

Australian Standard<sup>®</sup>

---

**Timber—Softwood—Visually  
stress-graded for structural  
purposes**

---

[Title allocated by Defence Cataloguing Authority:  
TIMBER, SOFTWOOD; BOARD (Visually Stress-graded for  
Structural Purposes)]

This Australian standard was prepared by Committee TM/101, Structural Timber Products. It was approved on behalf of the Council of the Standards Association of Australia on 22 April 1986 and published on 5 May 1986.

---

The following interests are represented on Committee TM/101:

Association of Consulting Engineers Australia  
Australian Federation of Timber Merchants Associations  
Australian Institute of Building  
Australian Timber Importers' Federation  
CSIRO, Division of Chemical and Wood Technology  
Department of Housing, New South Wales  
Department of Local Government and Lands, New South Wales  
Department of Public Works, New South Wales  
Forest Products Association of Western Australia  
Housing Commission, Queensland  
Lending Institutions  
Master Builders Federation of Australia  
National Association of Australian State Road Authorities  
National Timber Industry Training Committee  
New South Wales Timber Advisory Council  
Radiata Pine Research Institute Inc  
Royal Australian Institute of Architects  
Sawmillers Associations  
State Forestry Departments  
Tasmanian Timber Promotion Board  
Timber Development Association of South Australia  
Timber Merchants Associations  
Timber Promotion Council  
Timber Research and Development Advisory Council  
Universities

---

**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which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.*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.*

---

*This standard was issued in draft form for comment as DR 82130 and DR 83238.*

Australian Standard<sup>®</sup>

---

**Timber—Softwood—Visually  
stress-graded for structural  
purposes**

---

First published as—	
AS 1490 .....	1973
AS 1648 .....	1974
AS 2099 .....	1977
AS 2440 (Section 2 only) .....	1981
Above standards revised and amalgamated and issued as AS 2858 .....	1986

## PREFACE

This standard was prepared by the Association's Committee on Structural Timber Products. It supersedes the following standards:

- |              |  |
|--------------|--|
| AS 1490-1973 | Visually Stress Graded Radiata Pine for Structural Purposes  |
| AS 1648-1974 | Visually Stress Graded Cypress Pine for Structural Purposes  |
| AS 2099-1977 | Visually Stress-graded Seasoned Australian-grown Softwood (Conifers) for Structural Purposes (Excluding Radiata Pine and Cypress Pine) |

It also supersedes Section 2, Construction Timber, of AS 2440—1981, Sawn Douglas Fir (Oregon) and Sawn Western Hemlock (Canada Pine).

A comparison of knot sizes and sloping grain in the above standards for visually stress-graded timber revealed a general consistency in these requirements, with differences of 10 to 12 percentage units in single knots and knot groups on the face occurring in AS 2440—1981.

For the first time in Australia, this new standard has adopted the knot-area ratio (K.A.R.) method of knot assessment and has simplified the number of knot classifications. This is consistent with the general order of accuracy of determining stress grades by visual inspection.

The grade nomenclature first used in AS 2082, Visually Stress-graded Hardwood for Structural Purposes, and continued in AS 2099 has been adopted in this standard. Derived from the five Structural Grades are Stud Grades and Lintel Grades, which provide the straighter material required for studs and lintels, and Structural Appearance Grades, which have limitations on the visual blemishes allowed in structural members exposed to view. Because of the subjective nature of the aesthetic requirements for Structural Appearance Grades, different limitations may be specified by the purchaser, provided that all the requirements dictated by strength considerations are complied with.

In the ordering and marketing of structural timber, it is preferable to nominate the required stress grade rather than the structural grade.

Stress grades for cypress pine have been determined from tests on full size scantlings. This has resulted in the separate grade descriptions for that species given in Section 3.

© 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 . . . . .	4
1.2 Referenced Documents . . . . .	4
1.3 Timber Species and Stress Grades . . . . .	4
1.4 Grades . . . . .	4
1.5 Application . . . . .	4
1.6 Definitions . . . . .	4
1.7 Dimensions and Squareness . . . . .	5
1.8 Moisture Content . . . . .	5
1.9 Preservative Treatment . . . . .	6
1.10 Imperfections . . . . .	6
1.11 Grade Limitation and Grading . . . . .	6
1.12 Marking . . . . .	6
SECTION 2. GRADE DESCRIPTIONS (EXCLUDING CYPRESS PINE)	
2.1 Structural Grade No 1 . . . . .	8
2.2 Structural Grade No 2 . . . . .	8
2.3 Structural Grade No 3 . . . . .	9
2.4 Structural Grade No 4 . . . . .	9
2.5 Structural Grade No 5 . . . . .	10
2.6 Stud Grades . . . . .	11
2.7 Lintel Grades . . . . .	11
2.8 Structural Appearance Grades . . . . .	11
SECTION 3. GRADE DESCRIPTIONS FOR CYPRESS PINE	
3.1 Stress Grade F7 . . . . .	13
3.2 Stress Grade F5 . . . . .	13
3.3 Stress Grade F4 . . . . .	14
3.4 Stud Grades . . . . .	15
APPENDICES	
A Stress Grades and Densities of Softwoods for Structural Purposes . .	16
B Measurement of Imperfections . . . . .	18
C Summary of Permissible Imperfections (Excluding Cypress Pine) . .	29
D Summary of Permissible Imperfections for Cypress Pine . . . . .	31
E Strength Groups, Structural Grades and Stress Grades of Timber . . .	33

