affected by this.

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12/09/2014

Test Conditions for Compressive Strength Test

All testing was completed at 270°F BHCT and 300°F BHST. Testing was conducted with pressures ranging from 1,500 PSI to 5,000 PSI. The sample was cured for 24 hours

Slurry Information

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Time to atmospheric temperature	6:00	80°F
Time to final Pressure	1:00	3,000 psi

Results

<i>BHST</i>	<i>300°F</i>
<i>Compressive Strength</i>	<i>35,000 pounds to crush- 15,046 psi</i>

The sample was removed after curing for 24 hours in the curing chamber, no contamination was observed and sample was fully set. The sample was removed from the modified consistometer cell and then cut into equal sections to be crushed. Crush results were much better than expected, achieving 15,046 psi crush value.

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Cube after removing from curing



Cubes after cutting 1

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Cubes after cutting 2

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