



BSI Standards Publication

Fences

Part 10: Specification for anti-intruder fences in chain link
and welded mesh

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Summary of pages

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Foreword

Publishing information

This part of BS 1722 was published by BSI Standards Limited, under licence from The British Standards Institution, and came into effect on 30 April 2019. It was prepared by Technical Committee B/201, *Fences and gates*. A list of organizations represented on this committee can be obtained on request to its secretary.

Supersession

This part of BS 1722 supersedes [BS 1722-10:2006](#), which is withdrawn.

Relationship with other publications

BS 1722 is published in parts as follows:

- *Part 1: Specification for chain link fences;*
- *Part 2: Specification for strained wire and wire mesh netting fences;*
- *Part 4: Specification for cleft chestnut pale fences;*
- *Part 5: Specification for close-boarded fences and wooden palisade fences;*
- *Part 7: Specification for wooden post and rail fences;*
- *Part 8: Specification for mild steel (low carbon steel) continuous bar fences and hurdles;*
- *Part 9: Specification for mild steel (low carbon steel) fences with round or square verticals and flat horizontals;*
- *Part 10: Specification for anti-intruder fences in chain link and welded mesh;*
- *Part 11: Specification for prefabricated wood panel fences;*
- *Part 12: Specification for steel palisade fences;*
- *Part 14: Specification for open mesh steel panel fences;*
- *Part 16: Specification for powder coatings used as a plastics finish to components and mesh;*
- *Part 17: Specification for electric security fences – Design, installation and maintenance;*
- *Part 18: Specification for free-standing temporary steel mesh perimeter fencing panels.*

Information about this document

This is a full revision of this part of BS 1722, and introduces the following principal changes:

- Performance-based requirements have been specified rather than descriptive where possible
- Heights up to 3.60 m are now covered.

No attempt has been made to standardize fences or gates of a purely decorative nature, or to suit special requirements; nor to specify requirements for “patent” proprietary fencing systems. However, the structure of such fences or gates can still be designed in accordance with the relevant clauses of this part of BS 1722.

Throughout this part of BS 1722 fence post spacings are given in terms of centre-to-centre distances.

Use of this document

It has been assumed in the drafting of this part of BS 1722 that the execution of its provision is entrusted to appropriately qualified and experienced people. Before installation commences, the Lead Installer and all other operatives are expected to have a suitable qualification.

NOTE An example of a suitable qualification for a Lead Installer is the attainment of a Joint Fencing Industry Skills Scheme (FISS) or Construction Scheme Skills Certification Scheme (CSCS) registration card skilled level (blue card). An example of a suitable qualification for all other operatives is the attainment of the basic fence operative card (green card). At the time of publication of this British Standard the registration cards are validated by the FISS and CSCS. FISS/CSCS maintains a national register of fence installers and operatives. Other schemes might be available.

This part of BS 1722 specifies the requirements for anti-intruder wire mesh fences. It may be used as a specification for work to be carried out by a specialist fencing contractor or, if such a contractor is not available, by local labour under strict supervision, with component parts supplied by firms approved by the client.

Presentational conventions

The provisions of this standard are presented in roman (i.e. upright) type. Its requirements are expressed in sentences in which the principal auxiliary verb is “shall”.

Commentary, explanation and general informative material is presented in smaller italic type, and does not constitute a normative element.

Where words have alternative spellings, the preferred spelling of the Shorter Oxford English Dictionary is used (e.g. “organization” rather than “organisation”).

Requirements in this standard are drafted in accordance with *Rules for the structure and drafting of UK standards*, subclause **G.1.1**, which states, “Requirements should be expressed using wording such as: ‘When tested as described in [Annex A](#), the product shall ...’”. This means that only those products that are capable of passing the specified test will be deemed to conform to this standard.

Contractual and legal considerations

This publication does not purport to include all the necessary provisions of a contract. Users are responsible for its correct application.

Compliance with a British Standard cannot confer immunity from legal obligations.

Introduction

Choosing a fence is affected by factors such as intended purpose, desired service life, aesthetic considerations and availability of components. The specifier can match a suitable choice of fence to its intended purpose by reference to [Table 1](#) and [Table 2](#), and inform those installing the fence of the basic characteristics required.

Premature failure of the fence can be avoided by taking care not to damage protective treatments during installation.

