AS 3519—2005

Australian Standard™

Timber—Machine proof grading

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Australian Standard™

Timber—Machine proof grading

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PREFACE

This Standard was prepared by the Australian members of Joint Standards Australian/Standards New Zealand Committee TM-003, Timber Grading, to supersede AS 3519—1993. After consultation with stakeholders in both countries, Standards Australia and Standards New Zealand decided to develop this Standard as an Australian Standard rather than an Australian/New Zealand Standard.

The objective of this Standard is to provide timber producers and graders with methods for machine proof grading of sorted sub-populations of timber to enable pieces of timber to be designated a stress grade for structural purposes.

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.

Changes to the previous edition are as follows:

(a) Now in limit states format (i.e., the ψ factor has been replaced with ψ_k).

(b) The application clause has been moved to the Preface.

(c) The requirements for pre-sorting of timber have been moved from the Appendix to Section 2.

(d) References to personnel have been removed, as they are contractual in nature.

The terms ‘normative’ and ‘informative’ have been used in this Standard to define the application of the appendix to which they apply. A ‘normative’ appendix is an integral part of a Standard, whereas an ‘informative’ appendix is only for information and guidance.

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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. It is supported by an initial evaluation of properties (that is, an in-grade evaluation using AS/NZS 4063) and continuous monitoring to check for variation of the properties of the population of timber.

The concept of proof grading is based on the principle that at some stage during the grading process a specified proportion of the timber (this Standard specifies all of the timber) 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 continuously 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.

It is expected that, when testing a population of timber, some proportion of the pieces tested will fail at the proof load. Tables are given for 5% and 1% expected failure rates. The remaining pieces that have not failed are assigned to the stress-grade.

It is intended the proof-grading machine be operated by a person who is properly trained (to the level necessary) in the technique of machine proof grading.

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.

Documentation should be kept of the process, its establishment (e.g., the initial evaluation) and any monitoring and quality control measures undertaken (including test results, calibration and ongoing records of production).

STANDARDS AUSTRALIA

Australian Standard
Timber—Machine proof grading

SECTION 1 SCOPE AND GENERAL

1.1 SCOPE

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

1.2 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS
1604 Specification for preservative treatment
1604.1 Part 1: Sawn and round timber

1613 Timber—Colours for marking F-grades

1720 Timber structures
1720.1 Part 1: Design methods

2082 Timber—Hardwood—Visually stress-graded for structural purposes

2858 Timber—Softwood—Visually graded for structural purposes

AS/NZS

4063 Timber—Stress-graded—In-grade strength and stiffness evaluation

1.3 DEFINITIONS

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

1.3.1 Characteristic proof load factor

Factor applied to the characteristic stress in bending to derive a proof stress.

1.3.2 Characteristic stress in bending

Design property for assessing the bending strength of timber having a designated stress grade.

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

1.3.3 Double-pass grading

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

1.3.4 F-grade

Stress-grade of timber for which the specific suite of design properties given in AS 1720.1 are applicable.

