Interim Industry Standard
Recycled Timber – Visually Graded Recycled Decorative Products
This Interim Industry Standard was prepared under a project supported by Forest and Wood Products Australia and the Department of Tourism, Regional Development and Infrastructure - Queensland, with input and development from stakeholders, including industry associations, representatives of the recycled timber industry, government, researchers and specifiers.

The objective of this Interim Standard is to provide recycled timber manufacturers, suppliers and users with requirements for visually grading recycled hardwood timber intended for use in decorative applications. The Standard is an Interim Standard, as this is the first time national visual grading rules have been developed for recycled timber in Australia. It is intended that after a period of application and use, the Interim Standard will be reviewed and amended and then will be submitted to Standards Australia for consideration for development as a formal Australian Standard.

Specifiers and purchasers of recycled timber should be aware of the following key points and considerations prior to specifying or ordering recycled timber:

a) Recycled timber is sourced from a disparate range of buildings, structures and products from a wide geographical area and from a wide range of environmental exposures. The resulting products obtainable from recycled timber will therefore reflect previous use, and availability of individual species/species mixes, grades and products may change with time.

b) Detailed discussions between purchasers and suppliers prior to specifying or ordering recycled timber is the key to a successful commercial transaction.

c) Where practical, prior inspection should be undertaken of a realistic representative sample of recycled timber product and that the grade/quality is agreed upon in writing between purchaser and supplier. The use of actual samples, electronic images etc, where available, may assist in facilitating satisfactory placement and delivery of the order.

d) It should be noted that the grades available under this standard do not include ‘Clear’ or ‘Select’ grade etc. All the grades in this standard are specific to recycled timber and include recycled timber features.

In respect of the application of this Standard, statements expressed in mandatory terms in notes to tables or diagrams are deemed to be requirements of this Standard.

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 this Standard, whereas an ‘informative’ appendix is only for information and guidance.
I N T E R I M   I N D U S T R Y   S T A N D A R D

r e cYcLeD tI Mb e r  –  V I SuA L y GrA DeD r e cYcLeD De c o rAtI Ve  Pr oDu c tS

A fourth grade description is provided in this Standard for lightly-loaded larger cross section non structural members.

This Standard also recognises that recycled hardwood will contain many features covered by the grade descriptions in AS 2796.2, however recycled timber also contains many valued features that are either not covered or would be excluded by the grade descriptions in AS 2796.2. The grade descriptions given in this Standard are to be used independently of AS 2796.2 but this does not preclude the specification and grading of recycled timber to AS 2796.2, where agreed to between purchaser and supplier.

1.3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS

1604 Timber – Preservative-treated – Sawn and round
1684 Residential timber framed construction
2796.1 Timber – Hardwood – Sawn and milled products. Part 1: Product specification
2796.1 Timber – Hardwood – Sawn and milled products. Part 2: Grade descriptions

AS/NZS

1080.1 Timber – Methods of Test – Method 1: Moisture content
1080.2 Timber – Methods of Test – Method 2: Slope of grain (Parts 1 to 3)
4491 Timber – Glossary of terms in timber related Standards

INDUSTRY STANDARDS

FWPA PN06.1039 – Recycled Timber – Visually Stress Graded Recycled Timber for Structural Purposes
1.4 DEFINITIONS

For the purpose of this Standard, the definitions given in AS/NZS 4491 and those in Appendix A apply. Where the definitions in Appendix A differ from those in AS/NZS 4491, for the purposes of this Standard those in Appendix A apply.

1.5 GRADES

1.5.1 Grades

The grades specified in this Standard are primarily based on features and the desired aesthetic appearance of recycled timber. The grades applying to recycled sawn and milled timber referred to as the ‘recycled feature grades’ are as follows (appropriate abbreviations in brackets):

(a) RECYCLED FEATURE GRADE 1 – (RFG1)
(b) RECYCLED FEATURE GRADE 2 – (RFG2)
(c) RECYCLED FEATURE GRADE 3 – (RFG3)

In addition to the above, one grade description is provided for larger end section, lightly-loaded, non structural members.

(d) RECYCLED DECORATIVE (RDG)

Recycled structural timber shall be graded in accordance with FWPA PN06.1039 – Recycled Timber – Visually Stress Graded Recycled Timber for Structural Purposes

NOTE:
For products manufactured from timber that has been sawn from larger members other grades may be specified by agreement between the purchaser and supplier as provided for in AS 2796.1.

This Standard does not preclude the use of grades other than those described herein, provided that it can be shown that these other grades satisfy the performance requirements for that product. Any such other grade shall be adequately documented and the product identified in accordance with Clause 1.6 (see also Clause 1.7).

Other grades may be specified by agreement between the purchaser and supplier, however adequate strength shall be maintained for flooring and light decking.

1.5.2 Ordering

The order shall nominate as applicable the grade, species or species mix and surface finish (refer clause 2.5).

1.6 IDENTIFICATION

Where a parcel or member is graded as complying with this standard, the following details shall be clearly stated on the invoice:

(a) The name of this standard
(b) The grade
(c) The species, or that mixed species have been supplied, if applicable
(d) The durability class if applicable
(e) If graded as seasoned, the word ‘SEASONED’ or the abbreviation ‘S’
(f) If preservative treated, additional branding in accordance with AS 1604.