1 Scope

This part of BS 1722 specifies requirements for anti-intruder chain link or welded mesh fences and gates of at least 2.4 m in height for situations that require a higher level of protection than that offered by fences conforming to BS 1722-1. It also includes requirements for the installation of the fencing at the specified location. Where enhanced levels of security are required, other types of fences are specified in [BS 1722-12](#) and in the relevant clauses of [BS 1722-14](#).

Provision is made for either single or double extension arms.

This British Standard includes requirements for component dimensions, together with the permissible tolerances on size. These are minimum requirements and it is acceptable to use larger sizes, except where this could adversely affect the fitting of components or if replacement parts are required to match with those already present.

This British Standard includes requirements for protective treatments. However, maintenance requirements for the fence after installation are outside the scope of this standard.

This British Standard specifies the requirements for posts, steel gates and gate posts and zinc coated or plastic coated zinc coated wire or mesh infill.

This British Standard also specifies requirements for fence materials and their combination and installation. Because a fence is made up of a number of separate components of which the particular features vary, e.g. zinc coated or plastic coated wire, a number of combinations are available to the user. [Annex A](#) provides details of the fence requirements and installation site to be agreed between the fence supplier and client at the time of ordering a fence. However, as conditions vary from site to site, the information in [Annex A](#) is not exhaustive.

Ground conditions might indicate that a variation in the length of a post or strut, or the depth to which it can be set, is desirable. The post and strut setting depths specified in this part of BS 1722 are intended for use in normal ground conditions but if special conditions exist that warrant a change in the specification, e.g. the ground is softer or firmer than usual, such a change should be agreed with the specifier. This also applies to other similar changes.

2 Normative references

The following documents are referred to in the text in such a way that some or all of their content constitutes provisions of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

BS 1722-1, *Fences — Part 1: Specification for chain link fences*

[BS 1722-16](#), *Fences — Part 16: Specification for powder coatings used as a plastics finish to components and mesh*

- [BS 4102:1998](#), *Specification for steel wire for general fencing purposes*
- [BS 4320](#), *Specification for metal washers for general engineering purposes — Metric series*
- [BS 7371-3](#), *Coatings on metal fasteners — Part 3: Specifications for electroplated zinc coatings*
- [BS 7371-6](#), *Coatings on metal fasteners — Part 6: Specification for hot dipped galvanized coatings*
- BS 8500 (all parts), *Concrete — Complementary British Standard to BS EN 206-1*
- BS EN 1011-1, *Welding — Recommendations for welding of metallic materials — Part 1: General guidance for arc welding*
- BS EN 1011-2, *Welding — Recommendations for welding of metallic materials — Part 2: Arc welding of ferritic steels*
- BS EN 10088-1, *Stainless steels — Part 1: List of stainless steels*
- BS EN 10088-3, *Stainless steels — Part 3: Technical delivery conditions for semi-finished products, bars, rods, wire, sections and bright products of corrosion resisting steels for general purposes*
- BS EN 10223-1, *Steel wire and wire products for fencing and netting — Part 1: Zinc and zinc alloy coated steel barbed wire*
- BS EN 10223-4, *Steel wire and wire products for fencing and netting — Part 4: Steel wire welded mesh fencing*
- BS EN 10223-6:2012, *Steel wire and wire products for fencing and netting — Part 6: Steel wire chain link fencing*
- BS EN 10240, *Internal and/or external protective coatings for steel tubes — Specification for hot dip galvanized coatings applied in automatic plant*
- BS EN 10244-2, *Steel wire and wire products — Non-ferrous metallic coatings on steel wire — Part 2: Zinc or zinc alloy coatings*
- BS EN 12620, *Aggregates for concrete*
- BS EN 12878, *Pigments for the colouring of building materials based on cement and/or lime — Specifications and methods of test*
- BS EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods*
- BS EN ISO 2063 (all parts), *Thermal spraying — Zinc, aluminium and their alloys*
- BS EN ISO 9606-1, *Qualification testing of welders — Fusion welding — Steels*
- [BS EN ISO 12944](#), *(Parts 1 to 8), Paints and varnishes – Corrosion protection of steel structures by protective paint systems*

3 Terms and definitions

For the purposes of this part of BS 1722, the terms and definitions given in BS 1722-1 apply.

4 Wire for chain link fences

4.1 General

All wire shall conform to the relevant parts of [BS EN 10223](#) or [BS 4102](#). Mild steel wire diameters shall be in accordance with [Table 1](#).

