

Determination of Flakiness Index

Lab Test Reference 012
British Standard Reference
812 : Part 105.1 : 1989

Principal Apparatus as follows:

- (i) 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 as shown in BS812:Part 102:1985 Inventory No's 161, 218, 81, 246.
- (ii) A ventilated drying oven controlled to maintain a temperature of 105 +/- 5 deg C, Inventory No's 324/3 and 324/4.
- (iii) Electronic balance to weigh 30 kg to .1 gram Inv No. 309 or 315.
- (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 particulars to Test Sieves (BS410)

Nominal Aperture Size

Square Hole Perf. 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.
In the sound proof cupboard.
- (vi) A metal thickness gauge as shown in Fig. 1 of BS 812 105.1.
- (vii) Clean square trays sufficiently large to completely contain the sample.

A stiff bristle sieve brush.
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.
- 1.6 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 BS812:1985 Part 102.

Minimum Mass of Test
Portion for Sieve Analysis

Nominal Size of Material mm	Minimum Mass of Test Portion c 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, Test 001 using the sieves specified in Table 1. (BS 812 part 102 Clause 7).
- 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 Aggregate 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 Aperture Size 100% Passing	100% Retained	Width of Slot Minimum Gauge	Subdivision
mm	mm	mm	mm
63.0	50.0	33.9+/-0.3	50
50.0	37.5	26.3+/-0.3	35
37.5	28.0	19.7+/-0.3	15
28.0	20.0	14.4+/-0.15	5
20.0	14.0	10.2+/-0.15	2
14.0	10.0	7.2+/-0.1	1
10.0	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 guage 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:-

$$\text{Flakiness Index} = \frac{M3}{M2} \times 100$$
 - 5.2 The flakiness index will be recorded to the nearest whole number.
6. Test Report
 - 6.1 The test report will affirm that the flakiness index was determined in accordance with BS812 Part 105.1:1989.
 - 6.2 The following information will be reported:
 - (a) Sample Identification
 - (b) Flakiness Index
 - (c) The Sieve Analysis of this material