

AS 1892.2—1992

Australian Standard®

Portable ladders

Part 2: Timber

This Australian Standard was prepared by Committee SF/34, Portable Ladders. It was approved on behalf of the Council of Standards Australia on 31 March 1992 and published on 20 July 1992.

The following interests are represented on Committee SF/34:

Aluminium Development Council
Attorney-General's Department
Business and Consumer Affairs, N.S.W.
Confederation of Australian Industry
Department of Administrative Services
Department of Industrial Affairs, Qld
Department of Occupational Health, Safety and Welfare, W.A.
Ladder Manufacturers Association of Australia
Metal Trades Industry Association of Australia
National Safety Council of Australia
Plastics Institute of Australia
Railways of Australia Committee
Telecom Australia
University of New South Wales

Review of Australian Standards. To keep abreast of progress in industry, Australian Standards are subject to periodic review and are kept up to date by the issue of amendments or new editions as necessary. It is important therefore that Standards users ensure that they are in possession of the latest edition, and any amendments thereto.

Full details of all Australian Standards and related publications will be found in the Standards Australia Catalogue of Publications; this information is supplemented each month by the magazine 'The Australian Standard', which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.

Suggestions for improvements to Australian Standards, addressed to the head office of Standards Australia, are welcomed. Notification of any inaccuracy or ambiguity found in an Australian Standard should be made without delay in order that the matter may be investigated and appropriate action taken.

AS 1892.2—1992

Australian Standard[®]

Portable ladders

Part 2: Timber

First published as AS A90—1959.
Second edition 1971.
Revised and redesignated AS 1688—1974.
Revised and redesignated AS 1892.2—1992.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140



Documents
ISBN 0 7262 7471 2
Document Sharing Hub

PREFACE

This Standard was prepared by the Standards Australia Committee on Portable Ladders, to supersede AS 1688–1974, *Portable timber ladders (including step-ladders and trestle-ladders)*.

This edition was initiated for a number of reasons including—

- (a) the need to amend design and constructional requirements in line with regulatory, manufacturing, and user practices;
- (b) the request to consider specification of performance criteria that might allow evaluation of ladders by means of compliance with performance testing criteria; and
- (c) the possibility of using alternative species of timber for ladder construction.

This edition has also updated the dimensional and constructional requirements for the traditional ladders made from Douglas fir, and rationalized the requirements for spacing of treads, rungs, and stiles.

It is not intended that these rationalized spacings be applied to ladders manufactured prior to the date of publication of this Standard.

The Standard now includes an additional method for grading of timber for use as stiles by means of a proof deflection test where visual grading alone is not considered adequate, or where mechanical stress grading equipment is not available.

The committee has reviewed the range of tests recently published in several overseas Standards (e.g. CSA, ANSI) and in AS 1892.1–1986, *Portable ladders*, Part 1: *Metal*; however, given the long and satisfactory service level of ‘traditional’ Douglas fir ladders manufactured in accordance with AS 1688, no justification could be seen for specifying that such ladders should now be tested and reassessed against performance tests primarily designed to assess new designs and materials. In this regard, the committee is concerned to minimize any unnecessary costs to the community and the industry.

During preparation of this Standard, reference was made to the Standards listed below. Acknowledgement is made of the assistance received from these sources.

ANSI	
A14.1 (1982)	Ladders—Portable, wood, safety requirements
BS	
1129 (1982)	Specification for portable timber ladders, steps, trestles and lightweight stagings
NZS	
3609 (1978)	Specification for timber ladders
SCC	
CAN3–Z11–M81	Portable ladders

© Copyright — STANDARDS AUSTRALIA

Users of Standards are reminded that copyright subsists in all Standards Australia publications and software. Except where the Copyright Act allows and except where provided for below no publications or software produced by Standards Australia may be reproduced, stored in a retrieval system in any form or transmitted by any means without prior permission in writing from Standards Australia. Permission may be conditional on an appropriate royalty payment. Requests for permission and information on commercial software royalties should be directed to the head office of Standards Australia.

