P-R400

TECHNICAL DATA SHEET

DATE: JANUARY 1, 2026

PETROCHEM – LOW TO HIGH TEMPERATURE RETARDER 400 (POWDER)

PRODUCT DESCRIPTION

P-R400 is a high-performance powdered cement retarder engineered for low to high temperature oilfield cementing applications, including high-temperature and high-pressure (HTHP) conditions. P-R400 provides precise and repeatable retardation control, maintaining slurry pumpability and supporting reliable cement placement and zonal isolation across a broad temperature range.

APPLICATIONS

- Low to high temperature cementing operations
- High-temperature and high-pressure (HTHP) cementing operations
- Deep well cementing applications
- Production casing cementing
- Cement slurry systems requiring extended thickening time

TECHNICAL DATA

- Provides predictable and repeatable retardation control
- Maintains slurry pumpability and stable rheology under elevated temperature conditions
- Supports consistent thickening-time control and set-time predictability
- Enhances zonal isolation during critical wellbore operations
- Can be dry blended with cement or dispersed directly into mix water for uniform distribution

TYPICAL PROPERTIES

- Appearance: Light Tan Powder
- Specific Gravity: 1.67
- Temperature Range: < 400°F (204°C)

RECOMMENDED TREATMENT

- Typical concentration: 0.5 – 2.5% BWOC
- Up to 3.5% BWOC may be evaluated for applications up to 420°F (216°C)
- Thickening time and performance should be confirmed through API laboratory testing using actual cement, mix water, and additive systems prior to field application

PACKAGING

- Packaged in 40 × 50 lb (22.7 kg) sacks per pallet
- Bulk or custom packaging options available upon request

SAFETY

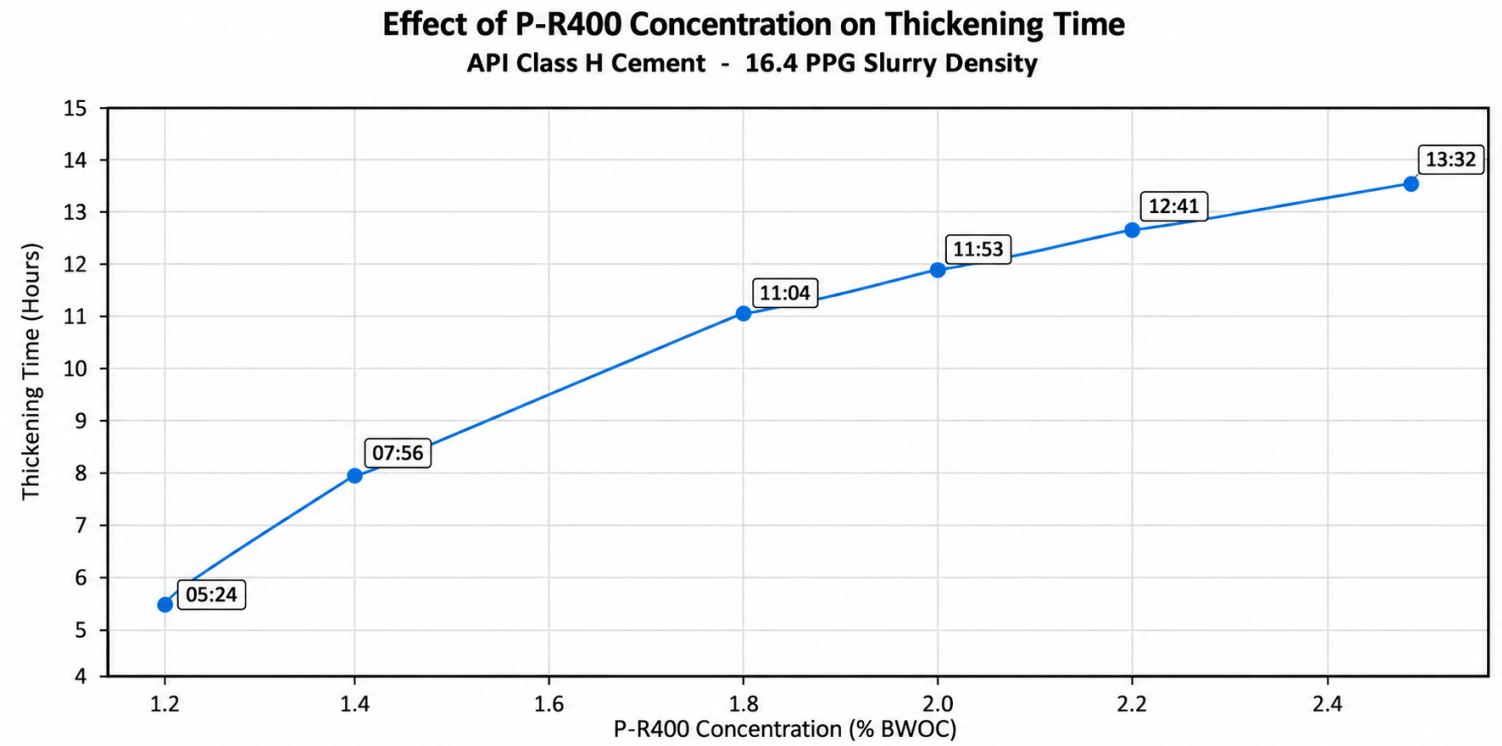
- Refer to the Safety Data Sheet (SDS) prior to handling or use

