

SRI LANKA STANDARD 874 : PART 1 : 1990

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SPECIFICATION FOR

STEEL PRODUCTS

PART 1 - CLASSIFICATION AND DEFINITIONS

SRI LANKA STANDARDS INSTITUTION

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SRI LANKA STANDARD
SPECIFICATION FOR STEEL PRODUCTS

PART 1 : CLASSIFICATION AND DEFINITIONS

FOREWORD

This Sri Lanka Standard was authorized for adoption and publication by the Council of the Sri Lanka Standards Institution on 90-08-13 , after the draft, finalized by the Drafting Committee on Steel Products had been approved by the Mechanical Engineering Divisional Committee.

This standard is published in the following two parts:

Part 1 Classification and definitions.

Part 2 Identification markings

Detailed specifications for each of the products covered in this standard are intended to be given in future standards.

This part of the standard includes terms widely used in the Steel Industry. The products classified and defined are grouped into four main categories according to their stage of manufacture. A further distinction is made between hot-worked finished products and cold-worked finished products. Although the products are generally classified independently of their end uses or manufacturing processes, sometimes it has been necessary to make references to them.

Other steel products, viz forged finished, bright, cold-formed, welded sections, castings, and powder metallurgy products are covered in an Appendix A.

All values given in this standard are in SI units.

In the preparation of this part of the standard, assistance obtained from relevant publications of the International Organization for Standardization and the British Standards Institution is gratefully acknowledged.

1 SCOPE

This standard defines and classifies steel industry products according to their:

- a) stage of manufacture;
- b) shape and dimensions; and
- c) appearance.

2 CLASSIFICATION AND DEFINITIONS

The range of products covered in this standard is grouped into four main categories according to their stage of manufacture.

- a) Crude products;
- b) Semi-finished products;
- c) Finished products; and
- d) End products.

2.1 crude products : Products which are either in the liquid state (liquid steel) or solid in the form of ingots, intended for subsequent processing into semi-finished or finished products.

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

NOTE

There are two classes of liquid steel.

- a) *Liquid steel for pouring into ingot moulds or for continuous casting.*
- b) *Liquid steel for casting.*

2.1.2 ingot : Crude product obtained by pouring liquid steel into a mould of a shape appropriate to the subsequent processing into semi-finished and finished products generally by hot rolling or forging.

NOTE

The shape generally resembles a pyramid or truncated cone; the side surfaces may be corrugated and the corners more or less rounded. Depending on their subsequent conversion requirements, and without altering their classification as ingots, they may

- a) *have been totally or partially dressed.*

EXAMPLE:

By tool or torch, to remove surface defects;

- b) *have been shortened (top or bottom cropping) or have been cut into lengths to facilitate the envisaged conversion, or*
- c) *have undergone both operations.*

Ingots have a cross-section which may be nominally square, rectangular (with a width to thickness ratio less than 2), polygonal, round, oval or shaped according to the profile to be rolled.

Ingots produced by the vacuum arc or electroslag process are obtained by melting steel electrodes which have previously been cast, forged or rolled.

2.1.2.1 slab ingots : Have a rectangular cross-section, with a width to thickness ratio greater than or equal to 2.

2.2 semi-finished products : Products obtained either by hot rolling or forging of ingots or by continuous casting, and intended for conversion into finished products generally by rolling or forging.

NOTE

The cross-section can be of various shapes. The cross-sectional dimensions are constant along the length, with wider tolerances than those of the corresponding finished products, and the corners are more or less rounded.

The side faces are sometimes slightly convex or concave, retaining rolling or forging marks, and may be partially or totally dressed.

EXAMPLE :

By tool, torch or grinding.

2.2.1 square bloom : Semi-finished product with sides generally greater than 120 mm.

2.2.2 square billet : Semi-finished product with sides generally equal to or greater than 50 mm and less than or equal to 120 mm.

2.2.3 rectangular bloom : Semi-finished product with cross-sectional area greater than 14 400 mm² and with a ratio of width to thickness greater than 1 and less than 2.

2.2.4 rectangular billet : Semi-finished product with cross-sectional area equal to or greater than 2 500 mm² and less than or equal to 14 400 mm² and with a ratio of width to thickness greater than 1 and less than 2.

2.2.5 slab : Semi-finished product of thickness equal to or greater than 50 mm and with a width to thickness ratio greater than or equal to 2.

2.2.5.1 flat slab : Slab with a width to thickness ratio greater than 4.

2.2.6 sheet bar : Semi-finished product of width equal to or greater than 150 mm and of a thickness greater than 6 mm and less than 50 mm.

2.2.7 round billet : Semi-finished product with diameter greater than or equal to 75 mm.

