
**Heat-treatable steels, alloy steels and
free-cutting steels —**

Part 14:
**Hot-rolled steels for quenched and
tempered springs**

*Aciers pour traitement thermique, aciers alliés et aciers pour
décolletage —*

Partie 14: Aciers laminés à chaud pour ressorts trempés et revenus



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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.

International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 2.

The main task of technical committees is to prepare International Standards. Draft International Standards adopted by the technical committees are circulated to the member bodies for voting. Publication as an International Standard requires approval by at least 75 % of the member bodies casting a vote.

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.

ISO 683-14 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 683-14:1992), which has been technically revised.

ISO 683 consists of the following parts, under the general title *Heat-treatable steels, alloy steels and free-cutting steels*:

- *Part 1: Direct-hardening unalloyed and low-alloyed wrought steel in form of different black products*
- *Part 9: Wrought free-cutting steels*
- *Part 10: Wrought nitriding steels*
- *Part 11: Wrought case-hardening steels*
- *Part 14: Hot-rolled steels for quenched and tempered springs*
- *Part 15: Valve steels for internal combustion engines*
- *Part 17: Ball and roller bearing steels*
- *Part 18: Bright products of unalloyed and low alloy steels*

Heat-treatable steels, alloy steels and free-cutting steels —

Part 14:

Hot-rolled steels for quenched and tempered springs

1 Scope

1.1 This part of ISO 683 gives the technical delivery requirements for round and flat bars and wire rods manufactured from the alloyed steels listed in Table 2, intended for hot-formed and subsequently heat-treated springs or cold-formed and subsequently heat-treated springs. The products are supplied in one of the heat-treatment conditions given for the different types of products in Table 3, lines 2 to 6, and in one of the surface conditions given in Table 1.

NOTE 1 Table 2 only considers steels which have gained certain international importance. This does not, however, mean that these are available in all industrial countries. In addition, a great number of other steels are specified in regional and national standards.

NOTE 2 International Standards relating to steels complying with the chemical composition requirements in Table 2, but supplied in product forms or treatment conditions other than those given in 1.1 or intended for special applications, are given in the Bibliography.

1.2 In special cases, variations in these technical delivery requirements or additions to them may form the subject of an agreement at the time of enquiry and order.

1.3 In addition to this part of ISO 683, the general technical delivery requirements of ISO 404 are applicable.

2 Normative references

The following referenced documents are indispensable for the application 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 377:1997, *Steel and steel products — Location and preparation of samples and test pieces for mechanical testing*

ISO 404:1992, *Steel and steel products — General technical delivery requirements*

ISO 642:1999, *Steel — Hardenability test by end quenching (Jominy test)*

ISO 643:2003, *Steels — Micrographic determination of the apparent grain size*

ISO 1035-1:1980, *Hot-rolled steel bars — Part 1: Dimensions of round bars*

ISO 1035-3:1980, *Hot-rolled steel bars — Part 3: Dimensions of flat bars*

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

ISO 3887:2003, *Steels — Determination of depth of decarburization*

ISO 4885:1996, *Ferrous products — Heat treatments — Vocabulary*

ISO 683-14:2004(E)

ISO 4948-1:1982, *Steels — Classification — Part 1: Classification of steels into unalloyed and alloy steels based on chemical composition*

ISO/TR 4949:2003, *Steel names based on letter symbols*

ISO 6506-1:1999, *Metallic materials — Brinell hardness test — Part 1: Test method*

ISO 6508-1:1999, *Metallic materials — Rockwell hardness test — Part 1: Test method (scales A, B, C, D, E, F, G, H, K, N, T)*

ISO 6929:1987, *Steel products — Definitions and classification*

ISO 8457-1:1989, *Steel wire rod — Part 1: Dimensions and tolerances*

ISO 9442:1988, *Steel — Hot-rolled ribbed and grooved flats for spring leaves — Tolerances and dimensions*

ISO 9443:1991, *Heat-treatable and alloy steels — Surface quality classes for hot-rolled round bars and wire rods — Technical delivery conditions*

ISO 10474:1991, *Steel and steel products — Inspection documents*

ISO 14284:1996, *Steel and iron — Sampling and preparation of samples for the determination of chemical composition*

3 Terms and definitions

For the purposes of this part of ISO 683, the terms and definitions given in ISO 4885 and the following apply.

3.1

product forms

See ISO 6929.

3.2

spring steels

steels which are, because of their resilience in the quenched and tempered condition, particularly suitable for the manufacture of springlike components of all kinds

NOTE The resilience of a steel depends on its elastic deformability, which enables it to sustain loading within a given range without exhibiting any permanent deformation when the load is removed. The properties required of the steels for springs are obtained by increasing carbon content and alloying constituents such as silicon, manganese, chromium, molybdenum and vanadium, and also by heat-treatment, i.e. hardening in oil with subsequent tempering.

3.3

alloy steel

See 3.1.3 of ISO 4948-1:1982.

4 Ordering and designation

The designation of the product in an order shall cover the following:

- a) The designation of the product form (bar, wire rod) followed by
 - either the designation of the dimensional standard and the dimensions and tolerances selected from it (see 5.7) or
 - the designation of the drawing or any other document covering the dimensions and tolerances required for the product;