

Determination of Flakiness Index

Lab Test Reference

Was BS 812: Part 105.1: 1989:-

The current British Standard is

BS EN 933-3 1997
Tests for geometrical properties of aggregates
Part 3: Determination of particle shape – Flakiness Index

Principal Apparatus as follows:

Riffle Boxes, 63mm, 50mm, 40mm, 14mm gaps should be at hand and available for use depending on the nominal size of aggregate being tested. Type defined in BS EN 932-2 1999,

A ventilated drying oven controlled to maintain a temperature of 105 +/- 5 deg C, Inventory No's xxx

- (iii) Electronic balance to weigh 30 kg to 0.1 gram
- (iv) A set of BS test sieves marked with a red or yellow label will be signed out from the sieve store and will be selected from the following list depending on the type of material being tested.

Table 1 particular to Test Sieves (BS EN 933-2: 1997 Tests for geometrical properties of aggregates Part 2: Determination of particle size distribution: Test sieves, nominal size of apertures)

Nominal Aperture Size

Square Hole Perforated. Plate

450 or 300mm Diameter

- Mm
- 63.0
- 50.0
- 37.5
- 28.0
- 20.0
- 14.0
- 10.0
- 6.3

- (v) A mechanical sieve shaker placed in the sound proof cupboard.
- (vi) A metal thickness gauge as shown in Fig. 1 of BS EN 933-3:1997
- (vii) Clean square trays sufficiently large to completely contain the sample.

A stiff bristle sieve brush. Defined as General laboratory ware

1. Preliminaries

- 1.1 A designated area will be used to perform this test and a clear area of bench must first be allotted before this test proceeds.
- 1.2 Ensure the sample number and Test Schedule correspond.
- 1.3 Obtain a test worksheet from the Cabinet.
- 1.4 All equipment to be used in this test must first be checked.
- 1.5 Check the calibration status of the oven, balance and flakiness gauge.
- 1 Check the sieves as required on receipt. If any splits, marks or dents are present on the mesh, they will be taken out of service.

2 Standard Test Method

- 2.1 The aggregate used in this test will have been obtained from a bulk sample that was initially taken and prepared in the manner described in

BS EN 932-1:1999. **Tests for general properties of aggregates Part 1: Methods for sampling**

BS EN 932-2:1997. **Tests for general properties of aggregates Part 2: Methods for reducing laboratory Samples**

Minimum Mass of Test Portion for Sieve Analysis		
Nominal Size		Minimum Mass
of Material		of Test Portion c
mm		kg
50		35
40		15
28		5
20		2
14		1
10		0.5

3. Preparation of Sample

- 3.1 The sample will first be prepared by carrying out a sieve analysis in accordance with the standard particle size analysis method, using the sieves specified in : BS EN 933 – 2:1996 **Tests for geometrical properties of aggregates Part 2: Determination of particle size distribution: Test sieves, nominal size of apertures**
- 3.2 During the sieving procedure each portion retained on a specific sieve will be placed in an individual tray after being weighed and recorded on the test sheet in Boxes 2 to 8.
- 3.3 Aggregates retained on the 63mm and passing the 6.3mm are not used in this test and may therefore be disregarded.

3.4 During the sieving process the sample should have already been riffled and the specified sieves should not at this stage be overloaded but if it is found that the mass of material retained on a specific sieve is excessive, and the mass is not less than half that shown in Table 3 for a particular fraction, then further reduction will take place at this stage. Adjustment to the final calculation will then be made.

TABLE 3 - DATA FOR DETERMINATION OF FLAKINESS INDEX

Aggregate Size - Fraction of Thickness Mass for BS Test Sieve Nominal 100% Passing		Width of Slot Minimum Gauge	Subdivision
	Aperture Size 100% Retained		
mm	mm	mm	mm
63	50	33.9+/-0.3	50
50	37.5	26.3+/-0.3	35
37.5	28	19.7+/-0.3	15
28	20	14.4+/-0.15	5
20	14	10.2+/-0.15	2
14	10	7.2+/-0.1	1
10	6.3	4.9+/-0.1	0.5

This dimension is equal to 0.6 times the mean sieve size Sum the masses retained on the trays, excluding that retained on the 63.0mm and passing the 6.3mm sieve. Record this mass on the test sheet as (M1) in Box 1.

- 3.5 Calculate the individual percentages retained on each of the sieves. Discard any fraction whose mass is 5% or less of the mass (M1).
- 3.6 Sum the remaining mass, after discarding that less than 5% of (M1) and record this mass on the test sheet as (M2) in Box 9.
- 3.7 Gauge each fraction by hand, using the thickness gauge for each size fraction.
- 3.8 Combine all the particles passing each of the gauge sieves, weigh to the nearest 0.1 gram and record the weight on the test sheet as (M3) in Box 10.

5. Calculation of Result

5.1 Calculate the value of the flakiness index as: $\text{Flakiness Index} = \frac{M3}{M2} \times 100$

1 The flakiness index will be recorded to the nearest whole number.

2 Test Report

6.1 The test report will affirm that the flakiness index was determined in accordance with BS EN 933-3 1997: Part 3

6.2 The following information will be reported:

- (a) Sample Identification
- (b) Flakiness Index
- (c) The Sieve Analysis of this material