Standards Australia will permit up to 10 percent of the technical content pages of a Standard to be copied for use exclusively in-house by purchasers of the Standard without payment of a royalty or advice to Standards Australia.

Standards Australia will also permit the inclusion of its copyright material in computer software programs for no royalty payment provided such programs are used exclusively in-house by the creators of the programs.

Care should be taken to ensure that material used is from the current edition of the Standard and that it is updated whenever the Standard is amended or revised. The number and date of the Standard should therefore be clearly identified.

The use of material in print form or in computer software programs to be used commercially, with or without payment, or in commercial contracts is subject to the payment of a royalty. This policy may be varied by Standards Australia at any time.

CONTENTS

	<i>Page</i>
SECTION 1 SCOPE AND GENERAL	
1.1 SCOPE	5
1.2 APPLICATION	5
1.3 REFERENCED DOCUMENTS	5
1.4 DEFINITIONS	5
SECTION 2 GENERAL REQUIREMENTS	
2.1 DESIGN AND CONSTRUCTION	8
2.2 RATINGS	8
2.3 MATERIALS	8
2.4 WORKMANSHIP AND FINISH	8
2.5 STILES	9
2.6 TREADS AND RUNGS	10
2.7 MARKING	10
SECTION 3 PARTICULAR REQUIREMENTS FOR SINGLE LADDERS (INCLUDING CLEATED LADDERS)	
3.1 LENGTH	11
3.2 STILES	11
3.3 RUNGS AND CLEATS	11
3.4 TIES AND THEIR FITTING	12
SECTION 4 PARTICULAR REQUIREMENTS FOR EXTENSION LADDERS	
4.1 LENGTH	13
4.2 STILES	13
4.3 RUNGS	13
4.4 FITTINGS	13
4.5 ROPE AND PULLEY	13
4.6 WIRE REINFORCEMENT	14
4.7 FIBRE-REINFORCED PLASTICS REINFORCEMENT	14
SECTION 5 PARTICULAR REQUIREMENTS FOR STEPLADDERS	
5.1 LENGTH	15
5.2 STILES AND BACK LEGS	15
5.3 TREADS	16
5.4 BRACING OF TREADS IN INDUSTRIAL STEPLADDERS	16
5.5 TOP	16
5.6 BACK SUPPORT PLATE	16
5.7 HINGES	16
5.8 TIES AND THEIR FITTING IN INDUSTRIAL STEPLADDERS	17
SECTION 6 PARTICULAR REQUIREMENTS FOR PLATFORM STEPLADDERS	
6.1 LENGTH	18
6.2 STILES AND BACK LEGS	18
6.3 TREADS	18
6.4 PLATFORM	19
6.5 HINGES	19
6.6 TIES AND THEIR FITTING	19
SECTION 7 PARTICULAR REQUIREMENTS FOR TRESTLE LADDERS	
7.1 LENGTH	20
7.2 STILES	20
7.3 CROSSBEARERS	20
7.4 HINGES	20
7.5 CHECK BLOCKS	21
7.6 TIES AND THEIR FITTING	21



	<i>Page</i>
SECTION 8 PARTICULAR REQUIREMENTS FOR DOMESTIC EXTENSION STEPLADDERS	
8.1 LENGTH	22
8.2 STILES	22
8.3 TREADS AND RUNGS	22
8.4 FITTINGS	23
8.5 TOP	23
SECTION 9 TIMBER LADDERS HAVING STILES OF TIMBER OTHER THAN DOUGLAS FIR	
9.1 APPLICATION	24
9.2 MATERIALS	24
9.3 DIMENSIONS	24
APPENDICES	
A METHODS OF GRADING TIMBER STILES	25
B EXAMPLES OF LABELS USED FOR ADDITIONAL SAFETY WARNINGS	29
C DERIVATION OF EQUATIONS FOR EXTREME FIBRE STRESS	31

STANDARDS AUSTRALIA

Australian Standard
Portable ladders

Part 2: Timber

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE This Standard sets out the minimum constructional and safety requirements for the design and manufacture of portable ladders with timber stiles.