NOTICE

The information provided herein is offered in good faith; however, no warranties, express or implied, are made. Users are responsible for determining product suitability and performance under actual operating conditions.

TEST MATRIX & DOSAGE SENSITIVITY

Testing conducted using API Class H cement at 16.4 ppg slurry density demonstrates strong dosage sensitivity and predictable thickening-time response.



As shown in the chart above, the thickening time increases in a near-linear relationship with increasing P-R400 concentration, demonstrating predictable dosage response.

Test Blend	P-R400 (% BWOC)	Cement Class	Density (ppg)	Thickening Time (HH:MM)
#1	1.20	API Class H	16.4	05:24
#2	1.40	API Class H	16.4	07:56
#3	1.80	API Class H	16.4	11:04
#4	2.00	API Class H	16.4	11:53
#5	2.25	API Class H	16.4	12:41
#6	2.50	API Class H	16.4	13:32

REPRESENTATIVE SLURRY PERFORMANCE (HTHP CONDITIONS)

TEST CONDITIONS

- BHCT/BHST: 385°F (196°C)
- BHP: ~13,800 Psi
- Cement: API Class H
- Slurry Density: 16.4 Ppg

TEST BLEND #1 — COMPOSITION & SLURRY PERFORMANCE

P-R400 Concentration: 1.20% BWOC | **BHST:** 385 °F | **Density:** 16.4 ppg | **BHP:** 13,841 psi | **Cement:** API Class H

