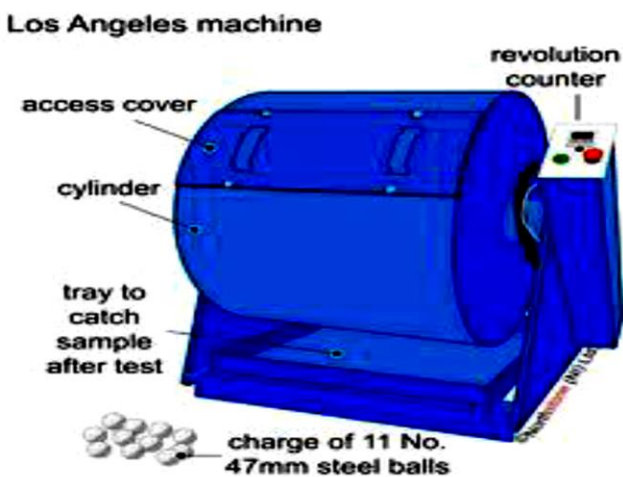


Los Angeles Abrasion Test on Aggregate

Objective: Abrasion test is carried out to test the hardness property of aggregates and to decide whether they are suitable as railway Track Ballast. The principle of Los Angeles abrasion test is to find the percentage wear due to relative rubbing action between the aggregate and steel balls used as abrasive charge.

Reference: IS: 2386 (Part IV)-1963 Methods of test for aggregate for concrete Part IV Mechanical Properties.

Apparatus required:



1. Los Angeles Machine
2. Abrasive charge: Cast iron or steel balls, approximately 48mm in diameter and each weighing between 390 to 445 g; six to twelve balls are required.
3. Sieve: 1.70, 2.36, 4.75, 6.3, 10, 12.5, 20, 25, 40, 50, 63, 80 mm IS Sieves.
4. Balance of capacity 5 kg or 10 kg
5. Drying oven
6. Miscellaneous like tray

Procedure for Los Angeles Test:

The test sample consists of clean aggregates dried in oven at 105° – 110°C. The sample should conform to any of the gradings shown in table 1.

Sieve Size		Weight in gm. of Test Sample For Grade						
Passing	Retained on	A	B	C	D	E	F	G
mm	mm							
80	63	-	-	-	-	2500	-	-
63	50	-	-	-	-	2500	-	-
50	40	-	-	-	-	5000	5000	-
40	25	1250	-	-	-	-	5000	5000
25	20	1250	-	-	-	-	-	5000
20	12.5	1250	2500	-	-	-	-	-
12.5	10	1250	2500	-	-	-	-	-
10	6.3	-	-	2500	-	-	-	-
6.3	4.75	-	-	2500	-	-	-	-
4.75	2.36	-	-	-	5000	-	-	-

Table 1: Gradation of Aggregate

1. Select the grading to be used in the test such that it conforms to the grading to be used in construction, to the maximum extent possible.
2. Take 5 kg of sample for gradings A, B, C & D and 10 kg for gradings E, F & G as shown in Table 2.

<i>Grading</i>	<i>Number of spheres</i>	<i>Weight of charge (gm)</i>
<i>A</i>	12	5000 ± 25
<i>B</i>	11	4584 ± 25
<i>C</i>	8	3330 ± 20
<i>D</i>	6	2500 ± 15
<i>E</i>	12	5000 ± 25
<i>F</i>	12	5000 ± 25
<i>G</i>	12	5000 ± 25

Table 2: Number of Spheres as per Gradation of Aggregate

3. Choose the abrasive charge as per Table 2 depending on grading of aggregates.
4. Place the aggregates and abrasive charge on the cylinder and fix the cover.
5. Rotate the machine at a speed of 30 to 33 revolutions per minute. The number of revolutions is 500 for gradings A, B, C & D and 1000 for gradings E, F & G. The machine should be balanced and driven such that there is uniform peripheral speed.
6. The machine is stopped after the desired number of revolutions and material is discharged to a tray.
7. The entire stone dust is sieved on 1.70 mm IS sieve.
8. The material coarser than 1.7mm size is weighed correct to one gram.

Calculation:

Original weight of aggregate sample = W_1 g

Weight of aggregate sample retained = W_2 g

Weight passing 1.7mm IS sieve = $W_1 - W_2$ g

Abrasion Value = $(W_1 - W_2) / W_1 \times 100$

Results:

Los Angeles Abrasion Value =