

Testing concrete —

Part 208: Recommendations for the determination of the initial surface absorption of concrete

ICS 91.100.30

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Committees responsible for this British Standard

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- Association of Lightweight Aggregate Manufacturers
- Association of Metropolitan Authorities
- British Aggregate Construction Materials Industries
- British Cement Association
- British Civil Engineering Test Equipment Manufacturers' Association
- British Precast Concrete Federation
- British Ready Mixed Concrete Association
- Building Employers' Confederation
- Cement Admixtures Association
- Cementitious Slag Makers' Association
- Concrete Society
- County Surveyors' Society
- Department of the Environment (Building Research Establishment)
- Department of the Environment
- Department of Transport (Highways Agency)
- Electricity Association
- Federation of Civil Engineering Contractors
- Federation of Piling Specialists
- Institute of Concrete Technology
- Institution of Civil Engineers
- Institution of Structural Engineers
- Institution of Water and Environmental Management
- National House-Building Council
- Quality Ash Association
- Sand and Grovel Association
- Society of Chemical Industry

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Foreword

This Part of BS 1881 has been prepared by Subcommittee B/517/1. It supersedes clause 6 of BS 1881-5:1970 which has been deleted. All aspects of testing concrete are included as Parts of BS 1881 from sampling fresh concrete to assessing concrete in structures. BS 1881-201:1986 *Guide to the use of non-destructive methods of test for hardened concrete* gives general guidance on the choice of non-destructive test methods and should be consulted for advice on methods which complement the measurement of initial surface absorption or are useful as alternatives.

In this Part of BS 1881, recommendations for surface absorption differ from those in clause 6 of BS 1881-5:1970 in the omission of the requirement for a measurement at 2 h after commencing the test since this is no longer regarded as providing useful additional information in practice. Recommendations on applications, factors influencing results and interpretation is also provided.

The method given in this standard provides a low pressure assessment of the water absorption of the concrete surface. Other tests currently under development involve higher pressures or surface drilling and the results from such tests will be governed by properties of the concrete not necessarily related to surface absorption.

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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 1881 gives recommendations for a method of determining the initial surface absorption of oven dried concrete, of concrete in the laboratory which cannot be oven dried and of site concrete. Recommendations are given on areas of application of this method and the interpretation of results.

2 References

2.1 Normative references

This Part of BS 1881 incorporates, by dated or undated reference, provisions from other publications. These normative references are made at the appropriate places in the text and the cited publications are listed on the inside back cover. For dated references, only the edition cited applies; any subsequent amendments to or revisions of the cited publication apply to this Part of BS 1881 only when incorporated in the reference by amendment or revision. For undated references, the latest edition of the cited publication applies, together with any amendments.

2.2 Informative references

This Part of BS 1881 refers to other publications that provide information or guidance. Editions of these publications current at the time of issue of this standard are listed on the inside back cover, but reference should be made to the latest editions.

3 Definitions

For the purposes of this Part of BS 1881 the definitions in BS 6100-6.2 apply together with the following:

3.1

location

region of concrete that is being assessed and that, for practical purposes, is assumed to be of uniform quality

3.2

initial surface absorption

rate of flow of water into concrete per unit area at a stated interval from the start of the test and at a constant applied head

3.3

surface zone

zone of concrete immediately behind the surface

NOTE The thickness of the zone that influences the result of this test may range between a few millimetres and several centimetres depending on the nature and condition of the concrete.

4 Applications

4.1 General

This test method provides data for assessing the uniaxial water penetration characteristics of a concrete surface. The applied pressure of 200 mm head of water is worse than the severest weather exposure in the UK due to driving rain. The results may be considered to be related to the quality of finish and to the durability of the surface under the effects of natural weathering. The results are of little relevance to behaviour under higher water pressures, and cannot be used to assess the permeability of a body of concrete.

This test method can be applied to exposed aggregate or profiled surfaces provided that a watertight seal can be obtained with the apparatus. The test is not applicable to specimens or areas showing obvious porosity, honeycombing or cracking. Misleading results can be obtained when tests are performed on thin concrete sections through which water could penetrate during the test. Tests should not be repeated at positions within an area affected by previous tests.

4.2 Quality control

4.2.1 Precast concrete

The test is most reliably applied to precast concrete units which can be tested under standardized dry conditions. Results obtained may be compared with predetermined acceptance limits.

4.2.2 Cast stone

Details of recommended acceptance requirements for cast stone are given in BS 1217 on the basis of results obtained by this method.

4.2.3 In situ concrete

It is difficult to achieve standardized drying conditions for in situ concrete although generalized classification limits relating to surface weathering characteristics have been proposed which can be applied to in situ test results. The method has been successfully used on this basis to assess compliance with specifications for weathering performance¹⁾.

Combinations of initial surface absorption and cover to reinforcement have been proposed²⁾.

4.3 Comparability surveys

Since it is sensitive to surface finish as well as to the quality of the concrete in the surface zone, the test provides a means of comparative assessment of these characteristics. With careful interpretation, the test may usefully be applied to in situ concrete construction.

¹⁾ *Permeability testing of site concrete — A review of methods and experience.* Concrete Society Technical Report 31

²⁾ Levitt, M. The ISAT for limit state design for durability. Concrete. Vol 19, No.7, p 29. July 1985.