

Chemical Composition and Physical Properties of Ordinary Portland cement [CEM I 42.5R]

NO	DESCRIPTION (EN 197-1 CEM I 42.5R)		UNIT	VALUE	range
CHEMICAL COMPOSITION					
1	Silicon Dioxide	SiO ₂	%	19.75	19.0 - 20.0
2	Aluminum Oxide	Al ₂ O ₃	%	5.75	5.2 - 5.70
3	Ferric Oxide	Fe ₂ O ₃	%	3.68	3.3 - 3.8
4	Calcium Oxide	CaO	%	64.10	63.0- 64.5
5	Magnesium Oxide (Max 5.0)	MgO	%	0.92	0.7 – 2.2
6	Sulfur Trioxide (Max 4.0)	SO ₃ <4	%	2.80	2.3 - 3.0
7	Chloride < 0.10	Cl ⁻ <0.1	%	0.05	0.02 - 0.08
8	Insoluble residue (Max 5.0)	IR< 5	%	0.51	0.30 - 1.5
9	Loss On ignition	L.O.I.< 5	%	3.0	2.5 - 4.0
10	Free-Lime < 2	F-CaO< 2	%	1.40	0.6 – 1.8
11	Chromium Hexavalent (Max 2.0)	Cr VI< 2	ppm	1.6	0.7 - 1.8
12	Alkali Equivalent	Na ₂ O equivalent	%	0.65	0.50 - 0.75
13	Sieve 45		%	9.0	7.0 – 12.0
14	Sieve 90		%	0.00	0.00- 0.2
PHYSICS TEST					
1	Fineness (Blaine)		Cm ² /g	3400	3200-3500
2	Water consistency		%	28.1	26.5-29.0
3	Initial setting time	Min 60	Minutes	145	120 - 150
4	Final setting time		Minutes	205	180 - 220
5	2Day (Compressive Strength)	Min 20	MPa	25	21 - 27
6	28Day (Compressive Strength)	Min 42.5	MPa	49	44.0 - 52
7	Soundness	Max 10mm	mm	1.15	0.6 – 4.0

