

Testing concrete —

Part 204: Recommendations on the use of electromagnetic covermeters

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- Association of Metropolitan Authorities
- British Aggregate Construction Materials Industries
- British Civil Engineering Test Equipment Manufacturers' Association
- British Precast Concrete Federation
- British Ready Mixed Concrete Association
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- Cement Admixtures Association
- Cement and Concrete Association
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- Concrete Society
- County Surveyors' Society
- Department of the Environment (Building Research Establishment)
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- Institution of Highways and Transportation
- Institution of Structural Engineers
- Institution of Water and Environmental Management
- Royal Institution of Chartered Surveyors
- Sand and Gravel Association
- Society of Chemical Industry

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Nuclear Fuels Limited
- United Kingdom Atomic Energy Authority

This British Standard, having been prepared under the direction of the Cement, Gypsum, Aggregates and Quarry Products Standards Committee, was published under the authority of the Board of BSI and comes into effect on 31 August 1988

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Foreword

This Part of BS 1881 has been prepared under the direction of the Cement, Gypsum, Aggregates and Quarry Products Standards Committee. It supersedes BS 4408-1:1969, which is withdrawn. All aspects of testing concrete are being included as Parts of BS 1881, from sampling fresh concrete to assessing concrete in structures. Part 201 gives general guidance on the choice of non-destructive test methods and should be consulted for advice on methods which complement the measurement of cover to reinforcement or are useful as alternatives.

Electromagnetic covermeters have now been in use long enough for experience to have accumulated of applications for a variety of types of structure and under different conditions. Development of other forms of covermeter is in progress but no significant field experience is yet available.

A range of suitable devices is commercially available. Since the capabilities of these vary, the choice of instrument may be governed by the particular test conditions and information required.

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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 on and describes the principles of operation of electromagnetic devices that may be used for estimating the position, depth and size of reinforcement buried in concrete. It also describes their methods of use and applications, the accuracy to be expected and the factors which may influence the results.

NOTE 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 1881 the definitions given in BS 6100-6 apply, together with the following.

2.1 actual cover

least distance, c_1 , between the face of the concrete and the surface of the reinforcement as shown in Figure 1

2.2 indicated cover

distance, c_m , between the face of the concrete and a notional surface of the reinforcing bar under investigation as shown in Figure 1

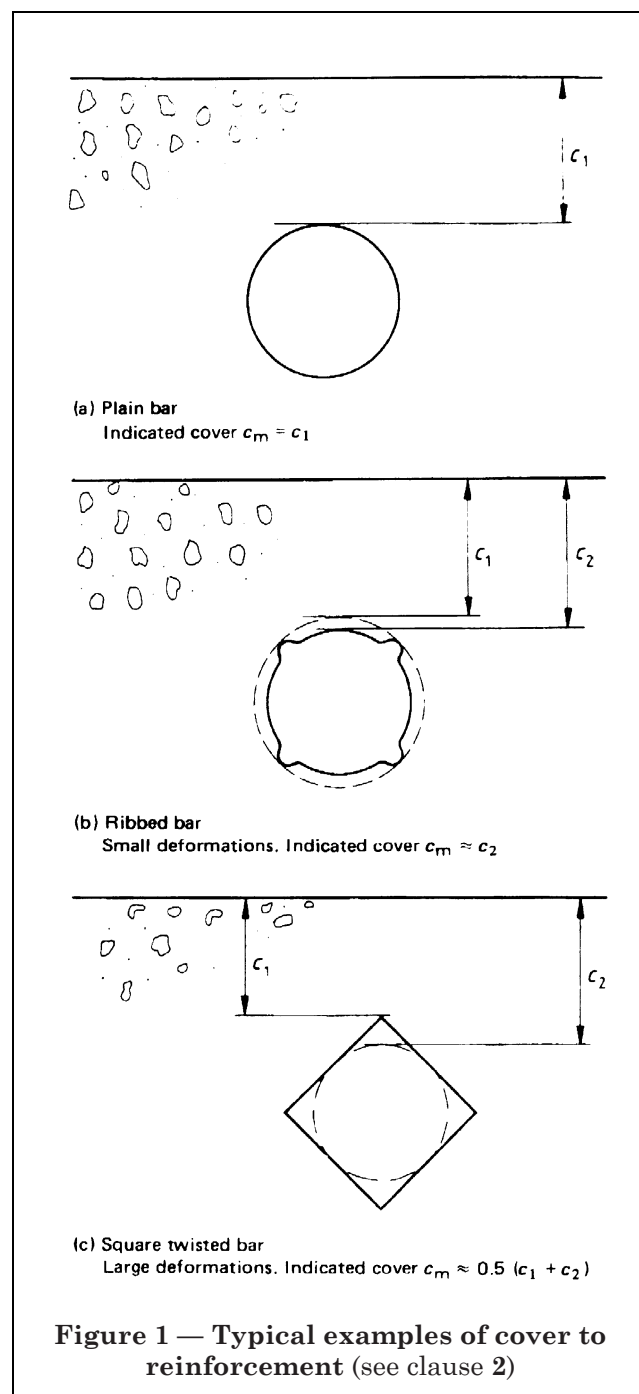
NOTE Where values of cover are required for compliance with specified cover to a bar of known cross section, the indicated cover has to be converted to actual cover by a method such as that described in 7.2 a).

3 Applications

Electromagnetic covermeters can be used for:

- quality control, to ensure correct location and cover to reinforcing bars after concrete placement;
- investigation of concrete members for which records are not available or need to be checked;
- location of reinforcement as a preliminary to some other form of testing in which reinforcement should be avoided or its nature taken into account, e.g. extraction of cores, ultrasonic pulse velocity measurement or "near-to-surface" methods;
- location of buried ferromagnetic objects other than reinforcement, e.g. water pipes, steel joists, lighting conduits.

NOTE Some devices may also detect non-ferromagnetic metal objects. Such use is outside the scope of this Part and reference should be made to manufacturers' publications.



4 Basic principles of the method

An electromagnetic field is generated by the search head (see clause 5). When a reinforcing bar or other metal object lies within this field, the lines of force become distorted. The disturbance caused by the presence of the metal in turn produces a local change in field strength as detected by the search head and indicated by the meter (see clause 5).