2.2.8 blanks for sections : Semi-finished products intended for the manufacture of sections and preformed for that purpose. The cross-sectional area of these products is generally greater than 2 500 mm².

2.3 finished products : Products obtained generally by rolling or forging and normally not further hot-worked in the steel works.

NOTE

The cross-section is uniform over the whole length. It 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 reinforcing bars or floor plates, for example, may have a regularly raised or indented pattern.

Finished products are categorized according to:

- a) Stage of manufacture;
- b) Whether surfaces are treated or not.

According to the stage of manufacture, a distinction is made as follows :

- i) **hot-worked finished product** : Product generally obtained by hot working of semi-finished products and sometimes by hot working of crude products.
- ii) **cold-worked finished product** : Products generally obtained by cold working of hot-worked finished products.

According to whether surfaces are treated or not a distinction is made as follows:

- i) **products surface treated**: (classified in this standard separately as End products. See 2.4)
Products having permanent coating which may be applied,
 - a) on both sides:
 - 1) with equal coating on each side;
 - 2) with different thickness on each side
(differential coatings)
 - b) on one side only .

- 11) **products not surface treated:** Products which have not undergone any surface treatment, apart from those products which may have received a simple protective coating against corrosion or mechanical damage in handling or storage, or to facilitate their use.

NOTE

The simple protective coatings may be produced, by one of the following methods:

- a) passivation (with chromic or phosphoric acid):**
The product is electrochemically or chemically coated with a layer of chromate or phosphate; as distinct from surface treatment by chromating or phosphating, the layer deposited is so thin as to be hardly discernible by optical means (7 mg/m² to 10 mg/m² per side);
- b) application of an organic coating :** The coating itself offers no protection against corrosion but serves as a surface preparation for the subsequent application of other undercoates or coatings forming part of an anti-corrosion system;
- c) application of protective films:**

EXAMPLE:

Adhesive coating, adhesive paper, lacquer;

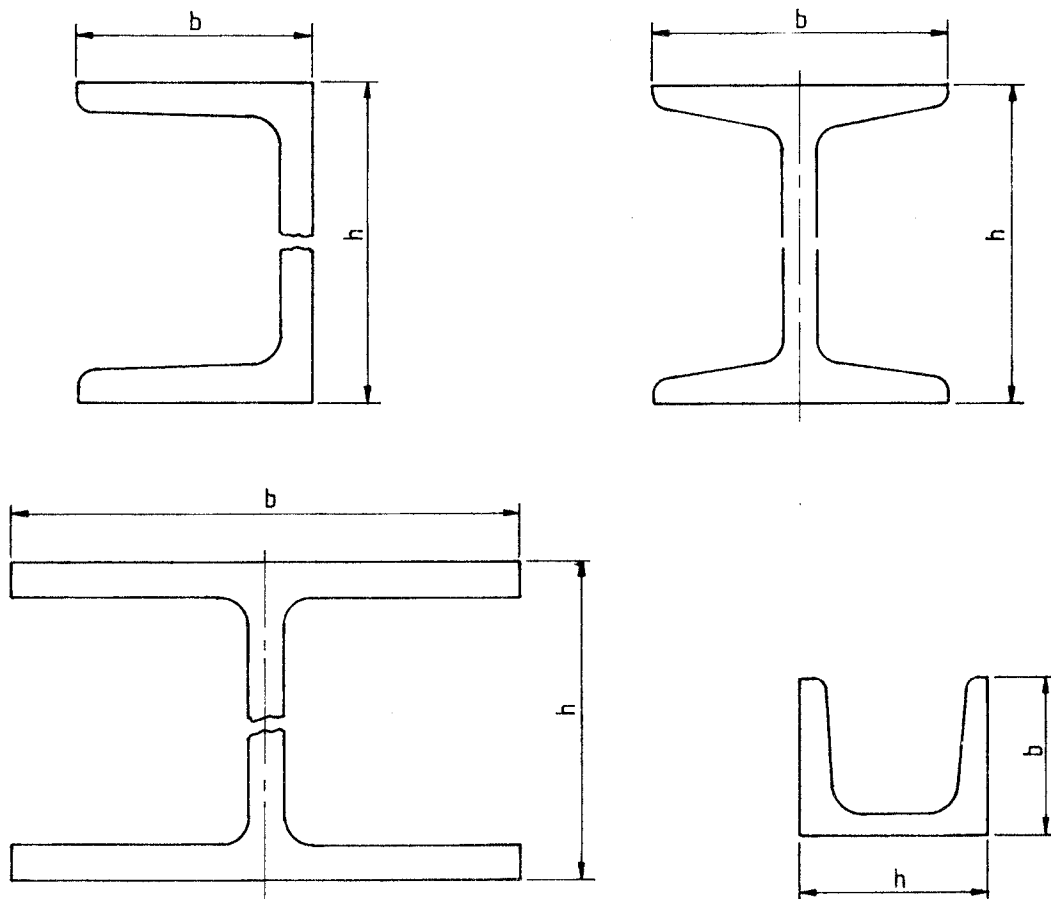
- d) application of a film :** Of grease, oil, tar, asphalt, lime or any soluble material.

