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for

AS 5604-2005 Timber - Natural durability ratings

AS 5604—2005

Australian Standard™

Timber—Natural durability ratings

This Australian Standard was prepared by Committee TM-006, Timber Preservation and Durability. It was approved on behalf of the Council of Standards Australia on 28 April 2005. This Standard was published on 3 June 2005.

The following are represented on Committee TM-006:

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Australian Pesticides and Veterinary Medicines Authority
Consumers' Federation of Australia
CSIRO Forestry and Forest Products
Department of Primary Industries and Fisheries
Engineers Australia
Forests NSW
Glued Laminated Timber Association of Australia
Housing Industry Association, Australia
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Australian Standard™

Timber—Natural durability ratings

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PREFACE

This Standard was prepared by the Australian members of the Joint Standards Australia/Standards New Zealand Committee TM-006, Timber Preservation. 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 natural durability ratings for timber species for use by producers and users of timbers products. It will reduce problems associated with the existence of different lists in different Standards that do not agree with each other.

The objectives of this revision are as follows:

(a) Update the timber natural durability ratings to include the latest research data.

(b) Include marine borer resistance classes.

This Standard has been drafted to provide an authoritative source for information on the natural durability of timber, and will be used as a reference by other Standards.

The natural durability ratings given in this Standard are based upon expert opinions and assessments from a wide range of sources including, but not limited to, CSIRO, state forest organizations, and port authorities.

The term ‘normative’ has been used in this Standard to define the application of the appendix to which it applies. A ‘normative’ appendix is an integral part of a Standard.

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FOREWORD

Natural durability rating may be defined as the inherent resistance of a timber species to decay, insect, and marine borer attack. In the context of this Standard, natural durability ratings refer to the timber's performance both in contact with the ground and above ground when exposed to average environmental conditions, and in southern marine waters. The performance of untreated heartwood above ground will generally be better than its performance in the ground.

Classification of the durability of a species is not something that can be done with great precision because of the variability of wood properties within species, even within the individual tree and the variable nature of the hazard to which the timber will be exposed. An in-ground classification, which is widely accepted as a general guide, is based on one developed many years ago by CSIRO Forestry and Forest Products. It is essentially a rating of the durability of the species' heartwood when in ground contact and exposed to attack by decay and termites. Because of this combined assessment, the classification does not truly reflect the special qualities of some species (e.g., brush box, which is very resistant to termites but much less so to decay). A further consideration is the size of the specimen at risk.

In the selection of species for a particular location, local experience should be used as a guide to what is practicable in the area. The extent of decay, termite and marine borer hazard varies greatly in a continent with such a wide range of climates.

All untreated sapwood has poor resistance to biological attack. General species resistance is determined largely by the extractives formed when sapwood changes into heartwood. Termites and marine borers are less easily deterred by these extractives than fungi and will attack most species, though slowly in the case of the very durable species.

STANDARDS AUSTRALIA

Australian Standard
Timber—Natural durability ratings

1 SCOPE

This Standard provides natural durability ratings for a range of biological hazards for a number of Australian and imported timber species.

NOTES:

1 An attempt has been made to account for the more aggressive termite of the northern areas of Australia and to account for the increased durability achieved for timbers not in contact with the ground.

2 This Standard does not provide natural durability ratings against the following hazards:

(a) Physical or mechanical hazards.

(b) Chemical hazards.

(c) Fire hazards.

2 APPLICATION

The ratings given in this Standard are intended to provide the users with a relative comparison of the performance of untreated timber against the given biological hazards.

It is not intended that these ratings will be used as stand-alone criteria for determining the suitability of timber species for particular products, applications or environments. The performance and life expectancy of timber used in specific applications and environments will be greatly influenced by many other factors in addition to the natural durability ratings. These other factors include—

(a) presence or absence of preservative treatment;

(b) supplementary protection and maintenance;

(c) climate;

(d) environmental conditions;

(e) human influence; and

(f) manufacturing process.

This Standard is intended to assist with the development of other Standards and specifications for timber product and application.

3 REFERENCED DOCUMENTS

The following documents are referred to in this Standard:

AS	
1720	Timber structures
1720.2	Part 2: Timber properties
AS/NZS	
1148	Timber—Nomenclature—Australian New Zealand and imported species
1604	Specification for preservative treatment (all Parts)
4491	Timber—Glossary of terms in timber-related Standards

4 DEFINITIONS

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

4.1 Natural durability

The inherent resistance of a timber species to decay, or to insect or marine borer attack.

