

Portable ladders for fire service use

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National foreword

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Attention is drawn to annex NA which contains additional information and advice for UK users.

The UK participation in its preparation was entrusted by Technical Committee FSH/17, Fire brigade equipment, to Subcommittee FSH/17/5, Ladders for fire service use, which has the responsibility to:

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 42, an inside back cover and a back cover.

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Portable ladders for fire service use

Echelles portables à l'usage des services d'incendie

Tragbare Leitern für den Einsatz bei der Feuerwehr

This European Standard was approved by CEN on 25 May 2000.

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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Foreword

This European Standard has been prepared by Technical Committee CEN/TC 192, Fire service equipment, the Secretariat of which is held by BSI.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by December 2000, and conflicting national standards shall be withdrawn at the latest by December 2000.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

The annexes A, B, C, D, E, F, G, H, J, K, L and M are normative; the annexes N, P and Q are informative.

Introduction

This European Standard is based on the performance of portable ladders in normal use and includes safety requirements. A safety factor of the order of 3:1 has been used and the mass of a fire-fighter including personal equipment and breathing apparatus has been taken as 108 kg.

The standard sets out minimum and/or maximum values within which the customer may specify his own requirements.

In preparing this standard it has been recognized that the operational use of portable ladders varies throughout Europe and therefore it may be necessary for particular countries to specify additional requirements.

Any additional features not covered by the standard and required by the customer should be included by agreement between the customer and manufacturer.

1 Scope

This European Standard specifies requirements, test methods and performance criteria for portable ladders for fire-fighting service use and associated purposes.

Non-portable ladders for fire-fighting service use and ladders for other specific professional use are excluded from this standard.

NOTE For ladders for other uses see EN 131.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies.

EN 131-2:1993, *Ladders — Requirements, testing, marking*

3 Definitions

For the purposes of this standard the following definitions apply

3.1

access ladder

ladder designed for gaining access

NOTE Access ladders are not recommended for rescue by carry-down or carry-up

3.2

angle of pitch

angle between the horizontal plane and the underside of the stiles of the ladder in use

3.3

cable

wire rope for mechanically extending and housing an extension ladder

3.4

carry-down and carry-up

when one person takes the total weight of another person

3.5

compulsory pole ladder

ladder where the use of poles to support the ladder is mandatory

3.6

distance between rungs

distance between the rungs measured in the middle line between the stiles from the upper edge of a rung to the upper edge of an adjacent rung

3.7

extending ladder

ladder consisting of two or more sliding sections

3.8

extending line

rope for manually extending and housing extending ladder sections

3.9

foot, anti-skid device

device fitted to the bottom of ladders to prevent slipping

3.10

hook ladder

ladder which has a hook(s) from which it is suspended in use

3.11

internal ladder

narrow ladder primarily for use inside buildings or restricted spaces

3.12

length overall

distance measured from the bottom of the foot to the top of a ladder at its maximum length

3.13

mechanically operated extending ladder

extending ladder where the upper parts are extended by mechanical means for example by extending lines or cables

3.14

multifunction ladder

ladder which can be configured to serve more than one function

3.15

one-piece ladder

ladder consisting of one section only

3.16

pawl

load-bearing mechanism which holds the sections of an extending ladder in the extended position

3.17

pole

device used for handling and/or support and to improve the stability of the ladder

3.18

pulley sheave

wheel with a groove in its rim for a rope or cable

3.19

push-up extending ladder

extending ladder where the upper parts are extended by hand

3.20

rescue ladder

ladder designed for rescue by carry-down or carry-up

3.21

roof ladder

ladder which follows the surface of a roof and has a hook which hooks over the ridge of the roof

3.22

rung

horizontal climbing support with a walking surface attached to stiles to form a ladder

3.23

sectional ladder

ladder consisting of several sections that can be fitted together by means of connection devices but the length can only be varied by one whole section at a time

3.24

stabilizing means

any device or part of the ladder the function of which is to improve the stability of the ladder in use

3.25

step in/step out

distance between adjacent rung centres where ladder sections overlap

3.26

stile

lateral part of a ladder which supports the rungs

3.27

stick ladder

ladder with hinged rungs allowing the stiles to fold together

3.28

total mass

mass of the ladder complete with all extras and fittings as specified

4 Categorization

Ladders shall be categorized by their type, the maximum number of persons permitted on the ladder and the permitted use mode (see Table 1).

Table 1 — Ladder categories

Type of ladder	Maximum number of persons	Permitted use mode
Extending	3	Rescue and access
	2	Rescue and access
	1	Access
Hook	1	Access
One piece	3	Rescue and access
	2	Rescue and access
	1	Access
Roof	1	Access
Sectional	3	Rescue and access
	2	Rescue and access
	1	Access
Stick	1	Access

NOTE 1 For multifunction ladders reference should be made to the manufacturer's permitted use mode and maximum number of persons for the various forms of configuration.

NOTE 2 It is anticipated that further development in portable ladders for fire service use may add to Table 1.

5 Dimensions and total masses

5.1 Length

The maximum length of a hook ladder shall be 5 000 mm.

5.2 Width between stiles

5.2.1 The minimum width between stiles for different types of ladder (see Figure 1) shall be:

5.2.1.1 For roof ladders 240 mm

5.2.1.2 For hook ladders 170 mm

5.2.1.3 For stick and internal ladders 230 mm

5.2.1.4 For all other ladders 295 mm.

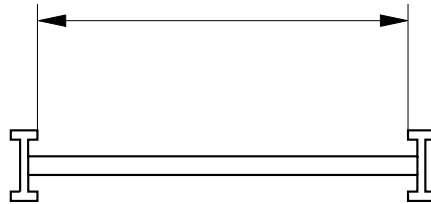


Figure 1 — Width between stiles

5.2.2 The maximum width between stiles on hook ladders shall be 250 mm.

5.3 Mass

The mass for different types of ladders shall not be more than:

5.3.1 25 kg for a ladder operated by one person

5.3.2 15 kg for hook ladders

5.3.3 8 kg/m of overall length for all other ladders.