Alternatively, if the timber is branded, labeled, stamped or marked to indicate that it complies with this Standard, the information in (a) to (f) shall be legibly marked on each piece.
1.7 CLAIM OF COMPLIANCE

In any statement or claim of compliance with this Standard, one of the following shall apply:

(a) Reference to one of the grades described in this Standard is a claim of compliance with the general requirements, product requirements and grading requirements set out in this Standard for that specific grade and that the product is of recycled timber.

(b) Reference to this standard and a grade other than those described in this Standard is a claim of compliance with the general requirements and product requirements set out in this Standard and the requirements of the other grade and that the product is of recycled timber. It is also a claim that product performance (e.g. structural adequacy for flooring) is appropriate for the intended use.

NOTE:
Manufacturers making a statement of compliance with this Standard on a product, packaging, or promotional material related to that product are advised to ensure that such compliance is capable of being verified.
## Section 2

### General requirements

#### 2.1 Timber Species

Decorative recycled hardwood products shall be supplied in parcels or as individual members complying with one of the following, as applicable:

(a) Mixed hardwoods where the species are similar in properties or appearance (colour), or in both.

(b) Mixed hardwoods where the species are deliberately selected with dissimilar appearance.

(c) Single species.

**NOTE:**

Products from recycled hardwood timber of individual species may not be readily available. Also, individual species identification may require specialist services.

#### 2.2 Sapwood and Low Durability Heartwood

Some products covered by this Standard could be used in exposed situations or other areas of significant decay risk. Untreated sapwood and low durability heartwood are not restricted by the grading rules in this Standard except for limits on Lyctid susceptible sapwood.

However, building codes and AS 1684 restrict the use of low durability timber including untreated sapwood where such timber is not suitably protected from the ingress of moisture.

**NOTES:**

1. Where products are used in weather-exposed or other hazardous situations, the presence of untreated sapwood and untreated heartwood of low durability requires ongoing maintenance to ensure an adequate service life.

2. The untreated sapwood of any species is considered non-durable when exposed to the weather or the ingress of moisture, regardless of the durability rating of the heartwood of that species.

3. To achieve maximum service life, any untreated sapwood must be protected from weather exposure and the ingress of moisture.

#### 2.3 Sapwood Susceptible to Lyctid Borer

Sapwood susceptible to Lyctid borers shall be immunised against such attack in accordance with AS 1604.

**NOTES:**

1. The method for the detection of Lyctid susceptible sapwood is given in AS 1604.

2. Guidelines for the immunization of susceptible sapwood are given in AS 1604 and further information is available from state forestry departments and the CSIRO.

#### 2.4 Preservative Treatment

Where timber is preservative treated, treatment shall be in accordance with AS 1604.

If products are preservative-treated with a waterborne preservative, the moisture content of the products will increase. Products so treated shall be re-seasoned to comply with the seasoning requirements for those products.

**NOTE:**

Generally, only the sapwood of hardwoods can be impregnated with preservative.

#### 2.5 Surface Finish and Finish Imperfections

**2.5.1 Surface Finish**

When graded recycled timber is specified to this Standard, the surface finish may be:

(a) as in its recovered state or,

(b) a remanufactured surface (e.g. ground, wire brushed, sawn or machined etc)

**2.5.2 Machining and surface imperfections**

When products covered by this Standard are manufactured from timber that has been sawn or milled from larger recycled members, the following machining and surface imperfection limitations apply.
Machining imperfections and surface imperfections on exposed surfaces shall not exceed the limits specified in Table 2.1, or as otherwise specified. Machining imperfections and surface finish imperfections on concealed surfaces, which do not prevent the proper fixing of the product or unduly impair its strength, are permitted.

**Table 2.1 Machining and surface finish imperfections**

<table>
<thead>
<tr>
<th>Imperfection</th>
<th>Internal Products</th>
<th>External Products</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Sanded after installation</td>
<td>Not sanded after installation</td>
</tr>
<tr>
<td>Skip, hit and miss</td>
<td>Permitted once per board and not deeper than 0.5 mm</td>
<td>Not permitted</td>
</tr>
<tr>
<td>Cutter marks</td>
<td>Must exceed 10 in number per 30 mm</td>
<td>Must exceed 15 in number per 30 mm</td>
</tr>
<tr>
<td>Raised grain, ridges, torn grain</td>
<td>Permitted when not deeper than 0.5 mm</td>
<td>Permitted when not higher or deeper than 0.5 mm</td>
</tr>
<tr>
<td>Chip marks or roller marks</td>
<td>Permitted up to two-thirds the length</td>
<td>Permitted up to one-third the length</td>
</tr>
<tr>
<td>Pause marks or glazed surfaces</td>
<td>Permitted provided that each occurs not more than once per piece</td>
<td></td>
</tr>
<tr>
<td>Knot chipping</td>
<td>Permitted up to 3 mm in width</td>
<td></td>
</tr>
<tr>
<td>Torn corners and edges, gouge, kick out</td>
<td>Not permitted</td>
<td></td>
</tr>
</tbody>
</table>

2.6 **END-MATCHED PRODUCT**

Tongues and grooves at the ends of end-matched products shall be milled across the ends of the board cleanly, at right angles to the longitudinal axis of the board with the tongue and groove dimensions and tolerances appropriate to the product.