4.2 Lyctids

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

5 LYCTID SUSCEPTIBILITY

Appendix A lists a number of timber species that are resistant to lyctid attack. The method for detection of lyctid-susceptible sapwood shall be as specified in AS 1604.1.

NOTES:

1 In Queensland the Timber Utilization and Marketing Act 1987 and in New South Wales the Timber Marketing Act 1977 require approval of a preservative treatment and registration of a brand before timber, offered for sale in either of these states, can be described as preservative-treated. Detailed information about the requirements of such legislation may be obtained from the state government agencies concerned.

2 A number of species listed in Appendix A are deemed to be not susceptible and do not need to be tested; however, where there is doubt about a species not shown in the list, the user is referred to the test in AS 1604.1 for confirmation.

3 Softwoods are not lyctid-susceptible.

4 Attack by lyctid beetle is confined to the sapwood of certain hardwoods. The two elements that most commonly limit the susceptibility of a species are pore diameter and starch content. In only a few hardwood species are the pores too small (<90 μm) to permit attack, hence susceptibility is usually governed by starch content.

5 Lyctid susceptibility ratings may be obtained from the state government agencies and CSIRO Forestry and Forest Products.

6 TERMITE RESISTANCE

Appendix A lists a number of timber species that are deemed to have a high resistance to termites.

For all timber species listed as resistant, only the heartwood may be resistant to attack by termites, while untreated sapwood shall be regarded as susceptible to attack. Inner heartwood (nearer the pith) is considered less resistant to attack than the outer heartwood.

NOTES:

1 Different timber species have different levels of resistance to various species of termite. Local experience should be referred to for specific installations.

2 Within a species, timbers can vary in termite resistance from tree to tree as well as within the same tree. In addition, the termite-resistance of timber exposed above the ground may be superior to its resistance in the ground.

3 Resistance to termites has been drawn from in-ground durability tests on timber specimens cut from mature trees in the presence of wood-rotting fungi (see Note 4). Where data from such tests is not available, termite resistance is based on recognized durability ratings obtained from many years of experience with the particular timber in service. Reference was made to AS 1604.1, AS 1720.2 and AS/NZS 1148 in compiling the list of termite-resistant timbers given in Appendix A.

4 For information on termite resistance of imported timbers not listed in Appendix A, refer to Keating, W.G., and Bolza, E. Characteristics, properties and uses of timbers. Vol 1, Southeast Asia, Northern Australia and the Pacific, Inkata Press, Melbourne, Sydney and London (1982).

7 NATURAL DURABILITY AND MARINE BORER RESISTANCE CLASSES

The classification system is based on the average life expectancy (in years), as given in Tables 1 and 2, for a species used in ground, above ground and in sea and estuarine waters.

NOTES:

1 Consideration should be given to the fact that the classification is very broad and it is not intended to distinguish between the relative merits of species in the same classification.

2 Generally, marine borer hazard is more severe in the northern waters of Australia than it is in the southern waters. Experience has shown that a general rule of thumb for differentiating between northern and southern is to regard north of Perth in the west, and north of Batemans Bay in the east, as northern waters. Obviously the separation between northern waters and southern waters cannot be exact and so, care should be taken by the specifier when a site is around the line of differentiation.

TABLE 1

NATURAL DURABILITY—PROBABLE LIFE EXPECTANCY*

Class	Probable in-ground life expectancy (years)	Probable above-ground life expectancy (years)
1	Greater than 25	Greater than 40
2	15 to 25	15 to 40
3	5 to 15	7 to 15
4	0 to 5	0 to 7

* The ratings in this Table are based on expert opinions and the performance of the following test specimens:

(a) In-ground: 50 × 50 mm test specimens at four sites around Australia.

(b) Above-ground: 35 × 35 mm test specimens at eleven sites around Australia.

NOTES:

1 As further reliable evidence becomes available, these ratings may require amending.

2 The heartwood of an individual piece of timber may vary from the species' nominated classification.

3 Above-ground conditions equate to outside above-ground subject to periodic moderate wetting when ventilation and drainage are adequate.

TABLE 2

MARINE BORER RESISTANCE—PROBABLE LIFE EXPECTANCY

Class	Probable marine-borer-resistance life expectancy in southern waters (years)
1	Greater than 60
2	41 to 60
3	21 to 40
4	0 to 20, usually less than 5

NOTE: Marine borer resistance is based on natural round piles containing 350 mm diameter of heartwood in southern seas reaching from Perth in the west to Batemans Bay in the east. Only class 1 timbers can be expected to give reasonable service life (12 to 30 years) in northern waters.

