SLOVENSKI STANDARD
SIST EN 10025:1996

01-avgust-1996

Vroče valjani izdelki iz nelegiranih konstrukcijskih jekel - Tehnični dobavni pogoji (vključuje dopolnilo A1:1993)

Hot rolled products of non-alloy structural steels - Technical delivery conditions (Includes amendment A1:1993)

Warmgewalzte Erzeugnisse aus unlegierten Baustählen - Technische Lieferbedingungen (enthält Änderung A1:1993)

Produits laminés a chaud en aciers de construction non alliés - Conditions techniques de livraison (inclut l'amendement A1:1993)

Ta slovenski standard je istoveten z: **EN 10025:1990/A1:1993**

ICS:

77.140.10	Jekla za toplotno obdelavo	Heat-treatable steels
77.140.45	Nelegirana jekla	Non-alloyed steels

SIST EN 10025:1996 **en**

EUROPEAN STANDARD

NORME EUROPEENNE

EUROPÄISCHE NORM

EN 10 025

March 1990

UDC 669.14.018.25-4:620.1

Key words: Iron and steel products, structural steels, non-alloy steel, hot rolled products, quality classes, designation, specification, chemical composition, mechanical property, mechanical test, inspection, marking

English version

Hot rolled products of non-alloy structural steels: Technical delivery conditions

Produits laminés à chaud en aciers de construction non alliés - Conditions techniques de livraison

Warmgewalzte Erzeugnisse aus unlegierten Baustählen - Technische Lieferbedingungen

This European Standard was accepted by CEN on 1990-03-30.
CEN members are bound to comply with the requirements of the CEN/CENELEC Common Rules 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 CEN Central Secretariat or to any CEN member.

This European Standard exists 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 CEN Central Secretariat has the same status as the official versions.

CEN members are the national standards organizations 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 Bréderode 2, B-1000 Brussels

Brief history

This European Standard has been drawn up by ECISS/TC 10 "Structural steel -- qualities" whose Secretariat is held by NNI.

This document was originally drawn up as a draft Euronorm under the European Coal and Steel Community. With the formation of ECISS and the establishment of the ECISS work programme TC 10 was asked to prepare this document for eventual publication as a European Standard.

This European Standard replaces EURONORM 25-72 "Structural steels for general application".

It has been submitted to the CEN Formal Vote on 1989-11-08.

It has been adopted and ratified by CEN/BT on 1990-03-30.

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

Contents

1 Object and field of application

1.1 This European Standard specifies requirements for long products and flat products of hot rolled non-alloy, base and quality steels in the grades and qualities given in tables 2 and 3 (chemical composition) and 4 and 5 (mechanical properties) in the usual delivery condition as given in 7.2.

The steels specified in this European Standard are intended for use in welded, bolted and riveted structures, for service at ambient temperatures (subject to the restrictions described in 7.5.1).
They are not intended to be heat treated except products delivered in the delivery condition N. Stress relief annealing is permitted. Products delivered in N condition may be normalized and hot formed after delivery (see clause 3).

NOTE 1: Semi-finished products which are to be converted to rolled finished products conforming to this European Standard should be the subject of special agreement at the time of the enquiry and order. The chemical composition can also be agreed at the time of enquiry and order, however the values should be within the limits of table 2.

NOTE 2: For certain grades and product forms suitability for particular applications may be specified at the time of the enquiry and order (see 7.5.3, 7.5.4 and table 6).

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

- Semi-finished products for forging in general purpose structural steel -(see EURONORM 30).
- Weldable fine grain structural steel -(see EURONORM 113).
- Weathering steels for structural purposes - (see EURONORM 155).
- Plates and wide flats made of weldable fine-grained structural steels in the quenched and tempered condition - (see EURONORM 137).
- Flat products in high yield strength steels for cold forming - wide flats, sheet/plate, wide and narrow strip - (see EURONORM 149).
- Steels for shipbuilding - normal and high strength qualities - (see EURONORM 156).
- Hollow sections (EN 10 xxx in preparation).

