



15301 Dixie Highway  
 Louisville, KY 40272  
 Telephone (502) 933-0122  
 FAX (502) 933-6334

CEMENT  
 MILL  
 TEST  
 REPORT

**Cement Identified as Type I, Type II HA**  
**Kosmos Cement**  
**Location: Louisville, Kentucky**  
**Kosmos Cement Customers**  
**Sample Receiving and Testing Dates: August 1-31**

**Date: 09/04/2021**

**August**

STANDARD COMPOSITION REQUIREMENTS (ASTM C114)	ASTM C150 SPECIFICATIONS	TYPE I	TYPE II	TEST
Silicon Dioxide (SiO <sub>2</sub> ), %		---	---	18.3
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ), %	Maximum	---	6.0	4.6
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> ), %	Maximum	---	6.0	3.2
Calcium Oxide (CaO), %		---	---	61.4
Magnesium Oxide (MgO), %	Maximum	6.0	6.0	4.1
Sulfur Trioxide (SO <sub>3</sub> ), %	Maximum	3.0	3.0	3.9 <sup>A</sup>
Loss on Ignition (LOI), %	Maximum	3.5	3.5	3.2
Insoluble Residue, %	Maximum	1.50	1.50	0.80
Alkalies (Na <sub>2</sub> O equivalent), %		---	---	0.53
Tricalcium Silicate (C <sub>3</sub> S),		---	---	62.1
Dicalcium Silicate (C <sub>2</sub> S), %		---	---	3.0
Tricalcium Aluminate (C <sub>3</sub> A), %	Maximum	---	8	6.6
(C <sub>3</sub> S+4.75C <sub>3</sub> A)	Maximum		100	93.5
Limestone %	Maximum	5	5	4.7
CO <sub>2</sub> %				1.90
CaCO <sub>3</sub> % in Limestone	Minimum	70	70	82
<b>STANDARD PHYSICAL REQUIREMENTS</b>				
(ASTM C204) Blaine Fineness, m <sup>2</sup> /kg	Minimum	280	280	3886
(ASTM C430) -325 Mesh, %		---	---	96.0
(ASTM C191) Time of Setting (Vicat)				
Initial Set ,minutes	Minimum/Maximum	45/375	45/375	120
Final Set , minutes				251
(ASTM C1702) Calorimetry	Maximum	---	---	63.3 <sup>B</sup>
(ASTM C451) False Set, % (Optional)	Minimum	50	50	80
(ASTM C185) Air Content, %	Maximum	12	12	7.2
(ASTM C185) Air Content, %	Maximum	0.80	0.80	
(ASTM C151) Autoclave Expansion, %		---	---	0.130
(ASTM C187) Normal Consistency, %				26.3
(ASTM C109) Compressive Strength, psi (MPa)				
3 Day - psi (MPa)	Minimum	1740(12.0)	1450(10.0)	4453
7 Day - psi (MPa)	Minimum	2760(19.0)	2470(17.0)	5420
28 Day - psi (MPa) (Optional)				

• Kosmos Cement hereby certifies that this cement meets or exceeds the chemical and physical specifications of ASTM C150 and AASHTO M85 for TYPE I and TYPE II portland cement.

<sup>A</sup> In compliance with ASTM C150, since Optimum SO<sub>3</sub> exceeds 3.0%, the most recent results of ASTM C1038 for expansion in water at 14 days is <0.020%.

<sup>B</sup> The value for ASTM C1702 is in accord with the required testing frequency.

*Tom Kyser*

By:  
 Tom Kyser  
 Quality Control Manager  
 Kosmos Cement

Physical testing/sampling completed by: EO, DB  
 Chemical testing/sampling completed by : E.O, EW,



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Additional Data Limestone					TEST
Silicon Dioxide (SiO <sub>2</sub> ), %					5.6
Aluminum Oxide (Al <sub>2</sub> O <sub>3</sub> ), %					0.80
Ferric Oxide (Fe <sub>2</sub> O <sub>3</sub> ), %					0.40
Calcium Oxide (CaO), %					45.7
Sulfur Trioxide (SO <sub>3</sub> ), %					0.15
Base Cement Composition					65.2
C3S %					3.2
C2S %					6.9
C3A %					9.6
C4AF %					None
Inorganic Processing Data					None

• Kosmos Cement hereby certifies that the above described data represents the materials used in the cement manufactured during the production period indicated

*Tom Kyser*

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Quality Control Manager  
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