**NOTE:**

The end matching need not be of the same profile as the tongue and groove on the edge of the board (e.g. in secret nail profiles) and may be manufactured either left hand or right hand.

2.7 **PLUGGING AND PATCHING**

Plugging and patching of products shall be permitted by agreement between purchaser and supplier. Where used, plugs and patches shall be of materials such as glued plugs, epoxy resins or similar suited to their intended applications.
3.1 GENERAL

When grading products (other than lightly-loaded non structural members) to this Standard and

(a) the product is manufactured from timber that has been sawn from larger members then the product requirements set out in Sections 3 to 10 of AS 2796.1 shall apply, or where

(b) the product has been recovered from previous use and will be re-used without further sawing or machining, then the requirements of sections 3 to 10 of AS 2796.1 do not apply, except for the applicable clauses for moisture content, or if there is specific agreement between purchaser and supplier to apply these requirements.

When grading lightly-loaded non structural members the product requirements of AS 2796.1 do not apply and aspects relating to product requirements (e.g. moisture content and tolerances etc) are as set out in Clause 3.2.

NOTE:
Product specification aspects generally have a significant affect on product performance. For example high moisture content material often results in high in-service shrinkage, distortion and increased checking.

3.2 LIGHTLY-LOADED NON STRUCTURAL MEMBERS

3.2.1 General

Recycled lightly loaded non structural members must meet the minimum dimensional requirements specified in the order in terms of length, depth and width, except where permitted characteristics, want, wane or hit and miss occurs, measured at any point in the length of a piece.

3.2.2 Bow, Spring

Bow and spring shall be evenly distributed and shall not exceed 25 mm per 3.6 m length of the piece or equivalent curvature in other lengths.

3.2.3 Moisture Content

The moisture content in these larger cross section members may be variable due to past history and whether any re-sawing has taken place. This Standard does not impose any specific moisture content requirements on these members. From a utility perspective moisture content needs to be considered as in-service stability may be affected and more pronounced checking may occur depending on the member supplied.

3.3 RESIDUAL FIXINGS

Unless otherwise agreed between the purchaser and supplier, recycled timber shall be supplied relatively free of nails, screws, bolts, brackets or similar fixings.

NOTE:
It may not be practical or possible to detect and remove 100% of all fixings that can occur in recycled timber and indeed some purchasers may deem retention of some residual fixings as a desirable feature.
Grading requirements

SECTION 4

4.1 GRADING METHOD

4.1.1 General
Each piece shall be graded on the face, back, edges and ends, as appropriate, in accordance with this Section, and the appropriate grade description given in Section 5.

4.1.2 Basis
Grading is based on visual assessment of individual pieces. The amount (size) of a feature or group of features (within a piece) is compared to the maximum amount of that feature permitted for the grade.

The maximum amount of features permitted is set out in a grade description. All features in the piece shall comply with the limits given in the grade description. Grade descriptions are primarily based on features and desired aesthetic appearance. They are also based on utility considerations.

4.1.3 Grade limits
The grade descriptions describe material containing the maximum amount of permitted feature for the particular grade. Each parcel shall contain a range of material such that not all of the material contains the maximum amount of permitted feature for the grade.

4.1.4 Variation in assessment
Within any parcel, grading differences may occur if the parcel is re-graded by another grader or inspector. If the differences relate to less than 5% of the pieces and grade limits in these disputed pieces are not considered to exceed grade limits by more than 10%, then this is considered to be an acceptable variation.

4.1.5 Grading and profile check
A check of the grading of the timber may be required some time after the grading undertaken by the producer or supplier.

Where the purpose of the check is to estimate the accuracy of the previous grading or machining, reasonable allowance shall be made for changes that may have occurred since that time. These changes may include but are not limited to:

(a) change in dimensions and tolerances due to moisture uptake or loss (swelling or shrinkage);
(b) increase in distortion (bow, spring, twist and cup);
(c) increase in, or development of features due to subsequent processes (e.g., sanding);
(d) in unseasoned products or where significant moisture gradients exist, an increase in, or development of, seasoning checks, splits, end splits and shakes;

NOTES:
1 Critical changes may arise due to moisture content change. For example, the formation of large checks affecting the structural adequacy of the piece or excessive twist affecting the utility of the piece. Such changes in a piece may be cause for rejection of the piece with respect to its final application.
2 Where timber products are sanded after installation, reasonable allowance should be made for features on the exposed surface that become larger or appear as a result of the removal of the original surface.

4.2 MEASUREMENT OF FEATURES
The measurement of features shall be as given in Appendix B.
4.3 COMBINATION OF FEATURES

Combination of features shall be limited in products where adequate strength is a consideration (e.g. flooring on joists or battens but not overlay flooring installed over a structural sub-floor). In such cases, a combination of features shall be permitted if the combination is less than that of one feature of the maximum permissible size.

