

Fences —

Part 2: Specification for rectangular wire mesh and hexagonal wire netting fences

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- British Independent Steel Producers' Association
- British Precast Concrete Federation Ltd.
- British Steel Industry
- British Timber Merchants Association
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- Concrete Society
- Country Landowners' Association
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- Royal Institution of Chartered Surveyors
- Society of Chain Link Fencing Manufacturers
- Timber Growers United Kingdom
- Timber Research and Development Association
- Wire Products Association

The following bodies were also represented in the drafting of the standard, through subcommittees and panels:

- British Gas Plc
- British Wire Netting Association
- Cold Rolled Sections Association
- Consumer Policy Committee of BSI
- Fencing Industry Association
- Timber Trade Federation

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Foreword

This British Standard has been prepared under the direction of the Road Engineering Standards Policy Committee. It is a revision of BS 1722-2:1973 which is withdrawn. BS 1722 is published in separate Parts as follows.

- *Part 1: Specification for chain link fences;*
- *Part 2: Specification for rectangular wire mesh and hexagonal netting fences;*
- *Part 3: Specification for strained wire fences;*
- *Part 4: Specification for cleft chestnut pale fences;*
- *Part 5: Specification for close boarded fences;*
- *Part 6: Specification for wooden palisade fences;*
- *Part 7: Specification for wooden post and rail fences;*
- *Part 8: Specification for mild steel (low carbon steel) continuous bar fences;*
- *Part 9: Specification for mild steel (low carbon steel) fences with round or square verticals and flat posts and horizontals;*
- *Part 10: Specification for anti-intruder chain link fences;*
- *Part 11: Specification for woven wood and lap boarded panel fences;*
- *Part 12: Specification for steel palisade fences;*
- *Part 13: Specification for chain link fences for tennis court surrounds.*

The various Parts specify requirements for the types of fences that are considered suitable for standardization. It should be noted that no attempt has been made to standardize fences or gates of a purely decorative nature, to suit special requirements, or to specify requirements for “patent” proprietary fencing systems. It is recommended that the structure of such fences or gates should comply with those Parts of the specification that are applicable.

It has been assumed in the drafting of this British Standard that the execution of its provisions is entrusted to appropriately qualified and experienced people.

The purpose of this standard is to establish minimum requirements for materials and workmanship for the more common types of fences in order to ensure satisfactory service for the purchaser, and to assist manufacturers and erecting contractors by eliminating unnecessary minor variations in the demands of purchasers. It specifies requirements for the components which make up a fence and the way in which the fence needs to be constructed. Throughout this standard there are requirements for sizes of components, together with the permissible tolerances on size. These are minimum requirements and it will normally be acceptable to use larger sizes, except where it would otherwise adversely affect the fit of components or where replacement parts need to match up with those already present.

The choice of a fence is affected by factors such as the intended purpose of the fence, the desired service life, aesthetic considerations, and the availability of components. The specifier of the fence will know its intended purpose and by reference to Table 1 a suitable choice can be made. This then gives those erecting the fence the basic characteristics that need to be provided. This standard includes requirements for protective treatments. However, an important aspect of providing an extended service life is the maintenance of the fence after its erection; this is outside the scope of this standard. Premature failure can be avoided by taking care not to damage protective treatments during installation.

Ground conditions may indicate that a variation in the length of a post or strut, or of the depth to which it should be set, is desirable. The posts and struts and setting depths specified in this standard are intended for use in normal ground but if special conditions exist that warrant a change in the specification such a change needs to be agreed with the specifier, as for other variations.

To assist those specifying and/or providing a fence Appendix D provides guidance on the more important details, that often take the form of selected options, that need to be specified at the time of ordering a fence. This is a new feature of the standard.

Wire, mesh and netting sizes have been selected from BS 4102 and BS 1485. Designations of bolt size are in accordance with BS 4190.

The proof test for concrete posts has been deleted as experience has shown that there were technical problems associated with the application and interpretation of the tests. Cube tests of concrete strengths are now required and the frequency of testing is specified to ensure that regular quality checks are made.

In Appendix B (Steel components) of this standard requirements are given for the protection of steel work.

Since the publication of the previous edition of this standard BS 5589 has been published, and Appendix C (Timber components) in this standard has been revised to include the recommendations of BS 5589. Grading requirements have been added for round and cleft timber posts.

