

ASH GROVE CEMENT COMPANY



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

Type V

Production Period: November 1 thru November 30, 2011

Date: 12/8/2011

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 Method	Spec. Limit	Test Result	Item	A.S.T.M. Test Method	Spec. Limit	Test Result
SiO ₂ (%)	C114	A	20.72	Air content of mortar (volume %)	C185	12 max	8
Al ₂ O ₃ (%)	C114	6.0 max	4.08	Fineness (cm ² /g):			
Fe ₂ O ₃ (%)	C114	6.0 max	3.90	Air permeability	C204	2600 min	4187
CaO (%)	C114	A	63.40	Autoclave expansion (%)	C151	0.80 max	0.04
MgO (%)	C114	6.0 max	1.91	Compressive strength (psi)			
SO ₃ (%)	C114	D	2.83	1 Day	C109	A	2102
Loss on ignition (%)	C114	3.0 max	2.58	3 Days	C109	1160 min	3500
Na ₂ O (%)	C114	A	0.06	7 Days	C109	2180 min	4609
K ₂ O (%)	C114	A	0.71	28 Days	C109	3050 min	C
Insoluble Residue (%)	C114	0.75 max	0.50	Time of setting (minutes)			
CO ₂ (%)	C114	A	1.62	(Vicat)			
Limestone (%)	C114	5.0 max	3.8	Initial: Not less than	C191	45	94
CaCO ₃ in limestone (%)	C114	70 min	98	Not more than		375	
Potential compounds (%)							
C ₃ S	C114	A	52				
C ₂ S	C114	A	20				
C ₃ A	C114	5 max	4				
C ₄ AF	C114	A	12				
C ₄ AF + 2(C ₃ A)	C114	25.0 max	20				

OPTIONAL REQUIREMENTS ASTM C150-09, Tables 2 and 4

CHEMICAL				PHYSICAL			
Item	A.S.T.M. Test Method	Spec. Limit	Test Result	Item	A.S.T.M. Test Method	Spec. Limit	Test Result
C ₃ S + C ₃ A (%)	C114	B	56	False set (%)	C451	50 min	83
Equivalent alkalies (%)	C114	0.60	0.53	Heat of hydration (kJ/kg)			
				7 days	C186	A	C
				Compressive strength (psi)			
				28 Days	C109	A	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:

Heath R. Hall

Title: Chief Chemist