
Tool steels

Aciers à outils



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Contents

Page

Foreword	iv
1 Scope	1
2 Normative references	1
3 Terms and definitions	2
4 Classification and designation	2
4.1 Classification	2
4.2 Designation	2
5 Information to be supplied by the purchaser	3
5.1 Mandatory information	3
5.2 Options	3
5.3 Ordering example	3
6 Manufacturing process	3
6.1 General	3
6.2 Heat-treatment condition and surface condition on delivery	4
6.2.1 General	4
6.2.2 Heat-treatment condition	4
6.2.3 Surface condition	4
7 Requirements	4
7.1 General requirements	4
7.2 Chemical composition and mechanical properties	4
7.3 Surface quality	4
7.4 Shape, dimensions and tolerances	5
8 Inspection, testing and conformance of products	5
8.1 Inspection and testing procedures and types of inspection documents	5
8.2 Specific inspection and testing	6
8.2.1 Number of sample products	6
8.2.2 Sampling	6
8.2.3 Test methods	6
8.2.4 Retests	6
8.2.5 Sorting and reprocessing	7
9 Marking	7
10 Tables	7
11 Location of test pieces in the hardening test	17
11.1 Product diameter or thickness ≥ 15 mm	17
11.2 Product diameter or thickness < 15 mm	18
Annex A (informative) Hardness-tempering temperature curves	19
Annex B (normative) Supplementary or special requirements	29
Annex C (informative) Designations of comparable steels	31
Bibliography	33

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 4957:1999), which has been technically revised.

The main changes compared with the previous edition are as follows:

- the delivery condition normalized/normalized rolled has been introduced;
- for surface quality, ISO 9443 for bars and ISO 7788 for plates now apply;
- an additional clause for sorting and reprocessing has been introduced;
- the normative references have been updated.

Tool steels

1 Scope

This document specifies requirements for the following grades of wrought tool steels:

- a) non-alloy cold-work tool steels;
- b) alloy cold-work tool steels;
- c) alloy hot-work tool steels;
- d) high-speed tool steels.

If not stated otherwise, this document applies to all types of hot-rolled, forged, cold-drawn or cold-rolled products or products produced by powder metallurgy, which are supplied in one of the surface and heat-treatment conditions given in [6.2](#) and [Table 1](#).

NOTE [Tables 2, 4, 6](#) and [8](#) cover only those steels which have gained certain international importance, which does not mean, however, that they are available in all industrial countries. In addition, a number of other steels for tools are specified in regional, national or company standards.

Where the heat resistance of the tools is of particular importance, as for example in the case of tools for hot forming glass, the material selection is based on 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 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 1035-1, *Hot-rolled steel bars — Part 1: Dimensions of round bars*

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

ISO 1035-4:1982, *Hot-rolled steel bars — Part 4: Tolerances*

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

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

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

ISO 6929, *Steel products — Vocabulary*

ISO 7452:2013, *Hot rolled steel plates — Tolerances on dimensions and shape*

ISO 7788, *Steel — Surface finish of hot-rolled plates and wide flats — Delivery requirements*

ISO 9443, *Surface quality classes for hot-rolled bars and wire rod*

ISO/TR 9769, *Steel and iron — Review of available methods of analysis*

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 17577, *Steel — Ultrasonic testing of steel flat products of thickness equal to or greater than 6 mm*

3 Terms and definitions

For the purposes of this document, the terms and definitions given in ISO 4885, ISO 4948-1 and ISO 6929 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 tool steel

special steel suitable for working or processing of materials, for handling and measuring workpieces and, for this purpose, exhibiting high hardness and wear resistance and/or toughness

3.2 cold-work tool steel

non-alloy or alloy *tool steel* (3.1) for applications in which the surface temperature is generally below 200 °C

3.3 hot-work tool steel

alloy *tool steel* (3.1) for applications in which the surface temperature is generally over 200 °C

3.4 high-speed tool steel

steel used mainly for machining and for forming processes and which, because of the chemical composition, has the highest high-temperature hardness and temper resistance up to about 600 °C

4 Classification and designation

4.1 Classification

The classification of the relevant steel grades shall be in accordance with ISO 4948-1.

4.2 Designation

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

For information on designation of comparable steels, see [Annex C](#).