INTERNATIONAL STANDARD

ISO 4951-1

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High yield strength steel bars and sections —

Part 1: General delivery requirements

Barres et profilés en acier à haute limite d'élasticité —
Partie 1: Conditions générales de livraison

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Foreword

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International Standards are drafted in accordance with the rules given in the ISO/IEC Directives, Part 3.

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 part of ISO 4951 may be the subject of patent rights. ISO shall not be held responsible for identifying any or all such patent rights.

International Standard ISO 4951-1 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 3, *Steels for structural purposes*.

This first edition of ISO 4951-1, together with ISO 4951-2 and ISO 4951-3, cancels and replaces ISO 4951:1979, the content of which has been revised and augmented.

ISO 4951 consists of the following parts, under the general title *High yield strength steel bars and sections*:

— *Part 1: General delivery requirements*

— *Part 2: Delivery conditions for normalized, normalized rolled and as-rolled steels*

— *Part 3: Delivery conditions for thermomechanically-rolled steels*

Annex A of this part of ISO 4951 is for information only.

High yield strength steel bars and sections —

Part 1:
General delivery requirements

1 Scope

This part of ISO 4951 specifies the requirements for the general delivery conditions of hot-rolled bars and sections, in high yield strength steels for use in bolted, riveted or welded structures[1)].

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of ISO 4951. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. However, parties to agreements based on this part of ISO 4951 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. For undated references, the latest edition of the normative document referred to applies. Members of ISO and IEC maintain registers of currently valid International Standards.

ISO 148:1983, *Steel — Charpy impact test (V-notch).*

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 2566-1:1984, *Steel — Conversion of elongation values — Part 1: Carbon and low alloy steels.*

ISO 4951-2:2001, *High yield strength steel bars and sections — Part 2: Delivery conditions for normalized, normalized rolled and as-rolled steels.*

ISO 4951-3:2001, *High yield strength steel bars and sections — Part 3: Delivery conditions for thermo-mechanically-rolled steels.*

ISO 6892:1998, *Metallic materials — Tensile testing at ambient temperature.*

ISO 6929:1987, *Steel products — Definition and classification.*

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

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

ISO/TR 9769:1991, *Steel and iron — Review of available methods of analysis.*

1) Compared with mild steels, these steels may require special precautions for welding. See the guide *Welding and weldability of C-Mn micro-alloy steels*, published by subcommission IX-G of the International Institute of Welding (document IIS/IIW 843-84).

3 Terms and definitions

For the purposes of this part of ISO 4951, the definitions of the terms "bars" and "sections", given in ISO 6929:1987 and the following terms and definitions apply.

3.1
as-rolled steel
steel without any special rolling and/or heat treatment condition

3.2
normalized steel
steel obtained by a normalizing treatment, i.e. heat treatment consisting of austenitizing followed by air cooling

3.3
normalized rolled steel
steel obtained by normalizing rolling

3.4
normalizing rolling
rolling process in which the final deformation is carried out in a certain temperature range leading to a material condition equivalent to that obtained after normalizing so that the specified values of the mechanical properties are retained even after normalizing

NOTE In international publications for both the normalizing rolling, as well as the thermomechanical rolling, the expression "controlled rolling" may be found. However in view of the different applicability of the products a distinction of the terms is necessary.

3.5
thermomechanical rolling
rolling process in which the final deformation is carried out in a certain temperature range leading to a material condition with certain properties which cannot be achieved or repeated by heat treatment alone

NOTE 1 Subsequent heating above 580 °C may lower the strength values. If temperatures above 580 °C are needed reference should be made to the supplier.

NOTE 2 Thermomechanical rolling leading to the delivery condition "thermomechanically rolled" can include processes with an increasing cooling rate with or without tempering, including self-tempering but excluding direct quenching or quenching and tempering

3.6
thermomechanically rolled steel
steel obtained by thermomechanical rolling

4 General requirements

4.1 Steelmaking method

Unless otherwise agreed at the time of enquiry and order, the steelmaking method is left to the discretion of the manufacturer.

4.2 Deoxidation process

The steels shall be made to a fine-grain practice.