UDC 669.14-4 : 001.4 February 1993

Definition of steel products

English version of DIN EN 10 079

DIN EN 10 079

Begriffsbestimmungen für Stahlerzeugnisse

European Standard EN 10 079 : 1992 has the status of a DIN Standard.

A comma is used as the decimal marker.

National foreword

This standard has been prepared by ECISS/TC 6b. The responsible German body involved in its preparation was the *Normenausschuß Eisen und Stahl* (Steel and Iron Standards Committee).

The present standard represents a revised version of the 1982 edition of EURONORM 79, the objectives being to harmonize the terminology used for steel products with the nomenclature used in the Harmonized Commodity Description and Coding System (HS), to offer more flexibility for classifying steel products, and to streamline the terminology.

As a result of the comprehensive revision made, the present standard no longer reflects the content of International Standard ISO 6929 : 1987, as the EURONORM did.

The definitions specified for hot rolled strip have been brought into line with those for cold rolled strip, i.e. the rolling width is now the main criterion for classifying hot rolled wide and narrow strip, as was always the case for cold rolled wide and narrow strip (the criterion used previously was the as delivered width).

Both hot rolled wide strip over 600 mm and hot rolled narrow strip slit from wide strip are not included in this standard.

Standards referred to

(and not included in **Normative references**)

See annexes A and B.

International Patent Classification

B 22 D 7/00
B 22 D 11/00
C 21 C 5/00
E 21 D 11/18
F 16 L 9/00
B 22 F 9/00
B 22 F 3/00
B 22 F 5/00
B 21 B 1/00
B 21 B 1/16
B 21 C 1/02
B 21 C 37/00
B 21 J 5/00

Continued overleaf.
EN comprises 21 pages.

Editor's note

*This standard reproduces the official text of the English version of EN 10 079 as issued by CEN. In its preparation for publication as DIN EN 10 079 (English version), certain points have been noted which we consider to be in need of correction. These have been marked *). The suggested amendments are given below and will be forwarded to the responsible CEN Secretariat for its consideration.*

In presentation, orthography, punctuation and hyphenation, the aim has been to implement the PNE Rules consistently. Obvious errors (e.g. redundancies and omissions) have been rectified without further reference.

Suggested amendments

1 *For the sake of clarity, the words given in parentheses in the third paragraph of the foreword should be replaced by 'statistics bureaus, customs authorities'.*
2 *To make the sense complete in the last paragraph of subclause 4.2, the word 'retaining' should be replaced be 'they may retain'.*
3 *For the sake of accuracy, the word 'sides' should be replaced by 'a side length' in subclause 4.2.1 and the note to subclause 6.4.1.2.*
4 *The note to subclause 5.2.1.1 does not reflect the German text, which states that EURONORM 91-81 includes in its definition of 'wide flats' those products which are produced by flame cutting materials that are wider than 1 250 mm and which comply with the tolerances specified here.*
5 *For the sake of clarity, the first sentence of the note to subclause 5.4.1 should be amended to read: 'Blackplate is normally used for the manufacture of tinplate or ECCS, but it may also be used directly for certain packaging applications'.*
6 *For the sake of comprehension, the first paragraph of subclause 5.4.4 should be amended to read: 'Unalloyed ... reduced. By means of a cathodic process, a two-layer coating shall be provided on both sides, the lower layer being metallic chromium and the upper, either hydrated chromium oxide or hydroxide.'*
7 *To avoid confusion, the words 'figures shown' should be replaced by 'values given in the following subclauses' in the note to subclause 5.5.*
8 *At the end of subclause 6.4.1.4, the terms 'semi rounds' and 'half flat semi rounds' should be replaced by 'half rounds' and 'flat half rounds', which are the common technical terms.*
9 *In the third sentence of subclause 6.5.1, the term 'cold working' is not used correctly in this particular context and should be replaced by 'work hardening'.*
10 *To clarify the sense in subclause 6.7.2.1, the term 'fitting' should be replaced by 'overlapping'.*
11 *For ease of reading, subclause 6.7.4.1 should be amended to read: 'Sections ... where the width of the flange is less than 300 mm, and not more than 0,66 times the nominal height of the section'.*
12 *For ease of reading, subclause 6.7.4.2 should be amended to read: 'Sections ... where the width of the flange is 300 mm or more, and more than 0,66 times the nominal height of the section'.*
13 *For ease of comprehension, the second sentence of annex C, 1.3, should be amended to read: 'It covers all ... including rolled products of circular cross section which comply with the specifications given for bars'.*
14 *For ease comprehension, the second paragraph of annex C, 1.5, should be amended to read: 'This European Standard has retained the distinction made in EURONORM 79-82 between wide and narrow cold rolled flats (see 5.2.2), the former being defined as those with a width of 600 mm or more. Such a distinction is made to account for the different types of rolling mills and the relevant tolerances specified in standards.'*
15 *For ease of reading, annex C, clause 2, item a), should be amended to read: '... in trade, and therefore includes manufacturing processes that are outside the scope of this European Standard'.*

EUROPEAN STANDARD
NORME EUROPÉENNE
EUROPÄISCHE NORM

EN 10079

October 1992

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 1992-10-25.

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.

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 the Central Secretariat has the same status as the official versions.

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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

Ref. No. EN 10079 : 1992 E

Contents

Foreword

This European Standard was prepared by ECISS/TC 6b 'Definition and classification of steel products', the Secretariat of which is held by AFNOR.

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

EURONORM 79-82 Definition and classification of steel products by shape and dimension

ISO 6929 : 1987 Steel products; definition and classification

Given the various classification systems existing in Europe (e.g. the Customs Cooperation Council and that in EURONORM 79-82), it was agreed by ECISS/TC 6b at its third and fourth meetings that this European Standard should deal only with definitions for steel products and abandon the concept of classification. It is for each organization (e.g. statistics, customs) +) to organize their own classifications according to their specific requirements.

At its last meeting in June 1990, ECISS/TC 6b agreed on the text of this European Standard, which was adopted by COCOR in December 1990 for submission to CEN for Formal Vote. France, Belgium, Germany, Italy, Luxembourg, Netherlands and the United Kingdom were represented at this meeting.

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 the United Kingdom.

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 Harmonized Commodity Description and Coding System.

2 Normative references

See annexes A and B.

3 Liquid steel [1]

Steel in the liquid state is 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, and liquid steel for castings.

4 Ingots and semi-finished products [2]

4.1 Ingots

Ingots are 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 the 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, and

4.1.2 slab ingots of rectangular cross section of width twice the thicknes or over.

4.2 Semi-finished products [4]

Semi-finished products are 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 for the corresponding flat or long products, and with 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 (e.g. 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 50 mm or over.

NOTE: This dimension may be less for certain types of high-alloy steel (e.g. high-speed steels).

4.2.2 Semi-finished products of rectangular cross section

Semi-finished products of cross-sectional area 2 500 mm^2 or over, of width up to twice the thickness.

4.2.3 Flat semi-finished products

Products of thickness generally 50 mm 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-sectional area is generally over 2 500 mm^2.

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

5.1 Definition

Flat products have an almost rectangular cross section, the width being much greater than the thickness. The surfaces are generally smooth, except for certain products (e.g. floor plates), which show a regularly raised or indented surface pattern.

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 (e.g. 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 150 mm up to and including 1 250 mm and thickness generally over 4 mm, always supplied in lengths, i.e. not coiled. A special requirement is that

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[1]) See annex C, 1.1.

[2]) See annex C, 1.2 and 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]) See annex C, 1.4 and 2.1.

[5]) See annex C, 1.3 and 2.1.2.

the edges be square. Wide flats are 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 a square or rectangular shape, with a width of 600 mm or over, but also in any other shape (e.g. 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 3 mm;
- plate: thickness 3 mm 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 it may also be supplied with sheared edges or slit from wider strip.

Hot rolled strip is further defined as:

a) hot rolled wide strip: width 600 mm or over;

b) hot rolled slit wide strip: rolling width 600 mm or over, slit to widths up to 600 mm before supply;

c) hot rolled narrow strip: rolling width up to 600 mm.

After being decoiled and cut to length, hot rolled strip may be supplied in 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 600 mm 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 a square or rectangular shape, with a width of 600 mm or over, but also in any other shape (e.g. 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 600 mm or over;

b) cold rolled slit wide strip: rolling width 600 mm or over, slit to widths up to 600 mm before supply;

c) cold rolled narrow strip: rolling width up to 600 mm.

After being decoiled and cut to length, cold rolled strip may be supplied in cut lengths.

5.3 Electrical steels [8])

Electrical steels are characterized 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 2 mm thick and of width up to and including 1500 mm.

