



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

Plant: Kosmos Cement

Location: Louisville, Kentucky

Kosmos Cement Customers

Sample Receiving and Testing Dates: December 1-31

Date: 01/19/2020

December

STANDARD COMPOSITION REQUIREMENTS (ASTM C114)	ASTM C150 SPECIFICATIONS	TYPE I	TYPE II		TEST
Silicon Dioxide (SiO ₂), %		----	----		19.7
Aluminum Oxide (Al ₂ O ₃), %	Maximum	----	6.0		4.6
Ferric Oxide (Fe ₂ O ₃), %	Maximum	----	6.0		3.3
Calcium Oxide (CaO), %		----	----		63.7
Magnesium Oxide (MgO), %	Maximum	6.0	6.0		3.8
Sulfur Trioxide (SO ₃), %	Maximum	3.0	3.0		3.5 ^A
Loss on Ignition (LOI), %	Maximum	3.5	3.5		3.1
Insoluble Residue, %	Maximum	1.50	1.50		.90
Alkalies (Na ₂ O equivalent), %		----	----		0.68
Tricalcium Silicate (C ₃ S), %		----	----		61.4
Dicalcium Silicate (C ₂ S), %		----	----		6.7
Tricalcium Aluminate (C ₃ A), %	Maximum	----	8		6.3
(C ₃ S+4.75C ₃ A)	Maximum		100		91.3
Limestone %	Maximum	5	5		4.6
CO ₂ %					1.90
CaCO ₃ % in Limestone	Minimum	70	70		82
STANDARD PHYSICAL REQUIREMENTS					
(ASTM C204) Blaine Fineness, m ² /kg	Minimum	280	280		405
(ASTM C430) -325 Mesh, %		----	----		95.9
(ASTM C191) Time of Setting (Vicat)					
Initial Set, minutes	Minimum/Maximum	45/375	45/375		118
Final Set, minutes					240
(ASTM C1702) Calorimetry	Maximum	----	----		72 ^B
(ASTM C451) False Set, % (Optional)	Minimum	50	50		75
(ASTM C185) Air Content, %	Maximum	12	12		7.0
(ASTM C151) Autoclave Expansion, %	Maximum	0.80	0.80		0.097
(ASTM C187) Normal Consistency, %		----	----		26.3
(ASTM C109) Compressive Strength, psi (MPa)					
3 Day - psi (MPa)	Minimum	1740(12.0)	1450(10.0)		3970
7 Day - psi (MPa)	Minimum	2760(19.0)	2470(17.0)		5070
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.

^A In compliance with ASTM C150, since Optimum SO₃ exceeds 3.0%, the most recent results of ASTM C1038 for expansion in water at 14 days is <0.020%.

^B The value for ASTM C1702 is in accord with the required testing frequency.

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

Tom Kyser

By:
Tom Kyser
Quality Control Manager
Kosmos Cement



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Additional Data Limestone					TEST
Silicon Dioxide (SiO ₂), %					5.6
Aluminum Oxide (Al ₂ O ₃), %					0.80
Ferric Oxide (Fe ₂ O ₃), %					0.40
Calcium Oxide (CaO), %					45.7
Sulfur Trioxide (SO ₃), %					0.15
Base Cement Composition					
C3S %					64.4
C2S %					7.0
C3A %					6.6
C4AF %					10.0
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

A handwritten signature in black ink that reads "Tom Kyser".

By:
Tom Kyser
Quality Control Manager
Kosmos Cement