



**GCC of America**

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**MATERIAL CERTIFICATION REPORT**

**Plant:** Samalayuca  
**Address:** Km 332 Carr. 45  
Samalayuca, Chih. MX 32720  
**Contact:** Guillermo Luna  
**Phone:** 52 656 6495000

**Cement Type:** III, Low Alkali, HE  
**Date Issued:** 31-Jul-19  
**Production Period:** 1-Jul-19  
**To:** 31-Jul-19

**STANDARD REQUIREMENTS ASTM C150/AASHTO M85/ASTM C1157**

CHEMICAL			
Item	ASTM Test Method	ASTM C150 Spec. Limit	Test Result
SiO <sub>2</sub> (%)	C114	-	20.2
Al <sub>2</sub> O <sub>3</sub> (%)	C114	-	5.0
Fe <sub>2</sub> O <sub>3</sub> (%)	C114	-	3.2
CaO (%)	C114	-	64.0
MgO (%)	C114	6.0 max	1.9
SO <sub>3</sub> (%)	C114	3.5 max <sup>A</sup>	3.3
Loss On Ignition (%) <sup>B</sup>	C114	3.5 max	1.0
Na <sub>2</sub> O (%)	C114	-	0.22
K <sub>2</sub> O (%)	C114	-	0.46
Insoluble Residue (%)	C114	1.5 max	0.2
CO <sub>2</sub> (%) <sup>B</sup>	C114	-	0.0
Limestone (%)	C150	5.0 max	0.0
CaCO <sub>3</sub> in Limestone (%)	C114	70 min	94
Inorganic Processing Addition	C150	5.0 max	-
Potential Phase Composition			
C <sub>3</sub> S (%)	C150	-	60
C <sub>2</sub> S (%)	C150	-	12
C <sub>3</sub> A (%)	C150	15 max	8
C <sub>4</sub> AF (%)	C150	-	10

PHYSICAL				
Item	ASTM Test Method	ASTM C150 Spec. Limit	ASTM C1157 Spec. Limit	Test Result
Air Content (% vol)	C185	12 max	12 max	6
Blaine Fineness (m <sup>2</sup> /kg)	C204	-	-	559
Residue 45 µm (No.325) Sieve (%)	C430	-	-	0.2
Autoclave Expansion (%)	C151	0.80 max	0.80 max	0.01
Compressive Strength				
1 day, MPa (psi)	C109	12.0 (1740) min	12.0 (1740) min	27.0 (3920)
3 days, MPa (psi)	C109	24.0 (3480) min	24.0 (3480) min	39.4 (5725)
Time of Setting, Initial Vicat (min)	C191	45min / 375 max	45 min / 420 max	90
Mortar Bar Expansion (%)	C1038	0.020 max	0.020 max	0.004

ADDITIONAL DATA					
Type	Limestone	Test Method	Base Phase Composition	ASTM Test Method	Test Result
SiO <sub>2</sub> (%)	6.0	Internal	C <sub>3</sub> S (%)	C150	60
Al <sub>2</sub> O <sub>3</sub> (%)	1.3	Internal	C <sub>2</sub> S (%)	C150	12
Fe <sub>2</sub> O <sub>3</sub> (%)	0.8	Internal	C <sub>3</sub> A (%)	C150	8
CaO (%)	49.8	Internal	C <sub>4</sub> AF (%)	C150	10
SO <sub>3</sub> (%)	0.8	Internal			

**OPTIONAL REQUIREMENTS ASTM C150/AASHTO M85/ASTM C1157**

CHEMICAL			
Item	ASTM Test Method	ASTM C150 Spec. Limit	Test Result
Equivalent Alkalies (%)	C114	0.60 max	0.52

PHYSICAL				
Item	ASTM Test Method	ASTM C150 Spec. Limit	ASTM C1157 Spec. Limit	Test Result
False Set (%)	C451	50 min	50 min	61

<sup>A</sup> It is permissible to exceed the specification limit provided that ASTM 1038 Mortar Bar Expansion does not exceed 0.020 % at 14 days.

<sup>B</sup> This alternative analysis has been qualified in accordance with ASTM C114 and meets the requirements of Table 1.

Time to achieve constant mass was experimentally determined rather than performing subsequent reheating of the sample.

<sup>C</sup> Test result of prior month

GCC of America Cement is warranted to conform at the time of shipment with current ASTM C150/AASHTO M85/ASTM C1157. No other warranty is made or implied. Having no control over the use of its cements, GCC of America does not guarantee finished work.