IS 4571 (1977): Specification Aluminium Extension Ladders for Fire Brigade use [CED 22: Fire Fighting]

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Indian Standard

SPECIFICATION FOR ALUMINIUM EXTENSION LADDERS FOR FIRE BRIGADE USE

(First Revision)

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NEW DELHI 110002

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Indian Standard

SPECIFICATION FOR ALUMINIUM EXTENSION LADDERS FOR FIRE BRIGADE USE

(First Revision)

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(*Continued on page* 7)

AMENDMENT NO. 1 MARCH 1979

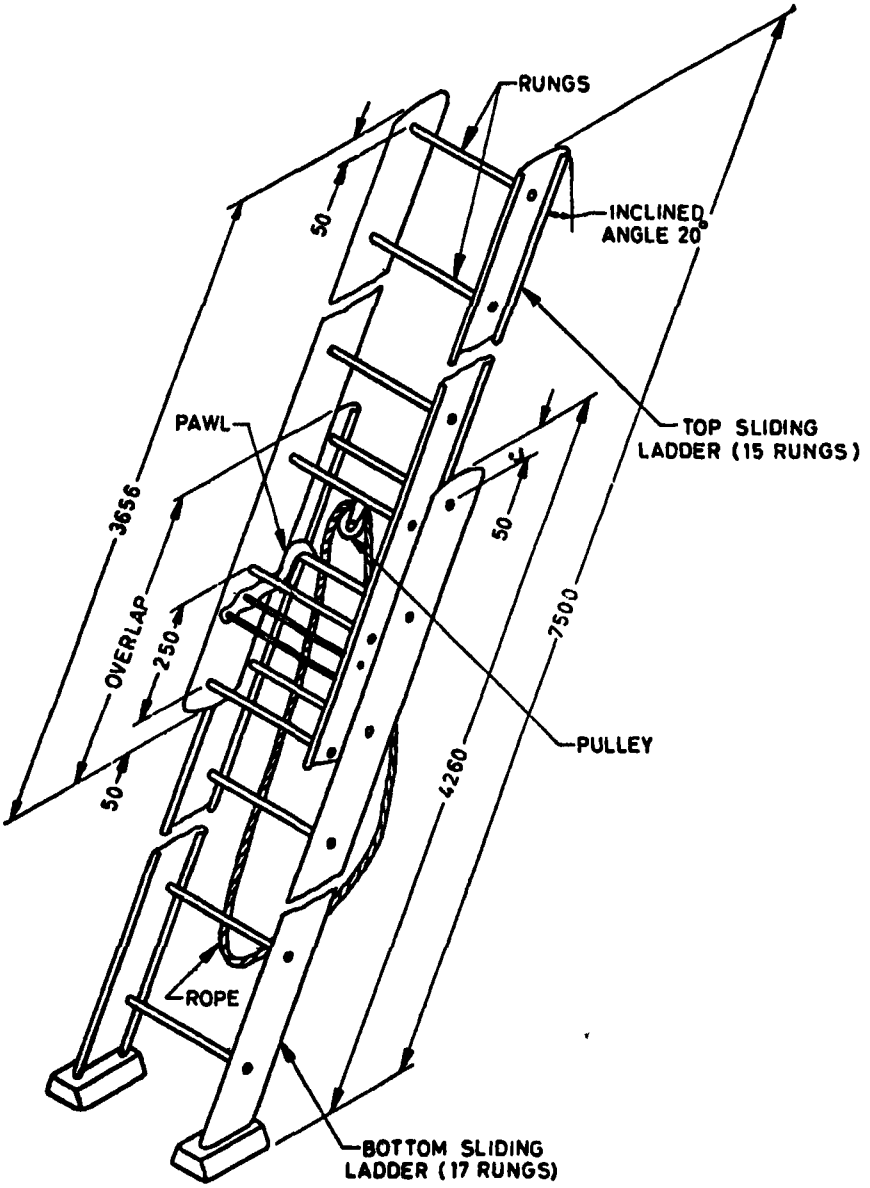
TO

IS : 4571-1977 SPECIFICATION FOR ALUMINIUM EXTENSION LADDERS FOR FIRE BRIGADE USE

(First Revision)

Addendum

(*Page* 4, *clause* 4.1) — Add the figure given on page 2 after 4.1:



All dimensions in millimetres.

