Australian/New Zealand Standard™

Glued laminated structural timber

Part 1: Performance requirements and minimum production requirements
Keeping Standards up-to-date

Standards are living documents which reflect progress in science, technology and systems. To maintain their currency, all Standards are periodically reviewed, and new editions are published. Between editions, amendments may be issued. Standards may also be withdrawn. It is important that readers assure themselves they are using a current Standard, which should include any amendments which may have been published since the Standard was purchased.

Detailed information about joint Australian/New Zealand Standards can be found by visiting the Standards Web Shop at www.saiglobal.com.au or Standards New Zealand web site at www.standards.co.nz and looking up the relevant Standard in the on-line catalogue.

For more frequent listings or notification of revisions, amendments and withdrawals, Standards Australia and Standards New Zealand offer a number of update options. For information about these services, users should contact their respective national Standards organization.

We also welcome suggestions for improvement in our Standards, and especially encourage readers to notify us immediately of any apparent inaccuracies or ambiguities. Please address your comments to the Chief Executive of either Standards Australia or Standards New Zealand at the address shown on the back cover.
AS/NZS 1328.1:1998
(Incorporating Amendment No. 1)

Australian/New Zealand Standard™

Glued laminated structural timber

Part 1: Performance requirements and minimum production requirements

Originated in Australia as part of AS 1328—1972.
Originated in New Zealand as part of NZS 3606:1979.
Reissued incorporating Amendment No. 1 (March 2011).

COPYRIGHT

© Standards Australia Limited/Standards New Zealand

All rights are reserved. No part of this work may be reproduced or copied in any form or by any means, electronic or mechanical, including photocopying, without the written permission of the publisher, unless otherwise permitted under the Copyright Act 1968 (Australia) or the Copyright Act 1994 (New Zealand).

Jointly published by SAI Global Limited under licence from Standards Australia Limited, GPO Box 476, Sydney, NSW 2001 and by Standards New Zealand, Private Bag 2439, Wellington 6140

ISBN 0 7337 1633 4
PREFACE

This Australian/New Zealand joint Standard was prepared by Joint Technical Committee TM/4 Glued timber products. It is based on performance based BS EN 386:1995 *Glued laminated timber—Performance requirements and minimum production requirements* which has been amended only where necessary to comply with Australian and New Zealand requirements. It supersedes AS 1328—1987 and NZS 3606:1987.

*This Standard incorporates Amendment No. 1 (March 2011). The changes required by the Amendment are indicated in the text by a marginal bar and amendment number against the clause, note, table, figure or part thereof affected.*

Glued laminated timber is obtained by bonding together a number of laminations having their grain essentially parallel. In this way a member with a rectangular solid cross section can be produced.

The requirements cover timber quality, the strength of end-joints and face-joints between laminations, and adhesive type which is related to Service Classes 1, 2 and 3. Service Class 3 requires weather resistant adhesives and may also require preservative treated timber. The requirements for the adhesives are given in AS/NZS 4364.
## CONTENTS

### SECTION 1 SCOPe AND GENERAL

1.1 SCOPE ................................................................. 5
1.2 REFERENCED DOCUMENTS ...................................................... 5
1.3 DEFINITIONS ............................................................. 5
1.4 SYMBOLS AND ABBREVIATIONS .................................................. 7

### SECTION 2 REQUIREMENTS

2.1 GENERAL ............................................................. 8
2.2 TIMBER ........................................................................ 8
2.3 ADHESIVES .............................................................. 8
2.4 COMPLETED GLULAM ...................................................... 8
2.5 END JOINTS .............................................................. 9
2.6 GLUELINE INTEGRITY ...................................................... 10
2.7 FINISHING ............................................................... 12

### SECTION 3 MANUFACTURING PROCEDURES

3.1 INTRODUCTION .......................................................... 14
3.2 PRODUCTION CONDITIONS .................................................. 14
3.2.1 GENERAL .......................................................... 14
3.2.2 PREMISES ........................................................... 14
3.2.3 EQUIPMENT .......................................................... 14
3.3 MATERIALS AND PROCESSES .................................................. 15
3.3.1 GENERAL .......................................................... 15
3.3.2 REQUIREMENTS FOR LAMINATION THICKNESS OF CURVED MEMBERS ........................................................................................................... 15
3.3.3 ADHESIVES .......................................................... 15

### SECTION 4 QUALITY CONTROL

4.1 FACTORY PRODUCTION CONTROL (INTERNAL CONTROL) .............. 16
4.1.1 GENERAL .......................................................... 16
4.1.2 PRODUCTION RECORD .................................................. 16
4.1.3 END JOINTS .......................................................... 17
4.1.4 FACE JOINTS .......................................................... 17
4.2 ORGANIZATION OF FACTORY PRODUCTION CONTROL ................... 17
4.2.1 GENERAL .......................................................... 17
4.2.2 MANAGEMENT REPRESENTATIVE FOR FACTORY PRODUCTION CONTROL .................................................. 17
4.2.3 MANAGEMENT REVIEW ............................................... 18
4.3 DOCUMENTATION OF THE QUALITY CONTROL SYSTEM ............... 18
4.4 INSPECTION AND TESTING ................................................... 19
4.4.1 GENERAL .......................................................... 19
4.4.2 ACTION IN CASE OF NON-CONFORMITY ........................................ 19
4.4.3 CONTROL OF NON-CONFORMING GLULAM ........................................ 19