A combination exists when two or more features occur in a length of the piece such that there is less than twice the width of the piece between them (see Figure 4.1). Features in combination are not necessarily on the same surface.

The distance between the features shall be measured parallel to the length of the piece, between lines drawn at 90° to the arrises (see Figure 4.2).

If bow, spring, twist, or cup is present in the piece, each shall be measured separately and deemed not to be in combination with each other or with any other feature.

**Figure 4.1** Measurement of distances between features.

**Figure 4.2** Examples of combinations.

**NOTES:**

1. c and b are in combination; a and b are in combination and a and c are not in combination

2. Given that knot ‘a’ is 90% of its allowance, bolt hole ‘b’ is 15% of its allowance and knot ‘c’ is 85% of its allowance, the combination of ‘b’ and ‘c’ complies but the combination ‘a’ and ‘b’ do not.
5.1 RECYCLED FEATURE GRADES

5.1.1 General
Products supplied to the ‘feature grades’ of this Standard shall comply with the general requirements of Section 2, product requirements specified in Section 3 and grading requirements of Section 4 of this Standard.

5.1.2 Features not permitted
On any surface, each piece of hardwood in the ‘recycled feature grades’ outlined in clause 1.5.1 shall be free of the following features:

(a) Enclosed termite galleries.
(b) Heart shakes.
(c) Shakes.
(d) Cross-fractures, cross-shakes.
(e) Splits.
(f) End splits.
(g) Decay, primary rot.
(h) Lyctid susceptible sapwood.

Except, for overlay flooring that is not required to provide a structural function, splits and end splits are permitted.

5.1.3 Permissible features
The permissible features and associated limits in each piece of hardwood in the ‘feature grades’ outlined in clause 1.5.1 are provided in Table 5.1
### Table 5.1 Grade limits for Recycled Feature Grades

<table>
<thead>
<tr>
<th>Feature</th>
<th>RECYCLED FEATURE GRADE 1 (RFG1)</th>
<th>RECYCLED FEATURE GRADE 2 (RFG2)</th>
<th>RECYCLED FEATURE GRADE 3 (RFG3)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>ON EXPOSED SURFACES</strong></td>
<td><strong>Tight Knots and any associated voids; individually or in aggregate</strong>&lt;br&gt;Not exceeding the lesser of 30 mm and 1/4 of the surface on which it occurs</td>
<td>Not exceeding the lesser of 40 mm and 1/3 of the surface on which it occurs</td>
<td>Not exceeding the lesser of 50 mm and 3/8 of the surface on which it occurs</td>
</tr>
<tr>
<td></td>
<td>Loose Knots&lt;br&gt;Not permitted unless secured with glue</td>
<td>As for holes</td>
<td>As for holes</td>
</tr>
<tr>
<td></td>
<td>Holes (borer, nail, screw, bolt holes, non-enclosed termite galleries and other holes)&lt;br&gt;* up to 4 mm dia&lt;br&gt;• Not more than 6 holes per 1.0 m length</td>
<td>Not more than 10 holes per 1.0 m length</td>
<td>Not more than 20 holes per 1.0 m length</td>
</tr>
<tr>
<td></td>
<td>* over 4 mm to 10 mm&lt;br&gt;• Not more than 2 holes per 1.0 m length and in flooring and light decking to be plugged</td>
<td>Not more than 4 holes per 1.0 m length and in flooring and light decking to be plugged</td>
<td>Not more than 6 holes per 1.0 m length and in flooring and light decking to be plugged</td>
</tr>
<tr>
<td></td>
<td>* over 10 mm to 25 mm&lt;br&gt;• Not more than 1 hole per 1.0 m length and in flooring and light decking to be plugged</td>
<td>Not more than 2 holes per 1.0 m length and in flooring and light decking to be plugged</td>
<td>Not more than 3 holes per 1.0 m length and in flooring and light decking to be plugged</td>
</tr>
<tr>
<td></td>
<td><strong>Slope of grain</strong>&lt;br&gt;Quartersawn: surface width measured across feature, not exceeding 3mm and aggregate length not more than 1/6 length of the piece</td>
<td>Quartersawn: surface width measured across feature, not exceeding 5mm</td>
<td>Quartersawn: surface width measured across feature, not exceeding 5mm</td>
</tr>
<tr>
<td></td>
<td>Backsawn: Surface width across the feature not exceeding 20 mm, depth not exceeding 2 mm and length not exceeding 250 mm</td>
<td>Backsawn: Surface width across the feature not exceeding 60 mm, depth not exceeding 2 mm and length not exceeding 1.0 m</td>
<td>Backsawn: Unlimited across the feature, depth not exceeding 2 mm</td>
</tr>
<tr>
<td></td>
<td><strong>Loose gum veins</strong>&lt;br&gt;Not one surface to another&lt;br&gt;Not intersecting an end&lt;br&gt;Surface width measured across the feature not exceeding 3 mm&lt;br&gt;Length not exceeding 250 mm.</td>
<td>Not one surface to another&lt;br&gt;Not intersecting an end&lt;br&gt;Surface width measured across the feature not exceeding 4 mm&lt;br&gt;Length not exceeding 500 mm.</td>
<td>Not one surface to another&lt;br&gt;Not intersecting an end&lt;br&gt;Surface width measured across the feature not exceeding 5 mm&lt;br&gt;Length not exceeding 1.0 m</td>
</tr>
<tr>
<td></td>
<td><strong>Gum pockets, latex pockets and overgrowth of injury</strong>&lt;br&gt;Surface width measured across the feature not exceeding 10 mm, length not exceeding 50 mm and depth not exceeding 2 mm when backsawn and not one surface to another when quartersawn</td>
<td>Surface width measured across the feature not exceeding 15 mm, length not exceeding 75 mm and depth not exceeding 2 mm when backsawn and not one surface to another when quartersawn</td>
<td>Surface width measured across the feature not exceeding 20 mm, length not exceeding 100 mm and depth not exceeding 2 mm when backsawn and not one surface to another when quartersawn</td>
</tr>
<tr>
<td></td>
<td><strong>Knot checks</strong>&lt;br&gt;Permitted</td>
<td>Permitted</td>
<td>Permitted</td>
</tr>
<tr>
<td></td>
<td><strong>Checks other than internal</strong>&lt;br&gt;Width not exceeding 1 mm Individual length not exceeding 500 mm</td>
<td>Width not exceeding 2 mm Individual length not exceeding 1.0 m</td>
<td>Width not exceeding 3 mm Individual length not exceeding 1.0 m</td>
</tr>
<tr>
<td></td>
<td><strong>Stain</strong>&lt;br&gt;Natural discolouration&lt;br&gt;Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td></td>
<td><strong>Other discoulouration including sticker marks</strong>&lt;br&gt;Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td></td>
<td><strong>Black speck</strong>&lt;br&gt;Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td></td>
<td><strong>Non-lyctid susceptible sapwood (which includes appropriately treated sapwood)</strong>&lt;br&gt;Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td></td>
<td><strong>Burls</strong>&lt;br&gt;Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td></td>
<td><strong>Hobnails</strong>&lt;br&gt;Unlimited</td>
<td>Unlimited</td>
<td>Unlimited</td>
</tr>
<tr>
<td></td>
<td><strong>Bow, Spring and Twist and Cup</strong>&lt;br&gt;Refer Tables</td>
<td>Refer Tables</td>
<td>Refer Tables</td>
</tr>
<tr>
<td></td>
<td><strong>Want, wane and mechanical damage</strong>&lt;br&gt;Not permitted unless associated with past use and does not prevent the proper fixing of the product or unduly impair its strength</td>
<td>Not permitted unless associated with past use and does not prevent the proper fixing of the product or unduly impair its strength</td>
<td>Not permitted unless associated with past use and does not prevent the proper fixing of the product or unduly impair its strength</td>
</tr>
</tbody>
</table>

