
**Steels for cold heading and cold
extruding**

Aciers pour transformation à froid et extrusion à froid



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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).

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).

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.

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

This third edition cancels and replaces the second edition (ISO 4954:1993) which has been technically revised. The main changes compared to the previous edition are as follows:

- the names of the steel grades have been updated in accordance with ISO/TS 4949;
- for steels not intended for heat treatment, three grades have been removed and five have been added;
- for case hardening steels, eight grades have been added;
- for steels for quenching and tempering, seven grades have been removed and 27 grades have been added;
- for stainless steels, six grades have been removed and ten grades have been added;
- the list of options has been completely updated.

Steels for cold heading and cold extruding

1 Scope

This document specifies requirements for non-alloy and alloy steels that are intended for cold heading or cold extruding and are delivered as wire rods, wire or bars. It also contains specific requirements for:

- steels not intended for heat treatment, with diameters from 2 mm to 100 mm (see [Annex A](#));
- case-hardening steels with diameters from 2 mm to 100 mm (see [Annex B](#));
- steels for quenching and tempering, including boron alloyed steels (see [Table C.3](#)), with diameters from 2 mm to 100 mm (see [Annex C](#));
- stainless steels with diameters of 0,8 mm up to 50 mm for austenitic steels, up to 25 mm for ferritic steels and up to 100 mm for martensitic steels (see [Annex D](#)).

This document (except [Annex A](#)) is applicable to the properties of cold-headed or cold-extruded parts which have been subjected to a subsequent heat treatment. As the properties of the parts in the cold-headed or cold-extruded, and subsequently not-heat-treated condition, are largely dependent on the applied cold-heading or cold-extruding conditions, these are, if necessary, subject to agreement between the purchaser and the manufacturer of the parts.

In addition to this document, the general technical delivery requirements of ISO 404 are applicable.

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 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 642, *Steel — Hardenability test by end quenching (Jominy test)*

ISO 643, *Steels — Micrographic determination of the apparent grain size*

ISO 683-1, *Heat-treatable steels, alloy steels and free-cutting steels — Part 1: Non-alloy steels for quenching and tempering*

ISO 683-2, *Heat-treatable steels, alloy steels and free-cutting steels — Part 2: Alloy steels for quenching and tempering*

ISO 683-3, *Heat-treatable steels, alloy steels and free-cutting steels — Part 3: Case-hardening steels*

ISO 683-18:2014, *Heat-treatable steels, alloy steels and free-cutting steels — Part 18: Bright steel products*

ISO 1035-1, *Hot-rolled steel bars — Part 1: Dimensions of round bars*

ISO 1035-2, *Hot-rolled steel bars — Part 2: Dimensions of square bars*

ISO 1035-3, *Hot-rolled steel bars — Part 3: Dimensions of flat bars*

ISO 1035-4, *Hot-rolled steel bars — Part 4: Tolerances*

ISO 3651-2, *Determination of resistance to intergranular corrosion of stainless steels — Part 2: Ferritic, austenitic and ferritic-austenitic (duplex) stainless steels — Corrosion test in media containing sulfuric acid*

ISO 3887, *Steels — Determination of the depth of decarburization*

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/TS 4949, *Steel names based on letter symbols*

ISO 4967:2013, *Steel — Determination of content of non-metallic inclusions — Micrographic method using standard diagrams*

ISO 6508-1, *Metallic materials — Rockwell hardness test — Part 1: Test method*

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

ISO 6929, *Steel products — Vocabulary*

ISO 9443, *Heat-treatable and alloy steels — Surface quality classes for hot-rolled round bars and wire rods — Technical delivery conditions*

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

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 15549, *Non-destructive testing — Eddy current testing — Part 1: General principles*

ISO 16124, *Steel wire rod — Dimensions and tolerances*

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

ISO 22034-2, *Steel wire and wire products — Part 2: Tolerances on wire dimensions*

JIS G 0555:2015, *Microscopic testing method for the non-metallic inclusions in steel*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 377, ISO 683-1, ISO 683-2, ISO 683-3, ISO 683-18, ISO 4885, ISO 4948-1, ISO 4948-2, ISO 6929, ISO 14284, ISO 16143-2 and the following 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

bright steel product

drawn or peeled/turned bar with smoother surface quality and better dimensional accuracy in comparison with a hot-rolled bar