2.3.1 bar : Finished product with uniform cross-section either round, square, hexagonal, octagonal or other similar shape manufactured by hot rolling or forging and supplied as straight lengths.

NOTES

- 1) For round bars the diameter should be at least 8 mm.
- 2) The sides should be at least 8 mm for square bars and 14 mm for hexagonal and octagonal bars.

2.3.1.1 flat : Bars of rectangular cross-section, rolled on the four faces, thickness being not less than 5 mm and the width not exceeding 150 mm; the thickness should be greater than 1/10 of the width (see 2.3.5.1 and 2.3.5.3)



Key
b width
h height

FIGURE 1 - Shape definition for I,H and U sections

2.3.2 section : Finished product with uniform cross-section either as I, H, U (channel), L (angle), T (tee), or other special sections such as trapezoids, semirounds, Z sections manufactured by hot/cold rolling or forging and supplied as straight lengths.

NOTE

These products are rolled generally in box passes or in universal rolling mills.

According to dimensions and manufacturing details, distinction is made as "Heavy sections" and "Medium and Light sections".

2.3.2.1 heavy sections : These have cross-sections resembling the letters I, H or U (see Fig.1) or other special sections.

NOTE

Heavy sections have the following characteristics in common :

- a) the height h is greater than or equal to 80 mm;
- 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 ' b ' ;
- d) the outside faces of the flanges are parallel;
- e) the flanges are either of decreasing thickness from the web to the edge, called 'tapered flanged' or of uniform thickness called 'parallel flanged'.

2.3.2.1. a) I and H sections : Heavy sections with cross section resembling the letters 'I' or 'H'.

NOTE

A distinction is made between:

- a) **parent sections:** Sections with web and flange thickness considered as standard;
- b) **thin sections:** Sections manufactured with the same series of rolls as those used in producing the corresponding parent section but which, for an approximately equal web height, have thinner web and/or flanges (as a result of adjustment of the vertical or horizontal rolls); and
- c) **thick sections:** Sections manufactured with the same series of rolls as those 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.)

Among I and H sections a distinction is made between :

- i) **narrow and medium flanges (I sections):** Flanges with width less than or equal to $0.66 \times$ nominal height of the section and less than 300 mm.
- ii) **broad or very broad flanges (H sections) :** Flanges with width greater than $0.66 \times$ nominal height or 300 mm or over, (except sections for colliery arches). Sections with flanges wider than $0.8 \times$ nominal height are sometimes called 'columns'.
- iii) **bearing piles:** I or H sections (defined above) where the thickness of web and flanges are identical are called 'bearing piles'.

2.3.2.1. b) U sections (channels) : Heavy sections with cross section resembling the letter 'U'.

NOTE

In the normal series, the flanges with tapered internal faces have a maximum width (in mm) of $0.5h + 25$. There are series which are thinner or thicker than the parent series and series with parallel flanges.

2.3.2.1. c) sections for colliery arches : Heavy sections with cross section resembling the letter 'H' or the Greek letter ' Ω '.

NOTE

In the first case, these sections are sometimes distinguished from other H sections by a greater slope of the inside face of the flanges (of about 30 per cent). They also have a width greater than $0.70 \times$ nominal height.

2.3.2.1. d) special I, H and U sections : Heavy sections with cross-section resembling the letters I, H or U but with special features of cross section and dimensions.

NOTE

These sections are generally manufactured in limited quantity. They comprise essentially I, H and U sections having unequal or asymmetric flanges and/or non-standard web thickness and height.

2.3.2.2 medium and light sections : These mainly have cross-sections resembling the letters U, L, or T but also include special sections generally produced in limited quantities (including small I and H sections)

2.3.2.2. a) small 'U' sections (small channels) : Product with cross section resembling the letter 'U' and height 'h' less than 80 mm (see Fig. 1)

2.3.2.2. b) angles : Product with cross section resembling the letter 'L'.

NOTE

The classification into equal or unequal angles depends on the ratio of the flange widths. The corners of the flanges are rounded.

2.3.2.2. c) T sections with equal flanges : Product with cross section resembling the letter 'T' and with equal flanges.

NOTE

The corners are rounded and the flanges and web are slightly tapered.

2.3.2.2. d) bulb flats : Product with generally rectangular cross-section with a bulge along the full length of a longitudinal edge of one of the wider surfaces and width generally less than 430 mm.

