

INTERNATIONAL STANDARD

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High yield strength flat steel products —

Part 1: General requirements

Produits plats en acier à haute limite d'élasticité

Part 1: Prescriptions générales

Document Preview

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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.

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.

International Standard ISO 4950-1 was prepared by Technical Committee ISO/TC 17, *Steel*, Subcommittee SC 3, *Steels for structural purposes*.

This second edition cancels and replaces the first edition (ISO 4950-1:1981), which has been technically revised.

ISO 4950 consists of the following parts, under the general title *High yield strength flat steel products*:

- *Part 1: General requirements*
- *Part 2: Products supplied in the normalized or controlled rolled condition*
- *Part 3: Products supplied in the heat-treated (quenched + tempered) condition*

High yield strength flat steel products —

Part 1:

General requirements

1 Scope

This part of ISO 4950 specifies the methods of manufacture, the acceptance conditions and the marking of high yield strength flat steel products.

It applies to hot-rolled plates, wide strip in coils of width greater than or equal to 600 mm, and wide flats in high yield strength steels (R_e min. ≥ 355 N/mm²) in the thicknesses and conditions specified in ISO 4950-2 and ISO 4950-3 for use in bolted, rivetted or welded structures¹⁾.

2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this part of ISO 4950. At the time of publication, the editions indicated were valid. All standards are subject to revision, and parties to agreements based on this part of ISO 4950 are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

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

ISO 377-1:1989, *Selection and preparation of samples and test pieces of wrought steel — Part 1: Samples and test pieces for mechanical tests*.

ISO 377-2:1989, *Selection and preparation of samples and test pieces of wrought steel — Part 2: Samples for the determination of the chemical composition*.

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 4950-2:1995, *High yield strength flat steel products — Part 2: Products supplied in the normalized or controlled rolled condition*.

ISO 4950-3:1995, *High yield strength flat steel products — Part 3: Products supplied in the heat-treated (quenched + tempered) condition*.

ISO 6892:1984, *Metallic materials — Tensile testing*.

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

ISO 7452:1984, *Hot-rolled structural steel plates — Tolerances on dimensions and shape*.

ISO 7788:1985, *Steel — Surface finish of hot-rolled plates and wide flats — Delivery requirements*.

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

3 Definitions

For the purposes of this part of ISO 4950, the definitions of the terms "plates", "wide strip" and "wide flat" given in ISO 6929 apply.

4 Manufacture

4.1 Steelmaking method

Unless otherwise agreed at the time of ordering, the steelmaking method is left to the discretion of the manufacturer; however, it shall be stated to the purchaser on request at the time of delivery.

1) For precautions to be taken when welding, the guide for the welding and weldability of C-Mn and C-Mn micro-alloy steels published by Sub-commission IX-G of the International Institute of Welding (Document ISS/IIW 843-87) may be helpful.

4.2 Weldability

Unlike low-carbon steels, these steels may necessitate special precautions when welding. [See in particular the guide for the welding and weldability of C-Mn and C-Mn micro-alloy steels published by Subcommittee IX-G of the International Institute of Welding (Document IIS/IIW 843-87).]

4.3 Surface appearance — Defects

4.3.1 Surface appearance

The products shall have a smooth surface corresponding to the rolling process used; they shall not show any defects which may prejudice processing or their appropriate application.

4.3.2 Removal of defects

The requirements of ISO 7788 shall be complied with. However, in the case of the products specified in ISO 4950-3, the prior agreement of the user is required.

4.4 Tolerances on dimensions

The requirements of ISO 7452 shall be complied with.

5 Inspection and testing

5.1 General

The products covered by this part of ISO 4950 may be the subject of an inspection and testing in accordance with the conditions specified in clause 8 of ISO 404:1992 relating to the chemical composition and mechanical properties of the product. Verification of the chemical composition of the product is only carried out if this is agreed and stated in the order.

If inspection and testing is specified in the order, it shall be carried out in accordance with 5.2 to 6.5.

5.2 Test unit

5.2.1 Products shall be tested separately for each cast and heat-treatment condition. The test unit shall be 50 t or part thereof. However, by agreement at the time of ordering, the test unit may be the parent sheet or coil.

5.2.2 For each test unit and thickness range according to tables 3 of ISO 4950-2:1995 and ISO 4950-3:1995, a series of tests shall be carried out comprising

- one tensile test (or more, in accordance with 5.2.4.1 in the case of products of thickness up to and including 16 mm);
- one set of three impact tests at the temperatures specified in tables 3 of ISO 4950-2:1995 and ISO 4950-3:1995. Verification at other temperatures may be agreed upon at the time of ordering (see annex A of ISO 4950-2:1995);

and, if specified on the order,

- one product analysis.

5.2.3 The purchaser or his representative may be present at the time of selection of the sample products from which samples shall be taken for verification of the properties (see ISO 404).

5.2.4 Unless otherwise stated by the purchaser, the procedure shall be as follows:

5.2.4.1 Tensile test

A sample shall be taken for each specified thickness range with the additional requirement that, for the thickness range $e \leq 16$ mm, the maximum thickness of the products of the batch shall be not greater than twice the minimum thickness.

5.2.4.2 Impact test

A sample shall be taken from each thickness range.

5.3 Position and orientation of test samples (see ISO 377-1)

Test samples shall be taken midway between the axis in the direction of rolling and the edge of the rolled product.

5.3.1 Tensile test pieces

The axis of the tensile test pieces shall be perpendicular to the direction of rolling, except for wide flats with a width of 600 mm or less, for which it shall be parallel to the direction of rolling.

5.3.2 Impact test pieces

In accordance with the requirements of the order, the axis of the impact test pieces shall be either parallel or