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Nickel and nickel alloy castings

Pièces moulées en nickel et alliages de nickel

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

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 155, *Nickel and nickel alloys*.

This second edition cancels and replaces the first edition (ISO 12725:1997) which has been technically revised. The main changes compared with the previous edition are as follows:

— the normative references have been updated;

— Clause 5, “General requirements for delivery”, has been added.

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.

Nickel and nickel alloy castings

1 Scope

This document specifies requirements for nickel and nickel alloy castings.

The grades specified represent types of alloys suitable for a broad range of application in a wide variety of corrosive and high temperature environments.

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 6372, *Nickel and nickel alloys — Terms and definitions*

ISO 6892-1, *Metallic materials — Tensile testing — Part 1: Method of test at room temperature*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 6372 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/

4 Alloy identification

For the purposes of this document, the principles for alloy identification are as given in Annex A.

5 General requirements for delivery

5.1 Information to be supplied by the purchaser

The enquiry and order should include the following information.

a) A description of the casting(s) by pattern number and/or drawing. When a pattern is supplied, a complete list of the pattern equipment should be included. When a drawing is not supplied, the casting is purchased on the basis of the pattern. In this case, the foundry shall not be responsible for the dimensions of the part.

NOTE Machining allowances, dimensional tolerances, and geometrical tolerances can be selected from ISO 8062-3.

All modifications to be made to the drawing, for the technical requirements of the manufacturer, shall be agreed between the manufacturer and the purchaser.

b) The material standard, delivery condition and grade.

5.2 Additional information to be supplied

Where appropriate, the enquiry and order should include additional information, for example:

a) any supplementary requirements in accordance with Annex B;

b) the non-destructive testing procedures to be used, the extent of the non-destructive testing and the acceptance criteria;

c) the type of inspection document to be provided at the time of supply;

d) the size of a test lot, (see B.2.2);

e) the procedures for marking (in accordance with Clause 8), machining, protection, packaging, loading, dispatching and the destination;

f) the submission of sample castings for approval before production quantities are produced;

g) the methods of statistical control to be used.

6 Manufacture

6.1 Melting

Nickel and nickel alloys shall be melted by the electric furnace process with or without separate refining, such as argon-oxygen decarburization (AOD) or by the vacuum induction melting process.

6.2 Heat treatment

Castings shall be heat treated in accordance with the procedures given in Table 1.

6.3 Welding

6.3.1 General

Selection of welding material, which shall be compatible with the casting composition, is generally left to the discretion of the manufacturer. However, as a supplementary requirement, selection of weld material may be agreed between the manufacturer and the purchaser.

NOTE ISO 11970 gives terms and definitions used for welding purposes for steel castings.

6.3.2 Restriction

Castings made from grades NC2000 and NC4030 shall not be welded.

7 Requirements

7.1 Composition

Materials shall conform to the chemical composition requirements given in Table 2.

The methods of determination of the chemical composition shall be at the discretion of the manufacturer. However, in cases of dispute, the method specified in an appropriate document shall be used. If no International Standard exists, an analytical method appropriately validated and acceptable by the purchaser shall be used.