| **ON CONCEALED SURFACES** | **Features listed above**<br>To the limits on the exposed surface of recycled feature grade 3 | To the limits on the exposed surface of recycled feature grade 3 | To the limits on the exposed surface of recycled feature grade 3 |
### 5.1.4 Bow

#### Table 5.1.4 Maximum permissible bow

<table>
<thead>
<tr>
<th>Product</th>
<th>Length</th>
<th>15 mm</th>
<th>19 mm</th>
<th>25 mm</th>
<th>35 mm</th>
<th>45 mm</th>
</tr>
</thead>
<tbody>
<tr>
<td>Joinery, dressed boards</td>
<td>1.2</td>
<td>2</td>
<td>2</td>
<td>1</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>1.8</td>
<td>5</td>
<td>4</td>
<td>2</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>2.4</td>
<td>10</td>
<td>7</td>
<td>3</td>
<td>2</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>3.0</td>
<td>15</td>
<td>10</td>
<td>5</td>
<td>2</td>
<td>2</td>
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<tr>
<td></td>
<td>3.6</td>
<td>22</td>
<td>14</td>
<td>7</td>
<td>4</td>
<td>3</td>
</tr>
<tr>
<td></td>
<td>4.2</td>
<td>30</td>
<td>20</td>
<td>10</td>
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<td>4</td>
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<td>4.8</td>
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<td>25</td>
<td>13</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>5.4</td>
<td>50</td>
<td>30</td>
<td>16</td>
<td>11</td>
<td>8</td>
</tr>
<tr>
<td>Strip flooring, light decking, lining boards, mouldings, bargeboards, sawn boards for feedstock, overlay</td>
<td>1.2</td>
<td>6</td>
<td>5</td>
<td>4</td>
<td>3</td>
<td>2</td>
</tr>
<tr>
<td></td>
<td>1.8</td>
<td>13</td>
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<td></td>
<td>3.6</td>
<td>50</td>
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<td></td>
<td>4.2</td>
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<tr>
<td></td>
<td>4.8</td>
<td>90</td>
<td>75</td>
<td>50</td>
<td>50</td>
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### 5.1.5 Spring

