



SLOVENSKI STANDARD

SIST EN 10079:1995

01-december-1995

Definicije jeklenih izdelkov

Definition of steel products

Begriffsbestimmungen für Stahlerzeugnisse

Définition des produits en acier

Ta slovenski standard je istoveten z: EN 10079:1992

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ICS:

01.040.77	Metalurgija (Slovarji)	Metallurgy (Vocabularies)
77.140.01	Železni in jekleni izdelki na splošno	Iron and steel products in general

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UDC 669.14-4:001.4

Descriptors: Iron and steel products, steel products, definitions

English version

Definition of steel products

Définition des produits en acier

Begriffsbestimmungen für Stahlerzeugnisse

This European Standard was approved by CEN on 1992-09-25. 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.

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CEN

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

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

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Foreword

This European Standard was prepared by the ECISS Technical Committee 6B (ECISS/TC 6B) "Definition and classification of steel products", the Secretariat of which is held by the "Association Française de Normalisation (AFNOR)".

This European Standard was established on the basis of the following documents :

- EURONORM 79:1982 "Definition and classification of steel products by shape and dimension"
- SIO 6929:1987 "Steel products - Definition and classification"

Given the various classification systems existing in Europe, eg the Customs Cooperation Council and that in EURONORM 79:1982 it was agreed by ECISS/TC 6B at its 3rd and 4th meetings that this European Standard should deal only with definitions for steel products and abandon the concept of classification. It is for each organisation, eg statistics, customs, to organise their own classifications according to their specific requirements.

This European Standard was approved by CEN on 1991-11-21.

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 and United Kingdom.

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1 Scope

This European Standard defines steel products according to:

- a) their shape and dimensions
- b) their appearance and surface condition.

Note 1: Although the products are generally defined independently of their end uses or manufacturing processes, it has been necessary sometimes to make reference to these criteria.

Note 2: All dimensions given in this European Standard are nominal.

Note 3: Annex C indicates the definition procedures of the ECSC Treaty and the Statistical Office of the European Communities and of the Harmonised Commodity Description and Coding System.

2 Normative references

See annexes A and B.

3 Liquid steel ¹

Steel in the liquid state ready for pouring and obtained from the melting of raw materials.

Note: A distinction is made between:

- liquid steel for pouring into ingot moulds or for continuous casting
- liquid steel for castings.

4 Ingots and semi finished products ²

4.1 Ingots

Products obtained by pouring liquid steel into moulds of a shape appropriate to the subsequent processing ³ into semi finished products, or flat or long products, generally by hot rolling or forging. The shape generally resembles a truncated pyramid or truncated cone; the side surfaces may be corrugated and the corners more or less rounded. Depending on subsequent conversion requirements, ingots may be dressed and/or hot scarfed or cropped without altering their status as 'ingots'.

According to the cross section a distinction is made between the following.

4.1.1

Ingots having a cross section which may be square, rectangular (of width up to twice the thickness), polygonal, round, oval or shaped according to the profile to be rolled.

4.1.2

Slab ingots of rectangular cross section of width twice the thickness or over.

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- 1) See annex C.1.1
 - 2) See annex C.1.2 and C.1.3
 - 3) In the case of ingots remelted by the vacuum arc or electroslag process, the products are obtained by melting, in a mould of appropriate shape, steel electrodes that have been previously cast, forged or rolled

4.2 Semi finished products ⁴

Products obtained by:

- continuous casting which may or may not be followed by rolling, forging or cutting
- pressure casting
- rolling, forging or cutting of ingots

and generally intended for conversion into flat or long products by hot rolling or forging, or for the manufacture of forgings.

The cross sections may be of various shapes (see 4.2.1 to 4.2.5); the cross sectional dimensions are constant along the length with wider tolerances than those of the corresponding flat or long products and side corners more or less rounded.

The side surfaces are sometimes slightly convex or concave, retaining rolling, forging or continuous casting marks and may be partly or totally dressed to remove surface defects, eg by cutting tool, torch or grinding.

Note: Semi finished products are defined in 4.2.1 to 4.2.5 according to shape, cross sectional dimensions and use.

