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Stainless steels for general purposes —

Part 4: Bright products

Aciers inoxydables pour usage général —

Partie 4: Produits transformés à froid

Reference number
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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 document 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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This document was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 4, *Heat treatable and alloy steels*.

This first edition of ISO 16143-4, together with ISO 683-7, cancels and replaces ISO 683-18:2014, which has been technically revised.

The main changes are as follows:

— ISO 683-18 was split into ISO 683-7 for non-alloy and alloy steels and into ISO 16143-4 for stainless steels;

— three austenitic steel grades, three austenitic-ferritic steel grades, two ferritic steel grades and two martensitic steel grades were added;

— definition for out-of-round was modified with two new definitions on ovality and out-of-shape;

— editorial revision.

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.

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Stainless steels for general purposes —

Part 4:
Bright products

1 Scope

This document specifies the technical delivery requirements for bright products made of stainless steels in the form of bars in the drawn, peeled/turned or additionally ground condition and they are intended for mechanical purposes, for example for machine parts, and/or for use at high temperature including creep-resistant applications.

NOTE 1 Bright steel products made of corrosion-resistant stainless steel are manufactured from steels mentioned in ISO 16143-2, and bright steel products intended for high-temperature purposes are manufactured from steels mentioned in ISO 4955.

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 148-1, *Metallic materials — Charpy pendulum impact test — Part 1: Test method*

ISO 286-2, *Geometrical product specifications (GPS) — ISO code system for tolerances on linear sizes — Part 2: Tables of standard tolerance classes and limit deviations for holes and shafts*

ISO 377, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing*

ISO 404, *Steel and steel products — General technical delivery requirements*

ISO 4885, *Ferrous materials — Heat treatments — Vocabulary*

ISO 4948-1, *Steels — Classification — Part 1: Classification of steels into unalloyed and alloy steels based on chemical composition*

ISO 4948-2, *Steels — Classification — Part 2: Classification of unalloyed and alloy steels according to main quality classes and main property or application characteristics*

ISO 4955, *Heat-resistant steels*

ISO 6506-1, *Metallic materials — Brinell hardness test — Part 1: Test method*

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

ISO 6892-2, *Metallic materials — Tensile testing — Part 2: Method of test at elevated temperature*

ISO 6929, *Steel products — Vocabulary*

ISO 10474, *Steel and steel products — Inspection documents*

ISO 14284, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition*

ISO 15510, *Stainless steels — Chemical composition*

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ISO 16143-2, *Stainless steels for general purposes — Part 2: Corrosion-resistant semi-finished products, bars, rods and sections*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 377, ISO 4885, ISO 4948-1, ISO 4948-2, ISO 4955, ISO 6929, ISO 14284, ISO 15510, ISO 16143-2 and the following apply.

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

— ISO Online browsing platform: available at https://www.iso.org/obp

— IEC Electropedia: available at https://www.electropedia.org/

3.1
bright product
drawn or peeled/turned product with smoother surface quality and better dimensional accuracy in comparison to hot-rolled product

3.2
drawn product
product of various cross-sectional shapes obtained, after descaling, by cold drawing of a hot-rolled product, on a drawing bench (cold formation without removing material)

Note 1 to entry: This operation gives the product special features with respect to shape, dimensional accuracy and surface finish. Products in lengths are delivered straightened, products of small cross-section may also be supplied in coils.

3.3
peeled/turned product
round bar produced by peeling or turning where the product can be further processed by straightening and polishing

Note 1 to entry: This operation gives the bar special features with respect to shape, dimensional accuracy and surface finish. The removal of metal is carried out in such a way that the bright product is generally free from rolling defects and surface decarburization.

3.4
product in the ground condition
ground product
drawn or peeled/turned round bar given an improved surface quality and dimensional accuracy by grinding or by grinding and polishing

3.5
thickness
nominal dimension of the product

Note 1 to entry: That means:

a) the diameter in the case of rounds;

b) the lateral length in the case of squares;

c) the width over flats in the case of hexagons;

d) the shorter lateral length in the case of flats (rectangular bars) and wide-flats.

For special sections, 'thickness' shall be defined at the time of enquiry and order.

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3.6
ovality
difference between the smallest and largest dimension measured across the pairs of opposing points at a common cross-section

3.7
out of shape
deviation from the nominal section profile

EXAMPLE Parallelism, perpendicularity and twist.

3.8
ruling section
that section for which the specified mechanical properties apply

Note 1 to entry: Independent of the actual shape and dimensions of the cross-section of the product, the size of its ruling section is always given by a diameter. This corresponds to the diameter of an "equivalent round bar". That is a round bar which will show the same cooling rate as the actual ruling section of the product concerned at its position for taking the test pieces, when being cooled from austenitizing temperature.

3.9
stainless steel
steel with at least 10,5 % (mass fraction) Cr and a maximum of 1,2 % (mass fraction) C

Note 1 to entry: For the classification of stainless steels according to their structure, composition and application, see ISO 15510:2014, Annex C.

[SOURCE: ISO 15510:2014, 3.1]

4 Classification and designation

4.1 Classification

The classification of the relevant steel grades is allocated in accordance with ISO 4948-1 and ISO 4948-2.

Stainless steels covered by this document are further classified according to their structure into

— austenitic steels,

— austenitic-ferritic steels,

— ferritic steels,

— martensitic steels, or

— precipitation-hardening steels.

4.2 Designation

For the steel grades covered by this document, the steel names given in the relevant tables are allocated in accordance with ISO/TS 4949.

NOTE Designation of steels covered by this document and of comparable grades covered in various other designation systems are given in Annex E.

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