NOTE: There are also certain hot rolled flat products in thicknesses of 1,5 mm up to 5 mm, 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, in T, and frequency, in Hz;

b) peak magnetic flux density, in T, at a specified level of peak magnetic field strength, in A/m, and frequency, in Hz.

Electrical steels are further defined as follows.

5.3.1 Not grain-oriented electrical steels

Unalloyed steels and steels alloyed with silicon or silicon and aluminium which are essentially isotropic in their magnetic properties, i.e. 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, where 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. Theses 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 Blackplate [12])

Unalloyed, low-carbon steel supplied in the form of strip or sheet which has been single or double cold reduced.

Single reduced blackplate is supplied in thicknesses from 0,17 mm up to and including 0,49 mm, double reduced blackplate in thicknesses from 0,14 mm up to and including 0,29 mm.

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 suitabe for varnishing (lacquering) or printing.

5.4.2 Tinplate

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

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[6]) See annex C, 2.2.

[7]) See annex C, 1.5.

[8]) See annex C, 1.6.

[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.

Single reduced tinplate is supplied in thicknesses from 0,17 mm up to and including 0,49 mm, double reduced tinplate in thicknesses from 0,14 mm up to and including 0,29 mm. Tinplate is normally supplied with a passivation treatment and a protective coating of oil and is suitable for varnishing (lacquering) or printing.

NOTE: Tinplate may also be produced by hot dipping in a bath of molten tin.

5.4.3 Tinned sheet and strip

Unalloyed, low-carbon steel supplied in the form of strip or sheet of a thickness of 0,50 mm or over and tin coated on both surfaces.

5.4.4 Electrolytic chromium/chromium oxide coated steel (ECCS)

Unalloyed, low-carbon steel supplied in the form of strip or sheet which has 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 0,17 mm up to and including 0,49 mm, and double reduced ECCS in thicknesses from 0,14 mm up to and including 0,29 mm. ECCS is normally supplied with a protective coating of oil and is suitable for varnishing (lacquering) or printing.

5.5 Coated hot or cold rolled flat products [13])

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, which may change in the 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-dip metal coated sheet and strip

Flat products metal coated by hot dipping, described by reference to the total coating mass, in g/m^2. 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 120 g/m^2 including both surfaces.

b) Zinc coated sheet and strip (galvanized 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 700 g/m^2 [14]). 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 or 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 g/m^2 and 300 g/m^2.

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 g/m^2 and 450 g/m^2. 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 %).

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 electrolytically with a lead-tin alloy, with a coating thickness generally between 2,5 µm and 10 µm on each surface.

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

Sheet and strip coated electrolytically with zinc, with a coating thickness generally between 1 µm 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 classification of such products as 'zinc coated flat products'.

c) Zinc-nickel coated sheet and strip

Sheet and strip coated electrolytically with a zinc-nickel alloy, with a coating thickness generally between 1 µm and 8,5 µm on each surface.

5.5.2 Sheet and strip with organic coatings

Uncoated or metal coated (e.g. 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 from 2 µm 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 µm to 500 µm on each surface.

5.5.3 Sheet and strip with miscellaneous inorganic coatings

Sheet and strip continuously coated with an inorganic material, e.g. 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 steel or alloys to resist, for example, wear, chemical corrosion or heat distortion; bonding is usually achieved by rolling, more rarely by spraying, welding or explosion;

[13]) See annex C, 1.6.

[14]) By agreement, the total coating mass may exceed 700 g/m^2.

[15]) See annex C, 1.8.

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).

6 Long products

6.1 Definitions

Long products are those which do not comply with the definition of flat products (see 5.1). They have a constant cross section which is usually defined by a standard which fixes the normal size ranges and the tolerances on shape and dimensions. The surface is generally smooth, but in certain cases (e.g. reinforcing bars), may have a regularly raised or indented pattern.

6.2 Rod

Hot rolled long product having a nominal size generally of 5 mm or over and wound into irregular coils.

The cross section may be round, oval, square, rectangular, hexagonal, octagonal, semi-circular or of any similar shape. Its surface is smooth. Rod is generally intended to undergo further processing. It may also be used, with or without further processing (e.g. cold forming), for the fabriaction of welded mesh or for other elements used to reinforce concrete.

6.3 Wire [16])

Product on constant full cross section along its length, obtained by cold drawing rod through a reducing die or passing under pressure between rollers and rewinding the drawn product.

The cross section is generally round, though sometimes oval, rectangular, square, hexagonal, octagonal or of any other convex shape.

Heat treatment or surface treatment may be carried out during production to improve the properties of wire. The manufacturing processes give close control of geometric (size, surface condition) and mechanical properties. Wire may be supplied uncoated (as drawn, annealed) or coated (e.g. with zinc, copper, nickel or plastic material).

6.4 Hot finished bars

These products are supplied in straight lengths but never in coils, which distinguishes them from rod.

6.4.1 Hot rolled bars [17])

Hot rolled products in straight lengths of constant transverse section having a solid (convex) cross section as defined in 6.4.1.1 to 6.4.1.3.

6.4.1.1 Rounds

Bars having a circular cross section of diameter generally 8 mm or over.

6.4.1.2 Squares, hexagons and octagons

Bars having square, hexagonal or octagonal cross sections; the side length is generally 8 mm or over for squares or 13 mm or over for hexagons.

NOTE: Squares of sides up to 50 mm with rounded corners are considered to be square bars.

6.4.1.3 Flats

Bars of rectangular cross section rolled on the four faces, of thickness generally 5 mm or over and width not over 150 mm.

6.4.1.4 Bars of special shape

This group includes hot rolled products, in lengths of particular full cross-sectional shape, which are generally rolled in limited quantities. This class includes, in particular, trapezoids, bevels, triangles, bars for grooved springs, semi-rounds and half flat semi-rounds. *)

6.4.2 Forged bars

Products obtained by forging, which do not undergo subsequent hot forming. These products are mainly supplied in the form of rounds or squares.

6.4.3 Hollow drill bars [17])

Bars with an internal hollow of any cross-sectional shape, suitable for the manufacture of drill bits, with a maximum external cross-sectional dimension over 15 mm up to and including 52 mm, which is at least twice the maximum dimension of the cross section of the hollow.

6.5 Bright products

6.5.1 Drawn products

Products of various cross-sectional shape obtained, after descaling, by drawing hot rolled bars or rod on a draw bench (cold forming without removing material). This operation gives the product special features with respect to shape, dimensional accuracy (tolerance class IT 11 to ISO 286-1, or better) and surface finish. In addition, the process causes cold working *) of the product, which can be eliminated by subsequent heat treatment. Products in lengths are delivered straightened regardless of size.

6.5.2 Turned products

Round products produced by turning on a lathe, followed by straightening and polishing. This operation gives the bar special features with respect to shape, dimensional accuracy and surface finish. The removal of metal is carried out in such a way that the bright product is generally free from rolling defects and surface decarburization.

NOTE: For technical reasons, some bars ordered as hot rolled products may be delivered roughly turned; nevertheless, such products are classified as hot rolled products and not bright products.

6.5.3 Ground products

Drawn or turned round bars given an improved surface quality and dimensional accuracy by grinding or grinding and polishing.

6.6 Deformed products for the reinforcement and prestressing of concrete

Products with a cross section that is round or almost round, with crenelated or ribbed surfaces, for the reinforcement and prestressing of concrete, supplied in the forms defined in 6.6.1 to 6.6.3.

6.6.1 Rod

See definition in 6.2.

6.6.2 Bars [18])

See definition in 6.4. These bars may, after being hot rolled, have undergone a controlled cold deformation (e.g. lengthening or twisting about their longitudinal axis).

6.6.3 Wire

See definition in 6.3.

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[16]) See annex C, 2.5.

[17]) See annex C, 1.7.

[18]) See annex C, 1.9 and 2.6.

6.7 Hot rolled sections

6.7.1 Railway materials

Products used in the construction of railway tracks and other systems of rails.

6.7.1.1 Railway track products

Hot rolled railway products are as follows:

a) heavy railway products:
   - rails of linear mass 20 kg/m or over (except those in 6.7.1.2);
   - sleepers of linear mass 15 kg/m or over;

b) light railway products:
   - rails of linear mass up to 20 kg/m (except those in 6.7.1.2);
   - sleepers of linear mass up to 15 kg/m;

c) conductor rails with specified electrical resistivity properties;

d) rails for switches and crossings;

e) check rails;

f) brake rails;

g) fish plates;

h) baseplates (also known as sole, tie or bearing plates).

