

CONFIRMED
DECEMBER 1986

Specification for

Metal door frames (steel)

UDC 69.028.1:691.714:669.14

NO COPYING WITHOUT BSI PERMISSION EXCEPT AS PERMITTED BY COPYRIGHT LAW

BSI
Documents

AVA

Document Sharing Hub

Co-operating organizations

The Hardware and Ironmongery Industry Standards Committee under whose supervision this British Standard was prepared consists of representatives from the following Government departments and scientific and industrial organizations:

- Association of Builders' Hardware Manufacturers
- British Lock Manufacturers' Association*
- British Plastics Federation
- British Steel Industry
- Copper Development Association
- Department of the Environment*
- Department of the Environment, Building Research Establishment*
- Greater London Council*
- Guild of Architectural Ironmongers
- Institution of Municipal Engineers*
- Metal Window Federation of Great Britain*
- Metropolitan Police
- Royal Institute of British Architects*
- Royal Institution of Chartered Surveyors
- Zinc Development Association

The Government departments and scientific and industrial organizations marked with an asterisk in the above list, together with the following, were directly represented on the committee entrusted with the preparation of this British Standard.

- Aluminium Federation
- Association of London Borough Engineers and Surveyors
- Cold Rolled Sections Association
- Flat Glass Association
- Light Metal Founders' Association
- Modular Society
- Individual manufacturers

This British Standard, having been approved by the Hardware and Ironmongery Industry Standards Committee, was published under the authority of the Executive Board on 28 February 1975

© BSI 07-1999

First published 1945
First revision November 1951
Second revision February 1975

The following BSI references relate to the work on this standard:
Committee reference HIB/12/1
Draft for comment 70/23320

ISBN 0 580 08217 2

Amendments issued since publication

Amd. No.	Date of issue	Comments

Contents

	Page
Co-operating organizations	Inside front cover
Foreword	ii
1 Scope	1
2 References	1
3 Definitions	1
4 General	1
5 Profiles	1
6 Construction	1
7 Sizes and tolerances	1
8 Base ties	1
9 Sills of external door frames	1
10 Glazing ceiling height frames	1
11 Fittings	2
12 Protection	2
Appendix A Ancillaries and alternatives	11
Appendix B Ordering instructions	11
Appendix C Typical application details	12
Appendix D Notes on fixing	14
Figure 1 — Key to sizing	3
Figure 2 — Co-ordinating sizes and work sizes of door frames	4
Figure 3 — Profiles for jambs, heads and transoms	5
Figure 4 — Profile for sills for external door frames	7
Figure 5 — Typical base tie	7
Figure 6 — Corrugated adjustable lugs (approximate dimensions)	8
Figure 7 — Hinges	9
Figure 8 — Typical elevations of door frames	10
Publications referred to	Inside back cover

Foreword

This Standard has been prepared with the authority of the Hardware and Ironmongery Industry Standards Committee as part of the change to metric dimensions in the construction industry. With the introduction of the concept of the door leaf and frames being combined into a single component, the doorset, the need has arisen for this standard to be revised to provide a specification and sizes for steel door frames suitable for wooden door leaves, whether supplied together as doorsets or as individual components for assembly on site. This standard also takes into account the need for ceiling height frames, not covered in previous issues of BS 1245. The door leaf sizes referred to in this standard are those included in BS 4787 *“Internal and external wood doorsets, door leaves and frames”* — Part 1 *“Dimensional requirements”*. The sizes given take account of the recommendations for dimensional co-ordination as laid down in BS 4011 *“Recommendations for the co-ordination of dimensions in building. Basic sizes for building components and assemblies”*; BS 4330 *“Recommendations for the co-ordination of dimensions in building. Controlling dimensions”*; PD 6444 *“Recommendations for the co-ordination of dimensions in building”* — Part 1 *“Basic spaces for structure, external envelope and internal sub-division (Functional Groups 1, 2 and 3)”* and DD 22 *“Recommendations for the co-ordination of dimensions in building. Tolerances and fits for building. The calculation of work sizes and joint clearances for building components”*.

