



Central Plains Cement Company

Cement Mill Test Report

Month of Issue: September 2018

Plant:	Tulsa, OK
Product:	Portland Cement Type I/II LA
Silos:	1, 3, 4, 6, 10, 11, 12, 13, 14, 15, 16
Manufactured:	August 2018

ASTM C 150-16 and AASHTO M 85-16 Standard Requirements

CHEMICAL ANALYSIS			PHYSICAL ANALYSIS		
Item	Spec limit	Test Result	Item	Spec limit	Test Result
Rapid Method, X-Ray (C 114)			Air content of mortar (%) (C 185)	12 max	7
SiO ₂ (%)	---	19.9	Blaine Fineness (m ² /kg) (C 204)	260 - 430	422
Al ₂ O ₃ (%)	6.0 max	4.9	-325 (%) (C 430)	---	95.4
Fe ₂ O ₃ (%)	6.0 max	3.3	Autoclave expansion (%) (C 151)	-0.2 min 0.80 max	-0.01
CaO (%)	---	62.2	Compressive strength (PSI) (C 109)		
MgO (%)	6.0 max	2.1	1 day	---	1890
SO ₃ (%)	3.0 max *	3.1	3 days	1740 min	3240
Loss on ignition (%)	3.0 max	2.2	7 days	2760 min	4090
Insoluble residue (%)	0.75 max	0.35	28 days (Reflects previous month's data)	---	5590
CO ₂ (%)	---	0.8	Time of setting (minutes)		
Limestone (%)	5.0 max	2.0	Vicat Initial (C 191)	45 - 375	106
CaCO ₃ in Limestone (%)	70 min	88	Heat of Hydration (KJ/Kg, [cal/g]) (C 186)		
Inorganic Process Addition	5.0 max	---	7 days (for information only)	---	276 (66.0)
Adjusted Potential Phase Composition (C 150)					
C3S (%)	---	52			
C2S (%)	---	17			
C3A (%)	8 max	7			
C4AF (%)	---	10			
C3S+4.75*C3A (%)	100 max	87			

ASTM C 150-09 and AASHTO M 85-09 Optional Chemical Requirements:

NaEq (%)	0.60 Max	0.51
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* Cement with SO₃ > 3.0 complies with ASTM C1038-14

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of ASTM C 150-16 & AASHTO M 85-16 STANDARD SPECIFICATIONS FOR TYPE I AND TYPE II (LOW ALKALI) CEMENT.

Certified By:

John Tierney

Central Plains Cement Co. LLC - Tulsa Plant
2609 North 145th East Ave
Tulsa, OK 74012
918-437-3902

September 5, 2018



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Additional ASTM C 150-16 and AASHTO M 85-16 Standard data

Limestone Addition - Additional Data

<u>Item</u>	<u>Test Result</u>
SiO ₂ (%)	7.4
Al ₂ O ₃ (%)	0.8
Fe ₂ O ₃ (%)	0.5
CaO (%)	48.1
SO ₃ (%)	0.2
CO ₂ (%)	38.7

Base Cement Phase Composition

<u>Item</u>	<u>Test Result</u>
C ₃ S (%)	53
C ₂ S (%)	18
C ₃ A (%)	8
C ₄ AF (%)	10

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