

Portland cement Class: CEM I 42.5 N



Q.C Department

Specification: ES 4756-1:2013
Standard: BS EN 197-1:2011

Period : May. 1st -31th 2021
Customer: To Whom It May Concern

We declare, on the basis of the below analysis, that the cement covered by the certificate conforms to annex ZA of EN 197-1 with conformity established according to EN 197-2 as given in annex ZA of EN 197-1.

Chemical Composition - Norm: EN196-2:2013

	Results	Standard Requirements Maximum
Silicon Oxide	SiO ₂ 19.59%	
Aluminum Oxide	Al ₂ O ₃ 5.13%	
Ferric Oxide	Fe ₂ O ₃ 3.53%	
Calcium Oxide	CaO 62.71%	
Magnesium Oxide	MgO 0.52%	
Sulphate	SO ₃ 3.03%	3.5%
Potassium Oxide	K ₂ O 0.17%	
Sodium Oxide	Na ₂ O 0.33%	
Chloride	Cl 0.040%	0.1%
Insoluble Residue	IR 0.36%	5.0%
Loss On Ignition	LOI 4.27%	5.0%
Free Lime	F.L 1.95%	
Tricalcium Silicate	C ₃ S 50.28%	
Dicalcium Silicate	C ₂ S 18.22%	
Tricalcium Aluminates	C ₃ A 7.62%	
Tetra calcium Aluminoferrate	C ₄ AF 10.75%	
Alkali Equivalent	AE 0.44%	
Chromium Hexavalent	Cr+6 1.1 ppm	

Physical and Mechanical Properties

Compressive Strength - Norm: EN196-1:2005

	Results	Standard Requirements Minimum
2 days	17.42	10.0 Mpa
28 days	48.13	42.5 Mpa

Setting Time-Norm: EN196-3:2017-03

	Results	Standard Requirements
Initial Time	165	60 minutes minimum
Final Time	3:20	Hours
Standard Consistency	26.5%	

Soundness(Expansion)-Norm: EN196-3:2017-03

	Results	Standard Requirements
Expansion	0.3	10 mm maximum
Fineness by Blaine cm ² /g	3614	cm ² /g

All the Above chemical, mechanical and physical analysis comply with the above mentioned standard requirements

Calculation method

$$C_3S = 4.07(CaO - F.L) - 7.6 SiO_2 - 6.718 Al_2O_3 - 1.43 Fe_2O_3 - 2.852 SO_3$$

$$C_2S = 2.867 SiO_2 - 0.754 C_3S \quad C_3A = 2.65 Al_2O_3 - 1.692 Fe_2O_3$$

$$C_4AF = 3.04 Fe_2O_3$$

$$(AE = Na_2O + 0.658 K_2O)$$