



# Certificate of Test

ASTM C150 Type I/II  
AASHTO M85 Type I/II

July 7, 2021  
Lot 152-181

**C150 Chemical Requirements – Table 1**

Item	Spec Limit	Result
Al <sub>2</sub> O <sub>3</sub>	6.0 Max	4.1
Fe <sub>2</sub> O <sub>3</sub>	6.0 Max	3.1
MgO	6.0 Max	0.8
SO <sub>3</sub>	3.0 <sup>A</sup>	3.0
L.O.I.	3.5 Max	2.3
Insoluble Res	1.5 Max	0.6

**C150 Physical Requirements – Table 3**

Item	Spec	Limit	Result	
Blaine Specific Surface, m <sup>2</sup> /kg	C204	260 Min	394	
Air Content of Mortar, Vol %	C185	12 Max	6.6	
Autoclave Expansion, %	C151	0.80 Max	0.01	
Vicat Initial Time of Set, min	C191	45 Min	100	
Vicat Final Time of Set, min	C191	375 Max	199	
Compressive Strength, psi:	C109			
		3 Days	1740 Min	3970
		7 Days	2760 Min	4880

**Compound Composition**

Item	Spec Limit	Result
C <sub>3</sub> A, %	8 Max	6
Equivalent Alkalies, %	N/A	0.68
Inorg Proc Addt's, %	5.0 Max	0
CaCO <sub>3</sub> in Limestone, %	70 Min	87.6
Limestone Additions	5.0 Max	4.2
C1038 Expansion, %	0.020% Max <sup>B</sup>	0.004 <sup>C</sup>

**Additional Data**

Limestone		Base Cement Phase Comp	
Amount (%)	4.2	C <sub>3</sub> S (%)	66
SiO <sub>2</sub> (%)	12.0	C <sub>2</sub> S (%)	11
Al <sub>2</sub> O <sub>3</sub> (%)	2.9	C <sub>3</sub> A (%)	6
Fe <sub>2</sub> O <sub>3</sub> (%)	17	C <sub>4</sub> AF (%)	10
CaO (%)	49.1		
SO <sub>3</sub> (%)	4.5		

**ASTM C150 Optional Requirements – Table 4**

Item	Spec Limit	Result
C452 Sulfate Resistance, 14 Days, % expansion	0.040 max	0.027 <sup>C</sup>

<sup>A</sup> N/A - In compliance with Footnote D, Table 1, ASTM C150 and AASHTO M85.

<sup>B</sup> Required only if percent SO<sub>3</sub> exceeds the limit in Table 1

<sup>C</sup> Test result for this production period not available. Most recent test result provided.

This cement has been sampled and tested in accordance with ASTM standard methods and procedures. Cement chemical analysis are reported as oxides, in accordance with ASTM Test Method C114. This cement is manufactured at our Laramie, Wyoming facility. All test results are certified to comply with the type and specification designated. We are not responsible for improper use or workmanship.

Bob Kersey, Quality Control Manager

