SalierGeotechnical Limited

Determination of Elongation Index

Lab Test Reference

Was BS 812: Part 105.2: 1990 Method of Determination of particle shape – Elongation Index of Coarse Aggregate. In the British Standard List this BS is described as (current, obsolescent) and, therefore, may still has some relevance, however, there is also some relevance in the various group of standards

BS EN 932 Parts 1 to 6 Tests for the general properties of Aggregates and

BS EN 933 Parts 1 to 10 tests for the Geometrical properties of aggregates.

A further associated set of British Standards are grouped under

BS EN 1097 Parts 1 to 10 Tests for the mechanical and physical properties of aggregates.

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. Was the type as shown in BS812: Part 102: 1989. The details are not currently shown in BS 932-1 1997 Tests for General Properties of Aggregates Part 1 Methods for Sampling.

(ii) A ventilated drying oven controlled to maintain a temperature of 105+/- 5 deg C.

(iii) Electronic Balance to weight at least 30kg to 0.1 gram.

(iv) The BS Test Sieves with a yellow label will be signed out from the sieve store on request and will be selected from the following list depending on the type of material being tested.

(v) A Mechanical Sieve Shaker.

(vi) A metal length gauge as shown in Fig. 1 of BS 812 Part 105.2: 1990. Awaiting update.

(vii) Clean Square Trays sufficiently large to completely contain the sample.

General laboratory ware

Table 1 Particulars of test sieves BS EN 933-2 Tests for geometrical properties of aggregates — Part 2: Determination of particle size distribution — Test sieves, nominal size of apertures

Nominal Aperture Size Square Hole Perf Plate 450 or 300mm Diameter mm
50
37.5
28
20
14
10
6.3

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 that the Sample Number and Test Schedule correspond.

1.3 Obtain the Test Worksheet.

1.4 All equipment to be used in this test must first be checked.
1.5 Check the calibration status of the oven and elongation gauge.

1 Check the sieves as required on receipt. If any splits, dents or tears 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 taken and prepared in the manner described in BS EN 932-1 1997, Test for the general properties of aggregates. Part 1 Methods for sampling, and BS EN 932-2 1999, Test for the general properties of aggregates Part 2, Methods for reducing laboratory samples. It shall be reduced in size by riffling to achieve the approximate masses shown in the table below, with care to make allowance for the later rejection of the particles retained on a 50mm test sieve.

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

2.2.1 The sample shall be dried to constant mass within 0.1% at $105+5^{0}$C in the ovens 324/3 and 324/4, allowed to cool then weighed.

3.0 Preparation of Sample

3.1 The Sample will first be prepared by carrying out a sieve analysis in accordance with the BS EN 933-1:1997 Tests for the geometrical properties of aggregates Part 1:Determination of particle size distribution – sieving method

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 50mm 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 Elongation Index

Aggregate Size-Fraction BS Test Sieve Nominal Aperture Size		Width of Slot Gauge *	Minimum of Thickness Mass of Subdivision
100% Passing	100% Retained		
mm	mm	mm	kg
50	37.5	78.7+/-0.3	35
37.5	28	59.0+/-0.3	15
28	20	43.2+/-0.3	5
20	14	30.6+/-0.3	2
14	10	21.6+/-0.2	1
10	6.3	14.7+/-0.2	0.5

*This dimension is equal to 1.8 times the mean test sieve size.

Sum the masses retained on the trays, excluding that retained on the 50.0 mm 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 as follows.

4.0 Gauging Method

4.1 Select the length gauge appropriate to the size fraction to be tested and gauge each particle separately by hand.

4.2 Elongated pieces with a dimension greater than the gauge length for the fraction are placed in a separate tray.

4.3.1 Combine all the particles that have failed to pass the gauge, weigh to the nearest 0.1 grm and record the weight on the test sheets as (M3) in Box 10.

5.0 Calculation of Result

5.1 Calculate the value of the Elongation index as:

Elongation Index = M3/M2 x 100

5.2 The Elongation Index will be recorded to the nearest whole number.

6.0 Test Report

6.1 The test report will affirm that the Elongation index was determined in accordance with BS 812 : Section 105.2 : 1990 and whether a sampling certificate is available.

6.2 The following information will be reported.

(a) Sample Identification

(b) Elongation Index

(c) The Sieve Analysis of this material