2 References

2.1 General standards

EN 10 020	(1989)	Definition and classification of grades of steels

EURONORM 21	(1978) [1]	General technical delivery requirements for steel and iron and steel products
EURONORM 27	(1974) [1]	Designation of steel
EURONORM 52	(1983) [1]	Vocabulary of heat treatment terms for ferrous products
EURONORM 79	(1982) [1]	Definition and classification of steel products by shape and dimensions
EURONORM 162	(1981) [1]	Cold-rolled sections -- Technical conditions of delivery
EURONORM 163	(1983) [1][2]	Delivery condition for surface finish of hot rolled plates and wide flats
EURONORM 168	(1986) [1]	Iron and steel products -- Inspection documents -- Contents
Information Circular n°2	(1983) [1]	Weldable fine-grained structural steels -- Recommendations for processing, in particular for welding

2.2 Standards on dimensions and tolerances

EURONORM 17	(1970) [1]	Non-alloy base steel wire rod for cold drawing -- Dimensions and tolerances
EURONORM 19	(1957) [1]	IPE beams: parallel-flanged beams
EURONORM 24	(1962) [1]	Standard beams and channel sections - Tolerances
EURONORM 29	(1981) [1]	Hot-rolled plates 3 mm thick or above - Tolerances on dimensions, shape and mass
EURONORM 34	(1962) [1]	Hot-rolled wide-flanged beams with parallel faces - Tolerances
EURONORM 44	(1963) [1]	Hot-rolled IPE beams - Tolerances
EURONORM 48	(1984) [1]	Specification for hot-rolled narrow steel strip -Tolerances on dimensions, shape and mass
EURONORM 51	(1982) [1]	Continuously hot-rolled non-coated sheet/plate and strip of non-alloyed and alloyed steel with specified minimum yield strength - Tolerances on dimensions and shape
EURONORM 53	(1962) [1]	Wide-flanged beams with parallel flanges
EURONORM 54	(1980) [1]	Small hot-rolled steel channels
EURONORM 55	(1980) [1]	Hot-rolled equal flange tees with radiused root and toes in steel
EURONORM 56	(1977) [1]	Hot-rolled equal angles (with radiused root and toes)
EURONORM 57	(1978) [1]	Hot-rolled unequal angles (with radiused root and toes)
EURONORM 58	(1978) [1]	Hot-rolled flats for general purposes
EURONORM 59	(1978) [1]	Hot-rolled square bars for general purposes
EURONORM 60	(1977) [1]	Hot-rolled round bars for general purposes

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 B to this European Standard.

2) EN 10 163 in preparation will include also long products.

EURONORM 61	(1982) [1]	Hot-rolled steel hexagons
EURONORM 65	(1980) [1]	Hot-rolled round steel bars for screws and rivets
EURONORM 66	(1967) [1]	Hot-rolled half-rounds and flattened half-rounds
EURONORM 67	(1978) [1]	Hot-rolled bulb flats
EURONORM 91	(1981) [1]	Hot-rolled wide flats - Tolerances on dimensions, shape and mass

2.3 Standards on testing

EN 10 002-1	(1989)	Metallic materials -- Tensile testing. part 1: method of test (at ambient temperature)
EN 10 045-1	(1989)	Metallic materials -- Charpy impact test. part 1: test method
EURONORM 18	(1979) [1]	Selection and preparation of samples and test pieces for steel and iron and steel products
EURONORM 103	(1971) [1]	Microscopic determination of the ferritic and austenitic grain size of steel
EURONORM 164	(1983) [1]	Steel flat products with specified through thickness properties -- Technical conditions of delivery
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:

-- non-alloy base and quality steel as defined in EN 10 020;
-- heat treatment terms as defined in EURONORM 52;
-- long products, flat products (plate, sheet, narrow strip, wide strip and wide flats) and semi-finished products as defined in EURONORM 79;
-- normalizing rolling is 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 designation of this condition of delivery and of the normalized condition is N.

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.

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 B to this European Standard.

4 Information to be supplied by the purchaser

4.1 General

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

a. details of the product form, dimensions and quantity;

b. the grade and quality of steel (see tables 2 and 4);

c. whether products have to be submitted to inspection and testing and if inspection and testing is required which type of inspection and which inspection document is required (see 8.1.2);

d. whether the verification of the mechanical properties for the qualities B and 2 has to be carried out by lot or by cast (see 8.3.1).

Where no specific choice is made by the purchaser concerning point a and b the supplier shall refer back to the purchaser.

4.2 Options

A number of options are 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

See the EURONORMS listed in 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 of qualities; designation

6.1 Classification of qualities

This European Standard specifies six qualities: O, B, C, D, DD and 2.

Products of quality D and DD are subdivided into two qualities D1, D2, DD1 and DD2 (see 7.2). Steels of qualities O, 2 and B are base steels, unless a suitability for cold forming is specified.

Steels of qualities C, D1, D2, DD1 and DD2 are quality steels.

The qualities differ in weldability and specified impact values (see also 7.5.1).

6.2 Designation

6.2.1 The designation of the steels is as specified in EURONORM 27 (1974).

NOTE 1: For a list of corresponding former national designations see Annex C, table 10.