SLURRY COMPOSITION

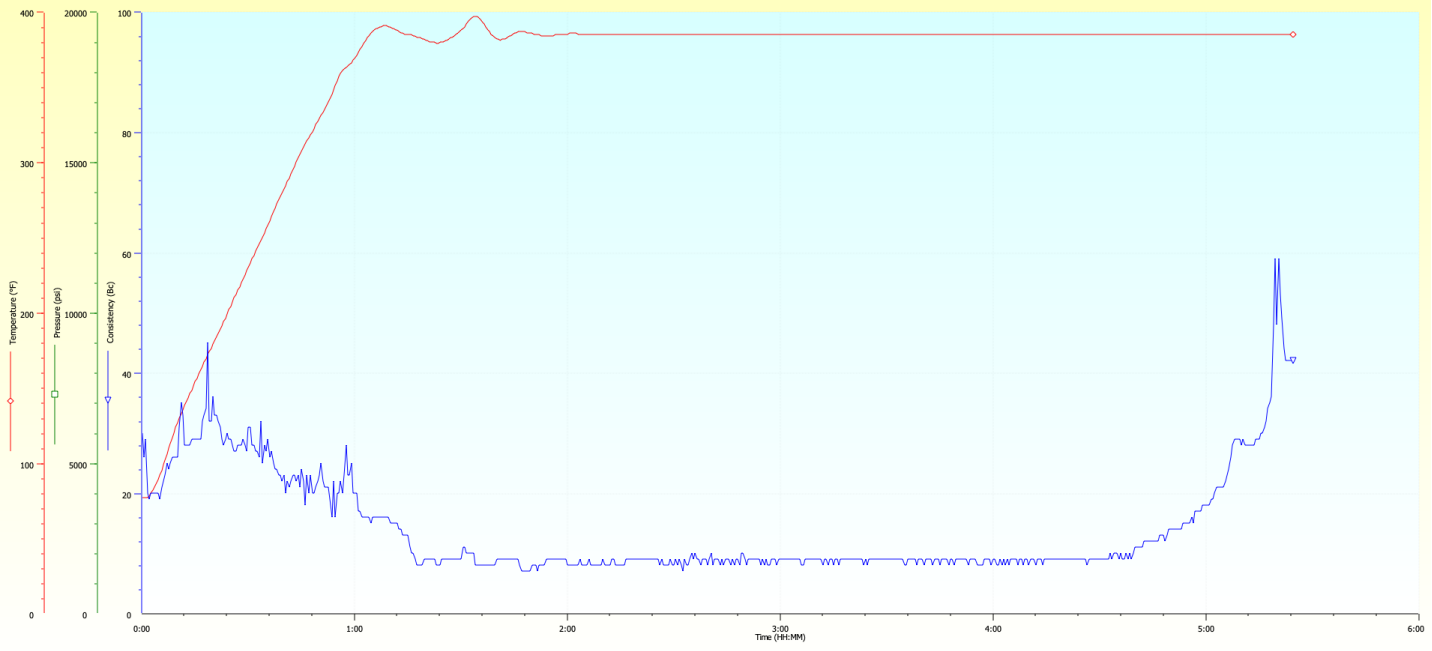
COMPONENT	CONCENTRATION
API Class H Cement	100%
325 Mesh Silica Flour	30%
Micro-Silica	5%
Dispersant	0.3%
Fluid Loss Additive	0.3%
Tri-Functional Additive	0.1%
Anti-Foam	0.02 gal/sk
P-R400	1.20% BWOC

RHEOLOGICAL RESULTS

- 1-Min Gel Strength: 20 @ 80°F | 18 @ 190°F
- 10-Min Gel Strength: 29 @ 80°F | 29 @ 190°F
- Mix Time: 27 Seconds
- Free Water: None Observed After 2 Hours @ 190°F

THICKENING TIME RESULTS

- BHCT/BHST: 385°F (196°C)
- BHP: 13,841 Psi
- 70 Bc Thickening Time: 05:24 (HH:MM)



TEST BLEND #2 — COMPOSITION & SLURRY PERFORMANCE

P-R400 Concentration: 1.40% BWOC | **BHST:** 385 °F | **Density:** 16.4 ppg | **BHP:** 13,912 psi | **Cement:** API Class H