4.2 Chain link mesh

Chain link mesh shall be of zinc or class A zinc alloy coated wire conforming to BS EN 10223-6:2012, 5.2 a) to e). The size of mesh shall be a maximum of 50 mm as defined in BS EN 10223-6. The width of the mesh shall be a minimum of 2.4 m, if it is not to be buried, or 2.7 m if it is to be buried. The top edge and, if exposed, the bottom edge shall be barbed.

NOTE For higher security installations, 3 m high fences and chain link manufactured from high-tensile wire (1050 N/mm² minimum tensile) is recommended.

Chain link mesh shall be joined by interweaving a spiral and restoring the knuckle or barb.

4.3 Line wire

Line wire shall be high tensile and shall conform to [BS 4102:1998](#), Table 2, with a diameter conforming to [Table 1](#).

4.4 Stirrup wire

Stirrup wire, used for securing line wires to intermediate posts, shall be of mild steel conforming to [BS 4102](#), with a diameter conforming to [Table 1](#).

4.5 Tying wire

Tying wire, used for securing mesh to line wires, shall be of mild steel conforming to [BS 4102](#), with a diameter conforming to [Table 1](#).

4.6 Barbed wire

Barbed wire shall conform to BS EN 10223-1.

Table 1 — Minimum diameters of wires in chain link

Dimensions in millimetres													
Type of mesh protection	Mesh wire			Line wire ^{A)}				Stirrup wire			Tying wire		
	Mesh size	Zinc coated wire diameter	Plastic coated wire		Zinc coated wire diameter	Plastic coated wire		Zinc coated wire diameter	Plastic coated wire		Zinc coated wire diameter	Plastic coated wire	
			Core wire diameter	External diameter		Core wire diameter	External diameter		Core wire diameter	External diameter		Core wire diameter	External diameter
High-tensile zinc-coated chain link	40	3.00	—	—	3.15	—	—	2.5 ^{B)}	—	—	1.60 ^{B)}	—	—
High-tensile zinc-coated chain link	50	3.00	—	—	3.15	—	—	2.5 ^{B)}	—	—	1.60 ^{B)}	—	—
Plastic-coated chain link ^{B)}	50	—	3.55	4.75	—	3.55	4.75	—	2.5	3.55	—	1.40	2.00

^{A)} Line wires should be set 20 mm down from the top of the mesh and 20 mm up from the bottom of the mesh and equal spaces in between.

^{B)} Mild steel.

^{A)} Line wires should be set 20 mm down from the top of the mesh and 20 mm up from the bottom of the mesh and equal spaces in between.

^{B)} Mild steel.

5 Materials and construction

5.1 Wire

5.1.1 General

As per [4.1](#), wire for fences shall conform to the appropriate part of [BS EN 10223](#) or [BS 4102](#).

5.1.2 Chain link mesh and line wire

Chain link mesh and line wire shall be wire conforming to BS EN 10223-6:2012, [5.2](#) a), b) or c) and [Table 1](#).

5.1.3 Welded mesh

Welded mesh shall be manufactured from 3 mm diameter zinc coated wire and, if specified, plastic coated. The size of the mesh shall be (50 × 50) mm or 75 mm vertical × 25 mm horizontal. The width of the welded mesh shall be 2.4 m, if it is not buried, or 2.7 m if it is buried. The top edge and, if exposed, the bottom edge shall be barbed, or a strand of barbed wire shall be fixed to the edge.

If plastic coated mesh is used in two separate widths each width shall be overlapped horizontally by a minimum of two complete meshes. The width of 2.4 m for (75 × 25) mm mesh shall be made up of 1 500 mm and 1 050 mm widths, and for (50 × 50) mm mesh of 1 500 mm and 1 000 mm widths. The width of 2.7 m for (75 × 25) mm mesh shall be made up of 1 800 mm and 1 050 mm widths, and for (50 × 50) mm mesh of 1 800 mm and 1 000 mm widths.

NOTE If plastic coated mesh is specified, it should be noted that it is currently not possible to obtain full height plastic coated mesh from UK manufacturers.

5.1.4 Line wire

As per [4.1](#), line wire shall conform to BS EN 10223-6 or [BS 4102](#).

5.1.5 Stirrup wire

Stirrup wire shall conform to BS EN 10223-6:2012, [5.2](#) a), b) or c), and shall be appropriate for the line wire used, with a minimum nominal diameter of 2.50 mm.

