Concrete Slump Test: Procedure & Slump Chart

ASTM C143 · IS 1199 · ACI 211.1 · IS 456:2000 Cl. 7.1 · ASTM C94 / IS 4926 tolerances

SLUMP CONE AND ROD

Item	Size
Cone height	12 in (300 mm)
Base / top diameter	8 in (200 mm) / 4 in (100 mm)
Tamping rod	5/8 in (16 mm) dia., about 24 in (600 mm) long, rounded tip
Layers	ASTM C143: 3 of equal volume · IS 1199: 4 layers
Strokes	25 per layer, spread evenly

PROCEDURE (ASTM C143)

1. Start within 5 min of taking the sample. Dampen the cone and stand it on a flat, moist, non-absorbent base; hold it down by the foot pieces.
2. Fill in layers, rodding each layer 25 times; rod just into the layer below.
3. Strike off the top level and clean around the base.
4. Lift the cone straight up in 5 ± 2 s, without twisting.
5. Measure from the top of the cone to the displaced centre of the concrete, to the nearest 1/4 in (5 mm). Finish the whole test within 2.5 min.

Recommended slump by type of construction

ACI 211.1 (US practice), for concrete compacted by vibration

Type of construction	Slump (min–max)	Slump (mm)
Reinforced foundation walls and footings	**1–3 in**	**25–75 mm**
Plain footings, caissons, substructure walls	**1–3 in**	**25–75 mm**
Beams and reinforced walls	**1–4 in**	**25–100 mm**
Building columns	**1–4 in**	**25–100 mm**
Pavements and slabs	**1–3 in**	**25–75 mm**
Mass concrete	**1–2 in**	**25–50 mm**

The maximum may be raised by 1 in (25 mm) where the concrete is compacted by hand instead of by vibration. Higher slumps for pumping or congested steel should come from water-reducing admixtures, not extra water.

Workability by placing condition

IS 456:2000, Clause 7.1 (Indian practice)

Placing condition	Degree of workability	Slump (mm)
Blinding concrete; shallow sections; pavements laid with pavers	Very low	**Use compacting factor 0.75–0.80 (Cl. 7.1.1)**
Mass concrete; lightly reinforced slabs, beams, walls, columns; floors; hand-placed pavements; canal lining; strip footings	Low	**25–75**
Heavily reinforced slabs, beams, walls, columns	Medium	**50–100**
Slipform work; pumped concrete	Medium	**75–100**
Trench fill; in-situ piling	High	**100–150**
Tremie concrete	Very high	**Use flow test (Cl. 7.1.2)**

READING THE SHAPE

- **True slump:** the cone of concrete drops evenly and keeps its shape. Record it.
- **Shear slump:** one side shears off. Repeat on a new sample; if it shears again, the mix lacks cohesion and the test does not apply.
- **Collapse:** the concrete spreads flat. The mix is too wet for a slump test; use a flow test for flowing or self-compacting concrete.
- The test suits slumps of roughly 1/2 to 9 in (15–230 mm).
- **Never add water at site** to raise slump; ask for an admixture. Retest once before rejecting a load.

ALLOWED TOLERANCE

Specified slump (ASTM C94)	Tolerance
2 in (50 mm) or less	± 1/2 in (15 mm)
Over 2 in up to 4 in	± 1 in (25 mm)
Over 4 in (100 mm)	± 1-1/2 in (40 mm)
Specified as a maximum, 3 in or less	+0 / −1-1/2 in
Specified as a maximum, over 3 in	+0 / −2-1/2 in
IS 4926 (ready-mixed, India)	± 25 mm or ± 1/3 of the specified value, whichever is less

For guidance only. The project specification and the engineer's instructions take priority. Prepared by TheCivilStudies, November 2026.