In Appendix C details have been included of methods for measuring defects in timber, and in particular the measurement of knots. In the case of the structural members of a fence, including posts, struts and rails, the principle of knot area ratio (K.A.R.) has been introduced as a means of determining, by visual assessment of the proportion of the cross section occupied by knots, the maximum permissible knots for fencing grade timber. Although the application of this method of knot measurement is new in so far as timber fencing components are concerned, it has been applied to the grading of structural timber for more than a decade. K.A.R. is a firmly established and widely accepted method of knot assessment which in itself is a critical part of all timber grading. The adoption of K.A.R. as part of grading timber for fencing is a logical move in unifying timber grading rules where the question of strength is involved.

Appendix E contains a suggested sampling procedure.

A British Standard does not purport to include all the necessary provisions of a contract. Users of British Standards are responsible for their correct application.

Compliance with a British Standard does not of itself confer immunity from legal obligations.

Summary of pages

This document comprises a front cover, an inside front cover, pages i to iv, pages 1 to 34, an inside back cover and a back cover.

This standard has been updated (see copyright date) and may have had amendments incorporated. This will be indicated in the amendment table on the inside front cover.

Section 1. General

1.1 Scope

This Part of BS 1722 specifies requirements for the construction and erection of rectangular wire mesh fences, including the use of mild steel or high tensile woven wire fencing, welded mesh fencing, hexagonal wire netting fences of the general pattern, and spring steel wire pattern fences where the mesh is fixed onto spring steel line wires.

This Part of the standard is divided into sections specifying requirements for general pattern fences (Section 2), spring steel pattern fences (Section 3) and high tensile mesh fences (Section 4), and subdivided into subsections dealing with materials and erection for each pattern.

Maintenance of these fences is outside the scope of this standard.

NOTE The titles of the publications referred to in this standard are listed on the inside back cover.

1.2 Definitions

For the purposes of this Part of BS 1722 the timber definitions given in BS 6100-4.1 apply.

NOTE For convenience, the relevant definitions have been repeated in C.2.

1.3 Dimensions and general characteristics

Applications of rectangular wire mesh and hexagonal wire netting fences are shown in Table 1.

NOTE Figure 1 illustrates the general characteristics of rectangular wire mesh and hexagonal wire netting fencing. It is not intended to illustrate any particular requirements of this Part of the standard but provides guidance as to the general layout of a typical fence, and on the terminology associated with this form of fencing.

Table 1 — Applications of fences

Type of mesh		Application											
Rectangular wire mesh ^a	Hexagonal wire netting ^b	General agricultural purposes	Pigs	Lambs	Sheep	Cattle	Rabbits	Hares	Rabbits and muntjac deer	Roe deer		Red, fallow and sika deer ^c	
										Lower mesh	Upper mesh	Lower mesh	Upper mesh
4/60/15	75 mm × 900 mm × 19 31 mm × 900 mm × 18 31 mm × 1050 mm × 18 31 mm × 1200 mm × 18 100 mm × 900 mm × 16 ^d 100 mm × 900 mm × 14 ^d	×											
8/80/15		×	×	×						×		×	×
8/80/30		×								×		×	×
6/90/30					×							×	×
7/10/15					×	×				×	×	×	×
8/10/15						×						×	×
8/11/30						×							
								×	×				
									×	×			
										×		×	
										×		×	

NOTE To prevent damage to the fence by animals, barbed wire may be attached to the face of the posts in a suitable position.

^a Type code as given in BS 4102 (see also Table 2).

^b Size from BS 1485 (see also Table 3).

^c Double height fences. Any of the meshes shown can be used in combination, according to the animals to be restrained.

^d With one 3 ply centre strand and 3 ply selvages.

^e A jump wire is required to give a minimum height of 1.8 m.

Section 2. Materials for general pattern fences

2.1 Wire

NOTE Some wire based fixings are described in 2.5.

2.1.1 General

All wire shall comply with the requirements of BS 4102 or BS 1485, as appropriate.

2.1.2 Rectangular wire mesh

Rectangular wire mesh shall comply with the requirements of BS 4102 and with Table 2.

2.1.3 Hexagonal wire netting

Hexagonal wire netting shall comply with the requirements of BS 1485 and with Table 3.

2.1.4 Stirrup wire

Stirrup wire shall be zinc coated mild steel wire and shall have a nominal wire diameter of 2.5 mm.

2.1.5 Tying wire

Tying wire shall be zinc coated and shall have a nominal wire diameter of 1.6 mm.

2.1.6 Barbed wire

Barbed wire shall be zinc coated mild steel or high tensile steel wire.