## STANDARDS ASSOCIATION OF AUSTRALIA

## Australian Standard

for

## TIMBER—SOFTWOOD—VISUALLY STRESS-GRADED FOR STRUCTURAL PURPOSES

## SECTION 1. SCOPE AND GENERAL

**1.1 SCOPE.** This standard specifies requirements for softwood which is intended for structural purposes and stress-graded by visual means.

This standard does not apply to timber species with an average density, at 12 percent moisture content, below 360 kg/m<sup>3</sup>.

## NOTES:

1. The coverage by this standard in Appendix A of species listed in Table A1 or species mixtures listed in Table A2 does not imply their availability or the availability of any particular grade of any species or species mixture.
2. Information on the relationship between strength groups, structural grades and stress grades is given in Appendix E.

**1.2 REFERENCED DOCUMENTS.** The following documents are referred to in this standard:

- AS 1080 Methods of Testing Timber  
1080.2.1—Determination of Slope of Grain by Scribe  
1080.2.2—Determination of Slope of Grain by Reference to Surface Checks  
1080.2.3—Determination of Slope of Grain by Splintering
- AS 1080 Methods of Test for Timber  
Part 1—Moisture Content
- AS 1148 Nomenclature of Commercial Timbers Imported into Australia
- AS 1604 Preservative Treatment for Sawn Timber, Veneer and Plywood
- AS 1684 SAA Timber Framing Code
- AS 1720 SAA Timber Engineering Code
- AS 2543 Nomenclature of Australian Timbers
- AS 2878 Timbers—Classification into Strength Groups
- AS O1 Glossary of Terms Used in Timber Standards
- Radiata Pine Industry Standard 100—1979 High Temperature Seasoning Under Restraint of Heart-in, Radiata Pine, Structural Material

**1.3 TIMBER SPECIES AND STRESS GRADES.**

The standard trade names of species covered by this standard shall be interpreted in accordance with AS 1148 or AS 2543, as appropriate.

The stress grades of the major species covered by this standard are listed in Tables A1 and A2 of Appendix A.

The stress grade applicable to a parcel of mixed species, shall be that of the species with the lowest stress grade present in the parcel (see Tables A2 and A4 of Appendix A).

The stress grades applicable to unidentified softwoods shall be as given in Table A1 and Table A3 of Appendix A but no timber species with an average density at 12 percent moisture content below 360 kg/m<sup>3</sup>

shall be accepted, nor shall any piece with a density at 12 percent moisture content below 300 kg/m<sup>3</sup> be accepted (see Clause 1.6.1).

## NOTES:

1. The stress grades given in Tables A1 and A2 of Appendix A do not preclude the specific mechanical properties of a species being used for design purposes (see AS 1720).
2. The lower density species need extra care in regard to assessing nail and connector holding capacity.
3. Where it is intended to use preservative treated timber at a moisture content in excess of 15 percent the appropriate stress grade is determined by reference to Table E2 of Appendix E, having first obtained the particular species unseasoned strength group from AS 2878.

This standard may be used for the grading of species other than those listed in Table A1 of Appendix A provided that the appropriate stress grades for the species have been determined beforehand by the appropriate SAA Committee.

**1.4 GRADES.**

**1.4.1 Grades of structural softwood (excluding cypress pine).** The grades of structural softwood (excluding cypress pine) shall be as follows:

Structural Grade No 1  
Structural Grade No 2  
Structural Grade No 3  
Structural Grade No 4  
Structural Grade No 5  
Stud Grades  
Lintel Grades  
Structural Appearance Grades

**1.4.2 Grades of structural cypress pine.** The grades of structural cypress pine shall be as follows:

Stress Grade F7  
Stress Grade F5  
Stress Grade F4  
Stud Grade

## NOTES:

1. Stud and lintel grades require a greater amount of straightness, while structural appearance grades have additional requirements for those factors affecting the appearance of structural members exposed to view.
2. The assumed relationship between the structural grades and stress grades of seasoned softwood (excluding cypress pine) is given in Table E1 of Appendix E and that of unseasoned softwood (excluding cypress pine) is given in Table E2 of Appendix E.

**1.5 APPLICATION.** The specification of any grade shall consist of the requirements of this Section, together with the relevant grade description given in Section 2 or Section 3, as appropriate.

**1.6 DEFINITIONS.** For the purpose of this standard, the definitions given in AS O1 and the following apply: