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**BSI Standards Publication**

## **Steel and iron castings — Magnetic particle testing**

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## National foreword

This British Standard is the UK implementation of ISO 4986:2020. It supersedes BS ISO 4986:2010, which is withdrawn.

The UK participation in its preparation was entrusted to Technical Committee ISE/111, Steel Castings and Forgings.

A list of organizations represented on this committee can be obtained on request to its secretary.

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

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**Compliance with a British Standard cannot confer immunity from legal obligations.**

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## Steel and iron castings — Magnetic particle testing

*Pièces moulées en acier et en fer — Contrôle par magnétoscopie*



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## Foreword

ISO (the International Organization for Standardization) is a worldwide federation of national standards bodies (ISO member bodies). The work of preparing International Standards is normally carried out through ISO technical committees. Each member body interested in a subject for which a technical committee has been established has the right to be represented on that committee. International organizations, governmental and non-governmental, in liaison with ISO, also take part in the work. ISO collaborates closely with the International Electrotechnical Commission (IEC) on all matters of electrotechnical standardization.

The procedures used to develop this document and those intended for its further maintenance are described in the ISO/IEC Directives, Part 1. In particular the different approval criteria needed for the different types of ISO documents should be noted. This document was drafted in accordance with the editorial rules of the ISO/IEC Directives, Part 2 (see [www.iso.org/directives](http://www.iso.org/directives)).

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights. Details of any patent rights identified during the development of the document will be in the Introduction and/or on the ISO list of patent declarations received (see [www.iso.org/patents](http://www.iso.org/patents)).

Any trade name used in this document is information given for the convenience of users and does not constitute an endorsement.

For an explanation on the voluntary nature of standards, the meaning of ISO specific terms and expressions related to conformity assessment, as well as information about ISO's adherence to the World Trade Organization (WTO) principles in the Technical Barriers to Trade (TBT) see the following URL: [www.iso.org/iso/foreword.html](http://www.iso.org/iso/foreword.html).

This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 11, *Steel castings*.

This third edition cancels and replaces the second edition (ISO 4986:2010), which has been technically revised. The main changes compared to the previous edition are as follows:

- addition of definition of a cluster of non-linear (SM) in [6.1.2](#);
- addition of “aligned (AM) indications” in [6.1.3](#), [6.2.3](#), [6.2.4](#), [7.1.3](#) and [Annex C](#)

Any feedback or questions on this document should be directed to the user's national standards body. A complete listing of these bodies can be found at [www.iso.org/members.html](http://www.iso.org/members.html).

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## Introduction

This document complements the general principles of magnetic particle testing described in ISO 9934-1 with additional requirements of the steel foundry industry.

Magnetic particle testing, as well as any other non-destructive testing, is part of a general or specific assessment of the quality of a casting to be agreed between the purchaser and the manufacturer at the time of acceptance of the order.

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# Steel and iron castings — Magnetic particle testing

## 1 Scope

This document specifies a method for the magnetic particle testing of ferro-magnetic steel and iron castings.

It also gives acceptance criteria through severity levels defined by the nature, the area and the dimensions of the discontinuities present.

This document is applicable to all ferro-magnetic castings, independent of the moulding method.

A steel and iron casting is considered to be ferro-magnetic if the magnetic induction is greater than 1 T (Tesla) for a magnetic field strength of 2,4 kA/m.

This document only applies to those areas of the castings specified for testing, as well as the percentage of castings to be tested.

## 2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes requirements of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

ISO 3059, *Non-destructive testing — Penetrant testing and magnetic particle testing — Viewing conditions*

ISO 4990, *Steel castings — General technical delivery requirements*

ISO 9712, *Non-destructive testing — Qualification and certification of NDT personnel*

ISO 9934-1, *Non-destructive testing — Magnetic particle testing — Part 1: General principles*

## 3 Terms and definitions

No terms and definitions are listed in this document.

ISO and IEC maintain terminological databases for use in standardization at the following addresses:

- IEC Electropedia: available at <http://www.electropedia.org/>
- ISO Online browsing platform: available at <http://www.iso.org/obp>

## 4 Ordering information

Subject to agreement between the manufacturer and the purchaser, enquiries and purchase orders for castings requiring magnetic particle testing should include the following information:

- a) the area of the casting to be tested;
- b) the qualification of the operators who will carry out the testing (see 5.2) or interpretation (see 7.2);
- c) the frequency/number of castings to be tested;
- d) the manufacturing stage, when magnetic particle testing is to be performed;
- e) the required surface finish of the areas to be tested (see 5.3):