

# ENGINEERING DATA

## HOW TO MAKE A SLUMP TEST

**Purpose of test:** To determine consistency of fresh concrete and to check uniformity of concrete from batch to batch.

**Typical specification limits:** Some specifications call for both a minimum and maximum requirement, such as 2 to 4 inches; other specifications give only a maximum, such as "the slump shall not exceed 4 inches."

**When to make test:** First batch of concrete each day; whenever consistency of concrete appears to vary; and whenever cylinders are made.

**Precautions:** Sample must be representative. Be sure slump cone is clean and prewetted. Use round nosed  $\frac{5}{8}$ " rod to rod each of three layers 25 times, uniformly distributing the strokes. Clean away excess concrete around base before lifting the cone. If the molded concrete falls over, disregard test and start over again.

**Corrective measures if test results are beyond specification limits:** Adjust mix proportions, especially water content. Check aggregate gradation and air content, and adjust mix accordingly.



## TYPICAL SLUMP RANGES FOR VARIOUS TYPES OF CONCRETE CONSTRUCTION

TYPES OF CONSTRUCTION	Slump, inches*	
	Maximum	Minimum
Reinforced foundation walls and footings	4	2
Unreinforced footings, caissons, and substructure walls	3	1
Reinforced slabs, beams, and walls	5	2
Building columns	5	3
Pavements	2	1
Sidewalks, driveways, and slab-on-ground	4	2
Heavy mass construction	2	1

\*When high-frequency vibrators are not used, the values may be increased by about 50 percent, but in no case should slump exceed 6 inches.

## NUMBER OF SQUARE FEET OF CONCRETE FLOOR OF ANY THICKNESS FROM 1 CUBIC YARD OF CONCRETE

Thickness Inches	No. Sq. Ft.	Thickness Inches	No. Sq. Ft.
1	324	7	46
1 1/4	259	7 1/4	44
1 1/2	216	7 1/2	43
1 3/4	185	7 3/4	42
2	162	8	40
2 1/4	144	8 1/4	39
2 1/2	130	8 1/2	38
2 3/4	118	8 3/4	37
3	108	9	36
3 1/4	100	9 1/4	35
3 1/2	93	9 1/2	34
3 3/4	86	9 3/4	33
4	81	10	32
4 1/4	76	10 1/4	31
4 1/2	72	10 1/2	31
4 3/4	68	10 3/4	30
5	65	11	29 1/2
5 1/4	62	11 1/4	29
5 1/2	59	11 1/2	28
5 3/4	56	11 3/4	27 1/2
6	54	12	27
6 1/4	52	12 1/4	26 1/2
6 1/2	50	12 1/2	26
6 3/4	48	12 3/4	25 1/2

## EFFECT OF WATER CONTENT ON STRENGTH AND SLUMP

28 DAY COMPRESSIVE STRENGTH

Water — gal. per Sack Cement

8      7.5      7      6.5      6

Water — gal. per Cubic Yard

40      37.5      35      32.5      30

