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**CEMENT  
 MILL  
 TEST  
 REPORT**

**Cement Identified as Type III LA, Low Alkali Portland Cement**

**Date: 03/17/2022**

**Plant: Kosmos Cement**

**Location: Louisville, Kentucky**

**Kosmos Cement Customers**

**Sample Receiving and Testing Dates : February 1-28**

**Production Month: February**

STANDARD COMPOSITION REQUIREMENTS (ASTM C114)	ASTM C150 SPECIFICATIONS	TYPE I	TYPE II	TYPE III LA	TEST
Silicon Dioxide (SiO <sub>2</sub> ), %		---	---	---	19.8
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ), %	Maximum	---	---	---	4.7
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> ), %	Maximum	---	---	---	3.1
Calcium Oxide (CaO), %		---	---	---	61.8
Magnesium Oxide (MgO), %	Maximum	---	---	6.0	3.9
Sulfur Trioxide (SO <sub>3</sub> ), %	Maximum	---	---	3.5	3.74 <sup>A</sup>
Loss on Ignition (LOI), %	Maximum	---	---	3.0	1.3
Insoluble Residue, %	Maximum	---	---	1.50	
Alkalies (Na <sub>2</sub> O equivalent), % (Optional)		---	---	0.60	0.41
Tricalcium Silicate (C <sub>3</sub> S), %		---	---	---	0.60
Dicalcium Silicate (C <sub>2</sub> S), %		---	---	---	55
Tricalcium Aluminate (C <sub>3</sub> A), %	Maximum	---	---	15	15.2
(C <sub>3</sub> S+4.75C <sub>3</sub> A)	Maximum	---	---	---	7.3
					90
<b>STANDARD PHYSICAL REQUIREMENTS</b>					
(ASTM C204) Blaine Fineness, cm <sup>2</sup> /gm	Minimum	---	---	---	582
(ASTM C430) -325 Mesh, %		---	---	---	99.4
(ASTM C191) Time of Setting (Vicat)					
Initial Set, minutes	Minimum	---	---	45	90
Final Set, minutes	Maximum	---	---	375	200
(ASTM C451) False Set, % (Optional)	Minimum	---	---	50	69
(ASTM C185) Air Content, %	Maximum	---	---	12	9.0
(ASTM C151) Autoclave Expansion, %	Maximum	---	---	0.80	0.122
(ASTM C187) Normal Consistency, %		---	---	---	31.3
(ASTM C109) Compressive Strength, psi (MPa)					
1 Day-psi (MPa)	Minimum	-----	-----	1740(12.0)	4531
3 Day - psi (MPa)	Minimum	-----	-----	3480(24.0)	5686
7 Day - psi (MPa)	Minimum	-----	-----		6800
28 Day - psi (MPa) (Optional)	Minimum	-----	-----		

• Kosmos Cement hereby certifies that this cement meets or exceeds the chemical and physical specifications of ASTM C150 for TYPE III LA Portland Cement.

In compliance with ASTM C563, since Optimum SO<sub>3</sub> exceeds 3.5%, and the most recent results of ASTM C1038 for expansion in water at 14 days is <0.020%.

Physical testing completed by: EM, DB  
 Chemical testing completed by : MA, TG, EO, NJ

By: *Tom Kyser*  
 Tom Kyser  
 Quality Control Manager  
 Kosmos Cement