SLURRY COMPOSITION

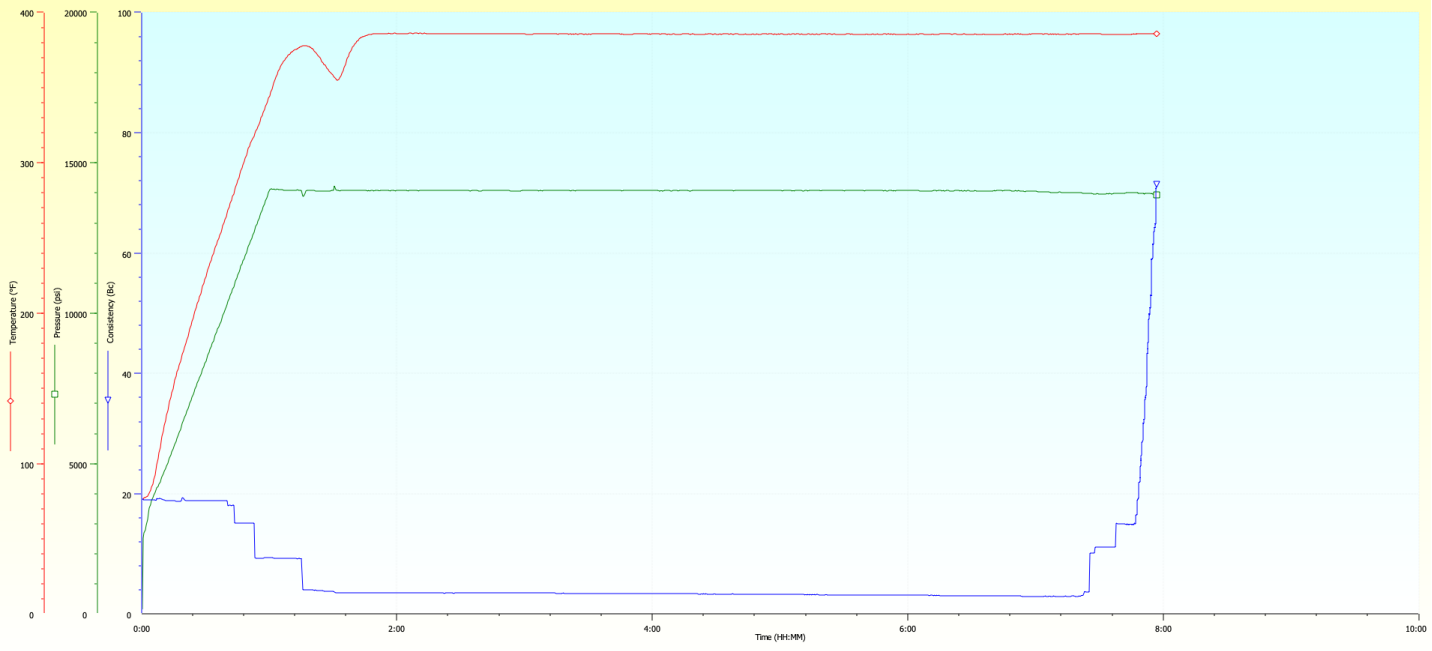
COMPONENT	CONCENTRATION
API Class H Cement	100%
325 Mesh Silica Flour	30%
Micro-Silica	5%
Dispersant	0.3%
Fluid Loss Additive	0.3%
Tri-Functional Additive	0.2%
Anti-Foam	0.02 gal/sk
P-R400	1.40% BWOC

RHEOLOGICAL RESULTS

- 1-Min Gel Strength: 19 @ 80°F | 13 @ 190°F
- 10-Min Gel Strength: 27 @ 80°F | 22 @ 190°F
- Mix Time: 25 Seconds
- Free Water: None Observed After 2 Hours @ 190°F

THICKENING TIME RESULTS

- BHCT/BHST: 385°F (196°C)
- BHP: 13,912 Psi
- 70 Bc Thickening Time: 07:56 (HH:MM)



TEST BLEND #3 — COMPOSITION & SLURRY PERFORMANCE

P-R400 Concentration: 1.80% BWOC | **BHST:** 385 °F | **Density:** 16.4 ppg | **BHP:** 13,807 psi | **Cement:** API Class H

