

Manufacturer's Certification

Report Date: 11/7/2024

We hereby certify that CalPortland Type I/II Cement meets the standard requirements of ASTM C150 and AASHTO M85 specification for Type I and Type II cements. Reported are the average chemical and physical data for the lot.

Lot #: 24-240

Type I / II Cement

Source: Nghe An, Vietnam

Chemical Properties, (ASTM C114)	ASTM C150 and AASHTO M85 Requirements		Analysis	Limestone
	Type I	Type II	Results	Analysis
Silicon dioxide (SiO ₂), %	---	---	19.0	2.0
Aluminum oxide (Al ₂ O ₃), max, %	---	6.0	4.3	0.7
Ferric oxide (Fe ₂ O ₃), max, %	---	6.0	4.8	0.5
Calcium oxide (CaO), %	---	---	62.3	48.8
Magnesium oxide (MgO), max, %	6.0	6.0	3.4	4.6
Sulfur trioxide (SO ₃), max, %	3.0	3.0	2.8	0.1
Loss on ignition (LOI), max, %	3.5	3.5	2.0	
Insoluble residue (IR), max, %	1.5	1.5	0.6	Base
Alkalies (Na ₂ O+0.658*K ₂ O), %	---	---	0.57	Cement
Tricalcium silicate (C ₃ S), %	---	---	60	62
Dicalcium silicate (C ₂ S), %	---	---	9	9
Tricalcium aluminate (C ₃ A), max, %	---	8	3	3
Tetracalcium aluminoferrite (C ₄ AF), %	---	---	14	15
CO ₂ , %	---	---	1.3	
Limestone addition, max, %	5.0	5.0	3.0	
CaCO ₃ in Limestone, min, %	70	70	97	
Physical Properties				
Air content of mortar, max, volume %, (C185)	12	12	7	
Blaine Fineness, min, m ² /kg, (C204)	260	260	375	
Autoclave expansion, max, %, (C151)	0.80	0.80	0.04	
Compressive Strength, min, (C109)				
1 Day, psi	---	---	2200	
3 Day, MPa	12.0	10.0	28.5	
3 Day, psi	1740	1450	4130	
7 Day, MPa	19.0	17.0	33.3	
7 Day, psi	2760	2470	4840	
28 Day, MPa	---	---	44.7	
28 Day, psi	---	---	6480	
Vicat Setting Time, min-max, minutes, (C191)	45 – 375	45 – 375	125	
False Set, min,%, (C451) (amended)	50	50	82	

Apparatus and methods used in this laboratory have been checked by the Cement and Concrete Reference Laboratory of the National Institute of Standards and Technology. A copy of the report detailing their findings is available upon request. Major oxides are analyzed in accordance with ASTM C114.



X. Schlee
Quality Control Manager