2.3.2.2. e) special medium and light sections : Products with special cross sections.

NOTE

These include :

a) *small I and H sections of height h less than 80 mm;*

b) *products usually of small cross section or of very special shape and generally manufactured in limited quantities. This includes, in particular, trapezoids, hollow bits for mine drills, bars for grooved springs, semi-rounds and half flat semi-rounds, Z sections, T sections with unequal flanges and square-edged L, U and T sections.*

2.3.3 *rod* : Finished product with uniform cross-section either circular, oval, square, rectangular, hexagonal, octagonal, halfround or other similar shape with at least 5 mm nominal dimensions manufactured by hot rolling and supplied as hot-wound coils.

Rod is also termed "**bar in coil**". Rod straightened and cut to length before delivery is considered to be classified with bars and flats.

NOTE

Rod intended for reinforcement and prestressing of concrete is covered by 2.3.7.1

Rod used for wire-drawing purposes in coil form is generally termed 'wire rod'.

2.3.4 wire : Finished product with uniform cross-section either circular, oval, square, rectangular, hexagonal, octagonal, half round or other similar shape (other than strip), the dimensions of the section being very small compared with the length, manufactured by cold working (either by drawing wire rod or by rolling) and supplied as coils.

2.3.5 flat products : Finished products of nominally rectangular cross-section with a width much greater than thickness, generally manufactured by rolling.

i) *hot rolled flat product* : Flat product produced by hot rolling

NOTE

The very light cold rolling pass, generally less than 5 per cent called a 'skin-pass' or 'dressing-pass' which is given to certain hot rolled flat products does not alter their classification as hot rolled flat products.

ii) *cold rolled flat product* : Flat product that has undergone during finishing a reduction in cross section generally at least 25 per cent by cold rolling without prior reheating.

NOTE

In the case of flat products of width less than 600 mm and for certain qualities of special steel, levels of reduction of cross section less than 25 per cent may be included.

2.3.5.1 wide flat (hot rolled) : Finished flat product of width greater than 150 mm but not exceeding 1250 mm and thickness not less than 4 mm always supplied in lengths, with sharp edges.

NOTE

Wide flats are hot rolled on the four sides (or in box passes) or produced by shearing or flame cutting wider flat products. Wide flats, rolled on all four sides are sometimes termed 'Universal Plates'.

2.3.5.2 sheet/plate (hot/cold rolled) : Finished flat product, the edges being allowed to deform freely during rolling supplied flat and generally square or rectangular but also in any other shape, for example circular or according to the design sketch. The product may also be delivered pre-curved.

NOTE

The edges are as rolled or sheared or flame cut or chamfered.

2.3.5.2. a) sheet (hot/cold rolled) : If the thickness is less than 3 mm;

NOTE

Sheet is generally cut from hot or cold rolled strip rolled on a continuous mill.

2.3.5.2. b) plate (hot/cold rolled) : If the thickness is equal to or greater than 3 mm.

NOTE

Plate may be produced :

- a) directly on a reversing mill or by cutting from a parent plate rolled on a reversing mill (generally known as 'quarto plate');
- b) by cutting from hot or cold rolled strip rolled on a continuous mill.

2.3.5.3 strip (hot/cold rolled) : Finished flat product that immediately after the final rolling pass or after pickling or continuous annealing is wound into laps so as to form a coil with almost flat sides.

NOTE

Strip as rolled has slightly convex edges but it may also be supplied with sheared edges or be obtained by slitting wider rolled strip. Strip may be subsequently cut and supplied as cut lengths or as coils of any narrower width.

2.3.5.3. a) narrow strip (hot/cold rolled) : Strip rolled in nominal widths less than 600 mm.

NOTE

Narrow strip, after decoiling and cutting to length, may be supplied in folded bundles.

2.3.5.3. b) wide strip (hot/cold rolled) : Strip rolled in nominal widths equal to or greater than 600 mm.

2.3.5.3. b). i) slit wide strip : Product that has been slit from wide strip.

NOTE

The width may be less than 600 mm.

2.3.6 tubes (pipes) : Concentric, long, hollow, open ended finished product of uniform cross-section with only one enclosed void along its whole length, having inner and outer surfaces of the same form.

NOTE

Steel tubes are mainly of circular, oval, rectangular (including square) cross sections but in addition may include other regular convex polygonal cross sections.

For the purposes of this standard, no difference is intended between 'pipe' and 'tube' although idiomatic use prefers sometimes the one and sometimes the other.

According to the method of manufacture steel tubes are classified as :

a) welded tubes : Tube formed from either hot or cold rolled plate, sheet or strip welded across the abutting edges. The weld may be either longitudinal or spirial.