Table 5.1.5 Maximum Permissible Spring

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<th>140 mm</th>
<th>150 mm</th>
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<td>4</td>
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<tr>
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<td>5.4</td>
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<td>80</td>
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</tr>
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</table>
5.1.6 Twist and Cup

Table 5.1.6 Maximum Permissible Twist and Cup

<table>
<thead>
<tr>
<th>Length (m)</th>
<th>Twist per 25 mm of width (mm)</th>
<th>Cup, per 100 mm of width</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Up to 25 mm of thickness</td>
<td>Over 25 mm of thickness</td>
</tr>
<tr>
<td>1.2</td>
<td>1</td>
<td>0.5</td>
</tr>
<tr>
<td>2.4</td>
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</tr>
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</table>

5.2 RECYCLED DECORATIVE GRADE

5.2.1 General

Products supplied to Recycled Decorative Grade of this Standard shall comply with the general requirements of Section 2, product requirements specified in Section 3 and grading requirements of Section 4 of this Standard. This grade only applies to larger end-section members such as beams and posts that are lightly-loaded and not required to have any significant structural load carrying capacity.

5.2.2 Features not permitted

On any surface, each piece of hardwood in Recycled Decorative Grade as outlined in Clause 1.5.1 shall be free of the following features:

(a) Cross-fractures, cross-shakes.

(b) Lyctid susceptible sapwood.

5.2.3 Permissible features

The permissible features and associated limits in each piece of hardwood in the Recycled Decorative Grade outlined in Clause 1.5.1 are provided in Table 5.2.

The limits provided in Table 5.2 are intended as maximums to ensure satisfactory structural performance for these lightly loaded members. For product intended for use in external weather exposed applications, durability based aspects including limiting ‘open’ characteristics such as checks, shakes and holes on surfaces where moisture could accumulate or be trapped should also be considered and further limited as appropriate. Requirements for connections and joints may also impose the need for additional restrictions.

The grade limits given in Table 5.2 do not preclude the use of grades other than those described provided that it can be shown that these other grades satisfy the performance requirements for that product. Any such other grade shall be agreed between purchaser and supplier and be adequately documented and the product identified in accordance with Clause 1.6.
### Table 5.2 Grade limits for Recycled Decorative Grade (RDG)

<table>
<thead>
<tr>
<th>Feature</th>
<th>RECYCLED DECORATIVE GRADE (RD)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Knots (Tight, loose, sound or unsound)</td>
<td>Permitted up to ¼ of the width of the surface on which they occur</td>
</tr>
<tr>
<td>Holes and notches</td>
<td>Permitted up to ¼ of the width of the surface on which they occur</td>
</tr>
<tr>
<td>Longitudinal checks, shakes, heart shakes and splits</td>
<td>Up to 15 mm width, permitted provided they do not extend from one surface to another and not greater than L/2</td>
</tr>
<tr>
<td>End splits</td>
<td>Permitted up to 15 mm in width and up to 250 mm in length</td>
</tr>
<tr>
<td>Tight gum veins</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Loose gum veins and pockets</td>
<td>Up to 15 mm width, permitted provided they do not extend from one surface to another and exceeding one-half of the length of the piece</td>
</tr>
<tr>
<td>Stain and discoloration</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Slope of grain</td>
<td>Not exceeding 1 in 6</td>
</tr>
<tr>
<td>Want, wane and mechanical damage</td>
<td>Permitted up to ¼ of the surface on which it occurs and not more than one-half of the length of the piece</td>
</tr>
<tr>
<td>Sound heart</td>
<td>Unlimited</td>
</tr>
<tr>
<td>Unsound heart, pipe etc</td>
<td>Not exceeding 1/9 of the cross-sectional area</td>
</tr>
<tr>
<td>Bow and Spring</td>
<td>Shall not exceed 25 mm per 3.6 m length of the piece or equivalent curvature in other lengths</td>
</tr>
</tbody>
</table>
**Arris**
The sharp intersection of two surfaces, e.g., the face and edge of a piece of timber (see Figure A1).

**Backsawn**
Timber that has been sawn or cut so that the average inclination of the growth rings to the wide faces is less than 45 degrees.

**Bargeboard**
Sawn or dressed boards that form a decorative capping at each end of a gable roof. Depending on the roof design and construction requirements, they can be fixed to either the side of the flying rafters, the top chord of a truss, or directly to the ends of the roof outriggers. They are fixed at an angle corresponding to the slope of the roof and, at their lower ends, are usually fixed to the end of the fascia.

**Figure A1** Timber surfaces and Arris.

**Board width**
For the purpose of grading, the overall finished width of the piece, including any tongue

**Bow**
A deviation in the longitudinal direction of the piece causing the face to curve away from its intended flat plane (see Figure B2.1).

**Check**
Separation of fibres radially across growth rings and along the grain forming a fissure but not extending from one surface to another. Types include the following (see Figure B3.4):

(a) **End check** – A check occurring at the end of a piece.

(b) **Heart check** – A check extending from the pith outwards in any direction but not reaching the surface of the piece.

