SLOVENSKI STANDARD
SIST EN 10149-1:1997

01-december-1997

Vroče valjani ploščati izdelki iz jekel z veliko napetostjo tečenja za preoblikovanje v hladnem - 1. del: Splošni dobavni pogoji

Hot-rolled flat products made of high yield strength steels for cold forming - Part 1: General delivery conditions

Warmgewalzte Flacherzeugnisse aus Stählen mit hoher Streckgrenze zum Kaltumformen - Teil 1: Allgemeine Lieferbedingungen

Produits plats laminés a chaud en aciers a haute limite d'élasticité pour formage a froid - Partie 1: Conditions générales de livraison

Ta slovenski standard je istoveten z: **EN 10149-1:1995**

ICS:

77.140.10	Jekla za toplotno obdelavo	Heat-treatable steels
77.140.50	Ploščati jekleni izdelki in polizdelki	Flat steel products and semi-products

SIST EN 10149-1:1997 **en**

EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 10149-1

September 1995

ICS 77.140.10; 77.140.50

Descriptors: iron and steel products, hot rolled products, alloy steels, high yield strength steels, cold-working, metal rolling, designation, classifications, grades:quality, chemical composition, delivery condition, mechanical properties, inspection, tests, marking

English version

Hot-rolled flat products made of high yield strength steels for cold forming - Part 1: General delivery conditions

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This European Standard was approved by CEN on 1995-08-06. CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CEN member.

The European Standards exist in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Central Secretariat has the same status as the official versions.

CEN members are the national standards bodies of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CEN

European Committee for Standardization
Comité Européen de Normalisation
Europäisches Komitee für Normung

Central Secretariat: rue de Stassart,36 B-1050 Brussels

Contents

Foreword

This European Standard was prepared by the Technical Committe ECISS/TC 10 "Structural steels - Qualities" of which the secretariat is held by NNI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by March 1996, and conflicting national standards shall be withdrawn at the latest by March 1996.

According to the CEN/CENELEC Internal Regulations, the following countries are bound to implement this European Standard: Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland, United Kingdom.

1 Scope

1.1 This European Standard specifies requirements for flat products made of weldable, hot-rolled, high yield strength alloy quality and special steels for cold forming.
Part 1 of this European Standard specifies the general delivery conditions.
Part 2 of this European Standard specifies the delivery conditions for thermomechanically rolled steels in the grades given in table 1 (chemical composition) and table 2 (mechanical properties) of Part 2.
Part 3 of this European Standard specifies the delivery conditions for normalized or normalized rolled steels in the grades given in table 1 (chemical composition) and table 2 (mechanical properties) of Part 3.

The steels specified in Part 2 and 3 of this European Standard are applicable to hot-rolled flat products in the thickness range of 1,5 mm to 20 mm for the steels with $R_{eH} \leq 460$ N/mm² and 1,5 mm to 16 mm for the steels with higher minimum yield strength.

1.2 This European Standard does not apply to products for pressure vessels and products for which other EURONORMS exist or European Standards dealing with steels for general structural applications are being prepared:

- Hot-rolled products of non-alloy structural steels - (see EN 10025).
- Semi-finished products for forging in general purpose structural steel - (see EURONORM 30).
- Weldable fine grain structural steels - (see EN 10113 Parts 1 - 3).
- Plates and wide flats made of high yield strength structural steels in the quenched and tempered or precipitation hardened condition - (see EN 10137 Parts 1 - 3).
- Structural steels with improved atmospheric corrosion resistance - (see EN 10155).
- Steels for shipbuilding - normal and high strength qualities - (see EURONORM 156).
- Hot finished structural hollow sections (see EN 10210-1).

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

2.1 General standards

EN 10020	Definition and classification of grades of steels
EN 10021	General technical delivery requirements for steel and iron products
EN 10027-1	Designation systems for steel - Part 1: Steel

		names principal symbols
EN 10027-2		Designation systems for steel - Part 2: Numerical system
EN 10052		Vocabulary of heat treatment terms for ferrous products
EN 10079		Definitions of steel products
EN 10163		Delivery requirements for surface condition of hot-rolled steel plates, wide flats and sections - Part 1: General requirements; Part 2: Plates and wide flats
EN 10164		Steel products with improved deformation properties perpendicular to the surface of the product - Technical delivery conditions
EN 10204		Metallic products - Types of inspection documents
EURONORM 162	(1981) [1])	Cold-rolled sections - Technical conditions of delivery
EURONORM 168	(1986) [1])	Iron and steel products - Inspection documents - Contents
ECSC IC 2	(1983) [1])	Weldable fine-grained structural steels - Recommendations for processing, in particular for welding
ECISS IC 10		Designation systems for steel - Additional symbols for steel names

2.2 Standards on dimensions and tolerances

EN 10029		Hot-rolled plates 3 mm thick or above - Tolerances on dimensions, shape and mass
EN 10048		Hot-rolled narrow steel strip - Tolerances on dimensions and shape
EN 10051		Continuously hot-rolled non-coated sheet and strip of non-alloy and alloy steels - Tolerances on dimensions and shape
EURONORM 91	(1981) [1])	Hot-rolled wide flats - Tolerances on dimensions, shape and mass

2.3 Standards on testing

EN 10002-1		Metallic materials - Tensile testing - Part 1: Method of test (at ambient temperature)
EN 10045-1		Metallic materials - Charpy impact test - Part 1: Test method
EURONORM 6	(1955) [1])	Bend test on steel
EURONORM 12	(1955) [1])	Bend test on steel sheet and strip with a thickness less than 3 mm
EURONORM 18	(1979) [1])	Selection and preparation of samples and test pieces for steel and iron and steel products

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1) Until these EURONORMS are transformed into European Standards, they can either be implemented or reference made to the corresponding national standards, the list of which is given in Annex A to this European Standard.