SLURRY COMPOSITION

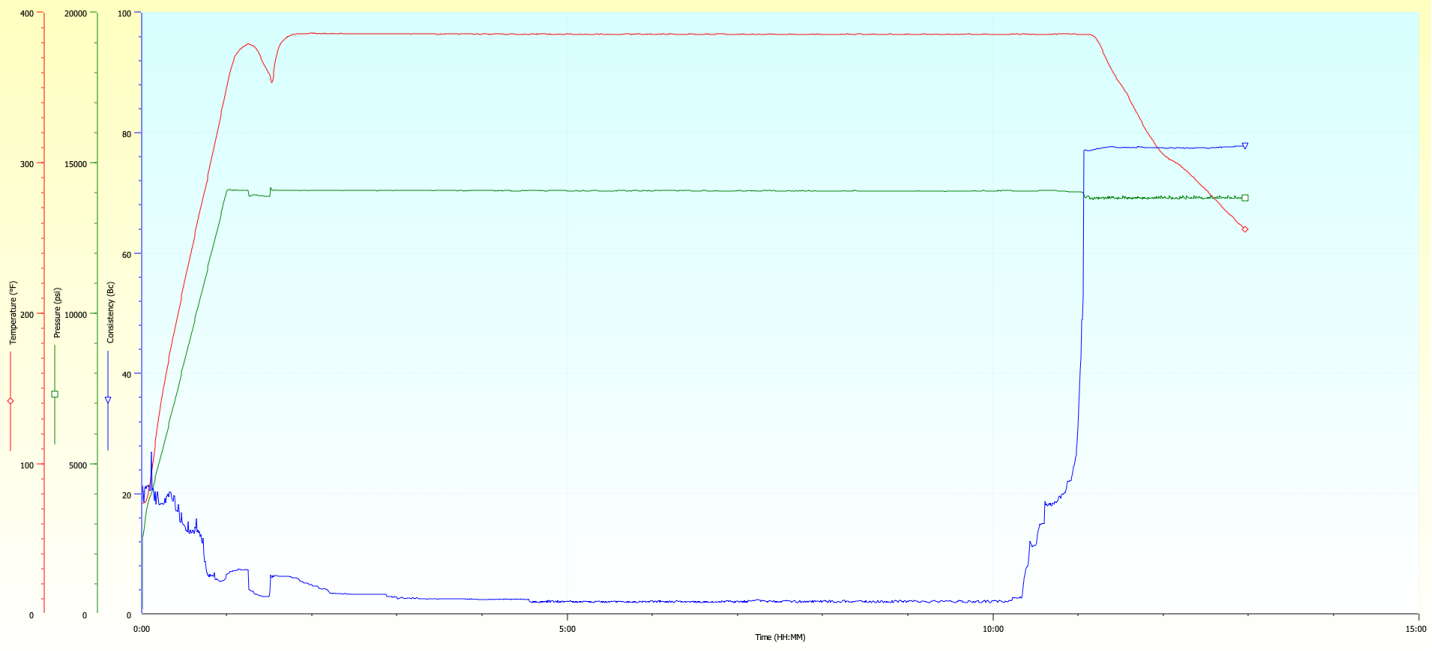
COMPONENT	CONCENTRATION
API Class H Cement	100%
325 Mesh Silica Flour	30%
Micro-Silica	5%
Dispersant	0.30%
Fluid Loss Additive	0.3%
Tri-Functional Additive	0.1%
Anti-Foam	0.02 gal/sk
P-R400	1.80% BWOC

RHEOLOGICAL RESULTS

- 1-Min Gel Strength: 20 @ 80°F | 16 @ 190°F
- 10-Min Gel Strength: 30 @ 80°F | 24 @ 190°F
- Mix Time: 27 Seconds
- Free Water: None Observed After 2 Hours @ 190°F

THICKENING TIME RESULTS

- BHCT/BHST: 385°F (196°C)
- BHP: 13,807 Psi
- 70 Bc Thickening Time: 11:04 (HH:MM)



TEST BLEND #4 — COMPOSITION & SLURRY PERFORMANCE

P-R400 Concentration: 2.00% BWOC | **BHST:** 385 °F | **Density:** 16.4 ppg | **BHP:** 13,804 psi | **Cement:** API Class H