NOTE

Several types of welding process are used in the manufacture of these tubes.

EXAMPLE :

i) electric resistance welding (including induction welding);
 ii) submerged arc welding; and
 iii) furnace butt welding (also known as 'continuous weld' or 'Fretz-Moon' process).

b) **seamless tubes** : Tube without a seam, manufactured from an ingot, billet or bar or by casting.

NOTE

Seamless tubes and welded tubes may be either hot or cold finished, as follows :

a) **hot finished tube** : A tube manufactured by a hot-working process;

b) **cold finished tube** : A tube manufactured by a cold-working process, i.e. by a process whereby the cross-sectional area of the initial tubular hollow is reduced by a method such as rolling or by drawing through a die at ambient temperature.

The terms 'hot finished' and cold finished' apply to the condition of the tube before it is subjected to any heat treatment which may or may not be undertaken.

The term '**tubular hollow**' is used to denote the initial tubular product from which the finished tube or hollow section is manufactured.

2.3.6.1 hollow section : A tube used for structural and similar purposes.

EXAMPLE :

Structural hollow section.

2.3.6.2 hollow bar : A seamless tube intended principally for machining applications and distinguished by its close tolerances which ensure clean-up dimensions with minimal machining allowances.

2.3.7 finished products for special purposes

2.3.7.1 product for reinforcement and prestressing of concrete :

Product for reinforcement or prestressing of concrete with cross-section generally round, sometimes square with rounded corners, with nominal diameter or side at least 5 mm.

NOTE

Such products may be supplied as :

- a) bars in lengths with a smooth surface;
- b) bars in lengths with a crenellated, deformed or ribbed surface;
- c) rod in coils with a smooth surface ;
- d) rod in coils with a crenellated, deformed or ribbed surface.

Products supplied in lengths may have undergone a controlled deformation .

EXAMPLE :

Lengthening or twisting about their longitudinal axis.

2.3.7.2 railway materials : Products intended to be used in the construction of railway tracks or other systems of rails.

NOTE

This includes :

- a) hot rolled products used in the construction of railway tracks.

EXAMPLE:

Rails, sleepers, fish plates, sole and tie plates, base plates;

- b) similar hot rolled products such as :
 - i) crane rails;
 - ii) live conductor rails;
 - iii) grooved rails;
 - iv) rails for switches and crossings;
 - v) bridge rails;
 - vi) special rails,

EXAMPLE :

Guide rails, brake rails.

c) materials for railway tracks are subdivided as follows :

1) heavy track material which includes :

rails of linear mass of at least 20 kg/m; sleepers of linear mass of at least 15 kg/m;

11) light track material which includes:

rails of linear mass less than 20 kg/m; sleepers of linear mass less than 15 kg/m; fish plates, sole and tie plates, base plates and other hot rolled light materials for the construction of railway tracks.

2.3.7.3 sheet piling : : Products obtained by hot rolling or cold profiling (drawing, press forming on rolling machines, etc.) with a shape such that, by interlocking of the joints or fitting of longitudinal grooves or by means of special fasteners they form partitions or continuous walls.

NOTE

Sheet piling is differentiated according to its cross sectional shape or application: (see Fig. 2)

- a) U and Z sheet piling;
- b) flat sheet piling;
- c) fabricated sheet piling (built up from piles and angle pieces or similar sections);
- d) lightweight sheet piling (trench sheeting);
- e) interlocking H sheet piling;
- f) boxed sheet piling; and
- g) tubular sheet piling.

Certain finishing operations such as drilling, punching, welding of attachments or similar operations do not alter the classification of the product.

2.3.7.3. a) fabricated bearing pile : A fabricated pile, made up of U or similar shaped cross-sections, used for bearing purposes (see Figure 3).

2.3.7.3. b) tubular bearing pile : A tube of circular or rectangular (including square) cross-section, driven into the ground for transmitting the weight of a structure to the soil by the resistance developed at its base and by friction along its surface.

2.4 end products : Finished steel products which are permanently coated or otherwise conditioned in the steel works.

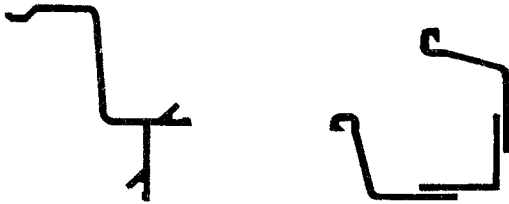
2.4.1 *tinned sheet, plate and strip* : Sheet, plate and strip products with a tin coating.