(c) **Surface check** – A check confined mainly to the surface of the piece but of no appreciable depth, that is, depth not exceeding 10 percent of the thickness of the piece.

**Cladding**
Dressed or sawn boards that form part of the external wall covering whose function includes keeping weather out of a structure.

**Concealed surface**
That part of a surface intended to be concealed from view when the product is fixed into position or is assembled.

**Cover width**
The actual width that will become the exposed surface when a product is fixed into position

**Exposed surface**
That part of a surface intended to be exposed to view when the product is fixed into position or is assembled.
**Fascia**
Sawn or dressed boards that form part of the decorative perimeter of the roof. They serve a dual purpose, being decorative, in that they can hide as well as support internal spouting (box guttering), and functional, in that they can be used to support external spouting while still being decorative. They are fixed horizontally to the ends of the rafters or trusses and serve to both hide the ends of the rafters or trusses and to support the outside edge of the under-eaves.

**Fracture, cross**
A fracture not in the direction of the fibres and resembling a breakage of the fibre.

**Gum pocket**
A cavity that contains or has contained gum or kino (see Figure B3.3).

**Gum vein**
A ribbon of gum or kino between growth rings that may be bridged radially at short intervals by wood tissue (see Figure B3.3).

**Gum vein, loose**
A gum vein associated with extensive discontinuity of wood tissue.

**Gum vein, tight**
A gum vein that is bridged radially at close intervals with woody tissue and not associated with extensive discontinuity of wood tissue.

**Heart**
The portion of a log that is near the growth centre (pith or log centre) and which is of reduced strength.

**Heartwood**
Wood which in the living tree had ceased to contain living cells and in which the reserve materials, e.g. starch, had been removed or changed into more durable substance.

**Hole**
A hole extending partially or entirely through the piece and attributable to any cause as follows:

(a) **Borer hole** – A small hole in timber caused by the larval or adult stage of a wood boring insect, e.g., Lyctid, Anobiid, Bostrychid, Platypodid or Lymexylid.

(b) **Grub hole** – A hole or excavation usually larger than a borer hole made by the larval or adult stage of an insect, e.g., Cerambycid, Buprestid or Lepidoptera.

(c) **Pinhole** – Usually stained, made by a pinhole borer, i.e. Platypodid or Lymexylid.

(d) **Plugged hole** – A hole filled by inserting a piece of wood, or other appropriate filler (e.g. epoxy resin).

(e) **Termite hole** – See termite gallery.

(f) **Nail hole** – Remaining from past fixing and may have associated discolouration

(g) **Bolt hole** – Remaining from past fixing and may have associated discolouration
Knot
A section of a branch that is embedded in the wood of a tree trunk or of a larger branch (see Figure B3.1). Knots are defined with respect to their position on a cross-section of a piece or by their appearance on a surface:

(a) **Defective knot** – A loose or unsound knot.

(b) **Loose knot** – A knot that is not held firmly in place by growth and which cannot be relied upon to remain in place in the piece.

(c) **Sound knot** – A knot solid across its face, as hard as the surrounding tissue and free from decay.

(d) **Unsound knot** – A knot more or less decayed and softer than the surrounding tissue; not solid across the face; checked or split.

Light decking
Dressed, sawn or reeded boards, produced with or without chamfered or rounded arrises, primarily intended for domestic deck purposes; not to be confused with bridge and wharf decking.

Lining
Dressed or sawn boards that are intended to form part of the interior wall or ceiling covering of a structure.

Lyctid
The commonly used term in the timber and building industries for the lyctine beetles.

Moulding
A piece of timber machined to a specified profile for use in finishing or decorating.

Overlap
The difference between board width and cover width of weatherboards, chamferboards and some lining board profiles.

Overlay strip flooring
A milled product intended to be installed over a solid supporting substrate to give the appearance of strip flooring.

Quartersawn
Timber that has been sawn or cut so that the average inclination of the growth rings to the wide faces is more than 45 degrees.

Sapwood
The outer layers of the wood of a tree, which, when the tree was living, contained tissue in which water and food materials were conveyed and stored; generally lighter in colour than the heartwood (see Figure A1).

Shake
A partial or complete dislocation, breakage or longitudinal separation of wood fibres due to causes other than drying and usually originating either in the standing tree or in the log during felling or conversion as in the following:

(a) **Heart shake** – A shake extending from the pith of a tree (see Appendix 3.5).

(b) **Ring shake** – A shake following a growth ring. Also referred to as a shell shake or cup shake and the timber may be described as shelly (see Appendix 3.5).

(c) **Star shake** – A number of adjoining heart shakes in the form of a star.

Shell-off
Missing material resulting from a ring shake.

Split
A longitudinal separation of wood fibres, which extends through a piece from one surface to another in sawn timber or through round timber.

Split, end
A split at the end of a log or piece.
Spring
A deviation in the longitudinal direction of the piece causing the edge to curve away from its intended flat plane (see Figure B2.2).

Strip flooring
Flooring made from machined timber with tongued and grooved joints intended to be installed over joists, battens or an underlay. This may be end-matched.