### SECTION 5 MARKING ........................................................................ 20

### APPENDICES

A ADHESIVES ............................................................. 21
B METHODS OF TEST—CLEAVAGE OF GLUED JOINTS ............................... 22
  B1 SCOPE .............................................................. 22
  B2 PRINCIPLE .......................................................... 22
  B3 APPARATUS .......................................................... 22
  B4 PREPARATION FOR TEST SPECIMENS .............................................. 22
  B5 PROCEDURE .......................................................... 24
  B6 RESULTS .............................................................. 24
C
DELAMINATION TEST OF GLUELINES .............................................................. 25
C1 SCOPE ............................................................................................................... 25
C2 PRINCIPLE ....................................................................................................... 25
C3 APPARATUS ..................................................................................................... 25
C4 PREPARATION OF TEST SPECIMENS .......................................................... 25
C5 PROCEDURE .................................................................................................... 26
C6 RESULTS .......................................................................................................... 27
D
SHEAR TEST OF GLUELINES ............................................................................... 29
D1 SCOPE ............................................................................................................... 29
D2 PRINCIPLE ....................................................................................................... 29
D3 APPARATUS ..................................................................................................... 29
D4 PREPARATION OF TEST SPECIMENS .......................................................... 30
D5 PROCEDURE .................................................................................................... 33
D6 RESULTS .......................................................................................................... 34
E
THIRD PARTY CERTIFICATION .......................................................................... 35
E1 SCOPE ............................................................................................................... 35
E2 PROCEDURE .................................................................................................... 35

TABLES
2.1 QUALIFICATION AND ROUTINE TEST PROCEDURES..................................... 11
2.2 MAXIMUM VALUES FOR THE TOTAL DELAMINATION PERCENTAGES ............. 11
2.3 RELATIONSHIP BETWEEN WOOD FAILURE PERCENTAGES, WFP AND BLOCK SHEAR STRENGTH $f_s$ ............................................................... 12
2.4 TOLERANCE AND OVERLAP LIMITS FOR APPEARANCE GRADE C GLULAM........................................................................................................ 13
A1 TYPE OF ADHESIVE FOR GIVEN SERVICE CONDITIONS ................................ 21
C1 CLIMATE IN THE DRYING DUCT FOR THE DIFFERENT METHODS ...................... 25
C2 NUMBER OF TEST CYCLES TO BE USED IN THE DIFFERENT TEST METHODS ...... 26
D1 NUMBER OF TEST BARS ....................................................................................... 31

FIGURES
1.1 GLUELINES IN CROSS SECTIONS SHOWING THE NORMAL POSITION OF THE GLUELINES ........................................................................................................ 6
2.1 OVERLAP OF LAMINATIONS ............................................................................... 13
B1 SPECIMEN ORIENTATION .................................................................................... 22
B2 CUTTING GLUELINE ............................................................................................. 23
B3 CLEAVAGE OF TEST SPECIMEN ......................................................................... 24
C1 TEST SPECIMEN CUT FROM A GLULAM MEMBER ......................................... 26
D1 SHEARING TOOL WITH A TEST BAR INSERTED .............................................. 29
D2 THE NORMAL TEST SPECIMEN, A TEST BAR, AND THE NUMBERING OF THE INDIVIDUAL GLUELINES FOR A TEST BAR CUT AT THE BOTTOM OF THE CROSS SECTION ................................................... 30
D3 A DRILL CORE WITH MACHINED PARALLEL PLANE SURFACES ..................... 30
D4 TEST BARS TO BE CUT FROM A FULL CROSS-SECTIONAL SPECIMEN ................ 32
D5 SUGGESTED IDENTIFICATION SHOWING THE LOCATION OF THE TEST BARS IN THE CROSS SECTION IN A MEMBER GLUED HORIZONTALLY .......................................................... 32
D6 ADDITIONAL IDENTIFICATION WITH NUMBERS SHOWING THE LOCATION OF THE GLULAM MEMBER DURING THE CRAMPING ......................................................... 33
SECTION 1   SCOPE AND GENERAL

1.1   SCOPE
This Standard specifies performance requirements for glued laminated timber members for structural use, and the minimum requirements for the production of such members.

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

AS
2082    Timber—Hardwood—Visually stress-graded for structural purposes
2796    Timber—Hardwood—Sawn and milled products (All Parts)
2858    Timber—Softwood—Visually graded for structural purposes

AS/NZS
1328    Glued laminated structural timber
1328.2  Guidelines for AS/NZS 1328: Part 1 for the selection, design, production and installation of glued laminated structural timber
1748    Timber—Mechanically stress-graded for structural purposes
4063    Characterization of structural timber (all Parts)
4364    Timber—Bond performance of structural adhesives
5068    Timber—Finger joints in structural products—Production requirements

NZS
3631    New Zealand timber grading rules

1.3   DEFINITIONS
For the purposes of this Standard, the definitions below apply:

1.3.1   Adhesive type
adhesive types I and II as defined in AS/NZS 4364.

1.3.2   Appearance grades
defines the surface characteristics of the finished beams.

1.3.3   Delaminated length
the sum of lengths of open gluelines on both end-grain surfaces of each test specimen.

1.3.4   Drill core
specimen of cylindrical shape drilled out of the glulam.