It should be noted that this standard differs in the following two ways from the methods used in BS 4787-1.

- a) Work sizes are shown between rebates of the frames as the control of these dimensions are essential to ensure that the standard wood door leaves will fit any standard steel frame.
- b) No cills are shown to internal door frames as these are not generally required.

As part of BSI’s programme of metrication this standard has been expressed in metric terms. For further information reference should be made to BS 3763, *“The International System of units (SI)”*.

Certification. Attention is drawn to certification facilities described on the back cover of this standard.

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 and ii, pages 1 to 14, 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.

1 Scope

This British Standard specifies sizes and general requirements for door frames fabricated from mild steel sheet and protective coatings suitable for internal or external use.

Further information is given in appendices as follows:

- A. Ancillaries and alternatives
- B. Ordering instructions
- C. Typical application details
- D. Notes on fixing

2 References

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

3 Definitions

For the purposes of this British Standard, the definitions given in BS 3589 and BS 2900, together with the following definition, apply.

Sill (sometimes referred to as **threshold**).

Horizontal bottom member of a door frame. The terms used in sizing are as shown in Figure 1.

4 General

Door frames shall comply with the elevations and sizes shown in Figure 2. They shall be manufactured from the profiles shown in Figure 3 and designed to suit the door leaves defined in BS 4787-1.

The profiles used to form the frames will accommodate walls or partitions of varying thicknesses.

Frames with a co-ordinating height of 2 100 mm are door height frames. Those with greater co-ordinating heights are ceiling height frames.

Internal steel door frames shall be supplied with a base tie. External door frames shall be supplied with a sill.

5 Profiles

The profiles for the manufacture of steel door frames shall be formed from mild steel, complying with the requirements of BS 1449-1, Classification CR4/GP, not less than 1.2 mm nominal thickness. The shapes and sizes of the profiles of jambs, heads and transoms shall be in accordance with Figure 3. Those for sills shall be in accordance with Figure 4.

NOTE It is recommended that door frames for a particular project should be selected from one suite of profiles, i.e. ABCP or FGHJK.

6 Construction

Each frame shall consist of two jambs and a head member and, when applicable, a transom and/or sill. The whole shall be, at the manufacturer's discretion, welded, or rigidly joined together by mechanical means. The surplus weld metal shall be neatly cleaned off. Where a transom is used the rebate of the transom shall fit flush with the rebate of the door frame.

7 Sizes and tolerances (see Figure 1)

Where both sizes are quoted, length is given before height.

<i>Co-ordinating sizes.</i>	The co-ordinating sizes of the frames shall be as shown in Figure 2.
<i>Work sizes.</i>	The work sizes of the frames shall be as shown in Figure 2.
<i>Deviations.</i>	The maximum permissible deviation on a work size shall be ± 1.5 mm.
<i>Tolerances.</i>	The total tolerance on a work size shall be 3 mm.
<i>Manufacturing size.</i>	The maximum manufacturing size shall be the work size plus 1.5 mm. The minimum manufacturing size shall be the work size minus 1.5 mm.

8 Base ties

The bases of internal frames shall be braced with adjustable base ties to hold the frames rigid during transit and erection. The base ties may be fitted to suit the thickness of floor finish which should be stated when ordering. See Figure 5.

9 Sills of external door frames

External door frames shall be fitted with a sill fixed flush to the base of the frame to suit the door frame profile.

10 Glazing ceiling height frames

Provision shall be made for glazing ceiling height frames above the transom by means of putty or beads. The specifier shall state which method is to be used. Provision shall be made for clips or cleats to be supplied by the manufacturer to hold the glass in place while putty is applied.