2.1.7 Line wire

Line wire shall be either of zinc coated mild steel or zinc coated high tensile steel wire. It shall have a minimum nominal wire diameter of 3.15 mm.

2.2 Concrete components

2.2.1 Material

Concrete posts and struts shall be of steel reinforced concrete complying with the requirements of Appendix A.

2.2.2 Tolerances on size

The following permissible deviations apply to the specified size of concrete components when determining the actual sizes:

- a) A demoulding draw allowance of up to 4 mm on each of two opposing sides.
- b) An allowance on the base dimensions of intermediate posts resulting from the use of a mould having the base dimensions specified in Table 4 that has been shortened by means of a stopping-off plate located not more than 300 mm from the base of the mould.
- c) Additional deviations on size of:

Length	+ 50 mm
	– 25 mm
Cross section	+ 6 mm
	– 4 mm

NOTE The cross section is measured about the centre lines.

2.2.3 General constructional details

The long arrises formed in the mould shall either be rounded or shall have all sharp edges removed. The heads of posts shall be weathered so as to prevent lodgement of water.

Posts shall be holed to allow the fixing of line wires, etc. in accordance with Table 2 or Table 3. The hole for the top horizontal wire shall be approximately 75 mm below the top of the post. Holes for bolts shall allow the bolt to be freely inserted. Holes for wire shall allow an M6 bolt to be freely inserted. All holes shall be free from obstructions and shall be accurately positioned.

2.2.4 Fence posts and struts

The dimensions of concrete fence posts and struts shall be as given in Table 4. Fence posts and struts shall be reinforced with four steel reinforcing bars of the size specified in Table 4 except that if steel having a characteristic strength greater than 250 N/mm^2 is used the cross section of the reinforcing bars may be proportionately reduced.

Straining posts and struts shall not be tapered. Straining posts shall be provided with a firm bearing for struts. This bearing shall be at a point within the top third of the length of the straining post, measured above the ground level. Straining posts shall be holed to allow the attachment of straining fittings.

Intermediate posts shall be tapered to $75 \text{ mm} \times 75 \text{ mm}$ at the top and shall be holed to allow the attachment of the top and bottom horizontal wires and at least one intermediate horizontal wire.

NOTE Table 2 gives details of the number and spacing of horizontal wires in rectangular mesh fencing, which will determine the position of fixing holes in posts.

2.3 Steel components

NOTE See clause 2.5 for steel fittings.

2.3.1 Materials and protective treatment

Steel posts and struts shall comply with the requirements of Appendix B.

2.3.2 Tolerances on size

The following permissible deviations apply to the specified sizes of steel components when determining the actual sizes:

Length: + 50 mm
 – 25 mm

Cross section: as specified in appropriate material standards in B.1.

2.3.3 General constructional details

Steel components shall be free of sharp edges and burrs. The tops of all hollow steel posts shall be capped. Posts shall be holed for the attachment of line wires etc. in accordance with Table 2 or Table 3. The hole for the top horizontal wire shall be approximately 25 mm below the top of the post. All holes shall be free from obstructions and shall be accurately positioned.

2.3.4 Fence posts and struts

The dimensions of steel posts and struts of rolled steel angle, or rectangular or circular hollow section shall be as given in Table 5.

Straining posts and struts shall either be fitted with baseplates or have spragged ends. Straining posts and struts shall be holed to allow the two to be bolted together with bolts with a minimum diameter of M8 at a point within the top third of the length of the straining post measured above the ground level. In addition straining posts shall be holed to allow the attachment of straining fittings.

Intermediate posts shall have spragged or dowelled ends as appropriate or shall be fitted with baseplates, or be pointed for driving into the ground. Intermediate posts shall be holed to allow the attachment of the top and bottom horizontal wires, and at least one intermediate horizontal wire.

NOTE Table 2 gives details of the number and spacing of horizontal wires in rectangular mesh fencing, which will determine the position of fixing holes in posts.