6.7.1.2 Products for other rail systems

Hot rolled products for other rail systems are as follows:

a) crane rails;

b) grooved rails.

6.7.2 Piling

6.7.2.1 Sheet piling

Sheet piling is a product obtained by hot rolling or cold forming (drawing, bending, cold rolling, etc.) to a shape such that, by interlocking joints, or fitting +) longitudinal grooves, or by means of special fasteners, it forms partitions or continuous walls.

Sheet piling is distinguished according to its cross-sectional shape and its application (see figure 3 for examples).

a) S, U, Z and Ω sheet piling;

b) flat sheet piling;

c) fabricated sheet piling [19]) (built up from sheet piles, angles and other sections);

d) interlocking H sheet piling;

e) trench sheeting.

6.7.2.2 Bearing piling

a) Fabricated bearing piling:

Fabricated piling, made up from U sections or similar shapes and used for bearing purposes (see figure 4).

b) Fabricated tubular sheet piling:

A tube of circular, square or rectangular cross section, fitted with external interlocks, driven into the ground to transmit the mass of structures to the soil by resistance developed at its base and by friction along its surface (see figure 4).

NOTE: The terms 'sheet piling' and 'bearing piling' include piling which has undergone certain finishing operations such as piercing or welding of attachments.

6.7.3 Mining frame sections

Products with cross sections resembling the letter I or the Greek capital letter Omega. Mining frame I sections are distinguished from other I sections by a greater slope of the inside face of the flanges. Generally, they also have a flange width over 0,70 of the nominal web height (see figure 5).

6.7.4 Heavy sections

Hot rolled products with cross sections resembling the letter I, H or U (see figure 6). They have the following characteristics:

a) web height of 80 mm or over;

b) the surfaces of the webs are continued by fillets to the inside faces of the flange;

c) the flanges are generally symmetrical and of equal width (see also 6.7.4.5);

d) the outside faces of the flanges are parallel;

e) the flanges are either of decreasing thickness from the web to the edge ('tapered flanged') or of uniform thickness ('parallel flanged').

A distinction is made between:

a) parent sections: section with web and flange thickness considered as standard;

b) thin sections: sections manufactured with the same series of rolls as used in producing the corresponding parent section but which, for an approximately equal web height, have a thinner web and/or flanges (as a result of adjustment of the vertical or horizontal rolls);

c) thick sections: sections manufactured with the same series of rolls as used in producing the corresponding parent section but which, for an approximately equal web height, have a thicker web and/or flanges (as a result of adjustment of the vertical or horizontal rolls).

6.7.4.1 I sections (narrow and medium flanges)

Sections having a cross-sectional shape resembling the letter I, where the flanges are not wider than 0,66 of the nominal height of the section and up to 300 mm. -)

6.7.4.2 H sections (wide flanged beams)

Sections having a cross-sectional shape resembling the letter H, where the flanges are wider than 0,66 of the nominal height or 300 mm or over. +)

6.7.4.3 U sections (channels)

Sections having a cross-sectional shape resembling the letter U. In the standardized series, the flanges have sloping internal faces and a maximum width of $(h/2 + 25)$ mm.

6.7.4.4 Bearing piles

Sections having a cross-sectional shape resembling the letter H or I, where the thickness of the web and flanges is identical.

6.7.4.5 Special heavy sections

Sections having I, H, U or similar cross-sectional shapes, with a web height of 80 mm or over, but with features such as unequal or asymmetric flanges, or non-standard web thickness. These products are generally manufactured in limited quantities.

6.7.5 Other sections [20])

6.7.5.1 Small U, I and H sections

The cross-sectional shapes resemble the letter U, I or H, and the web height is up to 80 mm (see figure 3).

6.7.5.2 Angles

The cross-sectional shapes resemble the letter L. Definition as equal or unequal angles depends on the ratio of the flange widths. The corners of the flanges are rounded.

6.7.5.3 T sections with equal flanges

The cross-sectional shapes resemble the letter T. The corners are rounded, and the flanges and web are slightly tapered. The flanges are of equal width.

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[19]) See annec C, 2.7.

[20]) See annec C, 1.7.

6.7.5.4 Bulb flats

The cross-sectional shapes are generally rectangular, with a bulge along the full length of a longitudinal edge of one of the wider surfaces and a width generally up to 430 mm.

6.7.5.5 Special sections [21])

These include products hot rolled in lengths usually of small, open cross section or of special shape which are generally rolled in limited quantities and are not covered by 6.7.4 or 6.7.5.1 to 6.7.5.4. This class includes in particular Z sections, T sections with unequal flanges, square-edged L, U and T sections, caterpillar track sections, etc.

6.8 Welded sections

Welded sections are long products of open cross section which have cross-sectional shapes similar to the products defined in 6.7.4 and 6.7.5, but instead of being obtained directly by hot rolling, are made up by welding together combinations of hot rolled long products, hot rolled flat products or cold rolled flat products.

6.9 Cold formed sections

Cold formed long products have various cross-sectional shapes, either open or with edges abutting, constant along their length. They are made from coated or uncoated hot or cold rolled flat products whose thicknesses are only slightly modified by the cold forming process (e.g. profiling, drawing, press forming, flanging, etc.).

They comprise:

a) general-purpose cold formed sections (e.g. L, U, C, Z, Omega sections);

b) products for particular applications, including cold formed sheet piling (see 6.7.2), crash barriers, building frames, door frames, lorry and wagon chassis.

6.10 Tubular products

6.10.1 Tubes [22])

Hollow long products, open at both ends, of round or polygonal cross section. Tubes may be finished at the ends, e.g. by threading or flaring, or coated on the interior and/or exterior surfaces (organic or metallic coating), or have integral or fitted flanges.

6.10.2 Seamless tubes

Tubes made by piercing ingots, billets or bars to obtain tube hollows. These hollows are then transformed into tubes by rolling, extrusion or drawing over a mandrel. Seamless tubes may be finished by reducing the cross section by hot or cold rolling or by drawing. They may also be manufactured by centrifugal casting.

6.10.3 Welded tubes

Tubes made by forming a circular profile from hot or cold rolled flat products and welding the adjacent edges. The welds may be longitudinal or helical.

6.10.4 Hollow sections

Seamless or welded tubes of circular, square or rectangular cross section used in construction (e.g. of structural steelwork, cranes, vehicle chassis, etc.).

6.10.5 Hollow bars

Circular seamless tubes, intended for the manufacture of engineering components by machining (e.g. by removing shavings with a tool). These products are distinguished from seamless fluid-carrying tubes or hollow sections by their dimensions and metallurgical properties which confer machinability, suitability for heat treatment and a surface condition suitable for final machining of the component.

7 Other products

7.1 Open-die forgings [23])

Products obtained by forming steel at a suitable temperature by impact or pressure, using an open die to produce approximate shapes which do not require further hot forming. They are generally machined to final shape.

Open-die forgings include products preforged and finishing in ring rolling mills (e.g. tyres).

NOTE: Forgings exclude semi-finished products as defined in clause 4 and bars as defined in 6.4.2.

7.2 Closed-die forgings and stampings

Products obtained by forming steel at a suitable temperature in a closed die which determines the required shape and volume of the product. Deformation may be carried out in a press (closed die forging) or under a drop hammer (stamping).

7.3 Castings

Products whose shapes and final dimensions, apart from any dressing or machining, are obtained directly by the solidification of liquid steel cast in sand moulds, fire clay or other refractory materials, or more rarely in durable metal or graphite moulds.

7.4 Powder metallurgy products

7.4.1 Steel powder

Collection of steel particles of dimensions generally up to 1 mm.

7.4.2 Sintered products [24])

Products manufactured from powder by pressing and sintering and sometimes re-pressing. These products often have close dimensional tolerances and are generally ready for use.

7.4.3 Full density products

Products manufactured from powder by joint use of temperature and pressure (hot isostatic compression, extrusion, etc.).

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[21]) Theses sections may also be obtained by hot extrusion. See annex C, 1.10.

[22]) Small diameter tubes may be supplied coiled.

[23]) See annex C, 1.10.

[24]) Sintering: thermal treatment of a powder or compact at a temperature below the melting point of the principal constituent with the object of increasing its strength.