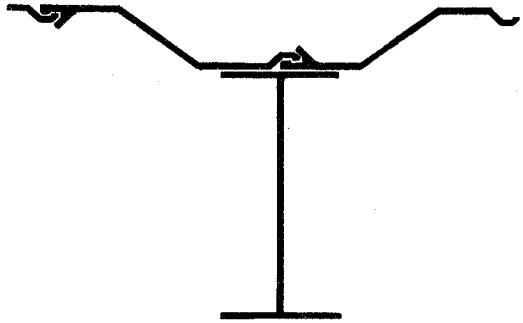
(a) U and Z sheet piling



(b) Flat sheet piling



(c) Fabricated sheet piling



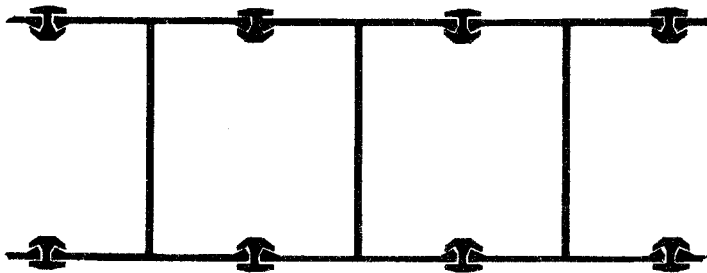
(1) Trench sheeting



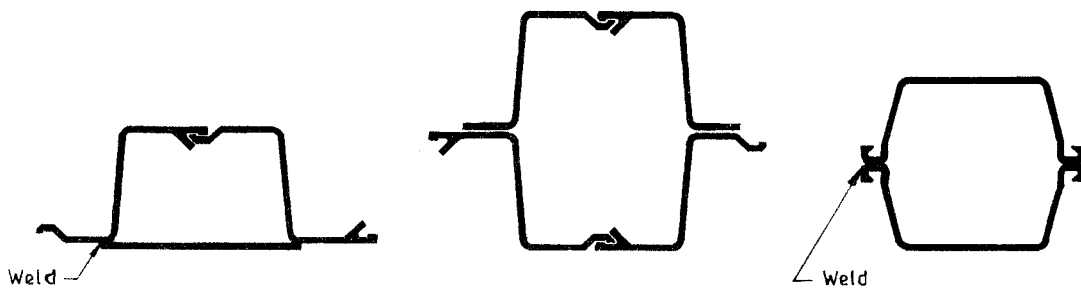
(2) Panel piling

(d) Lightweight sheet piling

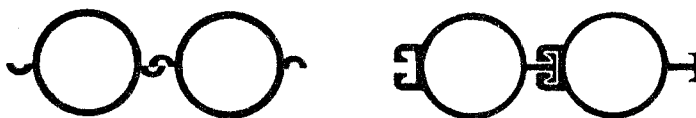
FIGURE 2 - Sheet piling shapes



(e) Interlocking H sheet piling



(f) Boxed sheet piling



(g) Tubular sheet piling

FIGURE 2 - Sheet piling shapes (concluded)

