

Blended Cement Samples 69 & 70

Please Note:

- Both of these cements are ASTM C595 Blended Hydraulic Cements. Sample No. 69 is a Type IS(20) and Sample No. 70 is a Type IS(20).
 - Correct SO_3 and LOI for S content
 - **NOTE: Uncorrected SO_3 and LOI test results will be assigned laboratory ratings using corrected SO_3 and LOI statistics.**
- Please allow until March 9th for receipt of samples.
- Closing date for submitting test results is April 13, 2012 (April 20 for 28-day results).
- **IMPORTANT!! Data Entry Confirmation** - After you successfully submit test results on the CCRL website:
 - You will receive a confirmation screen.
 - You will receive a confirmation email sent to the email provided on the data entry page.
 - Sign out and sign in again, visit the Data Entry page to review and confirm your test results. If the Data Entry page is blank CCRL did NOT receive your test results.
 - **Print and keep** the confirmation email and screen as proof your data was submitted.
- If you did not receive data entry confirmation visit ["Trouble Data Entry Trouble Shooting"](#) or contact CCRL at 240-436-4800.



February 24, 2012

TO: Participants in the CCRL BLENDED Cement Proficiency Sample Program

SUBJECT: Blended Cement Proficiency Samples No. 69 and No. 70

The current pair of samples in the Blended Cement Proficiency Sample Program were shipped to your laboratory. Both cements are ASTM C595 Blended Cement. Sample No. 69 is a Type IS(20) and Sample No. 70 is a Type IS(20). The samples for the physical tests are packaged in plastic bags and weigh approximately 6,000 grams each. The samples for chemical analysis are in glass vials and weigh approximately 30 grams each.

These blended cement samples are Type IS and require that SO₃ and LOI be corrected for S:

Corrected SO₃ (total sulfur - S), see Section 5.1.2 of ASTM C114-11a.

Corrected LOI, see Sections 17.2 and 25 of ASTM C114-11a.

NOTE: Uncorrected SO₃ and LOI test results will be assigned laboratory ratings using corrected SO₃ and LOI statistics.

Please allow until March 9, 2012 for receipt of these samples. If these samples have not been received on this date or if the samples you receive are damaged, notify us by sending email to <mailto:ccrl@astm.org> or by calling 240-436-4800. Replacement samples will be forwarded.

Instructions covering the proposed tests, and the necessary data sheets for reporting the test results, are on the following pages. Please read these carefully before proceeding with the tests.

Each sample should be tested separately. The tests should be made as soon as possible after the samples are received, and the results should be promptly reported to CCRL upon completion of the tests. Enter test results at our website: <http://www.ccrl.us/>. The closing date for test results will be April 13, 2012. The results for 28-day test results will be accepted until April 20, 2012. Notice and information about the final report will be sent by email.

Additional samples of this sample pair and past CCRL samples are available for sale. These samples can be used for research, technician training, and test equipment verification. Contact us for availability and pricing.

Sincerely,

Robin K. Haupt
Supervisor, Proficiency Sample Program
Cement and Concrete Reference Laboratory

**CCRL PROFICIENCY SAMPLE PROGRAM
BLENDED CEMENT SAMPLES NO. 69 AND NO. 70**

INSTRUCTIONS FOR TESTING

The two samples for the physical tests are packaged in plastic bags, each of which contains approximately 6,000 grams of cement. The two samples for chemical analyses are sealed in glass vials, each of which contains approximately 30 grams of cement. The physical and chemical samples for the odd numbered sample represent one cement, and the physical and chemical samples for the even numbered sample represent another cement. The odd and even numbered samples should **NOT** be combined. Both cements are ASTM C595 Blended Hydraulic Cements. **Sample No. 69 is a Type IS(20) and Sample No. 70 is a Type IS(20).**

Insofar as your laboratory is prepared to do so, make the chemical and physical determinations on each sample in accordance with the current edition of the ASTM Standard Specification for Blended Hydraulic Cements (C595), and with the various standards and specifications to which it refers. It is preferred that the same operator make all physical tests on both samples, and that the same chemist make all chemical determinations on both samples. The results of a single determination should be reported rather than an average of duplicate determinations.

PHYSICAL TESTS

Prior to testing, pass the cement for the physical tests through a No. 20 sieve in accordance with ASTM Specification C183.

Perform fineness tests on cement taken from the 6,000 g sample.

Perform the following physical tests on each sample in accordance with the current ASTM methods designated below.

Blended Hydraulic Cements	ASTM C595-11
Normal Consistency	ASTM C187-11
Time of Setting, Vicat	ASTM C191-08
Soundness, Autoclave	ASTM C151-09
Air Content of Mortar	ASTM C185-08
Specific Gravity	ASTM C188-09
Compressive Strength (nine cube batch)	ASTM C109-11
Fineness, Air Permeability	ASTM C204-07
Fineness, by the 45 µm (No. 325) Sieve	ASTM C430-08
Heat of Hydration	ASTM C186-05

CHEMICAL TESTS

Perform the following chemical tests in accordance with ASTM C114-11a on each sample.