5.1.6 Tying wire

Tying wire shall be zinc or zinc alloy coated tying wire of low carbon (mild) steel of nominal diameter 2 mm. Organic coated tying wire shall be of nominal core diameter 1.4 mm and nominal outside diameter 2 mm.

Preformed clips, if used, shall be applied using the correct tool.

5.1.7 Barbed wire

Barbed wire shall conform to BS EN 10223-1.

5.2 Posts, gate posts and struts

5.2.1 Materials and protective treatment

Steel grades for posts, struts, baseplates, caps and corrosion protective treatments applied to these materials shall conform to [Annex B](#).

5.2.2 Tolerances on size

Steel components shall conform to their specified sizes within the following tolerances:

- a) an allowance on length of ± 10 mm;
- b) an allowance on cross-section as specified in the appropriate material standards (see [Table B.1](#)).

5.2.3 General construction

Steel components shall be free from sharp edges and burrs. The tops of hollow steel posts shall be capped.

Posts shall be holed for attaching line wires, etc., as specified in [8.3](#) and [8.4](#). Holes for the top line wire shall be approximately 25 mm below the top of the post (excluding extensions for barbed wire). Holes shall be free from obstructions.

Posts for barbed wire shall have integral extensions with the same cross-section as the post, or means for attaching extension arms (see [5.4.11](#)).

NOTE Separate extension arms may be bolted or welded on.

If further security against climbing is required, a topping shall be fixed, such as:

- a) barbed wire (in accordance with BS EN 10223-1);
- b) barbed tape;
- c) rotating devices; or
- d) razor barb.

5.2.4 Fence posts and struts

Dimensions of steel posts and struts produced from rolled steel angle, round tube or rectangular or round hollow sections shall conform to [Clause 7](#).

NOTE 1 Typical sizes and minimum dimensions for steel posts and struts are given in [Table 2](#) and [Table 3](#). Thicker walls than those shown in [Table 3](#) for posts and struts may be used if agreed between the client and supplier. Alternative section sizes to those shown (e.g. 38 mm/44.5 mm or 51 mm OD circular) may be used in appropriate cases if agreed between the client and supplier.

Straining posts and struts shall be fitted with baseplates (see [5.2.6](#)) or have spragged ends.

Straining posts and struts shall be holed for bolting together with a minimum 8 mm bolt, or welded, within the top third of the length of the straining post above ground level (not including extensions for barbed wire). Straining posts shall be holed for attaching straining fittings.

Intermediate posts of rolled steel angle shall have spragged ends or shall be fitted with baseplates (see [5.2.6](#)). Intermediate posts of other sections shall have dowels fitted through the base or shall be fitted with baseplates. Intermediate posts shall be holed for attaching line wires.

NOTE 2 Spacing of line wires is specified in [Table 1](#).

5.2.5 Gate posts and struts

Gate posts shall be designed to bear a load equal to at least 3.5 times the weight of the finished gate leaf without deflection in any position detrimental to its operation and without permanent deformation.

NOTE 1 Typical dimensions for gate posts are shown in [Table 2](#).

NOTE 2 In calculating the dimensions, it has been assumed that the major axis of the post is perpendicular to the line of the fence.

NOTE 3 Alternative section sizes can be used if agreed between the client and supplier.

NOTE 4 Typical dimensions for steel posts and struts are shown in [Table 3](#).

Table 2 — Typical steel post sizes for individual gate leaf widths (pairs or singles) ^{A)}

Fence height	Embedded length (min)	Recommended size of steel posts for individual gate leaf widths			
		≤1.5 m	1.5 m ≤ 2.5 m	2.5 m ≤ 4 m	4 m ≤ 5 m
mm	mm	mm	mm	mm	mm
≤1800	650 ^{B)}	80 × 80	100 × 100	120 × 120	150 × 150
2000	650 ^{B)}	80 × 80	100 × 100	120 × 120	150 × 150
2400	850 ^{B)}	80 × 80	120 × 120	120 × 120	150 × 150
3000	950 ^{B)}	100 × 100	120 × 120	150 × 150	150 × 150

^{A)} Posts shall be selected to remain within the material's elastic limit when stated loads are applied and shall not deflect so as to affect the operation of the gate.

^{B)} Embedded depth varies depending on the length and loadings. The minimum is stated.