4.2.1 Semi finished products of square cross section

Semi finished products with sides of 50mm or over.

Note: This dimension may be less for certain types of high alloy steels, eg high speed steels.

4.2.2 Semi finished products of rectangular cross section

Semi finished products of cross section area 2500mm² or over of width up to twice the thickness.

4.2.3 Flat semi finished products

Products of thickness generally 50mm or over of width twice the thickness or over.

4.2.4 Round semi finished products ⁵

Continuously cast or forged semi finished products of circular cross section.

4.2.5 Blanks for sections

Blanks for sections are semi finished products intended for the manufacture of sections which have been preformed for that purpose. The cross section area is generally over 2500mm².

Note: In many countries the long products in question are obtained by rolling semi finished products of square or rectangular cross section.

5 Flat Products

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5.1 Definition

Products having almost rectangular cross sections, the width being much greater than the thickness. The surfaces are generally smooth except for certain products, eg floor plates, which show regular raised or indented surface patterns.

4) See annex C.1.4 and C.2.1

5) See annex C.1.3 and C.2.1.2

5.2 Uncoated flat products

Flat products without any coating or surface treatment.

Note: Flat products which have received a simple coating for the purpose of protection from corrosion or mechanical damage, eg passivation, organic coatings, paper, oil, lacquer etc are defined as uncoated flat products.

5.2.1 Hot rolled uncoated flat products

Flat products manufactured by hot rolling semi finished products, more rarely by hot rolling ingots.

Note: Hot rolled flat products include those which have been given a very light cold rolling pass, normally less than 5% reduction, known as a 'skin pass' or 'dressing pass'.

5.2.1.1 Wide flat

Flat product of width over 150mm up to and including 1250mm and thickness generally over 4mm, always supplied in lengths, ie not coiled. A special requirement is that the edges are square; the wide flat is hot rolled on the four sides (or in box passes).

Note: EURONORM 91:81 defines wide flats by reference to shape tolerances and so includes products which comply with these tolerances made by flame cutting wider flat products.

5.2.1.2 Plate and sheet ⁶

Flat rolled product, the edges being allowed to deform freely, supplied flat and generally in square or rectangular shapes with a width of 600mm or over; but also in any other shape, eg circular or according to a design sketch. The edges may be as rolled or sheared, flame cut or chamfered. The product may also be delivered pre-curved.

According to thickness, hot rolled plate and sheet are defined as:

- sheet: thickness up to 3mm
- plate: thickness 3mm or over

Plate and sheet may be produced:

- a) directly on a reversing mill, or by cutting from a parent plate rolled on a reversing mill
- b) by cutting from hot rolled wide strip.

Note: Plate produced on a reversing mill is generally known as quarto plate.
Plate and sheet cut from hot rolled wide strip is generally known as hot rolled sheet or plate.

5.2.1.3 Strip

Hot rolled flat product which immediately after the final rolling pass or after pickling or continuous annealing, is wound into a regular coil.

As rolled, strip has slightly convex edges, but may also be supplied with sheared edges or slit from wider strip.

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6) See annex C.2.2

Hot rolled strip is further defined as:

- a) hot rolled wide strip: width 600mm or over
- b) hot rolled slit wide strip: rolling width 600mm or over, slit to widths up to 600mm before supply
- c) hot rolled narrow strip: rolling width up to 600mm.

After decoiling and transverse cutting hot rolled strip may be supplied as cut lengths.

5.2.2 Cold rolled uncoated flat products ⁷

Uncoated flat products which have undergone a reduction in cross-section of 25% or over by cold rolling. For flat products of rolling width up to 600mm and for certain qualities of special steel, levels of reduction of cross-section less than 25% may be included.

These products are further defined as follows.

5.2.2.1 Plate and sheet

Cold rolled flat product, the edges being allowed to deform freely, supplied flat and generally in square or rectangular shapes with a width of 600mm or over, but also in any other shape, for example, circular or according to a design sketch; the edges may be as rolled or sheared, flame cut or chamfered.

