Australian Standard®

Timber—Machine proof-grading

This Australian Standard was prepared by Committee TM/3, Timber Grading. It was approved on behalf of the Council of Standards Australia on 30 April 1993 and published on 26 July 1993.

The following interests are represented on Committee TM/3:

CSIRO, Division of Building, Construction and Engineering

Forestry Commission of N.S.W.

Housing Industry Association

Master Builders Construction and Housing Association Australia

National Association of Forest Industries

Queensland Forest Service

University of Technology, Sydney

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which subscribing members receive, and which gives details of new publications, new editions and amendments, and of withdrawn Standards.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 90047.

Australian Standard®

Timber—Machine proof-grading

First published as AS 3519—1993.

PUBLISHED BY STANDARDS AUSTRALIA
(STANDARDS ASSOCIATION OF AUSTRALIA)
1 THE CRESCENT, HOMEBUSH, NSW 2140
ISBN 0 7262 8251 0

PREFACE

This Standard was prepared by the Standards Australia Committee on Timber Grading and provides a procedure for machine proof-grading, whereby the graded timber has the same properties as the targeted stress grade.

This Standard is concerned with the method of machine proof-grading. Procedures for evaluating properties are given in AS 4063, *Timber—Stress-graded— In-grade strength and stiffness evaluation*.

CONTENTS

Page

FOREWORD 3
1 SCOPE 4
2 APPLICATION 4
3 REFERENCED DOCUMENTS 4
4 DEFINITIONS 4
5 NOTATION 5
6 PROOF-GRADING SYSTEM 6
7 MACHINE PROOF-GRADER 6
8 PROOF-GRADING 8
9 MARKING 9
10 CALCULATION OF PROOF LOAD 10

APPENDICES
A PROOF-GRADING OPERATION FLOW CHART 11
B PRE-SORTING OF TIMBER 12
C ESTIMATE OF PROOF STRESS 13
D STRUCTURAL EQUATIONS 20

FOREWORD

The process of grading timber for obtaining stress grades incorporates three essential operations—

(a) specification of a parent population of timber;

(b) sorting of this parent population into sub-populations that are then designated to specific stress grades; and

(c) checking structural properties of each stress grade from the graded timber.

Proof-grading is a method for obtaining stress-graded timber by the use of a machine proof-grader.

The concept of proof-grading is based on the principle that at some stage during the grading process a specified proportion of the timber (usually all) is subjected to a proof stress which it sustains without failure.

The proof stress is induced in a piece of timber by a machine that applies the stress continuously along all or most of the length of timber. This proof stress is directly related to the specific stress grade of the timber.

In this Standard it is assumed that a proof load is applied in a continuous manner along the loaded edge of a piece of timber to induce a predetermined level of bending stress, that is, a proof stress corresponding to the specific stress grade of that timber.

Therefore, as a piece of timber passes through a machine proof-grader, the timber is continously loaded on edge by a proof load which induces an accompanying proof stress within the timber. If the timber sustains this proof stress without damage or excessive deformation, then it is deemed to belong to the specific stress grade. This Standard would require modification if the proof load is applied in some other manner.

The term ‘stress grade’ refers to the structural properties of a population of graded timber. All pieces of timber within the population are assigned a common suite of design properties to be used for structural design purposes. The design properties are established from the measured strength properties of the stress-graded sub-population. That is to say, the term *stress grade* is more appropriately applied to a population of graded timber and not to a single piece of timber.

Design information on joint strength and compression (bearing) perpendicular to the grain are not covered by the allocation of timber to a stress grade.

STANDARDS AUSTRALIA

Australian Standard

Timber—Machine proof-grading

1 SCOPE This Standard sets out procedures for obtaining stress-graded timber by machine proof-grading.

2 APPLICATION This Standard is intended for use by sawmill and grading operators, quality assurance auditors, government authorities, timber inspectors and all personnel concerned with the proof-grading of timber.

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

AS	
1604	Preservative treatment for sawn timber, veneer and plywood
1613	Colours for marking stress graded timber
1720	Timber structures
1720.1	Design methods
2082	Visually stress-graded hardwood for structural purposes
2858	Timber—Softwood—Visually stress-graded for structural purposes
4063	Timber—Stress graded—In-grade strength and stiffness evaluation

4 DEFINITIONS For the purpose of this Standard, the definitions below apply.

4.1 Basic working stress in bending A design property for assessing the bending strength of timber having a designated stress grade.

NOTE: The basic working stresses in bending for stress-graded timber which is assigned an F-grade, are given in AS 1720.1.

4.2 Double-pass grading A proof-grading method in which each piece of timber is proof tested twice, each time with the opposite edge placed in tension.

4.3 F-grade A stress-grade of timber for which the specific suite of design properties given in AS 1720.1 are applicable.

4.4 Edge-biased grading Proof-grading in which the weakest edge, assessed visually (or otherwise) is placed in tension during the proof loading operation.

4.5 Proof grading Method of stress grading timber through the use of a machine proof-grader to obtain stress-graded timber.

4.6 Grading operator A person having the responsibility for the proof-grading operation.

4.7 Grade run A grading operation applied to a sub-population of timber in which all parameters such as the method of grading (pre-sorting an ungraded parent population into a graded sub-population of stress grades) and the proof load are kept constant.

4.8 Machine proof-grader An apparatus for applying a proof load continuously along the edge of a piece of timber as it passes between supports and load rollers.

4.9 PG material Timber which has been proof loaded in a proof-grading system.