The Standard provides for ladders of two duty ratings, viz ‘industrial ladders’ and ‘domestic ladders’, which are assigned minimum load ratings.

The Standard does not cover ladder accessories such as ladder levellers, ladder stabilizers or stand-off devices, ladder jacks, or ladder straps or hooks that may be installed on or used in conjunction with ladders.

1.2 APPLICATION Portable timber ladders with stiles manufactured from Douglas fir shall comply with the relevant requirements of [Section 2](#) (general requirements), and with the specific requirements of the Section appropriate to the type of ladder, as follows:

- (a) [Single ladders: Section 3.](#)
- (b) [Extension ladders: Section 4.](#)
- (c) [Stepladders: Section 5.](#)
- (d) [Platform stepladders: Section 6.](#)
- (e) [Trestle ladders: Section 7.](#)
- (f) [Domestic extension/stepladders: Section 8.](#)

Portable timber ladders with stiles manufactured from timber other than Douglas fir shall comply with the relevant requirements of [Section 2](#) (general requirements) and with the specific requirements of [Section 9](#).

NOTE: Ladders used in industrial applications are required, in some States, to be approved by the relevant regulatory authority.

1.3 REFERENCED DOCUMENTS The following documents are referred to in this Standard:

AS

1080	Methods of testing timber
1080.1	Part 1: Moisture content
1080.2.1	Method 2.1: Determination of slope of grain by scribe
1148	Nomenclature of commercial timbers imported into Australia
1394	Round steel wire for ropes
1504	Fibre rope—Three-strand, hawser laid
1604	Preservative treatment for sawn timber, veneer and plywood
1728	Types of timber surfaces
1748	Mechanically stress-graded timber
2089	Sheave blocks (including ships’ cargo blocks) of maximum lift 60 t
2543	Nomenclature of Australian timbers

1.4 DEFINITIONS For the purpose of this Standard, the definitions below apply (see also [Figure 1.1](#)).

1.4.1 Portable timber ladder—a readily movable appliance consisting of timber stiles (see [Clause 1.4.13](#)) joined at regular intervals by crosspieces called rungs or treads (see [Clause 1.4.14](#)), on which a person may stand or step in ascending or descending.

1.4.2 Domestic ladder—a ladder designed to be used by a householder for construction, maintenance, and repairs carried out by the householder at the householder’s dwelling.

1.4.3 Industrial ladder—any ladder other than a domestic ladder.

1.4.4 Single ladder—a non-self-supporting portable ladder consisting of one section.

1.4.5 Extension ladder—a non-self-supporting portable ladder consisting of two or more sections travelling in guides or brackets arranged in order to permit adjustment of working length.

1.4.6 Single-sided stepladder—a self-supporting portable ladder, of fixed length, with flat treads for ascent and descent and a hinged back not intended for ascent or descent. Variations in designs of single-sided stepladders include the following:

- (a) *Platform stepladder*—a single-sided stepladder with a specially designed substantial platform fitted between the front and back sections (stiles and back legs) near the top to provide a working area.
- (b) *Dual-purpose stepladder*—a single-sided stepladder of which the back section is fitted with rungs, and which can be further adjusted to provide an extension of the front section as a non-self-supporting portable ladder (in the extended position).

1.4.7 Double-sided stepladder—a self-supporting portable stepladder of fixed length with two pairs of stiles which are—

- (a) hinged or fixed; and
- (b) each fitted with treads for ascent and descent.

1.4.8 Trestle ladder—a self-supporting portable ladder of fixed length, consisting of two sections hinged at the top to form equal angles with the base, each section being provided with crossbearers, fixed between the stiles, on which a plank or planks may be supported.

1.4.9 Trestle-backed steps—a self-supporting portable ladder, of fixed length with flat treads for ascent and descent and a hinged back fitted with crossbearers suitable for supporting a work platform.

1.4.10 Special-purpose ladder—a ladder that represents either a modification or a combination of design or construction features of one or more of the general-purpose ladders herein defined, in order to adapt to special or specific uses.