Termite gallery
An irregularly shaped passage or burrow excavated by termites in the bark or wood. An enclosed termite gallery is one that is not completely open to visual inspection throughout its entire length.

Thickness (T)
The smaller dimension of the cross-section of a piece of timber (see Figure A1).

Twist
A spiral distortion along the length of a piece of timber (see Figure B9).

Wane
The presence of the original underbark surface with or without bark, on any face or edge of a piece of timber (see Figure B3.6).

Want
The absence of wood, other than wane, from the corner or surface of a piece of timber (see Figure B3.6).

Warp
A distortion that is generally regular, part or all of the surface having become curved.

Width (W)
The larger dimension in the cross-section of a piece (see Figure A1).
B1 Measurement of board dimensions

Cross-sectional dimensions of rectangular sections and profiled sections shall be measured as shown in Figures B1.1 for moulded sections and B1.2 for tongue and groove sections.

Figure B1.1 Moulded section dimensions

Figure B1.2 T&G section dimensions

B2 Measurement of distortion

When a piece has a combination of at least two of bow, spring, twist and cup, care needs to be exercised to measure each separately.

Bow and spring

Bow and spring shall be measured as the maximum distance perpendicular to the surface of any point on the face (bow) or edge (spring) from a straight line joining the arris at one end to the same arris at the other end (see Figures B2.1 and B2.2).

Figure B2.1 Bow

Figure B2.2 Spring
Twist

Twist shall be measured by placing the piece so that three of the corners of one face are in contact with a flat surface and measuring the perpendicular distance from the fourth corner to the flat surface (see Figure B2.3).

Figure B2.3 Twist

Cup

Cup shall be measured on the concave surface as the maximum perpendicular distance of any point on the surface of the piece from a straight line joining the arrises of that surface (see Figure B2.4).

Figure B2.4 Cup

B3 Measurement of Features

Knots in sawn and milled timber

These include the following:

(a) Sound knots and knot holes – The size shall be the width as measured between lines enclosing the knot or hole and parallel to the arrises of the piece (see Figure 3.1).

(b) Arris knots – The size shall be the dimension of the knot that forms the lesser proportion of the surfaces on which it occurs, as measured between lines touching the boundaries of the knot on both surfaces and parallel to the arris that intersects the knot (see Figure 3.1).
**Slope of grain**

Slope of grain shall be determined by one of the methods described in AS/NZS 1080.2.1, AS/NZS 1080.2.2 or AS/NZS 1080.2.3, and shall be measured over a distance sufficient to determine the general slope. Localized variations, where the grain deviates over less than half the surface, may be disregarded. Grain deviation around knots shall be disregarded providing such deviation does not significantly affect the general slope within the piece (see Figure B3.2).

(a) General slope of grain = \(a:b\) expressed 1 in \(x\).

(b) Deviations around the knots and localized variation.

**Figure B3.2** Slope of grain

**Gum pockets, gum veins, overgrowths of injury and primary rot**

The widths of gum pockets, gum veins, overgrowths of injury and primary rot shall be measured radially (see Figure B3.3).

**Figure B3.3** Gum pockets, gum veins, bark pockets, overgrowths of injury
Checks

The measurement of checks shall be as follows (see Figure B3.4):

(a) For checks other than internal checks, the width shall be measured tangentially at the surface at 90 degrees to the longitudinal direction of the check. The length shall be measured parallel to the arrises.

(b) For internal checks, the size shall be measured at their projected length $s$, on the thickness of the piece.

Checks are not to be confused with shakes (see Figure B3.5).

---

Wane, want and lyctid-susceptible sapwood

Wane, want and Lyctid-susceptible sapwood shall be measured as the amount by which the cross-section of the piece is deficient or is Lyctid-susceptible sapwood (see Figure B3.6).
When enquiring about or ordering recycled timber products in accordance with this standard, the following particulars should be supplied, where appropriate, preferably in this sequence:–

(a) The product required e.g. flooring, light decking, furniture stock, lightly loaded decorative members such as pergola beam etc)

(b) If a milled product, the profile, cover width and thickness

(c) The grade of product in accordance with this Standard or alternative written agreed grade between purchaser and supplier

(d) Any special requirements such as moisture content or natural durability and/or preservative treatment where durability is an issue

(e) Any special requirements in respect of colour or colour matching. (Inspection and agreement of a representative sample is strongly recommended)

(f) Hole plugging required/not required

(g) Surface finish (sawn, dressed, brushed, wired etc)

(h) Lengths (set, multiple, lineal etc)

(i) Pre-delivery finishing (coatings, sealers, end grain anti split plates etc)

(j) Packaging requirements (wrapping, blocks, corner strap protection, pack size/weight)

(k) Place and time of delivery and

(l) Delivery and on-site storage requirements (e.g. protection from the weather)
APPENDIX D

Images of recycled decorative timber products (Informative)

D1 Examples of the use of Recycled Feature Grade Timber

[Images of recycled decorative timber products shown in the text]
D1  Examples of the use of Recycled Feature Grade Timber continued
D2 Examples of the use of Recycled Decorative Grade Timber
(‘Lightly loaded’ non-structural timber)
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