SLURRY COMPOSITION

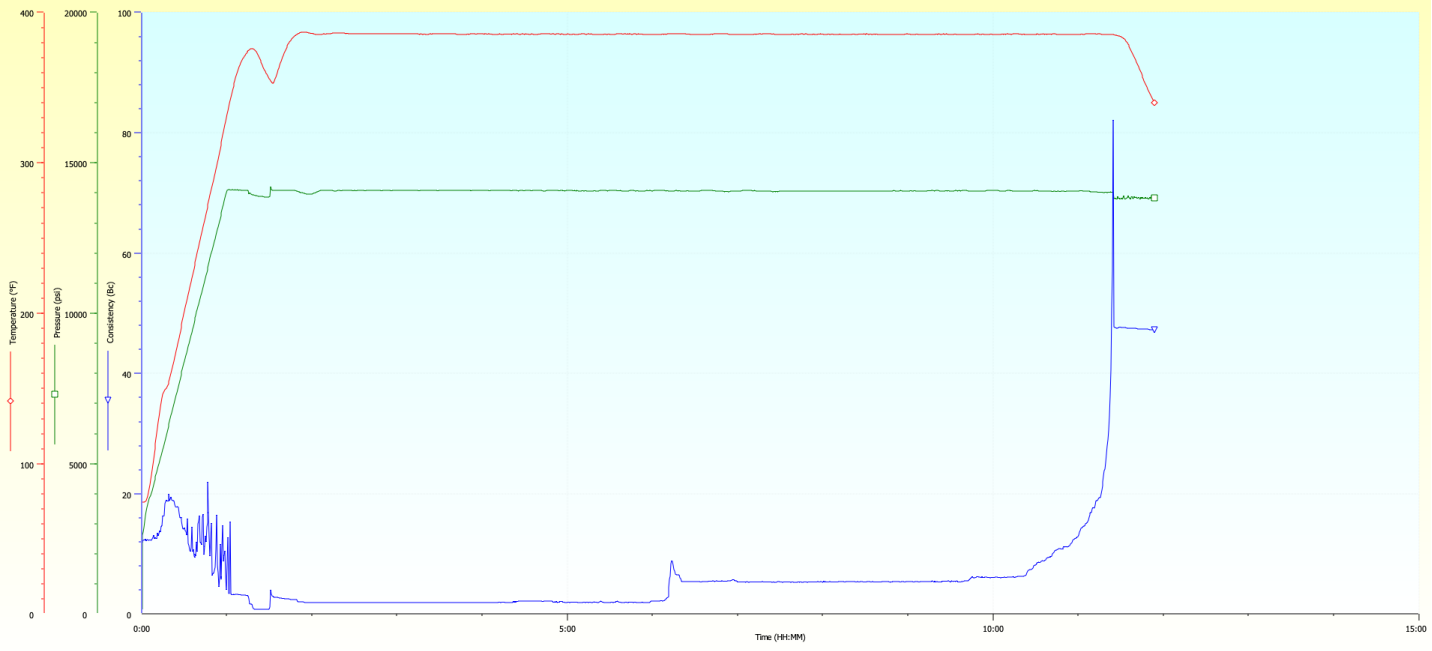
COMPONENT	CONCENTRATION
API Class H Cement	100%
325 Mesh Silica Flour	30%
Micro-Silica	5%
Dispersant	0.3%
Fluid Loss Additive	0.3%
Tri-Functional Additive	0.2%
Anti-Foam	0.02 gal/sk
P-R400	2.00% BWOC

RHEOLOGICAL RESULTS

- 1-Min Gel Strength: 16 @ 80°F | 19 @ 190°F
- 10-Min Gel Strength: 28 @ 80°F | 29 @ 190°F
- Mix Time: 25 Seconds
- Free Water: None Observed After 2 Hours @ 190°F

THICKENING TIME RESULTS

- BHCT/BHST: 385°F (196°C)
- BHP: 13,804 Psi
- 70 Bc Thickening Time: 11:53 (HH:MM)



TEST BLEND #5 — COMPOSITION & SLURRY PERFORMANCE

P-R400 Concentration: 2.25% BWOC | **BHST:** 385 °F | **Density:** 16.4 ppg | **BHP:** 13,806 psi | **Cement:** API Class H