APPENDIX A

TIMBER NATURAL DURABILITY RATINGS

(Normative)

A1 GENERAL

Table A1 lists species and their ratings for various aspects of natural durability.

The ratings apply only to the species indicated by their botanical/scientific names. Where a preferred common name covers more than one species and one of the species is not given a rating, ratings given to the other species shall not be applied to that species, regardless of the fact that it is included in the preferred common name with the others.

For all timbers, sapwood shall be regarded as non-durable unless preservative-treated in accordance with the AS/NZS 1604 series. Also the inner heartwood (the first few growth rings around the pith), generally, has lower natural durability than the rest of the heartwood.

NOTE: The list is by no means complete and is subject to change, particularly when the resource varies, e.g., the production from a young fast growth plantation compared with a mature, higher density resource.

A2 LEGEND TO TABLE A1

The following legend is used in Table A1:

— = no information available at publication

D_{ig} = in-ground natural durability class

D_{ag} = above-ground natural durability class

A3 NOTES TO TABLE A1

A3.1 Column 1—Standard common name and scientific/botanical name

The standard common names used in Table A1 to refer to the timber species are as given in AS/NZS 1148.

NOTES:

1 The common names listed in this Appendix may cover one or more timber species. Species that are not specifically given a rating under their botanical names are not covered by this Standard.

2 The nomenclature for Meranti applies to a large number of related timbers of varying natural durability. Unless the particular species can be identified, the lowest rating for this genus should be applied.

A3.2 Column 2—Lyctid susceptibility of sapwood

Lyctid susceptibility of sapwood is classified as follows:

(a) S—Susceptible.

(b) NS—Not susceptible.

NOTE: The Lyctid susceptibility of alpine ash timber shows a consistent variation depending on its origin as Tasmania—S, New South Wales—S, Victoria—NS. If the origin of the timber is not known with certainty, the timber should be regarded as susceptible.

A3.3 Column 3—Termite resistance of heartwood

Termite resistance of heartwood is classified as follows:

R — Resistant to termite.

NR — Not resistant to termite.

Other species not listed, or where there is no rating given (designated as '—'), should be assumed to be not resistant to termite unless evidence to the contrary is provided.

A3.4 Column 4—Natural durability class of heartwood

See Table 1, Clause 7.

A3.5 Column 5—Marine-borer resistance of heartwood

See Table 2, Clause 7.

TABLE A1

NATURAL DURABILITY RATINGS OF TIMBER SPECIES

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
alan *Shorea albida*	S	R	2	2	—
alder, blush *Sloanea australis*	S	—	4	—	4
alder, brown *Caldcluvia paniculosa*	S	NR	4	—	4
alder, pink *Gillbeea adenopetala*	NS	NR	4	—	4
alder, rose *Caldcluvia australiensis*	NS	NR	4	—	4
almond, rose *Owenia venosa*	NS	R	1	1	—
amberoi *Pterocymbium* spp.	S	NR	4	—	4
apple, rough-barked *Angophora floribunda*	S	—	3	—	—
apple, smooth-barked *Angophora costata*	S	—	3	—	4
ash, alpine *Eucalyptus delegatensis*	(See Note in Paragraph A3.2)	NR	4	3	4
ash, Blue Mountains *Eucalyptus oreades*	NS	—	4	—	4
ash, Crow's *Flindersia australis*	S	R	1	1	—
ash, hickory *Flindersia ifflaiana*	S	R	2	1	—
ash, mountain *Eucalyptus regnans*	NS	NR	4	3	4

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
ash, pink *Alphitonia petriei*	NS	NR	4	—	4
ash, red Alphitonia excelsa *Alphitonia whitei*	NS	NR	2	—	—
ash, silver *Flindersia bourjotiana* *Flindersia schottiana*	S	NR	3	—	4
ash, silvertop *Eucalyptus sieberi*	NS	NR	3	2	4
ash, white *Eucalyptus fraxinoides*	S	NR	4	—	4
backhousia, stony *Backhousia hughesii*	NS	NR	2	—	—
balau (selangan batu) *Shorea* spp.	S	NR	2	1	4
balau, red *Shorea* spp.	S	NR	4	—	—
baltic, red (pine, Scots) *Pinus sylvestris*	NS	—	4	—	4
baltic, white (spruce, Norway) *Picea abies*	NS	—	4	—	4
bamboo* (various species)	S	—	—	—	—
bean, black *Castanospermum australe*	S	—	2	—	—
beech, myrtle *Nothofagus cunninghamii*	S	NR	4	3	4
beech, negrohead *Nothofagus moorei*	S	NR	4	—	4
beech, silver *Nothofagus menziesii*	NS	NR	4	—	4
beech, white *Gmelina* spp.	S	—	—	—	—
beefwood *Grevillea striata*	S	NR	2	—	—
belah *Allocasuarina cristata*	NS	—	2	—	—
belian *Eusideroxylon zwageri*	—	R	1	1	1
birch, white *Betula pubescens*	—	—	4	—	4
birch, white, Australia *Schizomeria ovata*	S	—	4	4	4

