

ASH GROVE CEMENT COMPANY



PO Box 38069 HWY 132
Leamington, Utah 84638
Phone: 435-857-1212
FAX: 435-857-1288

Type V

Production Period: May 1 thru May 31, 2010

Date: 6/21/2010

The following information is based on average test data during the production period. The data is typical of cement shipped from the Leamington, Utah plant. Individual shipments may vary.

STANDARD REQUIREMENTS ASTM C150-09, Tables 1 and 3

CHEMICAL				PHYSICAL				
Item	A.S.T.M. Test		Spec. Limit	Test Result	Item	A.S.T.M. Test		Test Result
	Method	Limit				Method	Spec. Limit	
SiO ₂ (%)	C114	20.0 min		20.13	Air content of mortar (volume %)	C185	12 max	7
Al ₂ O ₃ (%)	C114	6.0 max		4.13	Fineness (cm ² /g):			
Fe ₂ O ₃ (%)	C114	6.0 max		4.04	Air permeability	C204	2800 min	4064
CaO (%)	C114	A		63.13	Autoclave expansion (%)	C151	0.80 max	0.01
MgO (%)	C114	6.0 max		2.34	Compressive strength (psi)			
SO ₃ (%)	C114	D		2.77	1 Day	C109	A	2467
Loss on ignition (%)	C114	3.0 max		2.14	3 Days	C109	1450 min	3889
Na ₂ O (%)	C114	A		0.05	7 Days	C109	2470 min	4918
K ₂ O (%)	C114	A		0.70	28 Days	C109	3050 min	C
Insoluble Residue (%)	C114	0.75 max		0.13	Time of setting (minutes)			
CO ₂ (%)	C114	A		1.09	(Vicat)			
Limestone (%)	C114	5.0 max		1.2	Initial: Not less than	C191	45	111
CaCO ₃ in limestone (%)	C114	70 min		96	Not more than		375	111
Potential compounds (%)								
C ₃ S	C114	A		63				
C ₂ S	C114	A		11				
C ₃ A	C114	5 max		4				
C ₄ AF	C114	A		12				
C ₄ AF + 2(C ₃ A)	C114	25.0 max		82				

OPTIONAL REQUIREMENTS ASTM C150-09, Tables 2 and 4

CHEMICAL				PHYSICAL				
Item	A.S.T.M. Test		Spec. Limit	Test Result	Item	A.S.T.M. Test		Test Result
	Method	Limit				Method	Spec. Limit	
C ₃ S + C ₃ A (%)	C114	B			False set (%)	C451	50 min	76
Equivalent alkalis (%)	C114	0.60		0.50	Heat of hydration (kJ/kg)			
					7 days	C186	290	C
					Compressive strength (psi)			
					28 Days	C109	4060	C

A = Not applicable.

B = Limit not specified by purchaser, test result provided for information only.

C = Test results for this period not available.

D = C 1038 expansion in water does not exceed 0.02% at 14 days

We certify that the above described cement, at the time of shipment, meets the chemical and physical requirements of ASTM C150-09 (Type V) or (other) _____ specification.

Signature:

Joshua Nelson

Title: Chief Chemist