1.4.11 Maximum working length—

- (a) *For ladders of adjustable length*: the length measured along the stiles, including feet and end caps where fitted, when the ladder is in the fully extended position.
- (b) *For ladders of fixed length*: the overall length measured along the stile, including feet, and top and end caps where fitted.

1.4.12 Overlap—the distance with which each section of an extension ladder coincides with its matching section when fully extended.

1.4.13 Stile—a side member that supports the treads or rungs.

NOTE: The terms 'stile', 'side rail', 'string', and 'stringer' are used synonymously in industry. For the purpose of this Standard, the term 'stile' is used throughout.

1.4.14 Rungs and treads—crosspieces joining the stiles and used by a person ascending or descending a ladder.

NOTES:

- 1 The terms 'rung', 'step', and 'tread' are used in industry. For the purpose of this Standard, the term 'rung' is used for straight and extension ladders, and the term 'tread' for stepladders. The term 'tread' is also used as a general term where applicable.
- 2 The terms 'rung', 'tread', and 'step' do not include the top cap.

1.4.15 Top cap—the uppermost horizontal member of a portable stepladder.

1.4.16 Step surfaces—the clear portion of steps, rungs, or treads on which a person may step while ascending or descending a ladder.

1.4.17 Section

1.4.17.1 Bottom or base section—the lowest section of a non-self-supporting portable ladder.

1.4.17.2 Middle or intermediate section—the section between the top (fly) and bottom (base) sections of a non-self-supporting portable ladder.

1.4.17.3 Top or fly section—the uppermost section of a non-self-supporting portable ladder.

1.4.18 Duty rating—the rating assigned to the ladder, i.e. industrial or domestic, which indicates the service capability of the ladder.

