

Fences —

Part 14: Specification for open mesh steel panel fences

ICS 91.090

Committees responsible for this British Standard

The preparation of this British Standard was entrusted to Technical Committee B/201, Fences, upon which the following bodies were represented:

- Association of Security Consultants
- British Precast Concrete Federation
- County Surveyors' Society
- Department of the Environment, Transport and the Regions
- European Fencing Industry Association
- Fencing Contractors' Association
- Forestry Commission
- Galvanizers Association
- National Farmers Union
- Security Facilities Executive
- The Open Spaces Society
- Timber Trade Federation
- UK Steel Association

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

- Construction Products Association
- Society of Chain Link Fencing Manufacturers
- UK Forest Products Association

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Foreword

This part of BS 1722 has been prepared by Technical Committee B/201. It supersedes BS 1722-14:1992, which is withdrawn.

BS 1772 is published in the following parts:

- *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 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;*
- *Part 14: Specification for open mesh steel panel fences;*
- *Part 16: Specification for organic powder coatings for use as a plastics finish to components and mesh.*

The various parts specify requirements for the types of fence 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, nor to specify requirements for “patent” proprietary fencing systems. It is recommended, however, that such fences or gates should be designed in accordance with the relevant clauses of this part of BS 1722.

The principal changes introduced in this edition are to bring the requirements up to date with other parts of BS 1722 and to accommodate changes in cross references to other standards. This edition also introduces requirements for very high security fences and for concrete posts for fences.

This standard aims to establish minimum performance requirements for materials and workmanship. It specifies requirements for open mesh steel panel fences of four types:

- a) a fence for boundary or general purposes up to 2 400 mm in height;
- b) a fence for security purposes of minimum 2 400 mm in height;
- c) a fence for high security use of minimum 3 000 mm in height;
- d) a fence for extra high security of minimum 3 000 mm in height.

The general purpose fence is intended for use as a boundary marker or for those locations where it is deemed necessary merely to deter the casual intruder or trespasser.

The security fence is designed for use in areas where greater protection is required from vandalism or trespass, and can be considered suitable for use for general industrial security such as for industrial estates, airfields and oil installations.

The high security fence is designed for areas where protection against determined intrusion is required. However, it should be appreciated that it is not possible to install a fence that cannot be negotiated by a determined intruder given adequate time, freedom from observation and suitable climbing aids or tools for forcing an entry.

The extra high security fence does not permit finger holds and therefore cannot be scaled without climbing aids.

Choosing a fence is affected by factors such as the intended purpose, desired service life, aesthetic consideration 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 also inform those installing the fence of the basic characteristics required.

Ground conditions may indicate that a variation in the length of a post or strut, or the depth to which it should be set, is desirable. The posts and struts setting depths specified in this standard 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.

NOTE The service life/durability is dependent on environmental conditions and may vary considerably. For this reason service life/durability is not included in this standard. For information relating to finishes and durability refer to the manufacturer.

This standard specifies requirements for fence materials and their combination and installation to provide a serviceable fence. Because a fence is made up of a number of separate components, of which the particular features may vary, a number of permissible combinations are available to the user. When preparing a specification for a fence, it is therefore important to give precise details of the requirements of the fence and of the site. Annex A provides details of the fence requirements and installation site that should be agreed between the fence supplier and purchaser. However, as conditions vary from site to site, Annex A should not be assumed to be exhaustive.

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 should either:

- a) have achieved the appropriate National Vocational Qualification (NVQ) or Scottish Vocational Qualification (SVQ) in fence installation (Level 2) relevant to this part of BS 1722; or
- b) be currently registered for the appropriate NVQ or SVQ in fence installation (Level 2) relevant to this part of BS 1722 provided such registration has not been in place for a period greater than 5 years from the date of registration without successful assessment having taken place.

Annex A and Annex G are informative. Annex B, Annex C, Annex D, Annex E and Annex F are normative.

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 25 and a back cover.

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1 Scope

This part of BS 1722 specifies requirements for the following categories of open mesh steel panel fences:

- a) category 1: general purpose fences up to 2 400 mm high;
- b) category 2: security fences at least 2 400 mm high;
- c) category 3: high security fences at least 3 000 mm high;
- d) category 4: extra high security fences at least 3 000 mm high.

Requirements for the performance of panel fences for this standard are based upon loadings described in clause 5.

Maintenance of the fence after installation is outside the scope of the standard.

NOTE Annex A list items that should be agreed between the fence supplier and the purchaser.

2 Normative references

The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of this British Standard. For dated references, subsequent amendments to, or revisions of, any of these publications do not apply. For undated references, the latest edition of the publication referred to applies.