EURONORM 103	(1971) [1])	Microscopic determination of the ferritic and austenitic grain size of steel
EURONORM 160	(1985) [1])	Manual ultrasonic testing of plate in thickness ≥ 6 mm (reflection method)
ISO 2566-1	(1984)	Steel - Conversion of elongation values - Part 1: Carbon and low alloy steels

3 Definitions

For the purposes of this European Standard the following definitions apply.

3.1 Alloy quality and special steel as defined in EN 10020.

3.2 Flat products (plate, sheet, narrow strip, wide strip and wide flats) as defined in EN 10079.

3.3 Heat treatment terms as defined in EN 10052.

3.4 **Fine grained steels:** steels with fine grain structure with an equivalent index of ferritic grain size ≥ 6 determined in accordance with EURONORM 103.

3.5 **Thermomechanical rolling:** a 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.
The abbreviated form of this delivery condition is M.

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

NOTE 2: Thermomechanical rolling leading to the delivery condition M can include processes with an increased cooling rate with or without tempering including self-tempering but excluding direct quenching and quenching and tempering.

3.6 **Normalizing rolling:** a 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.
The abbreviated form of this delivery condition is N.

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1) Until these EURONORMS are transformed into European Standards, they can either be implemented or reference made to the corresponding national standards, the list of which is given in Annex A to this European Standard.

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.

4 Information to be supplied by the purchaser

4.1 General

The following information shall be supplied by the purchaser at the time of the enquiry and order:

a) details of the product form and quantity;

b) reference to this European Standard;

c) nominal dimensions and tolerances (see 5.1);

d) the grade and delivery condition of the steel (see Parts 2 and 3 of this European Standard);

e) type of inspection document (see 8.8).

Where no specific choice is made by the purchaser concerning a), b), c), d) and e) the supplier shall refer back to the purchaser.

4.2 Options

A number of options is specified in clause 11. In the event that the purchaser does not indicate his wish to implement any of these options, the supplier shall supply in accordance with the basic specification.

5 Dimensions, mass and tolerances

5.1 Dimensions and tolerances

Dimensions and tolerances shall be in accordance with the relevant European Standards and EURONORMS (see 2.2).

5.2 Mass of steel

The calculated mass shall be determined using a volumetric mass of 7,85 kg/dm^3.

6 Classification and designation

6.1 Classification

6.1.1 Classification

Classification shall be in accordance with Parts 2 and 3 of this European Standard which specify steel grades that are alloy quality steels or alloy special steels according to EN 10020.

6.1.2 Grades

The steels for flat products specified in Parts 2 and 3 of this European Standard are subdivided into grades on the basis of the minimum specified yield strength at ambient temperature.

6.2 Designation

6.2.1 For the steel grades covered by this European Standard the steel names are allocated in accordance with EN 10027-1 and ECISS IC 10; the steel numbers are allocated in accordance with EN 10027-2.

6.2.2 The designation shall consist of the number of this European Standard (EN 10149-2 or EN 10149-3) followed either by the steel number or:

- the symbol S;
- the indication of the minimum specified yield strength expressed in N/mm²;
- the symbol for the delivery condition (M or N) (see Parts 2 and 3 of this European Standard);
- the capital letter C indicating the steel is suitable for cold forming (see Parts 2 and 3 of this European Standard).

EXAMPLE 1: Thermomechanically rolled (M) structural steels (S) with a specified minimum yield strength at ambient temperature of 420 N/mm² (420) suitable for cold forming (C):

Steel EN 10149-2 - 1.0980
or
Steel EN 10149-2 - S420MC

EXAMPLE 2: Structural steels (S) with a specified minimum yield strength at ambient temperature of 420 N/mm² (420) in the normalized or normalized rolled condition (N) suitable for cold forming (C):

Steel EN 10149-3 - 1.0981
or
Steel EN 10149-3 - S420NC

7 Technical requirements

7.1 Steel manufacturing process

7.1.1 The steel manufacturing process shall be at the manufacturer's option. If specified at the time of the enquiry and order the steel manufacturing process shall be reported to the purchaser.
See clause 11, option 1.

7.1.2 The steels specified in this European Standard shall be fully killed. The steels shall have a fine grain structure containing nitrogen binding elements in amounts sufficient to bind the available nitrogen.

7.2 Delivery condition

7.2.1 Thermomechanically rolled steel

The products described in Part 2 of this European Standard are obtained by thermomechanical rolling.

7.2.2 Normalized or normalized rolled steel

The products described in Part 3 of this European Standard are delivered in the normalized or normalized rolled condition.

7.2.3 Surface protection

Unless otherwise agreed at the time of the enquiry and order the products are generally supplied with their surfaces as rolled. If agreed at the time of the enquiry and order the products may be delivered with descaled surfaces. However, it is necessary to take into account the fact that certain descaling processes are liable to modify the cold forming properties.
See clause 11, option 2.

The descaled products are normally supplied oiled. In this case their two faces shall be coated with a uniform layer of neutral, non-drying oil, free from foreign matters, so that under dry conditions of packaging, transportation, handling and storing, the products can be protected from corrosion for at least three months.
When descaled products are supplied oiled, the oil coating shall be removable using alkaline solutions or any other usual solvent.

The type of oil shall be left to the discretion of the manufacturer, unless otherwise agreed.

If transportation or storage conditions are such that special corrosion protection is required, the purchaser shall inform the manufacturer at the time of the enquiry and order.

If the purchaser does not require surface oiling, he shall clearly state so at the time of the enquiry and order.

NOTE : When products are ordered in the unoiled condition