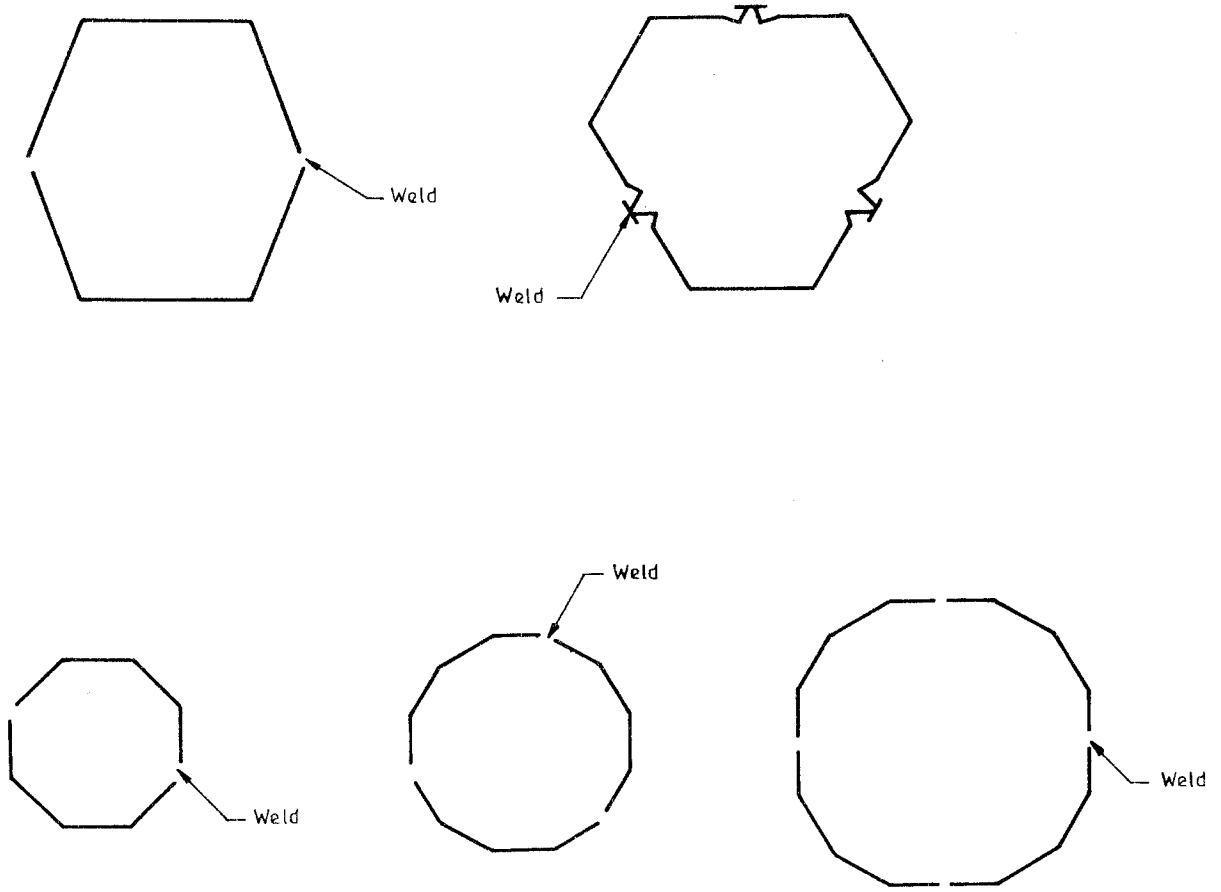


FIGURE 3 - Typical diagrams of fabricated bearing piles

NOTE

These products are subdivided into :

- a) tinplate, which is mild carbon steel of a thickness less than 0.50 mm, coated with tin, either by hot dipping (dipping in a bath of molten tin) or electrolytically.
- b) miscellaneous tin coated sheet, plate and strip.

2.4.2 chromium coated sheet and strip (tin free steel) : Sheet and strip products generally of a thickness less than 0.50 mm, electrolytically coated with chromium or chromium oxide or both, the total thickness being in general equal to or less than 0.05 μm .

2.4.3 terne coated sheet plate and strip : Sheet, plate and strip products coated with a lead-tin alloy, either by dipping in a bath of molten alloy or electrolytically.

NOTE

In general, the highest nominal mass specified for the coating corresponds to a minimum of 120 g/m^2 including both sides.

2.4.4 zinc coated sheet, plate and strip : Sheet, plate and strip products coated with zinc, either by dipping or electrolytically.

NOTE

These products are obtained as follows :

- a) By dipping in a bath of molten zinc, the mass of the zinc varying in general between a value as low as possible and 700 g/m^2 including both sides, which corresponds to a coating thickness of up to 50 μm per side. The coating may have a spangle finish, minimized spangle or be without spangle.
- b) Electrolytically, the mass of the zinc varying in general between 15 g/m^2 and 150 g/m^2 including both sides, which corresponds to a coating thickness of 1 μm per face to 10 μm per face. The coating never shown spangle.

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

2.4.5 aluminium coated sheet, plate and strip : Sheet, plate and strip products obtained by dipping in a molten bath.

NOTE

The coating mass varies in general between 80 g/m² and 300 g/m² including both sides, which corresponds to a coating thickness of 15 μm per face to 55 μm per face.

2.4.6 sheet, plate and strip with organic coating : Sheet, plate and strip products that are coated with an organic material or a mixture of metal powder and organic material by either of the following continuous processes.

a) By 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 μm per face to 400 μm per face.

b) By 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 per face and 500 μm per face.

2.4.7 sheet, plate and strip with inorganic coating : Sheet, plate and strip products that are coated with an inorganic material.

NOTE

These products are subdivided into :

- a) chromated products, the thickness of the coat of chromate varies from 1 g/m² per face to 20 g/m² per face.
- b) phosphate products, the thickness of the coat of phosphate varies from 1 g/m² per face to 20 g/m² per face; and
- c) miscellaneous inorganic coatings.

EXAMPLE :

Vitreous enamelled products.

2.4.8 composite product : Product that is either :

a) a product clad with steel or alloy which is resistant to wear or chemical corrosion; or

b) sheet, plate and strip to which are bonded, usually by rolling but sometimes by explosion or other welding, wear-resistant or chemical corrosion-resistant steels or alloys.

2.4.9 *electrical sheet and strip* : Products distinguished from other thin products by the fact that they are intended for electromagnetic applications and their principal characteristic is their performance with regard to specified permissible losses and sometimes magnetic induction and buckling factor.