11 Fittings

11.1 Fixing lugs. Three adjustable corrugated fixing lugs as shown in Figure 6 shall be supplied for each jamb. The lugs shall be of mild steel sheet of not less than 1.2 mm nominal thickness, complying with the requirements of BS 1449-1, classification CR4/GP. Lugs shall be protected by zinc coating of average minimum thickness not less than 0.002 mm or equivalent.

11.2 Hinges. Hinges shall be made of mild steel sheet not less than 2.5 mm nominal thickness complying with the requirements of BS 1449-1. They shall have five knuckles and shall be fitted with a removable pin of minimum diameter 6 mm. The leaves, pin and screws (where used) shall be zinc coated after manufacture, complying with the requirements of BS 4921 or BS 1706, classification ZN3, the method to be at the manufacturer's discretion. The leaves for screwing to the door shall have four countersunk holes as shown in Figure 7 to take No. 10 wood screws. Tolerances on hinge dimensions shall be those given in BS 1227-1A. Other suitable hinges complying with the requirements of BS 1227-1A may be used at the manufacturer's discretion.

11.3 Hinge fixings. The hinges shall be welded or screwed to the frame at the manufacturer's discretion. The outer surface of the hinge leaf fitted to the frame shall not project above the surface of the rebate. Where screwed on hinges are used, there shall be a reinforcing plate fixed to the frame to which the hinge shall be screwed. The plate shall be of mild steel sheet not less than 2.5 mm nominal thickness complying with the requirements of BS 1449-1. The length of the plates shall not be less than 70 mm greater than the length of the hinge. The edge of the holes shall be not less than the diameter of the hole from the edge of the plate. The position of the hinges for internal and external doors shall be as shown in Figure 8.

Minimum fixings shall be as follows:

Mass of door leaf	No. of hinges	Method of application
up to 30 kg	2	Welded
30 kg to 45 kg	3	Welded
up to 45 kg	2	Screwed
45 kg to 60 kg	3	Screwed

11.4 Mortar guards. Mortar guards shall be welded in the frame where cut-outs are provided for lock strike plates or bolts.

11.5 Lock strike plates. Frames for single doors shall be fitted with an adjustable lock strike plate of steel in the position shown in Figure 8. Strike plates shall be zinc coated after manufacture, complying with the requirements of BS 4921 or BS 1706, classification ZN3.

11.6 Rubber buffers. Buffers not less than 10 mm diameter and 2 mm thick of rubber or other suitable material shall be fixed in the rebate. For single doors there shall be a minimum of three on the lock jamb; one shall be placed adjacent to the lock strike plate, the other two located approximately 450 mm from it. For double doors there shall be one buffer for each door leaf at the head spaced approximately 150 mm from the joint between the door leaves.

12 Protection¹⁾

Door frames shall be supplied with a corrosion inhibiting protective coating.

12.1 Internal frames. Frames for internal use shall be manufactured from zinc coated mild steel sheet and shall have a zinc coating of average minimum thickness not less than 0.002 mm. The frames shall be treated with one coat of calcium plumbate priming paint complying with the requirements of BS 3698, type B, or other suitable priming paint [see also Appendix B b)]

12.2 Internal and external frames subject to corrosive atmospheres. Such frames shall be hot-dip galvanized complying with the requirements of BS 729, after manufacture (manufacturers shall indicate if frames are prepared for site painting by any treatment at works after galvanizing), or alternatively may be made from hot-dip galvanized steel sheet complying with the requirements of BS 2989, Class 2A, and treated with one coat of calcium plumbate priming paint complying with the requirements of BS 3698, type B, or other suitable priming paint.

12.3 Other protective coatings. Coatings recommended in CP 2008 or DD 24 may be used at the manufacturer's discretion. The nature of such protective coatings shall be clearly indicated by the manufacturer.

¹⁾ *Safety in use.* In all cases, users should assume that door frames have a lead based primer. It is therefore essential that when health hazards may arise, a suitable system using paint complying with the requirements of BS 4310 is applied correctly for finishing.