1.4.19 Load rating—the maximum load rating of the ladder.

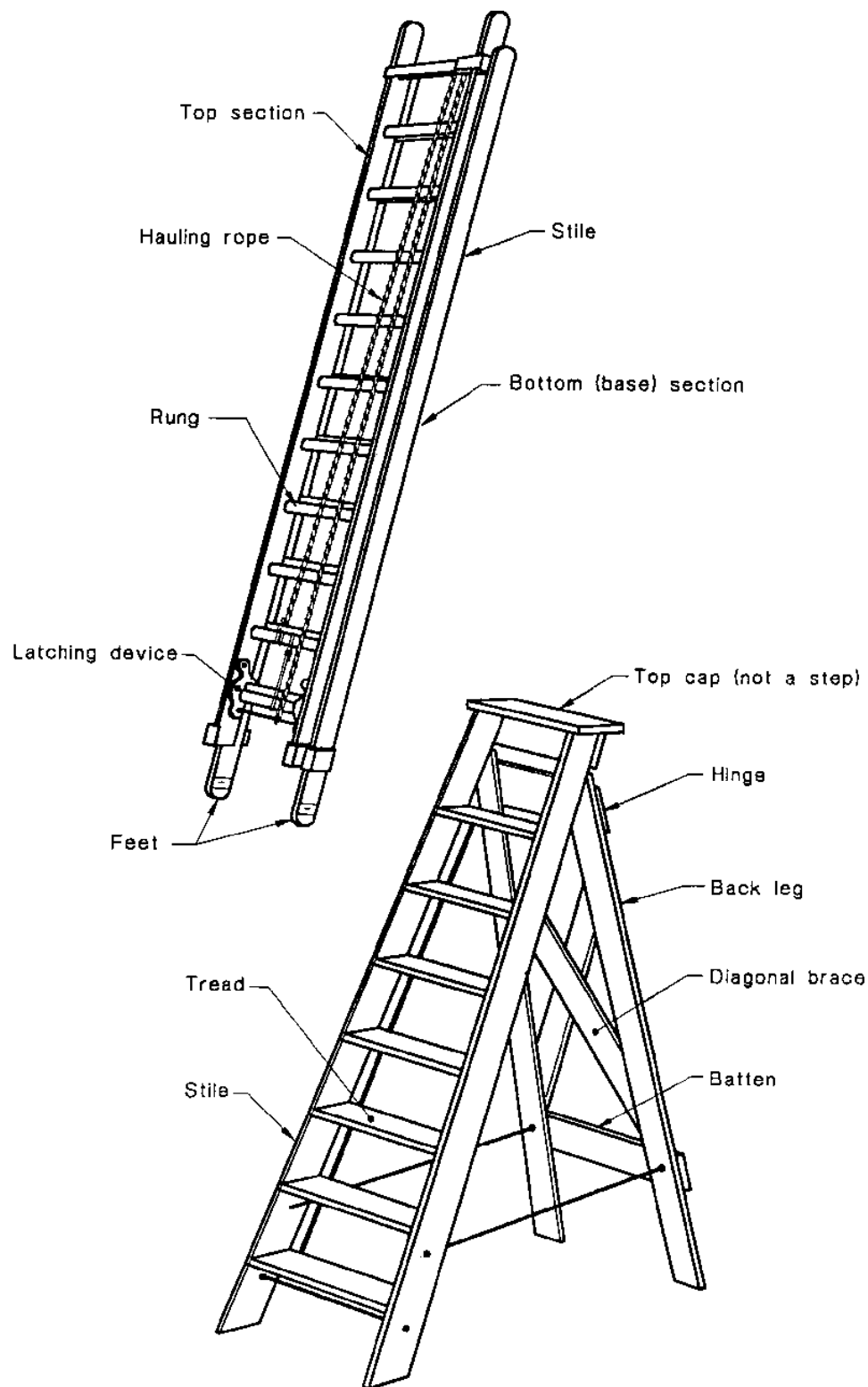


FIGURE 1.1 ILLUSTRATION OF COMPONENTS AND TERMS RELATIVE TO LADDERS

SECTION 2 GENERAL REQUIREMENTS

2.1 DESIGN AND CONSTRUCTION The ladder shall comply with the relevant requirements of this Standard, and shall be free from structural defects that would render the structure hazardous to the user.

2.2 RATINGS

2.2.1 Duty rating Portable timber ladders shall be rated as either industrial or domestic in accordance with their designed service capability.

2.2.2 Load rating Portable timber ladders shall have a load rating of—

- (a) for industrial ladders: not less than 120 kg; or
- (b) for domestic ladders: not less than 100 kg.

2.3 MATERIALS

2.3.1 General Materials used in the construction of the ladder shall be suitable for the intended use and sufficiently robust in form to withstand normal usage for the working life of the ladder.

2.3.2 Species of timber Acceptable species of timber for components of ladders with Douglas fir stiles are given in Table 2.1.

Other species of timber which provide equivalent characteristics may be used for components other than stiles.

**TABLE 2.1
TIMBER SPECIES**

Application	Species (standard trade common names*)	Minimum permissible air dry density kg/m ³
Trestle crossbearers	fir, Douglas (USA)	465
Rungs and cleats	box, grey, coast gum, grey gum, spotted ironbark tallowwood wandoo	1060 945 850 1040 930 1060
Treads and battens	ash, mountain coachwood pine, hoop pine, radiata ramin fir, Douglas (USA)	545 560 415 450 580 465

* Interpreted in accordance with AS 1148 and AS 2543, as appropriate.

2.3.3 Quality of timber

2.3.3.1 General Timber shall not be brittle nor contain compression failures. When finished, all timber components shall be free from shakes, cross-breaks, and compression wood. All timber shall be free from decay and insect attack.

NOTE: Lyctus-susceptible sapwood should, preferably, not be used. Where present it should be treated with a preservative in accordance with AS 1604 to its full depth and to a loading of 5 kg of dry salt per cubic metre of sapwood.

2.3.3.2 Moisture content All timber used in ladder construction, at the time of manufacture shall be seasoned to a moisture content not exceeding 17 percent when determined in accordance with AS 1080.1.

2.3.3.3 Density of timber The density of the timber used for ladder parts shall be not less than the respective minima listed in Table 2.1.