SLURRY COMPOSITION

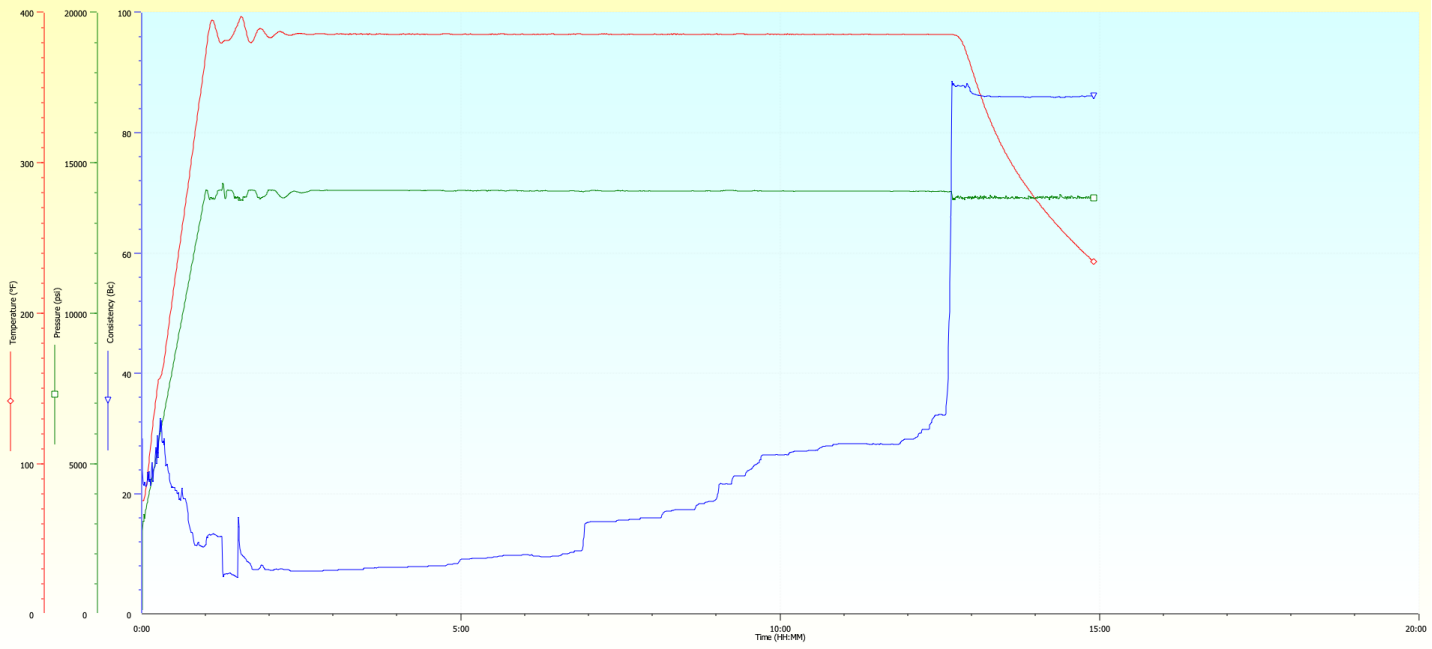
COMPONENT	CONCENTRATION
API Class H Cement	100%
325 Mesh Silica Flour	30%
Micro-Silica	5%
Dispersant	0.3%
Fluid Loss Additive	0.3%
Tri-Functional Additive	0.2%
Anti-Foam	0.02 gal/sk
P-R400	2.25% BWOC

RHEOLOGICAL RESULTS

- 1-Min Gel Strength: 20 @ 80°F | 17 @ 190°F
- 10-Min Gel Strength: 29 @ 80°F | 25 @ 190°F
- Mix Time: 25 Seconds
- Free Water: None Observed After 2 Hours @ 190°F

THICKENING TIME RESULTS

- BHCT/BHST: 385°F (196°C)
- BHP: 13,806 Psi
- 70 Bc Thickening Time: 12:41 (HH:MM)



TEST BLEND #6 — COMPOSITION & SLURRY PERFORMANCE

P-R400 Concentration: 2.50% BWOC | **BHST:** 385 °F | **Density:** 16.4 ppg | **BHP:** 13,780 psi | **Cement:** API Class H

SLURRY COMPOSITION

COMPONENT	CONCENTRATION
API Class H Cement	100%
325 Mesh Silica Flour	30%
Micro-Silica	5%
Dispersant	0.4%
Fluid Loss Additive	0.3%
Tri-Functional Additive	0.25%
Anti-Foam	0.02 gal/sk
P-R400	2.50% BWOC

RHEOLOGICAL RESULTS

- 1-Min Gel Strength: 18 @ 80°F | 17 @ 190°F
- 10-Min Gel Strength: 27 @ 80°F | 25 @ 190°F
- Mix Time: 25 Seconds
- Free Water: None Observed After 2 Hours @ 190°F

THICKENING TIME RESULTS

- BHCT/BHST: 385°F (196°C)
- BHP: 13,780 Psi
- 70 Bc Thickening Time: 13:32 (HH:MM)