Silicon dioxide,	SiO ₂	Potassium oxide,	K ₂ O
Aluminum oxide,	Al ₂ O ₃	Titanium dioxide,	TiO ₂
Ferric oxide,	Fe ₂ O ₃	Sodium oxide,	Na ₂ O
Calcium oxide,	CaO	Phosphorus pentoxide,	P ₂ O ₅
Magnesium oxide,	MgO	Zinc oxide,	ZnO
Sulfur trioxide, (Corrected for S)	SO ₃	Manganic oxide,	Mn ₂ O ₃
Loss on ignition (Corrected for S)		Sulfide Sulfur	S
Insoluble residue		Chloride,	Cl
		Chromium oxide,	Cr ₂ O ₃

These blended cement samples are Type IS and require that SO₃ and LOI be corrected for S:

Corrected SO₃ (total sulfur - S), see Section 5.1.2 of ASTM C114-11a.

Corrected LOI, see Sections 17.2 and 25 of ASTM C114-11a.

It is preferred that one chemist make the chemical tests on both samples, on the same day. The results of a single determination should be reported rather than the average result of duplicate determinations.

INSTRUCTIONS FOR REPORTING

For the sake of uniformity, report the values for the various tests to the nearest significant number indicated in the reporting forms. Be sure to indicate what chemical analysis procedure was used.

Test results should be entered at our website: <http://www.ccr1.us/>. The closing date for test results submitted through our website will be April 13, 2012. The results for 28-day tests will be accepted until April 20, 2012.

**CCRL PROFICIENCY SAMPLE PROGRAM
 BLENDED CEMENT SAMPLES NO. 69 AND NO. 70
 CHEMICAL ANALYSIS REPORT FORM**

RETURN TO: R.K. Haupt, Supervisor, PSP
 Cement and Concrete Reference Laboratory
 4441 Buckeystown Pike, Ste C
 Frederick, Maryland 21704
 Fax: 610-834-7066

FROM: _____

 e-mail: _____
Check here if name or address has changed _____

CHEMICAL ANALYSIS

NOTE: Test results reported on this form should be the laboratory's "best effort". The method used should be the method used to qualify cement, or test cement for acceptance or rejection.

	Sample No. 69	Sample No. 70	Test ID	X-ray *	ASTM Alternate Wet Method	ASTM Reference Wet Method	A.A.	Other (specify)
Report values below to nearest 0.01%				Check the method used				
Silicon dioxide, SiO ₂			10	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Aluminum oxide, Al ₂ O ₃			21	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Ferric oxide, Fe ₂ O ₃			30	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Calcium oxide, CaO			40	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Magnesium oxide, MgO			50	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfur trioxide, SO ₃ (Corrected for S)			61	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Sulfur trioxide, SO ₃ (Uncorrected for S)			62	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loss on ignition (Corrected for S)			71	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Loss on ignition (Uncorrected for S)			72	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Insoluble residue			80	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Potassium oxide, K ₂ O			100	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Titanium dioxide, TiO ₂			103	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<p>*Please provide the following information the XRF equipment used for these results.</p> <p>XRF instrument: <input type="checkbox"/> energy dispersive <input type="checkbox"/> wavelength dispersive</p> <p>Sample preparation: <input type="checkbox"/> pressed powder <input type="checkbox"/> fused glass disk</p>								

Comments:

Tests performed by _____ Date _____
 Tests reported by _____ Title _____
 Phone _____ FAX _____ CCRL laboratory number _____

**CCRL PROFICIENCY SAMPLE PROGRAM
 BLENDED CEMENT SAMPLES NO. 69 AND NO. 70
 CHEMICAL ANALYSIS REPORT FORM**

RETURN TO: R.K. Haupt, Supervisor, PSP
 Cement and Concrete Reference Laboratory
 4441 Buckeystown Pike, Ste C
 Frederick, Maryland 21704
 Fax: 610-834-7066

FROM: _____

 e-mail: _____
 Check here if name or address has changed _____

	Sample No. 69	Sample No. 70	Test ID
Report values below to nearest 0.001%			
Sodium oxide, Na ₂ O			90
Phosphorus pentoxide, P ₂ O ₅			102
Zinc oxide, ZnO			99
Manganic oxide, Mn ₂ O ₃			101
Sulfide sulfur, S			65
Chloride, Cl			104
Chromium oxide, Cr ₂ O ₃			105

X-ray *	ASTM Reference Wet Method	ASTM Reference Wet Method	A.A.	Other (specify)
Check the method used				
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

***Please provide the following information the XRF equipment used for these results.**

- XRF instrument: energy dispersive wavelength dispersive
 Sample preparation: pressed powder fused glass disk

Comments:

Tests performed by _____ Date _____
 Tests reported by _____ Title _____
 Phone _____ FAX _____ CCRL laboratory number _____

