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Steels, nickel alloys and cobalt alloys investment castings — Visual testing of surface quality

Pièces moulées par le procédé dit «à la cire perdue» en acier, alliages de nickel et alliages de cobalt — Examen visuel de la qualité de surface

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ISO copyright office
CP 401 • Ch. de Blandonnet 8
CH-1214 Vernier, Geneva
Phone: +41 22 749 01 11
Fax: +41 22 749 09 47
Email: copyright@iso.org
Website: www.iso.org

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Foreword

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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 second edition cancels and replaces the first edition (ISO 19959:2005), which has been technically revised. The main changes compared to the previous edition are as follows:

— "Terms and Definition" renumbered as Clause 3;

— "Ordering Information" renumbered as Clause 4;

— new Clause 7 for "Testing documentation".

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.

Steels, nickel alloys and cobalt alloys investment castings — Visual testing of surface quality

1 Scope

This document specifies the acceptance criteria for the surface examination of steel, nickel alloy and cobalt alloy investment castings by visual testing.

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

3 Terms and definitions

For the purposes of this document, the following terms and definitions apply.

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/

3.1
surface pit
depression on the surface of the casting, the length of the depression being less than three times its width

3.2
linear discontinuity
depression on the surface of the casting, the length of the depression being equal to, or greater than, three times its width

3.3
positive metal
protrusion on the surface of the casting

3.4
surface roughness
measure of the surface condition

Note 1 to entry: The surface roughness is normally determined by the use of a visual or tactile comparator.

3.5
parting line
surface condition resulting from joints in the tool or die

Note 1 to entry: Parting lines are not linear discontinuities.

3.6
ejector-pin mark
surface condition caused by pins used to remove the pattern from the die

3.7
gate stub
positive metal remaining after the removal of the gate used to direct molten metal into the mould

4 Ordering information

The enquiry and order shall specify:

a) the area of the surface to be examined;

b) the number of castings to be examined;

c) the acceptance level required (different acceptance levels may be specified for different surfaces of the same casting; if no acceptance level is specified, level IV applies); and

d) any surface conditions that are not acceptable.

5 Testing

5.1 Qualification of personnel

Testing shall be performed by qualified personnel. Qualification of personnel shall be according to ISO 9712. The qualification level of the personnel shall be agreed between the manufacturer and the purchaser at the time of acceptance of the order.

5.2 Conditions of testing

The testing shall be carried out with no greater than 3x magnification.

6 Acceptance criteria

6.1 Levels of acceptance for visual testing are given in Table 1.

6.2 Castings shall not exhibit linear discontinuities. Surface conditions that are less than 0,25 mm are non-relevant.

6.3 Any surface roughness and surface pits that will be removed by subsequent machining are acceptable.

6.4 Surface features not addressed in this document shall be agreed between the purchaser and manufacturer at the time of the enquiry and order.

7 Testing documentation

The manufacturer shall, if requested by the purchaser at the time of enquiry and order, keep a record of the inspection and provide a report.

The records of the manufacturer shall contain the following:

a) the identification of the casting;

b) the name and qualification of the person undertaking the test;

c) the reference of the comparator used;

d) the designated category and level of each area checked for the surface quality.