Table 2 — Mesh sizes, wire diameters and widths of rectangular wire mesh

Type ^a	No. of horizontal wires	Approx. width of roll	Spacing of verticals	Minimum nominal diameter of wires						Spacing of horizontals from top
				Top and bottom horizontals			Intermediate horizontals and verticals			
				Heavy weight (type B)	Medium weight (type C)	High tensile (type HT)	Heavy weight (type B)	Medium weight (type C)	High tensile (type HT)	
		mm	mm	mm	mm	mm	mm	mm	mm	mm
4/60/15 ^{bc}	4	600	150	—	3.15	2.5	—	2.5	2.5	230 200 180
8/80/15 ^c	8	800	150	4.00		2.5	3.00		2.5	150 140 130 115 100 90 75
8/80/30 ^c	8	800	300	4.00		2.5	3.00		2.5	150 140 130 115 100 90 75
6/90/30	6	900	300	4.00		—	3.00		—	230 200 180 150 140
7/10/15 ^b	7	1 000	150	—		—	—		—	230 200 180 150 140 130
8/10/15	8	1 000	150	4.00		—	3.00		—	175 150 150 150 125 125 125
8/11/30 ^b	8	1 150	300	—		—	—		—	230 200 180 150 140 130 115

NOTE 1 Types 7/10/15, 8/10/15 and 8/11/30 are available only in certain types of mesh.

NOTE 2 The dimensions in this table are subject to the tolerances specified in BS 4102.

^a The type coding is related to the three following columns in the table.^b Not available in heavy weight.^c Available in high tensile.

Table 3 — Mesh sizes, wire diameters and widths of hexagonal wire netting

Type	Width of netting	Mesh size	Diameter of wire	
			min.	max.
	mm	mm	mm	mm
75 × 900 × 19	900	75	0.90 ^a	0.95 ^a
31 × 900 × 18	900	31		
31 × 1 050 × 18	1 050	31		
31 × 1 200 × 18	1 200	31		
100 × 900 × 16 ^b	900	100	1.50 ^c	1.55 ^c
100 × 900 × 14 ^b			1.50 ^c	1.95 ^c

NOTE The dimensions in this table are subject to the tolerances specified in BS 1485.

^a Prior to zinc coating.

^b With one 3 ply centre strand and 3 ply selvages.

^c After zinc coating.

Table 4 — Concrete fences, posts and struts for general pattern fences

Fence height	Posts						Struts		
	Intermediate posts			Straining posts					
	Length	Base dimensions ^b	Reinforcement (diameter)	Length	Section	Reinforcement (diameter)	Length ^a	Section	Reinforcement (diameter)
m	m	mm	mm	m	mm	mm	mm	mm	mm
0.6	1.27	100 × 100	6	1.42	100 × 100	6	1.2	75 × 75	6
0.8	1.47			1.62			1.35		
0.9	1.57			1.72			1.5		
1.0	1.67			1.82			1.65		
1.15	1.82	125 × 125		1.97	125 × 125	8	1.83	75 × 100	

^a These lengths are suitable for struts fixed at an angle of 45° on level ground. If site conditions make the use of these lengths unsuitable the lengths may need to be specified (see foreword).

^b Reducing to 75 mm × 75 mm at the top. See also 2.2.4.

2.3.5 Base plates and dowels

Steel baseplates shall be fabricated from rolled steel plate complying with grade 43C of BS 4360 and shall have a minimum thickness of 3 mm. They shall be either bolted or welded to their associated posts. If welded on, the baseplates shall be welded in two places and for a length not less than 50 % of the sum of external faces of the post or struts. Baseplates for steel straining posts and struts shall project not less than 50 mm from all external faces of a post. Baseplates for steel intermediate posts shall project not less than 40 mm from at least one external face of a post.

Dowels shall be of steel and shall be at least 10 mm in diameter. They shall be driven through the post within 250 mm of the base of the post and shall project not less than 50 mm from either side of the post.

Table 5 — Steel fence posts and struts for general pattern fences

Fence height	Posts								Struts			
	Intermediate posts				Straining posts							
	Length	Section			Length	Section			Length ^a	Section		
		RSA	CHS	RHS		RSA	CHS	RHS		RSA	CHS	RHS
m	m	mm	mm	mm	m	mm	mm	mm	m	mm	mm	mm
0.6	1.20	40 × 40 × 5	33.7 × 2.6	40 × 40 × 2.5	1.35	60 × 60 × 8	60.3 × 3.2	50 × 50 × 3.0	1.20	45 × 45 × 5	42.4 × 3.2	40 × 40 × 2.5
0.8	1.40				1.55				1.40			
0.9	1.50				1.65				1.50			
1.0	1.60				1.75				1.60			
1.15	1.75				1.90				1.75			
^a These lengths are suitable for struts fixed at an angle of 45° on level ground. If site conditions make the use of the struts of these lengths unsuitable, the length may need to be varied.												