**CCRL PROFICIENCY SAMPLE PROGRAM
 BLENDED CEMENT SAMPLES NO. 69 AND NO. 70
 PHYSICAL TESTS REPORT FORM**

RETURN TO: R. K. Haupt, Supervisor, PSP
 Cement and Concrete Reference Laboratory
 4441 Buckeystown Pike, Ste C
 Frederick, Maryland 21704
 Fax: 610-834-7066

FROM: _____

 e-mail: _____
 Check here if name or address has changed _____

TEST RESULTS
Report as Indicated in ()

	<u>Sample No.</u> 69	<u>Sample No.</u> 70	
NORMAL CONSISTENCY:			
Water (<i>nearest 0.1 percent by weight of cement</i>)	_____	_____	[110]
VICAT TIME OF SETTING:	Minutes	Minutes	
Initial Set, Report in minutes (<i>nearest 5 minutes</i>)	_____	_____	[120]
Final Set, Report in minutes (<i>nearest 5 minutes</i>)	_____	_____	[121]
AUTOCLAVE EXPANSION:	<u>No. 69</u>	<u>No. 70</u>	
Final Reading	_____	_____	
Initial Reading	_____	_____	
Difference	_____	_____	
Percent Expansion (<i>nearest 0.01 percent</i>)	_____	_____	[160]
AIR CONTENT OF MORTAR:			
Percent Air (<i>nearest 0.1 percent</i>)	_____	_____	[170]
Mixing water (<i>nearest 0.1 percent by weight of cement</i>)	_____	_____	[180]
Flow Obtained (<i>nearest percent</i>)	_____	_____	[190]
Specific Gravity (<i>nearest 0.01</i>)	_____	_____	[310]
COMPRESSIVE STRENGTH:	<u>No. 69</u>	<u>No. 70</u>	
3-day, total load, lbs.	1) _____	_____	
	2) _____	_____	
	3) _____	_____	
Average 3-day (<i>nearest 10 psi</i>)	_____	_____	[200]

Tests performed by _____ Date _____
 Tests reported by _____ Title _____
 Phone _____ FAX _____ CCRL laboratory number _____

**CCRL PROFICIENCY SAMPLE PROGRAM
 BLENDED CEMENT SAMPLES NO. 69 AND NO. 70
 PHYSICAL TESTS REPORT FORM**

RETURN TO: R. K. Haupt, Supervisor, PSP
 Cement and Concrete Reference Laboratory
 4441 Buckeystown Pike, Ste C
 Frederick, Maryland 21704
 Fax: 610-834-7066

FROM: _____

 e-mail: _____
 Check here if name or address has changed _____

		<u>Sample No.</u> <u>69</u>	<u>Sample No.</u> <u>70</u>	
COMPRESSIVE STRENGTH (CONTINUED):				
	No. 69	No. 70		
7-day, total load, lbs..	1) _____	_____		
	2) _____	_____		
	3) _____	_____		
Average 7-day (nearest 10 psi)		_____	_____	[210]
	No. 69	No. 70		
28-day, total load, lbs..	1) _____	_____		
	2) _____	_____		
	3) _____	_____		
Average 28-day (nearest 10 psi)		_____	_____	[211]
Mixing Water (nearest 0.1 percent by weight of cement)		_____	_____	[220]
Flow Obtained (nearest percent)		_____	_____	[230]
FINENESS: Air Permeability, (nearest 10 cm ² /g)		_____	_____	[270]
45µm Sieve, Corrected percent passing (nearest 0.01 percent)		_____	_____	[281]
	No. 69	No. 70		
Correction Factor for 45 µm sieve (nearest 0.01 percent)	_____	_____		

Comments:

Tests performed by _____ Date _____
 Tests reported by _____ Title _____
 Phone _____ FAX _____ CCRL laboratory number _____

**CCRL PROFICIENCY SAMPLE PROGRAM
 BLENDED CEMENT SAMPLES NO. 69 AND NO. 70
 HEAT OF SOLUTION & HEAT OF HYDRATION REPORT FORM**

RETURN TO: R. K. Haupt, Supervisor, PSP
 Cement and Concrete Reference Laboratory
 4441 Buckeystown, Pike, Ste C
 Frederick, Maryland 21704
 Fax: 610-834-7066

FROM: _____

 e-mail: _____
 Check here if name or address has changed _____

**C186 HEAT OF HYDRATION
 TEST RESULTS**
Report as Indicated in ()

	Sample No. <u>69</u>	Sample No. <u>70</u>	
HEAT OF SOLUTION:			
Dry Cement, cal/g (<i>nearest 0.1 cal/g</i>)	_____	_____	[291]
Partially hydrated, 7-day cal/g (<i>nearest 0.1 cal/g</i>)	_____	_____	[292]
Partially hydrated, 28-day cal/g (<i>nearest 0.1 cal/g</i>)	_____	_____	[301]
HEAT OF HYDRATION:			
7-day, cal/g (<i>nearest 0.1 cal/g</i>)	_____	_____	[290]
28-day, cal/g (<i>nearest 0.1 cal/g</i>)	_____	_____	[300]

Comments:

Tests performed by _____ Date _____
 Tests reported by _____ Title _____
 Phone _____ FAX _____ CCRL laboratory number _____