6 Rungs

6.1 The distance between rungs shall remain constant throughout a ladder except where the hook is attached on a hook ladder.

6.1.1 For hook ladders the distance between rungs shall be a maximum of 365 mm and a minimum of 280 mm except for the rungs supporting the hook where the distance may be reduced to a minimum of 180 mm.

6.1.2 For all other ladders the distance between rungs shall be a maximum of 305 mm and a minimum of 250 mm.

6.2 Rungs shall have a flat or arched non-slip tread surface. Where the non-slip tread surface is a rung covering, the covering shall not move.

6.3 Roof ladder rungs shall have a flat or arched non-slip surface on all sides.

6.4 The minimum width/diameter for rungs shall be 25 mm except for wooden rungs where the minimum width shall be 20 mm.

6.5 Where ladder sections overlap, maximum step-in and step-out shall be 90 mm between adjacent rung centres (see Figure 2).

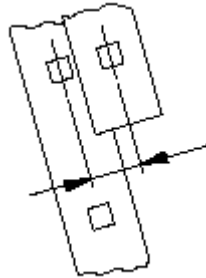
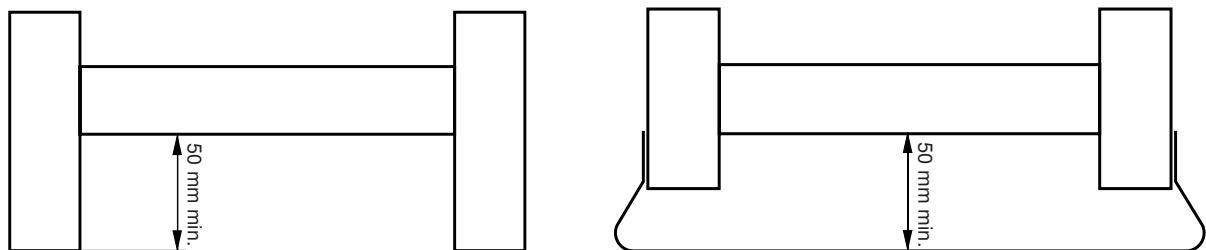


Figure 2 — Step in/step out

6.6 Rungs shall be fitted with their tread surface perpendicular to the stile axis (see Figure 2).

6.7 For hook and roof ladders, the minimum clearance between the underside of a rung and a flat surface roof or wall shall be 50 mm in the user position (see Figures 3a and 3b).



a) Direct contact type

b) Stand-off bracket

Figure 3 — Roof/wall clearance

7 Performance requirements

7.1 Extending ladders

The force required to fully extend the ladder shall not exceed 500 N for mechanically operated extending ladders and shall not exceed 260 N for push-up extending ladders.

7.2 Extending lines

7.2.1 The minimum line diameter shall be 8 mm for ladders requiring up to 260 N to extend and 14 mm for ladders requiring between 260 N and 500 N to extend.

7.2.2 Lines shall not obstruct the climbing of the ladder and, where they lie on the front face, a fitting shall be provided to secure the line.

7.2.3 The line shall be attached to the ladder such that the surplus does not foul safe operation.

7.3 Cables

7.3.1 The minimum breaking load of the cable and its attachments shall be 2 845 N.

7.3.2 Means of adjustment of the cable shall be provided.

7.3.3 Closed eyes shall be used on all cable attachments.

7.3.4 The cable shall only be removable by pulling it through the pulley.

7.4 Additional safety measures

7.4.1 The ladder shall be designed and constructed so that it shall not be possible for it to be over-extended.

7.4.2 In order to avoid injuries to personnel when operating the ladder, it shall be designed and constructed in such a manner that if the rope is released in operation, the ladder shall stop or the section(s) shall be lowered in a controlled manner.

7.5 Pawls

7.5.1 Pawls shall be fitted two to a section, to hold the ladder at any extension at which the section rungs coincide.

7.5.2 Each pawl shall be capable of supporting the required loads on its own (see also annex G).

NOTE 1 Pawls should be visible from the ground and when climbing the ladder.

NOTE 2 Pawls should preferably be independent but may be linked if desired.

8 Fittings

8.1 Hooks

Hooks, where fitted, shall conform to the following.

8.1.1 The tip of any hook shall be not less than 260 mm and not greater than 600 mm from the adjacent side of the ladder.

8.1.2 Roof ladder hooks shall be constructed so as to minimize damage to the roof surface when the hook comes into contact with the roof.

8.1.3 Where two hooks are fitted side by side the contact points shall be not less than 250 mm apart (see Figure 4).

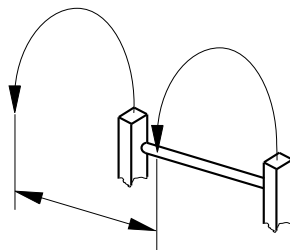


Figure 4 — Two hook contact points

8.2 Feet

The parts of all types of ladders in contact with the ground shall have non-skid fitments.

8.3 Wheels

NOTE. Where wheels are fitted, they should have a resilient solid contact surface, be able to withstand a temperature (in air) of 80 °C without malfunctioning and should be fitted to the ladder in such a way as to allow the ladder to roll up or roll down a wall or roof.

9 Stabilizing means

All ladders over 11 m in length shall be fitted with stabilizing means, which may, for example, be in the form of a pole. (See also annex Q)