Figure 1: Illustration of typical profiled sheet

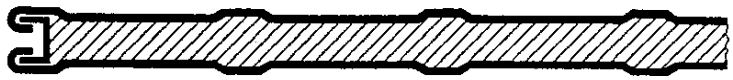


Figure 2: Illustration of typical sandwich panel

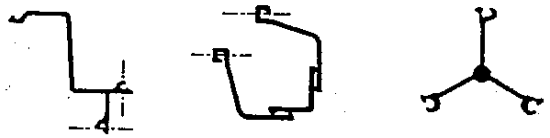
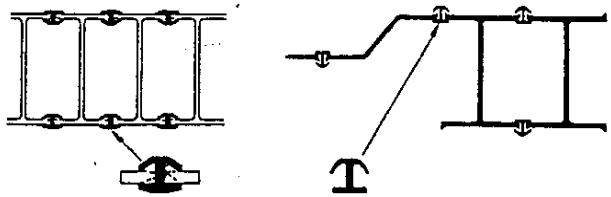
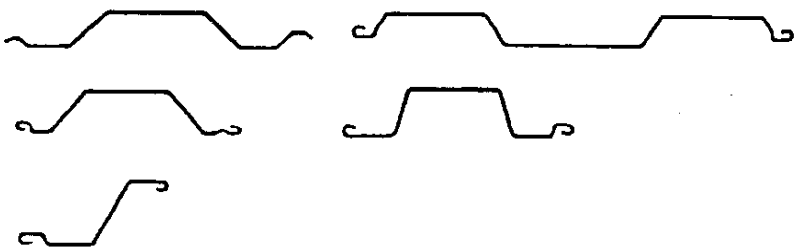
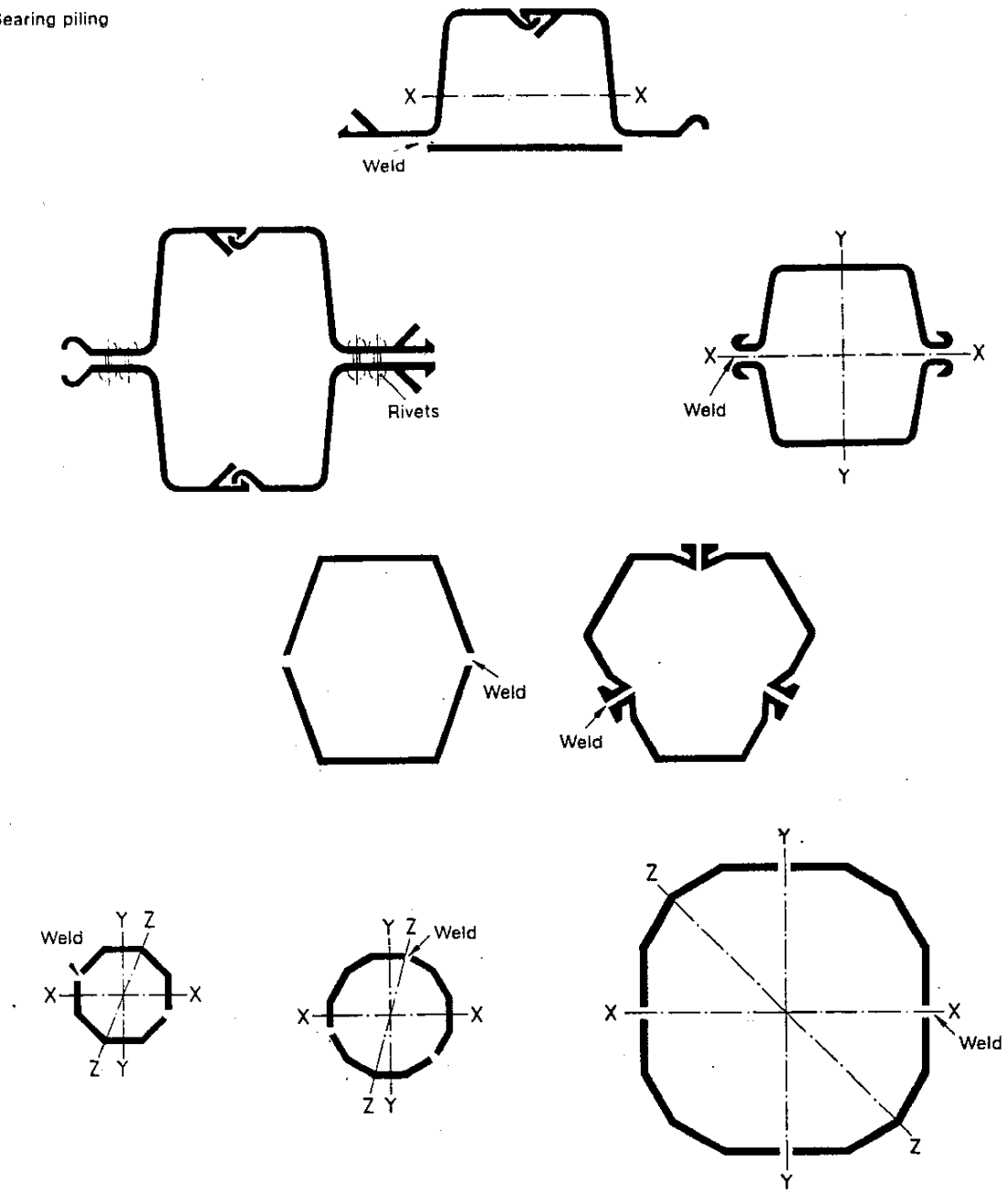
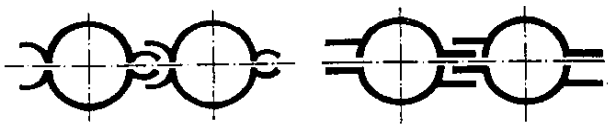
NOTE: Design of interlocks varies according to manufacturer.	
3 a) – d) Hot rolled sheet piling	
3a) (1) U sheet piling	
3a) (2) Z sheet piling	
3b) Flat sheet piling	
3c) Fabricated sheet piling	
3d) Interlocking H and Z sheet piling	
3e) Cold formed sheet piling	
3e) (1) Trench sheet piling 3e) (2) Panel sheet piling (OMEGA) *) 3e) (3) Z sheet piling	
*) In Germany, there is a type of fabricated sheet piling designated OMEGA.	