2.3.3.4 Grading of timber Timber used for ladder parts shall be selected by—

- (a) the visual grading method described in [Paragraph A2, Appendix A](#);
- (b) the combined visual grading/stiffness evaluation method described in [Paragraph A3, Appendix A](#); or
- (c) the mechanical stress grading method described in [Paragraph A4, Appendix A](#).

2.4 WORKMANSHIP AND FINISH

2.4.1 General All exposed metal surfaces shall be free from burrs and sharp edges.

2.4.2 Finish The timber shall be dressed on all sides to not less than a No. 3 Dressed Surface as defined in AS 1728, and the arrises shall be rounded. The material shall be entirely free from twist. The ladders, as supplied by the manufacturer, shall be either uncoated or treated with a protective coating which shall not conceal the grain of the timber. The tread surfaces shall not be treated in any way which may create a slipping hazard.

2.4.3 Fasteners Fasteners shall be either protected against corrosion or manufactured from material which is inherently resistant to corrosion.

Fasteners shall be applied in a tight and secure manner. Fasteners shall remain secure with normal use and care, or be such that they can be tightened with the aid of common hand tools such as a wrench or screwdriver.

Rivets shall be peened or set over the hardware or a washer.

NOTE: Attention is drawn to the probability of electrolytic corrosion resulting from contact between dissimilar materials.

2.4.4 Fittings Fittings shall be either protected against corrosion or manufactured from a material which is inherently resistant to corrosion.

2.4.5 Tolerances The dimensions of timber components shall be not less than those specified in the relevant Section of this Standard when measured at the time of manufacture and at a moisture content not exceeding 17 percent.

Corner radii of minimum specified stile section sizes shall not exceed 3 mm. Chamfers shall not exceed 3 mm × 3 mm.

2.5 STILES

2.5.1 Design Because of the wide variety of types of ladders and the varied conditions of use, ladders may be designed with parallel stiles or with stiles varying uniformly in separation along the length (i.e. tapered).

2.5.2 Manufacture The bottom of each stile in the bottom section of the ladder shall be shaped and finished so as to resist slipping, be faced with slip-resistant materials, or be fitted with slip-resistant feet complying with the requirements of Clause 2.5.5.

2.5.3 Joints in stiles The stiles of timber ladders shall not be of jointed material.

2.5.4 Grooving of stiles Grooving of extension and single ladder stiles shall be permitted only on ladders where a reinforcement of steel wire or fibre-reinforced plastics is to be subsequently fixed.

2.5.5 Feet

2.5.5.1 Requirement Feet fitted to the bottom of the stiles or the bottom section of the ladder may be fixed or hung. Where fitted, feet shall comply with the following requirements:

- (a) The feet shall be manufactured from or faced with a material which will resist deformation and slipping, and which, when tested in accordance with the relevant requirements of Clause 2.5.5.2, shall have a coefficient of friction not less than 0.5.
- (b) The feet or surfacing material shall be securely fixed to the stiles but may be removable for renewal.

The projected area of ladder feet shall be not less than the area enclosed by the external dimensions of the stile or back leg, as appropriate.

2.5.5.2 Foot friction test The test shall be performed as follows (see also [Figure 2.1](#)):

- (a) The test shall be carried out on a typical smooth, flat, horizontal, dry, unwaxed, vinyl tile floor.
- (b) A vertical force shall be applied as follows:
 - (i) For feet fitted to the front stiles: equivalent to one-half of the ladder load rating plus one-half of the mass of the ladder.
 - (ii) For feet fitted to the back legs: equivalent to one-quarter of the ladder load rating plus one-quarter of the mass of the ladder.
- (c) Apply a horizontal force of increasing magnitude to the foot until slip occurs. A spring balance is a convenient means of measuring (or applying) this force.
- (d) Record the maximum value of the applied force, and calculate the coefficient of static friction from the following equation:

$$\mu = \frac{F_h}{F_v}$$

where

- μ = coefficient of static friction
- F_h = horizontal force applied to the foot, in newtons
- F_v = vertical force applied to the foot, in newtons