British Standard

BRITISH STANDARD

BS 812-106: 1985

Testing aggregates —

Part 106: Method for determination of shell content in coarse aggregate

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Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Cement, Gypsum, Aggregates and Quarry Products Standards which the following bodies were represented:

Aggregate Concrete Block Association
Association of Consulting Engineers
Association of Consulting Scientists
Association of Lightweight Aggregate Manufacturers
Brick Development Association
British Aggregate Construction Materials Industries
British Ceramic Research Association
British Civil Engineering Test Equipment Manufacturers' Association
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Sand and Gravel Association Limited
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Contents

Foreword

This Part of BS 812, prepared under the direction of the Cement, Gypsum, Aggregates and Quarry Products Standards Committee, is a revision of **7.6** of BS 812-1:1975, which is to be withdrawn by amendment. The remainder of the 1975 edition is being revised and as each of the tests, or collection of related tests, is revised it is intended to issue it as a separate Part or Section of the standard.

It is intended that other British Standards should call up BS 812 test methods as the basis of compliance. Nevertheless, it is *not* intended that all aggregates should be subjected regularly to all the listed tests. Specifications in other standards will refer only to the relevant test methods.

Some of the tests in other Parts of this standard are of limited application, and advice on the use of simpler tests is given, for example when they can be used for a preliminary sorting of aggregates to see whether more expensive testing is justified.

In this revision the following changes have been made.

Separation of the test sample at the 10.0 mm test sieve has been introduced to accord with material standards and the mass of the test sample has been changed to accord with tests for particle size distribution.

Separation into shell categories, such as flat and hollow, has been omitted because of the unreliability of the method of description.

No data for the precision of this test is available and it is intended that a full scale precision trial will be carried out in due course.

Reference should be made to BS 812-101 for general guidance on testing aggregates, precision of test methods and variance arising from sampling errors.

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Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 and 2, an inside back cover and a back cover.
This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

1 Scope

This Part of BS 812 describes the method for the determination of the shell content of coarse aggregate.

NOTE The titles of the publications referred to in this standard are listed on the inside back page.

2 Definitions

For the purposes of this Part of BS 812 the definitions given in BS 812-101 and BS 812-102 apply.

3 Sampling

The sample used for the test (the laboratory sample) shall be taken in accordance with the procedure described in clause **5** of BS 812-102:1984.

4 Apparatus

4.1 *A sample divider*, of size appropriate to the maximum particle size to be handled or alternatively a flat shovel and a clean, flat, hard horizontal surface, e.g. a metal tray for use in quartering.

NOTE A suitable divider is the riffle box illustrated in BS 812-102.

4.2 *A ventilated oven*, thermostatically controlled to maintain a temperature of 105 ± 5 °C.

4.3 *A balance, or balances*, of suitable capacity accurate to 0.1 % of the mass of the test portion.

NOTE In general two balances, one of approximately 5 kg capacity accurate to 1 g and the other of approximately 500 g capacity accurate to 0.1 g will suffice. If aggregate of larger than 28 mm nominal size is to be tested a balance of 50 kg capacity accurate to 10 g will also be required.

4.4 *Test sieves*, complying with BS 410 and with aperture sizes of 10.0 mm and 5.0 mm, and with the appropriate sizes of lids and receivers.

5 Preparation of test portion

Reduce the sample by the procedures described in clause **6** of BS 812-102:1984 to produce a test portion that complies with Table 1 with due allowance for the later rejection of particles passing a 5.0 mm test sieve. Dry the test portion by heating at a temperature of 105 ± 5 °C to achieve a dry mass which is constant to within 0.1 %. Allow to cool and weigh.

Table 1 — Minimum mass of test portion

Nominal size of material	Minimum mass of test portion after rejection of undersize particles
mm	kg
63	50
50	35
40	15
28	5
20	2
14	1
10	0.5

6 Procedure

6.1 Separate the test sample into test fractions by sieving through 10.0 mm and 5.0 mm test sieves, ensuring that the sieves are not overloaded. Weigh the fraction retained on the 10.0 mm test sieve to the nearest gram and record as mass M_{10}. Similarly weigh the fraction retained on the 5.0 mm test sieve and record as mass M_5. Discard any aggregate passing the 5.0 mm test sieve.

6.2 Spread each fraction, separately, on a clean, dark surface and separate out any shells or shell fragments by hand picking under a good light. Weigh the total shell content in each fraction to the nearest gram and record as m_{10} and m_5.

NOTE When sieve analysis in accordance with BS 812-103[1)] has been done, the combined fractions retained on the 10.0 mm and larger test sieves and the combined fractions passing the 10.0 mm and retained on the 5.0 mm test sieves may be used for the determination of shell content.

7 Calculation and expression of results

Calculate the value of the shell content, expressed as a percentage, from the formula:

$$\text{shell content coarser than 10 mm} = \left(\frac{m_{10}}{M_{10}}\right) \times 100$$

and

$$\text{shell content finer than 10 mm} = \left(\frac{m_5}{M_5}\right) \times 100$$

Express the value of each shell content to the nearest whole number.

[1)] In preparation.

8 Test report

The test report shall affirm that the shell content was determined in accordance with this Part of BS 812 and whether or not a certificate of sampling is available. If available, a copy of the certificate of sampling shall be provided. The test report shall include the following additional information:

a) sample identification;

b) shell content.

Publications referred to

BS 410, *Specification for test sieves.*
BS 812, *Testing aggregates.*
BS 812-101, *Guide to sampling and testing aggregates.*
BS 812-102, *Methods for sampling.*
BS 812-103, *Methods for determination of particle size distribution*[2)].

[2)] In preparation.

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