FIG. 1 TYPICAL SKETCH OF 7·5 m EXTENSION LADDER

(BDC 22)

Printed at New India Printing Press, Khurja, India

AMENDMENT NO. 2 SEPTEMBER 1981

TO

IS:4571-1977 SPECIFICATION FOR ALUMINIUM EXTENSION LADDERS FOR FIRE BRIGADE USE

(First Revision)

Alterations

(*Page 4, clause 3.2*) - Substitute the following for the existing clause:

'3.2 The aluminium alloy section used for the rounds of the ladder shall conform to Grade HV-20(in W or WP temper) of IS:1285-1975*.'

(*Page 6, clause 6.4, first sentence*) - Substitute the following for the existing sentence:

'The ladder shall be capable of being extended by one man by means of rope of breaking strength not less than 10 000 kgf.'

(BDC 22)

Printed at New India Printing Press, Khurja, India

AMENDMENT NO. 3 JANUARY 1984

TO

IS : 4571-1977 SPECIFICATION FOR ALUMINIUM EXTENSION LADDERS FOR FIRE BRIGADE USE

(First Revision)

Alterations

(*Page* 4, *clause* **3.1**) — Substitute the following for the existing clause:

'**3.1** The aluminium alloy section for stiles or strings shall conform to aluminium alloy 64430 WP or 65032 WP of IS : 733-1975† and IS : 1285-1975‡ '.

[*Page* 4, *clause* **3.2**, (*see also* Amendment No. 2)] — Substitute the following for the existing clause:

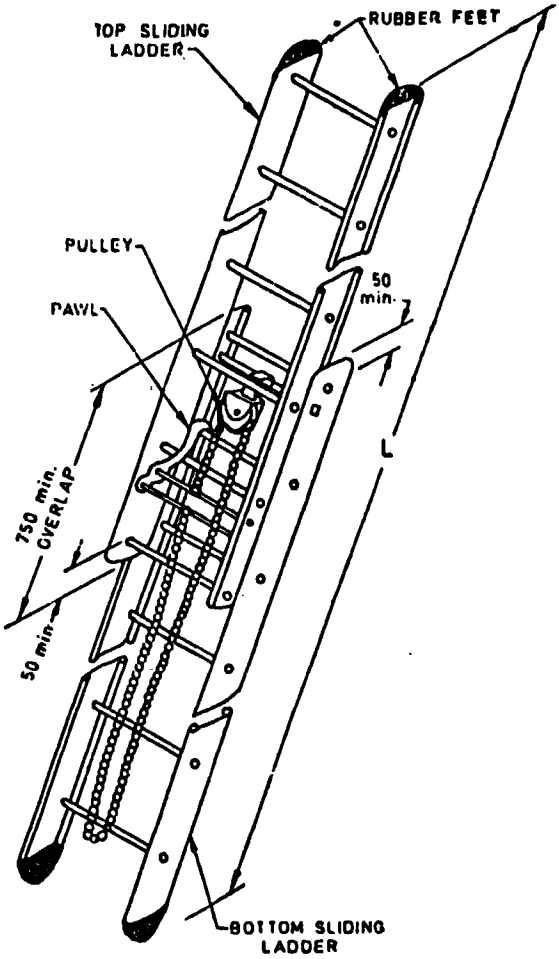
'**3.2** The aluminium alloy section used for the rounds of the ladder shall conform to aluminium alloy 64430 WP or 65032 WP of IS : 733-1975† and IS : 1285-1975‡.'

(*Page* 4, *clause* **3.3**, *line* 2) — Substitute '4600' *for* 'A-6'.

[*Page* 4, *clause* **4.1** *and* Fig. 1 (*see also* Amendment No. 1)] — Substitute the following for the existing clause and figure:

'**4.1** Extension ladders when fully extended shall meet the required sizes of 4·5, 7·5 and 10·5 m and overlap as shown in Fig. 1; when closed the distance between the same extremities of top and bottom sliding ladder shall not exceed 750 mm.'