BS 4-1, *Structural steel sections — Part 1: Specification for hot-rolled sections.*

BS 12, *Specification for Portland cement.*

BS 146, *Specification for Portland blastfurnace cement.*

BS 443, *Specification for testing zinc coatings on steel wire and for quality requirements.*

BS 882, *Specification for aggregates from natural sources for concrete.*

BS 1014, *Specification for pigments for Portland cement and Portland cement products.*

BS 1881-116, *Testing concrete — Part 116: Method for determination of compressive strength of concrete cubes.*

BS 3892 (all parts), *Pulverized fuel ash.*

BS 4027, *Specification for sulfate-resisting Portland cement.*

BS 4102, *Specification for steel wire for general fencing purposes.*

BS 4449, *Specification for carbon steel bars for the reinforcement of concrete.*

BS 4482, *Specification for cold reduced steel wire for the reinforcement of concrete.*

BS 4483, *Steel fabric for the reinforcement of concrete.*

BS 5075 (all parts), *Concrete admixtures.*

BS 5135, *Specification for arc welding of carbon and carbon manganese steels.*

BS 5328-1:1997, *Concrete — Part 1: Guide to specifying concrete.*

BS 6323-2, *Specification for seamless and welded steel tubes for automobile, mechanical and general engineering purposes — Part 2: Specific requirements for hot finished welded steel tubes.*

BS EN 10024, *Hot rolled taper flange I sections — Tolerances on shape and dimensions.*

BS EN 10025:1993, *Hot rolled products of non-alloy structural steels — Technical delivery conditions.*

BS EN 10056-1, *Specification for structural steel equal and unequal angles — Dimensions.*

BS EN 10210-1, *Hot finished structural hollow sections of non-alloy and fine grain structural steels — Part 1: Technical delivery conditions.*

BS EN 10210-2, *Hot finished structural hollow sections of non-alloy and fine grain structural steels — Part 2: Tolerances, dimensions and sectional properties.*

BS EN 12390-4, *Testing hardened concrete — Part 4: Compressive strength — Specification for testing machines.*

BS EN ISO 1461, *Hot dip galvanized coatings on fabricated iron and steel articles — Specifications and test methods.*

3 Dimensions and general characteristics

Fences shall conform to Table 1 and Table 2 and clause 5.

Table 1 — Basic characteristics of suitable expanded metal for panel fences

Category	Height of fence (excluding topping) mm	Typical applications	Typical expanded metal specifications							
			BS 405 reference	Vertical centres of mesh (LWM) mm	Horizontal centres of mesh (SWM) mm	Strand		Mass		Solidity %
						Thickness mm	Width mm	Uncoated kg/m ²	Galvanized kg/m ²	
1	Max. 2 400	General purpose boundary fence	Special	76	64	2.00	2.00	0.96	1.056	12
		General purpose boundary fence	EX41	100	50	2.50	2.69	2.08	2.288	11
2	Min. 2 400	Security	Special	76	64	3.00	3.00	2.21	2.431	14
		Security	EX42	100	50	3.00	3.53	3.106	3.417	16
3	Min. 3 000	High security	EX44	100	50	3.00	5.03	4.66	5.126	20
		High security	EX37	76	34	3.00	3.58	4.96	5.456	24
		High security	EX32	50	23	3.00	3.12	6.52	7.172	31
4	Min. 3 000	Extra high security	Special ^a	10 (SWM)	70 (LWM)	3.00	5.50 Main strand	9.00	9.90	38
NOTE 1 LWM denotes centre to centre of longest way of mesh; SWM denotes centre to centre of shortest way of mesh.										
NOTE 2 “Special” refers to meshes designed by manufacturers in accordance with BS 405 but which do not have a specific reference number.										
NOTE 3 Hot dip galvanizing refers to BS EN ISO 1461.										
^a Category 4. Aperture finger grip proof. Probe “no go” 11 mm diameter.										

Table 2 — Basic characteristics of suitable welded mesh for panel fences

Category	Height of fence (excluding topping)	Typical applications	Typical welded mesh specifications				
			Vertical mesh spacing	Horizontal mesh spacing	Vertical wire diameter	Horizontal wire diameter	Solidity
	mm		mm	mm	mm	mm	%
1	Max. 2 400	General purpose boundary fence	200	50	5	7	14
			200	50	6	8+8 ^a	16
			50	50	3	3	12
			75	25	3	3	16
			12.5 ^b	12.5 ^b	3	3	20
2	Min. 2 400	Security	75	75	3	3	16
			100	25	4	4	12
			200	50	5	5	13
			150	50	5	5	14
			12.5	50	4	4	36
			50	50	3	3	12
3	Min. 3 000	High security	50	50	4	4	16
			75	25	4	4	16
			75	25	3	3	16
4	Min. 3 000 ^c	Extra high security	12.5	75	4	4	36
			12.5	75	3	3	21
			12.5 ^d	12.5	4	4	58

^a 8+8 indicates a double horizontal wire.

^b Mixed mesh panel wire 50 mm and 12.5 mm meshes along the panel.

^c Category 4. Aperture finger grip proof. Probe “no go” 11 mm diameter.

^d Double skin.

4 Materials

4.1 Infill

Typical infill meshes shall be as given in Table 1 and Table 2.

NOTE 1 Specifications for expanded metal and welded mesh are contained in BS 405 and BS 4102.

NOTE 2 Examples of typical expanded metal and welded mesh panels are shown in Figure 1 and Figure 2.

4.2 Steel posts

NOTE 1 See 4.4 for steel fittings.

Steel posts shall conform to clause 5 and to the materials and protective treatment specified in Annex B.

NOTE 2 Tolerances of +50 mm and –25 mm are permissible on the specified lengths of steel posts when determining the actual lengths.

The steel post sections shall have a section moment of inertia of at least 5.4 cm⁴ for fences up to 1 800 mm high and 12.5 cm⁴ for fences over 1 800 mm high. The wall thickness shall be at least 2.5 mm for general purpose fences and 3.5 mm for high and maximum security fences.