5.2.2.2 Strip

Cold rolled flat product which immediately after the final rolling pass, or after pickling or continuous annealing, is wound into a regular coil. As rolled, strip has slightly convex edges, but may also be supplied with sheared edges or slit from wider strip.

Cold rolled strip is further defined as:

- a) cold rolled wide strip: width 600mm or over
- b) cold rolled slit wide strip: rolling width 600mm or over, slit to widths up to 600mm before supply
- c) cold rolled narrow strip: rolling width up to 600mm.

After decoiling and cutting to length cold rolled strip may be supplied as cut lengths.

5.3 Electrical steels ⁸

Electrical steels are characterised by their magnetic properties and are intended for the manufacture of electrical circuits. They are supplied in the form of cold rolled sheet or strip, generally less than 2mm thick and of width up to and including 1500mm.

Note: There are also certain hot rolled flat products in thicknesses of 1.5mm up to 5mm with specified mechanical and magnetic properties.

Electrical steels are defined by the following specified principal magnetic properties:

- a) specific total loss in W/kg at a specified level of peak magnetic flux density, T and frequency Hz
- b) peak magnetic flux density, T at a specified level of peak magnetic field strength A/m and frequency Hz.

7) See annex C.1.5

8) See annex C.1.6

Electrical steels are further defined as follows.

5.3.1 Non oriented grain electrical steels

Non alloy steels and steels alloyed with silicon or silicon and aluminium which are essentially isotropic in their magnetic properties; ie the magnetic properties are similar both in the direction of rolling and in the transverse direction.

They may be supplied:

- a) in the semi processed state with the required specific total loss achieved after the material has been annealed by the user according to a reference heat treatment
- b) in the finally annealed state, when the product may be supplied uncoated or with an insulating coating on one or both surfaces.

5.3.2 Grain oriented electrical steels

Steels alloyed with silicon which are anisotropic in that they possess a metallurgical structure which gives preferential magnetic properties in the direction of rolling. These steels are supplied with an insulating coating on both surfaces.

5.4 Tin mill and allied products for packaging^{9 10 11}

5.4.1 Blackplate¹²

Non alloy, low carbon steel supplied in strip or sheet form which has been single or double cold reduced.

Single reduced blackplate is supplied in thicknesses from 0.17mm up to and including 0.49mm, double reduced blackplate in thicknesses from 0.14mm up to and including 0.29mm.

Note: Blackplate is normally used to manufacture tinplate or ECCS, but in certain packaging applications it may be used as such. In such cases the product must be suitable for varnishing (lacquering) or printing.

5.4.2 Tinplate

Non alloy, low carbon steel supplied in strip or sheet form which has been single or double cold reduced, coated on both surfaces with tin in a continuous electrolytic process.

Single reduced tinplate is supplied in thicknesses from 0.17mm up to and including 0.49mm, double reduced tinplate in thicknesses from 0.14mm up to and including 0.29mm. Tinplate is supplied normally with a passivation treatment and a protective coating of oil and is suitable for varnishing (lacquering) or printing.

Note: Tinplate may also be obtained by hot dipping in a bath of molten tin.

5.4.3 Tinned sheet and strip

Non alloy, low carbon steel supplied in strip or sheet form of a thickness of 0.50mm or over and tin coated on both surfaces.

9) See annex C.1.6

10) These products may have other uses than for packaging

11) See annex C.2.3

12) See annex C.2.4

5.4.4 Electrolytic chromium/chromium oxide coated steel (ECCS)

Non alloy, low carbon steel supplied in strip or sheet form which may have been single or double cold reduced; coated on both surfaces by a cathodic process with a duplex film of metallic chromium adjacent to the steel substrate with an outer layer of hydrated chromium oxide or hydroxide.

Single reduced ECCS is supplied in thicknesses from 0.17mm up to and including 0.49mm, double reduced ECCS in thicknesses from 0.14mm up to and including 0.29mm. ECCS is supplied normally with a protective coating of oil and is suitable for varnishing (lacquering) or printing.