(*Page* 4, *foot-note with* '*' *mark*) — Delete.



L Means Extended Length of Ladder

All dimensions in millimetres.

FIG. 1 TYPICAL SKETCH OF EXTENSION LADDER

Printed at New India Printing Press, Khurja, India

AMENDMENT NO. 4 OCTOBER 1984

TO

IS:4571-1977 SPECIFICATION FOR ALUMINIUM EXTENSION LADDERS FOR FIRE BRIGADE USE

(First Revision)

Corrigendum

[*Page 6, clause 6.4, first sentence* (in Amendment No. 2)] - Substitute '1 000 kgf' *for* '10 000 kgf'.

(BDC 22)

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AMENDMENT NO. 5 FEBRUARY 1989
TO
IS : 4571 - 1977 SPECIFICATION FOR ALUMINIUM EXTENSION LADDERS FOR FIRE BRIGADE USE

(First Revision)

[*Page* 4, *clause* **3.1** (*see also* Amendment No. 3)] — Substitute 'IS : 733-1983† ' *for* 'IS : 733-1975† '.

[*Page* 4, *clause* **3.2** (*see also* Amendments No. 2 *and* 3)] — Substitute 'IS : 733-1983† ' *for* 'IS : 733-1975† '.

(*Page* 4, *foot-note marked with* '†' *mark*) — Substitute the following for the existing foot-note:

'†Specification for wrought aluminium and aluminium alloy, bars rods and sections (for general engineering purposes) (*third revision*).'

(*Page* 5, *clause* **6.1**, *line* 8) — Substitute '1098 N (112 kgf)' *for* '1 128 N (115 kgf)'.

(*Page* 6, *foot-note*) — Delete.

(BDC 22)

Printed at New India Printing Press, Khurja, India

Indian Standard

SPECIFICATION FOR ALUMINIUM EXTENSION LADDERS FOR FIRE BRIGADE USE

(First Revision)

0. FOREWORD

0.1 This Indian Standard (First Revision) was adopted by the Indian Standards Institution on 30 November 1977, after the draft finalized by the Fire Fighting Sectional Committee had been approved by the Civil Engineering Division Council.

0.2 Wooden extension ladders for fire fighting purposes have already been covered in IS : 930-1977*. During the course of working to this standard, it has been felt that timber ladders being difficult to handle because of their heavy mass, often present difficulties to the fire fighting personnel at the time of fire fighting. Aluminium ladders being lighter are now being preferred to timber ladders by the fire fighting personnel. This standard was published in 1968. Based on the indigenous availability of aluminium section this revision has been prepared, the principal modification being relaxation in regard to the deflection.

0.2.1 The aluminium extension ladder consist of one main and one extending section. The design shall be such as to ensure easy sliding of the extending section without excessive clearance in the guide and over extension of the ladder. The extending section shall be guided throughout the full range of extension in a manner such that the sections cannot separate, retaining clips being on the main section. If so required, an operating gear is fixed to facilitate removal of the extending section for separate use.

0.3 For the purpose of deciding whether a particular requirement of this standard is complied with, the final value, observed or calculated, expressing the result of a test or analysis, shall be rounded off in accordance with IS : 2-1960†. The number of significant places retained in the rounded off value should be the same as that of the specified value in this standard.

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*Specification for wooden extension ladder for fire fighting purposes (*first revision*).
†Rules for rounding off numerical values (*revised*).

1. SCOPE

1.1 This standard lays down the requirements regarding material, size, mass and performance tests of aluminium extension ladders for fire fighting purposes.

2. GENERAL

2.1 **Ladder** — The width of the extending section inside its strings shall be not less than 30 cm. The rounds shall be with non-slip serrations running the full length. These shall be fixed by expanding and flaring and shall be spaced at 25 cm centre to centre.

2.2 **Safety Device** — The heals of the stiles or strings of lower section shall be fitted with rubber feet. The pawls shall be bolted to stiles or strings and their action shall be such that they are set for engagement until they have been rested on a round, and trip to clear immediately the ladder is extended.

