

Testing aggregates —

Part 112: Methods for determination of aggregate impact value (AIV)

Committees responsible for this British Standard

The preparation of this British Standard was entrusted by the Cement, Gypsum, Aggregates and Quarry Products Standards Policy Committee (CAB/-) to Technical Committee CAB/2, upon 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 Cement Association
- British Ceramic Research Ltd.
- British Civil Engineering Test Equipment Manufacturers' Association
- British Geological Sciences
- British Precast Concrete Federation Ltd.
- British Ready Mixed Concrete Association
- British Steel Industry
- Building Employers Confederation
- Calcium Silicate Brick Association Ltd.
- Chartered Institute of Building
- Concrete Society
- County Surveyors' Society
- Department of the Environment (Building Research Establishment)
- Department of the Environment (Property Services Agency)
- Department of Transport
- Department of Transport (Transport and Road Research Laboratory)
- Electricity Supply Industry in England and Wales
- Federation of Civil Engineering Contractors
- Institute of Concrete Technology
- Institution of Civil Engineers
- Institution of Highways and Transportation
- Institution of Structural Engineers
- Institution of Water and Environmental Management
- Mortar Producers Association Limited
- Sand and Gravel Association Limited
- Society of Chemical Industry

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Foreword

This Part of BS 812 has been prepared under the direction of the Cement, Gypsum, Aggregate and Quarry Products Standards Policy Committee, and is a revision of clause 6 of BS 812-3:1975 which is withdrawn. It forms part of a general revision of the 1975 edition of BS 812. As each of the tests or collection of related tests is revised it will be issued as a separate Part or Section of this standard.

The methods described in this revision have not been changed technically from that given in BS 812-3:1975, but the opportunity has been taken to include a procedure for determining the aggregate impact value of aggregates in a soaked condition. This has been done because some aggregates have a significantly reduced resistance to impact when tested in this condition. With such aggregates, tests on soaked samples give a more reliable indication of their performance in practice.

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

Some of the tests in other Parts of BS 812 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 extensive testing is justified.

Reference should be made to BS 812-101:1984 for general guidance on testing aggregates, precision of test methods and variance arising from sampling errors.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i and ii, pages 1 to 8, 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 methods for the determination of the aggregate impact value (AIV) which gives a relative measure of the resistance of an aggregate to sudden shock or impact.

Two procedures are described, one in which the aggregate is tested in a dry condition, and the other in a soaked condition.

The methods are applicable to aggregates passing at 14.0 mm test sieve and retained on a 10.0 mm test sieve. For smaller size fractions, a recommended method is described in appendix A. Aggregate sizes larger than 14 mm are not appropriate to the aggregate impact value test.

NOTE 1 For the determination of the resistance of an aggregate to a slowly applied compressive load, see BS 812-110.

NOTE 2 The titles of the publications referred to in this standard are listed in the inside back cover.

2 Definitions

For the purposes of this Part of BS 812 the definitions given in BS 812-100, BS 812-101 and BS 812-102 apply.

3 Principle

A test specimen is compacted, in a standardized manner, into an open steel cup. The specimen is then subjected to a number of standard impacts from a dropping weight. This action breaks the aggregate to a degree which is dependent on the impact resistance of the material. This degree is assessed by a sieving test on the impacted specimen and is taken as the aggregate impact value (AIV).

4 Sampling

The sample used for the test (the laboratory sample) shall be taken in accordance with clause 5 of BS 812-102:1989.

5 Apparatus

NOTE All apparatus should comply with the general requirements of BS 812-100.

5.1 General

5.1.1 Impact testing machine

5.1.1.1 General The machine shall be of the general form shown in , have a total mass of between 45 kg and 60 kg and shall comprise the parts described in 5.1.1.2 to 5.1.1.6.

5.1.1.2 A circular metal base, with a mass of between 22 kg and 30 kg, with a plane lower surface of not less than 300 mm diameter and shall be supported on a level and plane concrete or stone block floor at least 450 mm thick. The machine shall be prevented from rocking either by fixing it to the block or floor or by supporting it on a level and plane metal plate cast into the surface of the block or floor.

5.1.1.3 A cylindrical steel cup, having an internal diameter of 102 ± 0.5 mm and an internal depth of 50 ± 0.25 mm. The walls shall be not less than 6 mm thick and the inner surfaces shall be case hardened. The cup shall be rigidly fastened at the centre of the base and be easily removed for emptying.

5.1.1.4 A metal hammer, with a mass of between 13.5 kg and 14.0 kg, the lower end of which shall be cylindrical in shape, 100.0 ± 0.5 mm diameter and 50 ± 0.15 mm long, with a 1.5 mm chamfer at the lower edge, and case hardened. The hammer shall slide freely between vertical guides so arranged that the lower (cylindrical) part of the hammer is above and concentric with the cup.

5.1.1.5 Means for raising the hammer, and allowing it to fall freely between the vertical guides from a height of 380 ± 5 mm on to the test sample in the cup, and means for adjusting the height of fall within 5 mm.

5.1.1.6 Means for supporting the hammer, whilst fastening or removing the cup.

NOTE Some means for automatically recording the number of blows is desirable.

5.1.2 Square-hole perforated-plate test sieves, of sizes 14.0 mm and 10.0 mm and a wovenwire 2.36 mm test sieve. The test sieves shall comply with BS 410.

5.1.3 A cylindrical metal measure, of sufficient rigidity to retain its form under rough usage and with an internal diameter of 75 ± 1 mm and an internal depth of 50 ± 1 mm.

5.1.4 A tamping rod, made out of straight iron or steel bar of circular cross section, 16 ± 1 mm diameter and 600 ± 5 mm long, with both ends hemispherical.

5.1.5 A balance, of capacity not less than 500 g readable to 0.1 g.

5.1.6 A well-ventilated oven, thermostatically controlled at a temperature of 105 ± 5 °C.

5.1.7 A rubber mallet.