Figure 3: Illustration of typical sheet piling

Bearing piling



a) Fabricated bearing piling



b) Fabricated tubular piling

Figure 4: Illustration of typical bearing piling

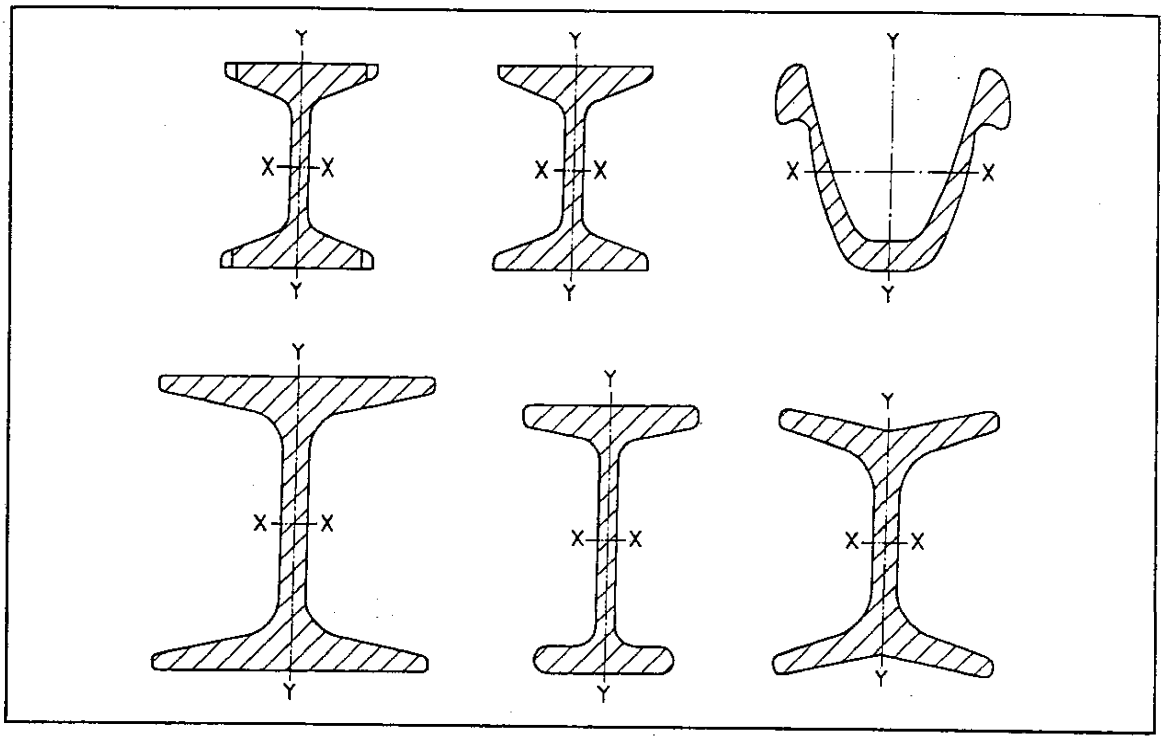


Figure 5: Illustration of typical mining frame sections

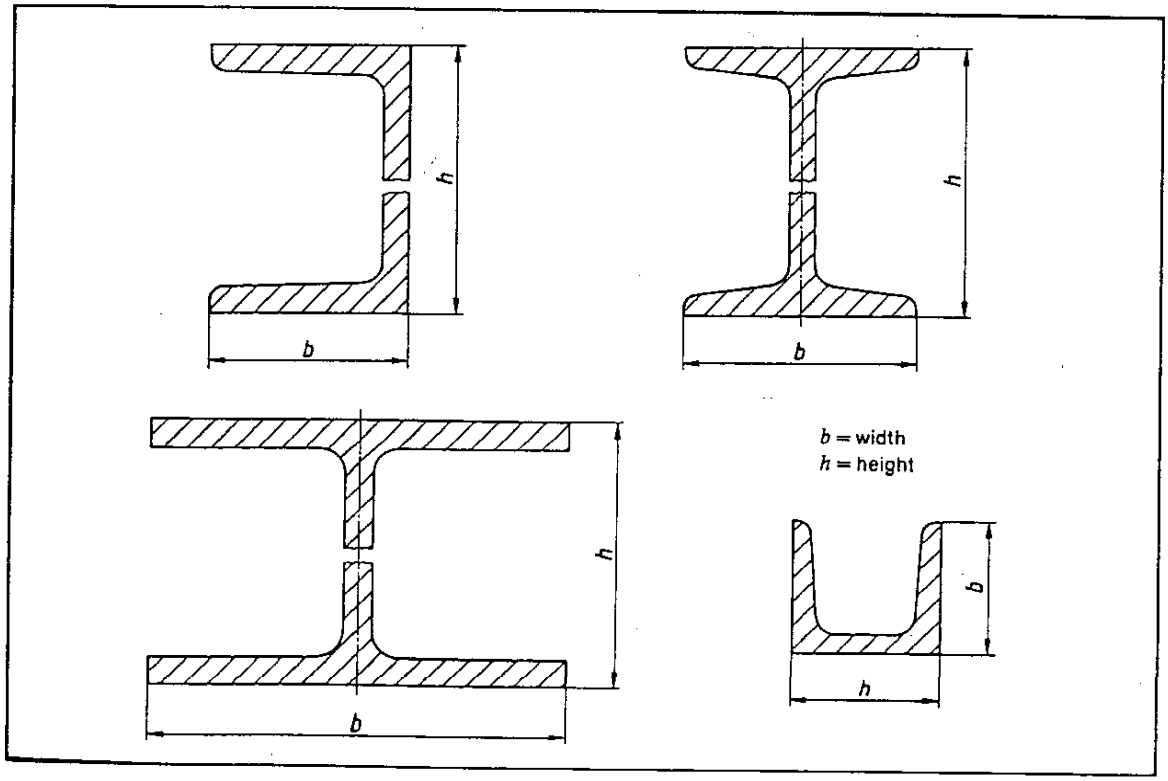


Figure 6: Illustration of typical heavy I, H and U sections

Annex A (informative)

Steel products and associated standards

This annex identifies, for the steel products defined in this European Standard, the corresponding EURONORMs (EU) or European Standards (EN) which specify dimensions and tolerances.

Clause	Steel product	EURONORM	European Standard
3	Liquid steel	–	–
4.1	Ingots	–	–
4.2.1	Semi-finished products of square cross section	–	–
4.2.2	Semi-finished products of rectangular cross section	–	–
4.2.3	Flat semi-finished products	–	–
4.2.4	Round semi-finished products	–	–
4.2.5	Blanks for sections	–	–
5.2.1	Hot rolled uncoated flat products	–	–
5.2.1.1	Wide flat	EU 91	–
5.2.1.2	Plate and sheet	–	EN 10029
5.2.1.3	Strip	–	EN 10051
		–	prEN 10048
5.2.2	Cold rolled uncoated flat products	–	–
5.2.2.1	Plate and sheet	–	EN 10131
5.2.2.2	Strip	Eu 140	EN 10131
5.3.1	Not grain-oriented electrical steels	EU 106 EU 126 EU 165	–
5.3.2	Grain-oriented electrical steels	EU 107	–
5.4.1	Blackplate	–	EN 10205
5.4.2	Tinplate	–	EN 10203
5.4.3	Tinned sheet and strip	–	–
5.4.4	Electrolytic chromium/chromium oxide coated steel (ECCS)	–	EN 10202
5.5	Coated hot or cold rolled flat products	–	–
5.5.1.1	Hot dip metal coated sheet and strip	–	prEN 10143
5.5.1.2	Electrolytically metal coated sheet and strip	–	EN 10131
5.5.2	Sheet and strip with organic coatings	–	–
5.5.3	Sheet and strip with miscellaneous inorganic coatings	–	–
5.6	Profiled sheet	–	–
5.7	Composite products	–	–
6	Long products	–	–
6.2	Rod	EU 17	–
6.3	Wire	–	prEN 10218-2
6.4.1	Hot rolled bars	–	–
6.4.1.1	Rounds	EU 60	–
6.4.1.2	Squares, hexagons and octagons	EU 59	–
		EU 61	–
		–	–
6.4.1.3	Flats	Eu 58	–
6.4.1.4	Bars of special shape	–	–
6.4.2	Forged bars	–	–
6.4.3	Hollow drill bars	–	–
6.5	Bright products	–	–
6.5.1	Drawn products	–	–
6.5.2	Turned products	–	–
6.5.3	Ground products	–	–
6.6.1	Rod	–	prEN 10138-5
6.6.2	Bars	EU 82	prEN 10138-4
		–	prEN 10080
6.6.3	Wire	–	prEN 10138-2
		–	prEN 10080
6.7.1	Railway materials	–	–
6.7.2	Piling	–	–
6.7.2.1	Sheet piling	–	–
6.7.2.2	Bearing piling	–	–
6.7.3	Mining frame sections	–	–
6.7.4.1	I sections (narrow and medium flanges)	EU 19	prEN 10034

Clause	Steel product	EURONORM	European Standard
Continued:			
6.7.4.2	H sections (wide flanged beams)	EU 53	prEN 10 034
6.7.4.3	U sections (channels)	EU 24	–
6.7.4.4	Bearing piles	–	–
6.7.4.5	Special heavy sections	–	–
6.7.5.1	Small U, I and H sections	EU 54	–
6.7.5.2	Angles	EU 56, EU 5	prEN 10 056-2
6.7.5.3	T sections with equal flanges	EU 55	–
6.7.5.4	Bulb flats	EU 67	–
6.7.5.5	Special sections	–	–
6.8	Welded sections	–	–
6.9	Cold formed sections	Eu 162	–
6.10.1	Tubes	–	prEN 10 220
6.10.2	Seamless tubes	–	prEN 10 216-1
6.10.3	Welded tubes	–	prEN 10 217-1
6.10.4	Hollow sections		prEN 10 210-2 prEN 10 219-2
6.10.5	Hollow bars	–	–
7.1	Open-die forgings	–	–
7.2	Closed-die forgings and stampings	–	–
7.3	Castings	–	–
7.4	Powder metallurgy products	–	–

Annex B (informative)

European Standards and EURONORMs referred to in this European Standard and in annexes A and C