NOTE

Their thickness is generally equal to or less than 3 mm and their width equal to or less than 1250 mm. There is a distinction between :

- a) grain oriented products supplied with an insulating coating on both sides; and*
- b) non-grain oriented products which may be supplied either uncoated or with an insulating coating on one or both sides.*

2.4.10 *blackplate* : Product of mild carbon steel less than 0.50 mm thick supplied in sheets or in coils, the surface of which is suitable for tinning, lacquering or printing and is not oiled.

APPENDIX A

OTHER STEEL PRODUCTS

A.1 FORGED FINISHED AND STAMPED FINISHED PRODUCTS

A.1.1 Forged products (open die) : Products other than semi-finished products defined in 2.2 and finished products defined in 2.3; obtained by forming steel at a suitable temperature by pressure, using an open die to produce approximate shapes which do not require further hot deformation. They are generally machined to final shape.

NOTE

Forged finished products are classified according to their application.

EXAMPLE :

Railways, automobiles, general engineering.

According to their shape.

EXAMPLE :

Wheels, discs

Products pre-forged and finished in ring rolls are also included under open-die forged products.

EXAMPLE :

Tyres

A.1.2 Drop forgings (closed die) : Products obtained by forming steel at a suitable temperature by pressure using a close die which determines the required shape and volume of the product.

A.2 BRIGHT PRODUCTS

A.2.1 Drawn products : Products of various cross-sectional shapes obtained, after descaling, by drawing of hot-rolled bars or rod, on a draw bench (cold deformation without removing material). This operation gives the products special features with respect to shape, dimensional accuracy and surface finish. In addition, the process causes cold work hardening of the product, which can be eliminated by subsequent heat treatment. Products in lengths are delivered straightened; products of small cross-section may also be supplied in coils.

A.2.2 Turned (or peeled) products : Steel bars of circular cross-section having the special features of drawn products (A.2.1) concerning shape, dimensional accuracy and bright surface finish, produced by turning on a lathe (or peeling) followed by straightening and polishing. The removal of metal by peeling is carried out in such a way that the bright product is generally free from rolling defects and decarburization.

A.2.3 Ground products : Drawn or turned bars of circular cross-section, given an improved surface quality and dimensional accuracy by grinding or grinding and polishing.

A.3 COLD-FORMED PRODUCTS : Products having various cross-sectional shapes, constant along their total length made from coated or uncoated hot- or cold-rolled flat material whose thickness is slightly modified by the cold-forming process.

EXAMPLE:

Profiling, drawing, press forming, flanging.

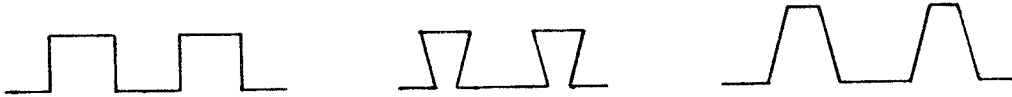
A.3.1 Cold-formed sections : Products formed cold in lengths having various open or closed cross-section shapes.

EXAMPLES :



A.3.2 Profiled sheets : Cold-formed products having a cross-section distinctly greater in width than height and normally showing along their total length several parallel undulations of constant cross-section.

EXAMPLES :



Products of sinusoidal profile are classified as end products

A.4 WELDED SECTIONS : Long products of open cross-section which have a shape characteristic of those products defined in 2.3.2 but instead of being obtained directly by hot rolling are made up by welding together combinations of hot-rolled sections, hot-rolled flat products and cold-rolled flat products.

A.5 CASTINGS : Finished products whose shapes and final dimensions, apart from any machining, are directly obtained by the solidification of liquid steel cast in moulds of sand, fire-clay or other refractory materials and, more rarely, in metal or graphite permanent moulds.

A.6 POWDER METALLURGY PRODUCTS

A.6.1 Steel powder : Collection of steel particles of dimensions usually less than 1 mm.

A.6.2 Sintered steel components : Pieces produced from powder by pressing and sintering and sometimes re-pressing. The pieces are often to close dimensional tolerances and are generally ready for use.

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The Institution is financed by Government grants, and by the income from the sale of its publications and other services offered for Industry and Business Sector. Financial and administrative control is vested in a Council appointed in accordance with the provisions of the Act.

The development and formulation of National Standards is carried out by Technical Experts and representatives of other interest groups, assisted by the permanent officers of the Institution. These Technical Committees are appointed under the purview of the Sectoral Committees which in turn are appointed by the Council. The Sectoral Committees give the final Technical approval for the Draft National Standards prior to the approval by the Council of the SLSI.

All members of the Technical and Sectoral Committees render their services in an honorary capacity. In this process the Institution endeavours to ensure adequate representation of all view points.

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