

Testing aggregates —

Part 117: Method for determination of water-soluble chloride salts

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Foreword

This Part of BS 812 has been prepared under the direction of the Cement, Gypsum, Aggregates and Quarry Products Standards Committee, and is a revision of BS 812-4:1976, which is withdrawn. In the revision of BS 812-2:1975 and BS 812-3:1975 each test, or collection of related tests, is being revised separately and is being issued as a separate Part or Section of BS 812.

BS 812-4:1976 although entitled “Methods for determination of chemical properties” contained only one test and it is this test for the determination of water-soluble chloride salts present in aggregates which has been revised and included in this Part of BS 812. Few changes have been made to the test.

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 aggregates should be subjected regularly to all the listed tests. Specifications in other standards should call up only relevant test methods.

Advice on the use of simpler qualitative tests is given, for example, when they can be used for a preliminary sorting of aggregates to see whether more precise and expensive testing is justified.

Reference should be made to BS 812-101 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 the method for determination of the water-soluble chloride salt content of aggregate.

NOTE 1 In appendix A a qualitative test is described and appendix B describes a more rapid method of test than the test described in the main text. It is strongly recommended that these tests are used as preliminary checks before resorting to the test described in the main text which may be needed for compliance with a specification. These rapid tests can also be used regularly for quality control.

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

2 Definitions

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

3 Principle

An aggregate sample is extracted with its own mass of distilled or demineralized water to remove chloride ions. The method of analysis of the extract is based on that of Volhard where an excess of silver nitrate solution is added to the chloride solution and the unreacted portion is back-titrated with a standardized solution of thiocyanate, using ammonium iron (III) sulphate solution as an indicator. The chlorides are expressed in terms of, and reported as, the chloride ion content of the aggregate sample.

4 Sampling

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

Ensure that the sample is representative of the moisture content as well as the solids, by preventing loss of moisture except through evaporation, throughout the sampling procedure and at any subsequent stage up to the point of test.

NOTE This is necessary because where the aggregate to be tested carries surface water the chlorides will normally be dissolved in both this and the absorbed water and hence the chloride content will be affected by migration of water through the bulk materials.

5 Apparatus

5.1 Apparatus for preparation of test portion and extraction of the chloride (see clause 8 and 9.1)

5.1.1 Well ventilated oven, capable of being controlled to maintain a temperature of 105 ± 5 °C.

5.1.2 Balance, capable of weighing up to 5 kg accurate to 5 g. The balance shall be regularly calibrated as specified in BS 5781-1.

5.1.3 Test sieve, 20 mm square hole perforated plate complying with BS 410.

5.1.4 Pestle and mortar, or suitable mechanical crusher.

NOTE This is not required for aggregates all passing the 20 mm sieve.

5.1.5 Two plastics or metal bottles, wide-mouthed, screw-capped. The bottles shall be 5 L capacity when testing coarse aggregate or 2 L when testing fine aggregates.

5.1.6 Two filter funnels, of approximately 100 mm diameter with medium grade¹⁾ filter papers of a diameter appropriate to the size of the funnel.

5.1.7 Beakers.

5.2 Apparatus for the determination of the chloride content of the extracts (see 9.2)

5.2.1 Pipette, 100 mL size, grade B in accordance with BS 1797.

5.2.2 Stoppered conical flasks, 250 mL capacity.

5.2.3 Graduated measuring cylinder, capacity 10 mL, grade B in accordance with BS 1797.

5.2.4 Wash bottle, containing distilled water or water of equivalent quality.

5.2.5 Two burettes, 50 mL size, grade B in accordance with BS 1797.

5.3 Additional apparatus for standardization of the thiocyanate solution (see clause 7)

5.3.1 Pipette, 25 mL size, grade B in accordance with BS 1797.

5.4 Apparatus for the preparation of reagents (see clause 6)

5.4.1 Balance, capable of weighing up to 100 g accurate to 0.001 g. The balance shall be regularly calibrated as specified in BS 5781-1.

5.4.2 Two volumetric flasks, capacity 1 000 mL, grade B in accordance with BS 1797.

5.4.3 Amber-coloured glass reagent bottle.

5.4.4 Plain glass reagent bottles.

5.4.5 Graduated measuring cylinder, capacity 500 mL, grade B in accordance with BS 1797.

5.4.6 Fume cupboard.

¹⁾ Whatman No. 40 is suitable.