Table 3 — Typical dimensions for steel posts and struts

Height of fence	Posts			Struts					
	Length			Straining posts (section size)			Section		
	m			mm			mm		
	m	30°	45°	Rolled steel angle	Tube or circular hollow section	Rectangular hollow section	Rolled steel angle	Tube or circular hollow section	Rectangular hollow section
0.90	1.50	1.30	1.40	50 × 50 × 6	48.3 × 3.0	50 × 50 × 3	40 × 40 × 4	33.7 × 3.0	40 × 40 × 2.0
1.20	1.80	1.50	1.71	50 × 50 × 6	48.3 × 3.0	50 × 50 × 3	40 × 40 × 4	33.7 × 3.0	40 × 40 × 2.5
1.40	2.00	1.68	2.00	60 × 60 × 6	60.3 × 3.0	50 × 50 × 3	50 × 50 × 5	42.4 × 3.0	40 × 40 × 2.5
1.80	2.50	2.15	2.55	60 × 60 × 6	60.3 × 3.0	50 × 50 × 3	50 × 50 × 5	42.4 × 3.0	40 × 40 × 2.5
1.80 with integral arms	3.00	2.15	2.55	60 × 60 × 6	60.3 × 3.0	50 × 50 × 3	50 × 50 × 5	42.4 × 3.0	40 × 40 × 2.5
2.15	2.80	2.50	2.95	60 × 60 × 6	60.3 × 3.0	50 × 50 × 3	50 × 50 × 5	42.4 × 3.0	40 × 40 × 2.5
2.15 with integral arms	3.25	2.50	2.95	60 × 60 × 6	60.3 × 3.0	50 × 50 × 3	50 × 50 × 5	42.4 × 3.0	40 × 40 × 2.5

^{A)} Struts should be fixed at an angle of 45° on level ground. If site conditions are unsuitable for this, and if agreed between the client and supplier, the struts may either be fixed at 30° or alternative strut lengths used.

5.2.6 Baseplates and dowels

Gate posts, straining posts and struts shall be fitted with baseplates, baseflats or dowels.

Baseplates and baseflats shall have a minimum thickness of 3 mm, shall be welded to the posts and shall project at least 50 mm on at least two sides of the post.

Where required, baseplates or baseflats for steel intermediate posts shall extend at least 40 mm from at least one face of the post.

Dimensions and masses of baseplates for steel gate posts shall conform to [Table 4](#). Baseplates shall not interfere with adjacent straining posts.

Dowels shall be of steel at least 10 mm in diameter.

Dowels shall be driven through the post within 250 mm of the base of the post and shall project at least 50 mm from either side of the post.

5.2.7 Welding

All welding operations shall be carried out in accordance with BS EN 1011-1 and BS EN 1011-2, by suitable personnel qualified according to BS EN ISO 9606-1.

5.3 Gates

5.3.1 General

Gates shall provide a comparable degree of security to the adjacent fencing. The overall height of the gates when fixed shall be not less than the adjacent fencing height.

Gates shall be designed such that the nominal gap from the bottom edge of the gate to the surface of the road does not exceed 70 mm when the gate is in the closed position.

NOTE 1 Specific site conditions and levels might dictate that additional measures are necessary.

The infill on the gates shall be the same as that used on the fencing (unless otherwise specified). In the closed position, the clear distance between the vertical framing of the gates and adjacent posts shall be not greater than 89 mm.

All gate frame joints shall be continuously welded.

NOTE 2 Attention is drawn to BS EN ISO 9606-1 regarding welding qualifications.

Frames shall conform to loading requirements in [5.3.2.1](#) and [5.3.2.2](#) without permanent deformation.

NOTE 3 See [Table 4](#) for typical frame sizes of gates.

Table 4 — Typical frame sizes for individual gate leaf widths (pairs or singles)

Fence height	Dimensions in mm			
	Typical frame size for individual gate leaf widths			
	≤1.5 m	1.5 m ≤ 2.5 m	2.5 m ≤ 4 m	4 m ≤ 5 m
1 800	50 × 50	50 × 50	60 × 60	60 × 60
2 000	50 × 50	50 × 50	60 × 60	80 × 60 / 60 × 60
2 400	50 × 50	50 × 50	60 × 60	80 × 60 / 60 × 60
3 000	60 × 60	60 × 60	60 × 60	80 × 60 / 60 × 60
3 600	60 × 60	60 × 60	60 × 60	80 × 60 / 60 × 60