5.5 Coated hot or cold rolled flat products¹³

Hot or cold rolled products with a permanent coating other than those defined in 5.2, 5.3 or 5.4 whether:

- a) on both surfaces:
 - of equal thickness on each surface
 - of different thickness: differential coating
- b) on one surface only.

Note: All figures shown are nominal and relate to the current technology; they may change in future.

According to the type of coating, the products are classified as follows.

5.5.1 Metal coated sheet and strip

5.5.1.1 Hot dipped metal coated sheet and strip

Flat products metal coated by hot dipping, described by reference to the total coating mass, in g/m². These include:

- a) **lead tin alloy coated sheet and strip (terne plate)**
Sheet and strip coated with a lead tin alloy by hot dipping. In general, the highest nominal mass for the coating corresponds to a minimum of 120g/m² including both surfaces.
- b) **zinc coated sheet and strip (galvanised sheet and strip)**
Sheet and strip coated with zinc by dipping in a bath of molten zinc: the total mass of the zinc varies in general between a value as low as possible and 700g/m²¹⁴. The coatings may have a spangle finish or be without spangle.

After zinc coating, the surfaces may be passivated by chromating or phosphating. This surface treatment does not alter the definition of such products as 'zinc coated flat products'.

- c) **aluminium/aluminium silicon alloy coated sheet and strip**
Sheet and strip coated with aluminium or an aluminium silicon alloy: the total mass of the alloy varies in general between 40 and 300g/m².
- d) **aluminium zinc coated sheet and strip**
Sheet and strip coated with aluminium zinc alloy: the total mass of the alloy varies in general between 90 and 450g/m².

According to the aluminium content a distinction is made between:

- aluminium zinc alloys (aluminium 50% or over);
- zinc aluminium alloys (aluminium over 3% up to 50%).

13) See annex C.1.6

14) By agreement, the total coating mass may exceed 700g/m²

5.5.1.2 Electrolytically metal coated sheet and strip

Flat products metal coated electrolytically, described by reference to the single surface coating thickness in μm . These include:

a) electrolytically lead tin coated sheet and strip

Sheet and strip coated with a lead tin alloy electrolytically with coating thickness generally between 2.5 and 10 μm on each surface.

b) electrolytically zinc coated sheet and strip (electrozinc sheet)

Sheet and strip coated with zinc electrolytically with coating thickness generally between 1 and 10 μm on each surface. This coating never shows a spangle finish. After zinc coating the surface may be passivated by chromating or phosphating. This surface treatment does not alter the definition of such products as 'zinc coated flat products'.

c) zinc nickel coated sheet and strip

Sheet and strip coated with zinc nickel alloy electrolytically with coating thickness generally between 1 and 8.5 μm on each surface.

5.5.2 Sheet and strip with organic coatings

Uncoated or metal coated (eg zinc coated) sheet and strip, subsequently coated with an organic material or a mixture of metal powder and organic material by either of the following continuous processes:

a) by the application of one or more coats of paint or other type of product. After drying, the thickness of the coating varies according to its character from 2 to 400 μm on each surface

b) by the application of an adhesive film whether or not followed by a coating of organic materials: the coating may have different surface designs and a thickness generally between 35 to 500 μm on each surface

5.5.3 Sheet and strip with miscellaneous inorganic coatings

Sheet and strip coated with an inorganic material, eg vitreous enamel.

5.6 Profiled sheet

Profiled sheet is usually manufactured from coated sheet, but also from uncoated sheet, with a width much greater than the height of the profile (see figure 1). A distinction is made between:

a) corrugated sheet: products showing large or small longitudinal corrugations, mainly used for cladding, flooring and roofing

b) ribbed sheet: products with rectangular or trapezoidal longitudinal ribs.

5.7 Composite products ¹⁵

Composite products comprise:

a) plate, sheet and strip clad with steels or alloys to resist for examples wear, chemical corrosion or heat distortion. Bonding is usually achieved by rolling, more rarely by spraying, welding or explosion

b) sandwich steel sheet formed from two sheets bonded together by means of a synthetic sound insulating (plastic layer

c) sandwich panels fabricated from two ribbed sheets bonded by an insulating layer (see figure 2).

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15) See annex C.1.8