
Steel and iron castings — Visual testing of surface quality

*Pièces moulées en acier ou en fonte — Contrôle visuel de l'état de
surface*



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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).

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For an explanation of 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 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 11971:2008), which has been technically revised. The main changes compared to the previous edition are as follows:

- “Normative References” added as new [Clause 2](#) and “Terms and Definitions” added as new [Clause 3](#); subsequent Clauses were renumbered
- Correction in [Clause 5](#) (previously [Clause 3](#)) regarding the use of SCRATA comparators for iron castings
- Table 3 and Table 4 in the previous edition were moved to new [Annex A](#)

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.

Introduction

The surface roughness of a casting is influenced by the manufacturing process (moulding, grinding, finishing, etc.), the moulding materials used (sand, coating, etc.), the equipment available and the alloy cast.

Since cast surfaces do not exhibit the same cyclic regularity as machined surfaces, it is difficult to evaluate their roughness using conventional mechanical, optical, or pneumatic devices.

The use of visual/tactile comparators is therefore preferred in these circumstances.

Moreover, in order to take account of the irregularities on as-cast surfaces, ground surfaces or other means of finishing of castings, comparators should have relatively large dimensions (greater than or equal to 15 000 mm²) in order to make them more reliable and their results repeatable and consistent.

Two sets of comparators¹⁾ are in widespread use:

1. *SCRATA or CTI comparators for the definition of surface quality of steel castings*, available from Castings Technology International (CTI), Advanced Manufacturing Park, Brunel Way, Rotherham, South Yorkshire, United Kingdom, info@castingstechnology.com;
2. *BNIF 359, Recommandation technique du Bureau de Normalisation des Industries de la Fonderie. Caractérisation d'états de surface des pièces moulées — Utilisation des échantillons types de 110 × 160 mm*, available from CTIF, 44 avenue de la Division Leclerc, 92310 Sèvres, France, www.ctif-editions.com.

1) This information is given for the convenience of users of this document and does not constitute an endorsement by ISO of these products.

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1 Scope

1.1 This document covers the acceptance criteria for the visual testing of the surface of steel and iron castings.

1.2 Acceptance levels utilize Bureau de Normalisation des Industries de la Fonderie (BNIF) and Steel Castings Research and Trade Association (SCRATA) or Casting Technology International (CTI) reference comparators for the visual determination of surface roughness and surface discontinuities described as follows:

- surface roughness;
- thermal dressing;
- mechanical dressing;
- non-metallic inclusions;
- gas porosity;
- fusion discontinuities;
- expansion discontinuities;
- metal inserts.

2 Normative References

There are no normative references in this document.

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:

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

4 Ordering information

The enquiry and order should specify the following information:

- a) the casting areas where the surface is to be tested should be clearly indicated on the drawing or solid model;
- b) the number of castings to be tested;
- c) the acceptance level: more than one acceptance level may be specified for different surfaces of the same casting;
- d) if any types of discontinuities are unacceptable.