EU 17-70	Wire rod in general purpose unalloyed steel for cold drawing or wire drawing; dimensions and tolerances
EU 19-57	Hot rolled IPE beams; parallel flanged I beams
EU 24-62	Normal beams and channels; rolling tolerances
EU 53-62	Wide-flanged beams with parallel flanges; dimensions
EU 54-80	Small hot rolled steel channels
EU 55-80	Hot rolled equal flange steel tees with radiused root and toes
EU 56-77	Hot rolled equal angles with radiused root and toes
EU 57-78	Hot rolled unequal angles with radiused root and toes
EU 58-78	Hot rolled flats for general purposes
EU 59-78	Hot rolled square bars for general purposes
EU 60-77	Hot rolled round bars for general purposes
EU 61-82	Hot rolled steel hexagons
EU 67-78	Hot rolled steel bulb flats
EU 82-79	Steel for the reinforcement of concrete with an improved bonding action; dimensions, mass and tolerances
EU 91-81	Hot rolled wide flats; dimensions, mass and tolerances
EU 106-84	Cold rolled non-oriented magnetic steel sheet and strip
EU 107-87	Grain-oriented magnetic sheet and strip
EU 126-77	Semi-processed steel strip for the construction of magnetic circuits
EU 140-81	Cold rolled uncoated steel narrow strip; dimensions, tolerances on dimensions, shape and mass
EU 162-81	Cold rolled sections; technical delivery conditions
EU 165-81	Cold rolled non-oriented magnetic alloy steel strip delivered in the semi-processed condition
EU 169-85	Continuously organic coated steel flat products
EN 10 020	Definition and classification of steel grades
EN 10 029	Hot rolled plates greater than 3 mm thick; tolerances on dimensions, shape and mass
prEN 10 034	Hot rolled I and H sections; tolerances on shape and dimensions
prEN 10 048	Hot rolled uncoated narrow strip; dimensions and tolerances
EN 10 051	Continuously hot rolled uncoated unalloyed and alloy steel plate, sheet and strip; tolerances on dimensions and shape

prEN 10 056	Hot rolled equal and unequal angles; tolerances on shape and dimensions
prEN 10 080	Steels for reinforcing concrete
EN 10 131	Cold rolled uncoated low carbon and high yield strength steel flat products for cold forming; tolerances on dimensions and shape
prEN 10 138-2	Steels for the prestressing of concrete; cold drawn and cold rolled wire
prEN 10 138-4	Steels for the prestressing of concrete; hot rolled and processed bar
prEN 10 138-5	Steels for the prestressing of concrete; quenched and tempered wire
prEN 10 143	Continuous hot dip metal coated steel sheet and strip; tolerances on dimensions and shape
EN 10 202	Cold reduced electrolytic chromium/chromium oxide coated steel
EN 10 203	Cold reduced electrolytic tinplate
EN 10 205	Cold reduced blackplate in coil form for the production of tinplate or electrolytic chromium/chromium oxide coated steel
prEN 10 210-2	Hot finished structural hollow sections of unalloyed and fine grain structural steels; tolerances, dimensions and sectional properties
prEN 10 216-1	Seamless steel tubes for pressure purposes; unalloyed steel with specified ambient temperature properties; technical delivery conditions
prEN 10 217-1	Welded steel tubes for pressure purposes; unalloyed steel with specified ambient temperature properties; technical delivery conditions
prEN 10 218-2	Steel wire and wire products; dimensions and tolerances
prEN 10 219-2	Cold formed structural hollow sections of unalloyed and fine grain structural steels, tolerances, dimensions and sectional properties
prEN 10 220	Seamless and welded steel tubes; dimensions and mass per unit length

Annex C (informative)

Notes on European Coal and Steel Community (ECSC) definitions and Harmonized Commodity Description and Coding System (HS) definitions

C.1 European Coal and Steel Community (ECSC) definitions

Annex 1 of the ECSC Treaty defines the products covered by the term 'steel'. This definition names the products subject to the Treaty and has legal force. In doubtful cases, the Directorates of the Commission may interpret the Treaty after consulting the industry concerned; disputed interpretations are resolved by the European Court of Justice.

The Statistical Office of the European Communities (EUROSTAT) publishes more explicit definitions of steel products in the Explanatory Notes to ECSC statistical questionnaires, which were originally given legal force by Decision number 1566/86 of the Commission. The EUROSTAT definitions are the best available interpretation of the meaning of the products named in Annex 1 of the ECSC Treaty but, from a strictly legal viewpoint, they do not define ECSC steel products, since such definition is the function of Annex 1 itself.

In most cases, the EUROSTAT definitions are identical to those in this European Standard, but there are a number of differences at present, partly for historical reasons. The following notes bring together these differences, which were mainly published as footnotes in the superseded EURONORM 79-82. In each case, the ECSC definition is given first, with references to the relevant clauses and paragraphs of this European Standard.

C.1.1 Liquid steel (see clause 3)

Statistical measurement of liquid steel production is based on the weight of liquid steel ready for pouring, which is obtained directly from the melting of raw materials or scrap.

C.1.2 Crude steel (see clause 4)

C.1.2.1 The ECSC definition given in EUROSTAT Questionnaire 2-11 'Crude Steel Production' covers ingots (see 4.1), continuously cast semi-finished products as cast (see 4.2) and liquid steel for the production of castings (see clause 3). In EUROSTAT Deliveries questionnaires and in this European Standard, continuously cast semi-finished products are defined as semi-finished products.

C.1.2.2 Statistical measurement of crude steel production is based on gross weights before dressing or scarfing.

C.1.3 Ingots and semi-finished products for seamless tube manufacture

This product description is found throughout in the EUROSTAT questionnaires. It covers all products supplied for seamless tube manufacture, including rolled rounds to bar specifications.+)

These products may be supplied as cast, as rolled or turned.

C.1.4 Semi-finished products (see clause 4)

C.1.4.1 The ECSC definition given in EUROSTAT Questionnaire 2-71 'Steel Deliveries' excludes forged semi-finished products, which are included as semi-finished products in clause 4 of this European Standard.

C.1.4.2 To avoid double counting, the ECSC questionnaires make a distinction between ingots, semi-finished products and hot rolled wide strip:

a) destined for conversion into other ECSC products in works covered by the ECSC Treaty;

b) intended for direct use, principally for tube manufacture (see annex C, 1.3) or forging.

In this standard, such a distinction is not considered to be relevant to the definitions of the products.

C.1.5 Cold rolled flat products (see 5.2.2)

The ECSC Treaty excludes cold rolled slit or narrow strip in coil and lengths of less than 500 mm wide, except that destined for the manufacture of tinplate. In EUROSTAT questionnaires, cold rolled wide strip, plate and sheet are therefore defined as being 500 mm or more in width.

This European Standard continues, in 5.2.2, the practice of EURONORM 79-82, which subdivided wide cold rolled flat

products from narrow at 600 mm, based on the technical capabilities of the different types of mills and the associated tolerances in standards.+)

C.1.6 Electrical steels, tin mill products, coated flat products (see 5.3, 5.4 and 5.5)

C.1.6.1 As with uncoated flat products, the ECSC Treaty covers only the above named products in widths of 500 mm or more, except tinplate and blackplate. In this European Standard, width subdivisions are not considered to be material to the definitions in 5.3, 5.4 and 5.5.

C.1.6.2 For electrical steel, only cold reduced products are covered in the statistics.

C.1.6.3 In its statistics, EUROSTAT includes corrugated coated sheets of sinusoidal profile with flat coated sheets. In this standard, corrugated sheets are considered to be within the definition of profiled sheets.

C.1.7 Merchant bars

This term, which is still used in some summary statistical questionnaires, covers the following hot rolled long products defined in this European Standard:

a) hot rolled bars (see 6.4.1);

b) hollow mining drill bars (see 6.4.3);

c) angles, T-sections, bulb flats, light and special sections (see 6.7.5).

C.1.8 Clad products

In this European Standard, clad products are defined within composite products in 5.7 a). In its statistics, EUROSTAT classifies clad products according to the substrate layer which has been clad, as provided in 4.1.6 of EN 10 020.

C.1.9 Products for concrete reinforcement (see 6.6)

In EUROSTAT statistics, the term reinforcing bars covers both deformed bars (see 6.6.2) and smooth bars used for concrete reinforcement.

C.1.10 Products obtained by extrusion or ring rolling

In its statistics, EUROSTAT considers hot extruded products to be hot rolled. On the other hand, products made in ring rolling mills, such as tyres and similar products, are considered to be forged and are thereby excluded from ECSC statistics.

C.2 Harmonized Commodity Description and Coding System definitions

The Harmonized Commodity Description and Coding System (HS) is a nomenclature for the classification of commodities, drawn up by the Customs Cooperation Council, and implemented by international convention as the basis for regional and national tariff coding systems. It has replaced the Customs Cooperation Council Nomenclature (CCCN) in West European and many other countries' tariffs from January 1988.

The products defined in this European Standard are classified generally in Chapters 72 and 73 of the HS. Definitions in this European Standard are closely aligned with those of the HS, but a number of differences exist because:

a) the HS encompasses every product in trade and provides headings for processes or further manufactures beyond the scope of this European Standard;+)

b) HS definitions classify products with more emphasis on shape than on manufacturing process or application;

c) the scope of product names and their descriptions may be different.

In the Combined Nomenclature, which is the common level of European Community Customs Tariff codes based on the Harmonized System, many steel products are followed by the descriptor '(ECSC)'. As for the EUROSTAT definitions, these products approximate the ECSC Treaty, but are not legally equivalent to its scope.