3. MATERIAL

3.1 The aluminium alloy section for stiles or strings shall conform to Grade HE-20 (in WP temper) of IS : 3921-1966* or IS : 733-1975†.

3.2 The aluminium alloy section used for the rounds of the ladder shall conform to Grade HV (in W temper) of IS : 1285-1975‡.

3.3 Aluminium alloy latch shall be produced from aluminium alloy conforming to IS Designation A-6 of IS : 617-1975§ by chill casting.

3.4 Rubber feet of aluminium ladder shall have shear hardness of 50 to 60.

4. SIZE

4.1 Extension ladders when fully extended shall be in the three sizes, namely, 4·5 m, 7·5 m and 10·5 m (*see* Fig. 1).

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*Specification for aluminium channels.

†Specification for wrought aluminium and aluminium alloy, bars rods and sections (for general engineering purposes) (*second revision*).

‡Specification for wrought aluminium and aluminium alloys, extruded round tube and hollow sections (for general engineering purposes) (*second revision*).

§Specification for aluminium and aluminium alloy ingots and castings for general engineering purposes (*second revision*).

5. MASS

5.1 The ladders shall be as light as possible, their total mass shall not exceed as given below:

4·5 m	20 kg
7·5 m	30 kg
10·5 m	48 kg

6. TEST REQUIREMENTS

6.1 Deflection — The fully extended ladder shall be placed across trestles, positioned 90 cm from each end. On a 30 cm wide board placed across the strings at the centre of the span, a load of 373 N (38 kgf) shall be applied, allowed to remain there for a period of not less than 1 minute and then removed. A load of 736 N (75 kgf) shall then be gradually applied and the deflection due to this load shall not exceed 30 cm measured from the original position. The load shall then be gradually increased to 1 128 N (115 kgf) and the additional deflection shall not exceed 50 percent of the deflection obtained with the 736 N (75 kgf). There shall be no sign of distress.

6.2 Strength of Round

6.2.1 With the feet of the ladder at a distance of 2·5 m in the case of 10·5 m, 1·75 m in the case of 7·5 m, and 1·25 m in the case of 4·5 m ladder from wall, the ladder shall be fully extended and its head rested against the wall. A load of 320 kgf shall then be gradually applied to the middle of at least one round in each section by means of a metal hook having a bearing surface 5 cm wide and suitably lined to prevent bruising of the round. No sign of failure shall be apparent either in the round or at its junction with the strings.

6.2.2 The fully extended ladder shall be placed vertically and a man weighing approximately 75 kg shall jump on each round from the round immediately above. No sign of failure shall be apparent either in the round or at its junction with the strings during this test.

6.2.3 The fully extended ladder shall be placed horizontally across trestles. One man weighing approximately 75 kg shall walk over the rounds. No sign of failure shall be apparent either in the round or at its junction with the strings during this test.

6.3 Sway — When pitched against a wall with feet of the ladder 1·25 m, 1·75 m and 2·5 m away from the wall in the case of 4·5 m, 7·5 m and 10·5 m ladders respectively and two men are ascending the ladder or one man carrying another while descending the ladders, it shall not sway.

6.4 Extension — The ladder shall be capable of being extended by one man by means of rope [manila 45 mm in circumference (*see* IS : 1084-1969*)] over a pulley on the main section to the required length. The ladder shall also be not over extended.

7. MARKING

7.1 Each extension ladder shall be clearly and permanently marked with the following information:

a) Manufacturer's name or trade-mark, if any;

b) The size of the ladder; and

c) Year of manufacture.

7.1.1 The product may also be marked with Standard mark.

7.1.1.1 The use of the Standard Mark is governed by the provisions of the *Bureau of Indian Standards Act*, 1986 and the Rules and Regulations made thereunder. The details of conditions under which the licence for the use of Standard Mark may be granted to manufacturers or producers may be obtained from the Bureau of Indian Standards.

8. SAMPLING AND CRITERIA FOR CONFORMITY

8.1 Each ladder shall be checked for the various requirements specified in this standard.

*Specification for manila ropes (*second revision*).

(*Continued from page* 2)

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