

A TYPICAL LIST OF TEST EQUIPMENTS FOR CEMENT TESTING

This list of test equipments for physical & chemical analysis for different types of cement is a general list for guidance only. It is expected that all applicants have availability of all test equipments as per relevant Indian Standards. Any other equipment required for any particular test as per specific cement standard may also be included in this list. The details in the blank columns may be filled in the format based on the availability of the test equipments within the factory premises(in-house). Non availability of any test equipments may be explicitly brought out.

TEST	Test Description	Clause No of Indian Standard	Name of Equipment	Range & Least Count/Accuracy	Sl. No.of equipment	Make	Qty	Calibration Certificate (Yes/No)
Fineness	To test the fineness of Cement		1. Blaine's Apparatus, Variable flow type					
			2. Permeability Cell with perforated metal disc					
			3. Stop watch with start- stop mechanism	0-30 min, LC 0.1s				
			4. Mercury for calibration					
			5. Balance (Electronic)	0-100g, LC 1 mg				
			6. Standard Cement for Standardization of Blaine's					
			7. Manometer Liquid					
			8. Light Grease & Oil					
			9. Le Chatlier Flask					
			10. Analytical Balance	0.0001g accuracy				
			11. Constant temperature bath to maintain temperature within $\pm 0.2^{\circ}\text{C}$					
			12. Kerosene/ Naptha					
Soundness	Auto Claving		1. Auto Clave Machine with thermostatic control to maintain pressure of 2.1 Mpa for 3 hours, Pressure to be attained within 1-1 1/4 hrs.					
			2. Pressure Gauge	0-42Kg/ sq cm, LC 1 Kg/sq.cm				
			3. Standard Bar	308 mm max				
			4. Bar Moulds	25x25x282mm (Minimum 3 nos)				
			5. Length Comparator with dial gauge	0.01- 10 mm, LC:0.002mm				
			6. L-Type Thermometer	0-300° C, LC-1° C				
			7. Hand Gloves (heat resistant)					
	Le-chatelier expansion.		1. Lechat water bath preferably with thermostatic control (To maintain temp. of $27\pm 2^{\circ}\text{C}$ & up to boiling)					
			2. Lechat moulds with weights and cover glasses	Minimum 8 nos.				
			3. Steel scale					
Setting Time	To test the Setting time of Cement		1. Vicat apparatus					
			2. Needle for IST & FST					
			3. Moulds					
Compressive Strength	To test the Compressive strength of cube moulds		1. CST machine (Motorized cum Hand operated)	0-500 KN, LC 2KN				

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			2. Proving ring with all accessories suitable for calibration of CST machine					
			3. Vibration m/c with timer & cube mould fitting assembly	12000 ± 400 rpm				
			4. Tachometer	Above 15000 rpm				
			5. Gauging Trowel	210 ±10 gms.				
			6. Cube Moulds	70.6x70.6x70.6mm (27 nos min)				
			7. Poking Rod					
			8. Gauging Plate, Stainless steel (non- perforated)					
			9. Standard Sand Gr. I, II, III (as per IS 650)	From TAMIN, India				
			10. Curing Tank of appropriate size with water circulation arrangement					
			11. Aeration Chamber with 2 partitions and side walls of mosquito proof wire					
GENERAL	To control Humidity & Temp. in laboratory		1. Humidity chamber with temp & RH control	Relative Humidity, Min. 90% at 27± 2°C				
			2. Hygrometer	0-100 %				
			3. Suitable arrangement to demonstrate maintenance of Temp of 27± 2°C & RH of 65± 5% constantly	Airconditioner				
	For sampling cement		1. Sampler					
			2. Mixing Trays -Adequate size including trays of 24 partitions for keeping hourly samples					
	To control the residue of Cement		Sieves of size (300,150,75 and 45 microns)					
	To measure temperature		Thermometers	0-50 °C/150 °C/300 °C.				
	To grind the clinker, slag & gypsum sample in lab ball mill for testing(as applicable)		Lab ball Mill (Motorised)	6 Kgs (Approx) capacity				
	To weigh the material		1. Platform type balance	60 kgs min, LC 100 gms				
			2. Double pan balance	5 kgs , LC 1 gm				
			3. Electrical/Electronic Balance	200 gms, LC 0.1 mg				
			4. Weight Box with weights	1 mg -500 gm				
Chemical Testing	To perform chemical testing as per IS 4032 & other related ISS		1. Muffle Furnace with thermostatic control	0 to 1200 °C				
			2. Oven with thermostatic control	0 to 300 °C				
			3. Heater					
			4. Hot Plate					
			5. Distillation Assembly					
			6. Sulphide Sulphur Appliance					
			7. Desiccators with cover & dessicant					

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			8. pH Meter/ Paper					
			9. Crucible:a. Platinum	20 to 25ml				
			b. Porcelain	20 to 25ml				
			10. Filter Paper (No 1,40,41,42)					
			11. Cutting Punch for filter papers					
			12. Flame photometer					
			13. Spectrophotometer					
			14. Glasswares (Volumetric Flask - o -250 ml, Beaker 0-250 ml, Measuring Cylinder 0-50, 100,500,1000ml,Burette 0-25/50 ml,Conical Flasks - 0-250ml,Pipette 0-5,10,25,50ml)					
			15 All Chemicals required for complete chemical analysis of cement					
			16. Tongs including platinum tipped tong					
			17. Wire gauge with Asbestos sheet at the middle					
			18. Washing bottle					
	For Pozzolana Cement		Hydrated Lime					
			cube moulds 50x50x50mm					
	Dry Shrinkage Test		1. Planetary Mixer					
			2. Flow table					
			3. Bar mould & Length Comparator as used in Autoclave					
			4. Humidity Chamber to maintain temp of 27+2°C & RH of 50+ 5%					