EURONORM 79-82 contained footnotes which commented on a number of differences from the Customs Nomenclature (CCCN). Some of these differences, notably the boundary between wide and narrow flat products, no longer apply. The following notes set out the main differences which remain or have arisen as a result of the adoption of the HS.

C.2.1 Semi-finished products (see clause 4)

C.2.1.1 The HS does not set any minimum size limits for the cross-sectional area or side dimensions for semi-finished products, but the definition is restricted to products which have been forged or continuously cast and/or subjected only to primary hot rolling. In this European Standard, the products in 4.2 are defined by lower size limits without reference to the manufacturing methods, except round semi-finished products (see 4.2.4).

C.2.1.2 The HS groups together semi-finished products of circular or polygonal cross section, but does not identify their applications.

C.2.2 Tapered plates (see 5.2.1.2)

Whilst the EEC Customs have ruled that tapered plates rolled in a reversing mill are structures under 73.08 of the HS, in this European Standard they are considered to be within the definition of quarto plates.

C.2.3 Varnished and/or printed tin mill products (see 5.4)

Under the HS, flat products are classified according to the final coating process. Thus, tin mill products which have been varnished and/or printed are considered to be organic coated products in Customs statistics. In ECSC statistics, however, such varnishing or printing is not considered to be a separate production stage when carried out in a works covered by the ECSC Treaty. The resulting products are counted as being unchanged from the products defined in 5.4 of this European Standard.

C.2.4 Blackplate (see 5.4.1)

This product is not identified separately in the HS, but is combined with uncoated flat cold rolled products of similar thicknesses.

However, the Customs (EEC only) define a subheading for unalloyed wide strip under 0,35 mm thick, which includes the majority of blackplate.

C.2.5 Wire (see 6.3)

The HS classifies wire which has been decoiled, straightened and cut to lengths among cold finished bars.

C.2.6 Products for the reinforcing and prestressing of concrete (see 6.6)

The HS identifies separately only hot rolled bars and rod with a ribbed (deformed) surface. In this European Standard, the scope of 6.6 extends to cold worked bars and wire.

C.2.7 Sheet piling (see 6.7.2.1 c))

The HS definition of sheet piling excludes fabricated products without external interlocks and classifies these among the 'structures' of HS heading 73.08. In this European Standard, such products are contained within the definition of sheet piling.

Annex D (informative)
Trilingual vocabulary

English	French	German	Other	Clause
aluminium/aluminium silicon alloy coated sheet and strip	tôle et bande aluminiée	aluminiertes Blech und Band		5.5.1.1c)
aluminium-zinc coated sheet and strip	tôle et bande revêtue d'un alliage d'aluminium-zinc	Blech und Band mit Überzügen aus einer Aluminium-Zink Legierung		5.5.1.1d)
angle	cornière	Winkelprofil		6.7.5.2
bar	barre	Stab		6.4
bar for grooved springs	barre pour plats rainurés	Feberstab, gerippt		6.4.1.4
base plate	selle	Unterlage		6.7.1.1h)
bearing piling	pieu métallique	Fundamentprofil (Höhe ≥ 80 mm)		6.7.2.2
bevel bar	barre biseau	Scherenstab		6.4.1.4
blackplate	fer noir	Feinstblech		5.4.1
blank for section	ébauche pour profilés	vorprofiliertes Halbzeug		4.2.5
boxed sheet piling	pieu caisson	Stahlrammpfahl		6.7.2.2
brake rail	rail frein	Bremsschiene		6.7.1.1f)
bright product	produit 'blanc'	Blankstahl		6.5
broad or very broad flange (H) heavy sections and columns	poutrelle à ailes larges ou très larges (poutrelle H et colonne)	H-Profil (Breitflanschträger einschl. Stützenprofil (Höhe ≥ 80 mm)		6.7.4.2
bulb flat	plat à boudin	Wulstflachprofil		6.7.5.4
cast	coulée	Guß		3
casting	pièce moulée	Gußstück		7.3
caterpillar track section	profil pour semelles due chenille	Profil für Raupenketten		6.7.5.5
clad sheet and strip	tôle et bande plaquée	plattiertes Blech und Band		5.7a)
closed die forging	pièce matricée	Gesenkschmiedestück Preßling		7.2
coated flat product	produit plat revêtu	Flacherzeugnis mit Oberflächenveredelung		5.5
coil	bobine (bande)	Rolle		5.2.1.3/5.2.2.2
cold formed product	produit formé à froid	Kaltprofil		6.9
cold formed section	profil formé à froid	Kaltprofil		6.9
cold formed sheet piling	profil formé à froid palplanche	Kaltprofilierte Spundwanderzeugnisse		6.7.2.1f)
cold rolled flat product	produit plat laminé à froid	kaltgewalztes Flacherzeugnis		5.2.2
cold rolled narrow strip	feuillard à froid	Kaltband		5.2.2.2c)

English	French	German	Other	Clause
cold rolled plate or sheet	tôle laminée à froid	kaltgewalztes Blech		5.2.2.1
cold rolled strip	bande à froid	Kaltband kaltgewalztes Band		5.2.2.2
cold rolled strip in cut lengths	feuillard coupé a longuer	Kaltband in Stäben		5.2.2.2
cold rolled wide strip	large bande à froid	Kaltbreitband		5.2.2.2a)
column	colonne	Stützenprofil (Höhe ≥ 80 mm)		6.7.4.2
composite product	produit composite	zusammengesetztes Erzeugnis		5.7
conductor rail	rail conducteur de courant	Stromschiene		6.7.1.1c)
continuous casting	coulée continue	Strangguß		3
corrugated sheet	tôle ondulée	Wellblech		5.6a)
crane rail	rail pour appareil de levage	Kranschiene		6.7.1.2a)
deformed products for reinforcement and prestressing of concrete	produit crénelé ou nervuré	gerippte oder profiliertes Erzeugnis für die Bewehrung von Beton		6.6
drawn product	produit étiré	gezogener Blankstahl		6.5.1
electrical steel	acier magnétique	Elektroblech und -band		5.3
electrolytic chromium/ chromium oxide coated steel (ECCS)	fer chromé (dit ECCS)	spezialverchromtes Blech und Band (ECCS)		5.4.4
electrolytically zinc-coated sheet and strip	tôle électrozinguée	elektrolytisch verzinktes Blech und Band		5.5.1.2b)
fabricated bearing piling	pieu métallique de façonnage	zusammengesetzter Rammpfahl		6.7.2.2a)
fabricated sheet piling	palplanche de façonnage	Konstruktionsbohle		6.7.2.1d)
fabricated tubular sheet piling	pieu métallique tubulaire	Rammrohr		6.7.2.2b)
fish-plate	éclisse	Lasche		6.7.1.1g)
flat	plat	Flachstab		6.4.1.3
flat product	produit plat	Flacherzeugnis		5
flat semi finished product	demi-produit plat	flaches Halbzeug		4.2.3
flat sheet piling	palplanche plate	Flachprofile		6.7.2.1b)
forged bar	barre forgée	geschmiedeter Stab		6.4.2
forged product (open die)	produit forgé (à frappe libre)	Freiformschmiedestück		7.1
full density product	pièce pleine densité	Sinterpreßteil		7.4.3
grain oriented electrical steel	acier magnétique à grains orientés	kornorientiertes Elektroblech und -band		5.3.2
grain oriented flat product	tôle à grains orientés	kornorientiertes Elektroblech und -band		5.3.3
grooved rail	rail à ornières	Rillenschiene		6.7.1.2b)
ground product	produit rectifié	geschliffener Blankstahl		6.5.3