NOTE 2: In this European Standard the old designation from EURONORM 25 (1972) based on tensile strength is used. This is done because at the time of publication of this European Standard the transformation of EURONORM 27 (1974) into a European Standard was not completed.

6.2.2 The designation consists of:
-- The number of this European Standard.
-- The symbol Fe.
-- The indication of the minimum specified tensile strength for thicknesses < 3 mm expressed in N/mm².
-- The quality designation (see 6.1) in respect to the weldability and specified impact values.
-- If applicable (for Fe 360 B), a letter combination for the deoxidation method (FU or FN) (see 7.1.3).
-- If applicable, the letter combination for the suitability for the particular application (see table 6).
-- If applicable, the letter N when the products shall be delivered in the condition N (see clause 3). (Not necessary for flat products of qualities D1 and DD1.)

Example: Steel EN 10 025 Fe 510 C KQ

7 Technical requirements

7.1 Steel manufacturing process

7.1.1 The steel manufacturing process shall be at the manufacturers option. If specified at the time of the enquiry and order the steel manufacturing process shall be reported to the purchaser, with the exception of steel Fe 310-0.
Option 1.

For qualities C, D1, D2, DD1 and DD2 a specific steel manufacturing process may be agreed at the time of the enquiry and order.
Option 2.

7.1.2 The method of deoxidation shall be as given in table 2. For steel Fe 360 B the purchaser may specify the method of deoxidation at the time of the enquiry and order. Option 3.

7.1.3 The deoxidation methods are designated as follows:

Optional	Method at the manufacturers option
FU	Rimming steel
FN	Rimming steel not permitted
FF	Fully killed steel containing nitrogen binding elements in amounts sufficient to bind the available nitrogen (for example min. 0,020 % Al). If other elements are used they shall be reported in the inspection document.

7.2 Delivery conditions

7.2.1 General

If an inspection document is required (see 8.1.2) and products are ordered and delivered in the condition N this shall be indicated in the document.

7.2.2 Flat products

7.2.2.1 Unless otherwise agreed flat products of qualities 0, 2, B and C shall be supplied in a delivery condition at the manufacturers discretion (see 7.4.1). Option 15.

7.2.2.2 Flat products of quality D1 and DD1 shall be supplied normalized or in an equivalent condition obtained by normalizing rolling as defined in clause 3.

7.2.2.3 Flat products of quality D2 and DD2 shall be supplied in a delivery condition at the manufacturers discretion.

7.2.3 Long products

7.2.3.1 Unless otherwise agreed long products of the qualities 0, 2, B, C, D1 and DD1 shall be supplied in a delivery condition at the manufacturers discretion. Option 20.

7.2.3.2 Long products of quality D2 and DD2 shall be supplied in a delivery condition at the manufacturers discretion.

7.2.4 The delivery conditions are summarized in table 1.

Table 1 -- Delivery conditions.

Delivery condition	Quality						Indication in the inspection document
	0	2	B	C	D1 DD1	D2 DD2	
Flat products							
Optional	x	x	x	x	-	-	N 1)
Optional	-	-	-	-	-	x	-
Normalized or normalized rolled	-	-	-	-	x	-	-
Long products							
Optional	x	x	x	x	x	-	N 1)
Optional	-	-	-	-	-	x	-
1) Only if ordered and delivered in the condition N.							

7.3 Chemical composition

7.3.1 The chemical composition determined by ladle analysis shall comply with the values of table 2.

The upper limits applicable for the product analysis are given in table 3.

7.3.2 For the steels Fe 360 B, C, D1 and D2 and Fe 510 C, D1, D2, DD1 and DD2 the following additional chemical requirement may be agreed at the time of the enquiry and order:
-- Copper-content between 0,25 and 0,40 %.
Option 4.

7.3.3 For the steels Fe 510 C, D1, D2, DD1 and DD2 the following additional requirements can be agreed at the time of the enquiry and order:

7.3.3.1 -- the recording in the inspection documents of the Cr, Cu, Mo, Nb Ni, Ti and V content (ladle analysis);
-- a maximum content of 0,18 % C ladle analysis or 0,20 % C product analysis for thicknesses ≤ 30 mm if the products contain more than 0,02 % Nb or 0,02 % Ti or 0,03 % V ladle analysis or 0,03 % Nb or 0,04 % Ti or 0,05 % V product analysis;
Option 5a.

7.3.3.2 -- a carbon equivalent value to be determined using the following formula:

$$CEV = C + \frac{Mn}{6} + \frac{Cr + Mo + V}{5} + \frac{Ni + Cu}{15}$$