English	French	German	Other	Clause
guide rail	rail guide	Führungsschiene		6.7.1.1e)
heavy plate	tôle forte	Grobblech		5.2.1.2
heavy section	profilé dit poutrelle	große I-, H- u. U-Profile Formstahl einschl. Breitflanschträger (Höhe ≥ 80 mm)		6.7.4
hexagon	hexagone	Sechskantstab		6.4.1.2
hollow bar	barre creuse	Drehteilrohr		6.10.5
hollow mining drill bar	barre creuse pour fleuret	Hohlbohrstab		6.4.3
hollow section	profil creux	Hohlprofil		6.10.4
hot dipped zinc coated sheet, plate and strip	tôle galvanisée	feuerverzinktes Blech und Band		5.5.1
hot finished bar	barre obtenue à chaud	warmgeformter Stab		6.4
hot formed section	profil laminé à chaud	warmgewalztes Profil		6.7
hot rolled flat product	produit plat laminé à chaud	warmgewalztes Flacherzeugnis		5
hot rolled long product	produit long laminé à chaud	warmgewalztes Langerzeugnis		6.2/6.4/...
hot rolled narrow strip	feuillard à chaud	Bandstahl		5.2.1.3c)
hot rolled narrow strip in cut lengths	feuillard à chaud coupé à longueur	Bandstahl in Stäben		5.2.1.3c)
hot rolled sheet or plate cut from wide strip	tôle à chaud issues de larges bandes	Bandblech		5.2.1.2b)
hot rolled strip	bande à chaud	warmgewalztes Band		5.2.1.3
hot rolled sheet and plate	tôle/feuille laminée à chaud	warmgewalztes Blech		5.2.1.2
hot rolled wide strip	large bande à chaud	Warmbreitband		5.2.1.3a)
I and H heavy sections	poutrelles I et H	I- und H-Profile (Höhe ≥ 80 mm)		6.7.4.1/6.7.4.2
I, H and U heavy sections having unequal or asymetric flanges	poutrelles I, H et U à ailes inégales ou dissymétriques	I-, H- oder U-Profile mit ungleichen oder unsymmetrischen Flanschen (Höhe ≥ 80 mm)		6.7.4.5
ingot	lingot	Block, fester Rohstahl		4.1
ingot casting	coulée en lingotière	Blockguß		3
interlocking H sheet piling	palplanche H	Kastenspundwande aus H Profilen		6.7.2.1d)
lead-tin alloy coated sheet and strip	tôle et bande plombée	Ternblech und Ternband		5.5.1.1a) 5.5.1.2a)
lightweight sheet piling (trench sheeting)	palplanche légère de blindage	leichte Spundbohle (Kanaldiele, Leichtprofil, Tafelprofil)		6.7.2.1d)
liquid steel	acier liquide	flüssiger Stahl		3
liquid steel for castings	acier liquide pour pièces moulées	flüssiger Stahl für Stahlguß		3

English	French	German	Other	Clause
liquid steel for ingot casting or continuous casting	acier liquide pour coulée en lingotière ou coulée continue	flüssiger Stahl für Block- oder Strangguß		3
long product	produit long	Langerzeugnis		6
mining frame section	profilé pour soutènement de mines	Grubenausbauprofil		6.7.3
narrow and medium flange heavy (I) section	poutrelle à ailes étroites et moyennes (poutrelle I)	I- Profil mit schmalen oder mittelbreiten Flanschen (Höhe ≥ 80 mm)		6.7.4.1
non oriented grain electrical steel	acier magnétique à grains non orientés	nicht kornorientiertes Elektroblech und -band		5.3.1
octagon	octogone	Achtkantstab		6.4.1.2
open die forging	pièce forgée (à frappe libre)	Freiformschmiedestück		7.1
parallel flanged section	profilé à 'ailes parallèles'	parallelflanschiges I- und H-Profil (Höhe ≥ 80 mm)		6.7.4d)
parent section	profil mère	Mutterprofil		6.7.4 l)
plate and sheet	feuille/tôle	Blech		5.2.1.2/5.2.2.1
prestressing of concrete steel	acier pour béton précontraint	Spannbetonstahl		6.6
profiled sheet	tôle profilée	profiliertes Blech		5.6
quarto plate	tôle quarto	Quartoblech		5.2.1.2 Note
rail	rail	Schiene		6.7.1
railway track products	matériel de voies ferrées	Gleisoberbauerzeugnis		6.7.1.1
reinforcing bar	acier à béton	Betonstahl		6.6
ribbed sheet	tôle nervurée	gerippies Blech		5.6b)
rod	fil machine	Walzdraht		6.2
rolled bar	barre laminée	gewalzter Vollstab		6.4.1
round	rond	Rundstab		6.4.1.1
round semi finished products	demi-produits ronds	rundes Halbzeug		4.2.4
S, U, Z and Ω sheet piling	palplanche S, U, Z, et Ω	S, U, Z und Ω Bolen		6.7.2.1
sandwich panel	panneau sandwich	Sandwichelement		5.7c)
sandwich sheet	tôle sandwich	Sandwichblech		5.7b)
seamless tube	tube sans soudure	nathloses Rohr		6.10.2
semi finished product	demi-produit	Halbzeug		4.2
semi-finished product of rectangular cross-section	demi-produit de section rectangulaire	rechteckiges Halbzeug		4.2.2
semi-finished product of square cross-section	demi-produit de section carrée	quadratisches Halbzeug		4.2.1
semi round bar	barre demi-rond	Halbrundstab		6.4.1.4
sheet	feuille/tôle	Feinblech, Blech		5.2.1.2. 5.2.2.1

English	French	German	Other	Clause
sheet and strip with inorganic coating	tôle et bande à revêtement non organique	Blech und Band mit anorganischer Beschichtung		5.5.3
sheet and strip with metal coating	tôle et bande à revêtement métallique	Blech und Band mit metallischem Überzug		5.5.1
sheet and strip with organic coating	tôle et bande à revêtement organique	Blech und Band mit organischer Beschichtung		5.5.2
sheet piling	palplanche	Spundwanderzeugnis		6.7.2.1
sheet/plate	tôle/feuille	Blech		5.2.2
sintered steel component	pièce frittée	Sinterformteil		7.4.2
slab ingot	lingot dit plat	Bramme		4.1.2
sleeper	traverse	Schwelle		6.7.1.1a)b)
slit cold rolled wide strip	large bande à froid refendue	längsgeteiltes Kaltbreitband		5.2.2.2b)
slit hot rolled wide strip	large bande à chaud refendue	längsgeteiltes Warmbreitband		5.2.1.3b)
small I and H sections	petit profilé I et H	kleines I- und H-Profil (Höhe ≤ 80 mm)		6.7.5.1
small U section (small channel)	petit profilé U	Kleines U-Profil (Höhe ≤ 80 mm)		6.7.5.1
sole plate	plaque d'appui	Klemmplatte		6.7.1.1h)
special bar	barre spéciale	Spezialstab		6.4.1.4
special heavy section	poutrelle spéciale	große Spezialprofile (Höhe ≥ 80 mm)		6.7.4.5
special section	profilé spécial	kleine Spezialprofile		6.7.5.5
square	carré	Vierkantstab		6.4.1.2
square edged, L, U and T sections	profils L, U, T à angles vifs	scharfkantige L-, U-, und T-Profile		6.7.5.5
stamping	pièce estampée	Gesenkschmiedestück		7.2
stamping (closed die)	produit estampé	Gesenkschmiedestück		7.2
steel powder	poudre d'acier	Stahlpulver		7.4.1
steel for prestressing of concrete	acier pour béton précontraint	Spannbetonstahl		6.6
strip	bande	Band		5.2.1.3/5.2.2.2
switch/crossing rail	rail pour aiguille	Weichenschiene, Kreuzungsschiene		6.7.1.1d)
tee with equal flanges	té à ailes égales	gleichschenkliges T-Profil		6.7.5.3
tee with unequal flanges	profil T à ailes inégales	T-profil mit ungleichen Flanschen		6.7.5.5
terne plate	fer terne	Ternblech und -band		5.5.1.1a)
thick section	profil renforcé	schweres Profil, abgeleitet		6.7.42)
thin section	profil mince ou allégé	leichtes Profil, abgeleitet		6.7.43)
tinned sheet and strip	tôle et bande étamée	verzinntes Blech und Band		5.4.3

English	French	German	Other	Clause
tinplate	fer blanc	Weißblech und -band		5.4.2
trapezoidal bar	barre trapèze	Trapezstab		6.4.1.4
trench sheeting	palplanche légère de blindage	Kaltprofilierte Leichtprofile		6.7.2.1e)
triangle bar	barre triangle	Dreieckstab		6.4.1.4
tube	tube	Rohr		6.10.1
turned product	produit écroûté galeté	geschälter Blankstahl		6.5.2
U heavy section (channel)	poutrelle U	U-Profil (Höhe ≥ 80 mm)		6.7.4.3
uncoated flat product	produit plat non revétu	Flacherzeugnis ohne Oberflächenveredelung		5.2
vitreous enamelled product	tôle émaillée	emailliertes Blech		5.5.3
welded section	profilé soudé	geschweißtes profil		6.8
welded tube	tube soudé	geschweißtes Rohr		6.10.3
wide flat	large plat	Breitflachstahl		5.2.1.1
wire	fil	gezogener Draht		6.3
Z section	profil Z	Z-Profil		6.7.5.5
zinc coated sheet and strip	tôle et bande revétue de zinc	verzinktes Blech und Band		5.5.1.1d)
zinc-nickel coated sheet and strip	tôle et bande revétue d'un alliage zinc-nickel	Blech und Band mit Überzügen aus einer Zink-Nickel Legierung		5.5.1.2c)