* Bamboo is not strictly a timber species although it may be used in building applications. (*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
blackbutt *Eucalyptus pilularis*	NS	R	2	1	3
blackbutt, New England *Eucalyptus andrewsii* *Eucalyptus campanulata*	S	R	2	2	2
blackbutt, Western Australian *Eucalyptus patens*	S	R	2	1	3
blackwood *Acacia melanoxylon*	S	—	3	3	4
bloodwood, brown *Corymbia trachyphloia*	S	R	1	1	—
bloodwood, Island, Melville *Corymbia nesophila*	S	—	—	—	—
bloodwood, red *Corymbia gummifera* *Eucalyptus intermedia* *Eucalyptus polycarpa*	S	R	1	1	3
bloodwood, yellow Corymbia eximia	S	NR	2	—	—
bollywood *Cinnamomum baileyanum* *Litsea* spp.	S	NR	3	3	4
box, black *Eucalyptus largiflorens*	S	—	1	1	—
box, brush *Lophostemon confertus*	NS	R	3	3	2
box, grey *Eucalyptus microcarpa* *Eucalyptus moluccana* *Eucalyptus woollsiana*	S	R	1	1	2
box, grey, coast *Eucalyptus bosistoana*	S	R	1	1	3
box, ironwood *Choricarpia leptopetala* *Choricarpia subargentea*	NS	NR	3	—	4
box, kanuka *Tristania exiliflora* *Tristania laurina*	NS	NR	3	—	4
box, long-leaved *Eucalyptus goniocalyx*	S	R	3	2	—
box, red *Eucalyptus polyanthemos*	S	R	1	1	—
box, steel *Eucalyptus rummeryi*	NS	R	1	1	—

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
box, swamp *Lophostemon suaveolens*	NS	R	2	1	2
box, white *Eucalyptus albens*	NS	R	2	1	—
box, white-topped *Eucalyptus quadrangulata*	NS	R	2	2	—
box, yellow *Eucalyptus melliodora*	NS	R	1	1	—
brigalow *Acacia harpophylla*	S	R	1	1	—
brownbarrel *Eucalyptus fastigata*	S	NR	4	3	4
bullich *Eucalyptus megacarpa*	S	NR	3	2	4
cadaga *Eucalyptus torelliana*	S	NR	2	—	—
calantas *Toona calantas*	S	—	2	1	—
calophyllum *Calophyllum* spp.	S	NR	4	—	4
candlebark *Eucalyptus rubida*	S	NR	4	3	4
carabeen, yellow *Sloanea woolsii*	S	NR	4	—	4
carbeen *Corymbia tessellaris* *Eucalyptus tessellaris*	S	R	1	1	—
cedar, red *Toona australis*	S	—	2	—	4
cedar, western red *Thuja plicata*	NS	R	3	2	—
cedar, yellow (Alaska) *Chamaecyparis nootkatensis*	NS	R	1	1	—
cheesewood, white *Alstonia scholaris*	S	—	4	—	4
chengal *Balanocarpus heimii*	NS	R	1	1	—
coachwood *Ceratopetalum apetalum*	NS	NR	4	—	4
cypress, black *Callitris endlicheri*	NS	R	2	1	3
cypress, white *Callitris glaucophylla*	NS	R	2	1	2

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
dabarima *Planchonia* spp.	NS	—	—	—	—
fir, amabilis *Abies amabilis*	NS	—	4	—	4
fir, Douglas (oregon) *Pseudotsuga menziesii*	NS	NR	4	4	4
gaboon *Aucoumea klaineana*	NS	NR	—	—	—
geronggang *Cratoxylon arborescens*	NS	NR	4	—	4
giam *Hopea* spp.	S	NR	2	—	—
gidgee *Acacia cambagei*	NS	NR	1	1	—
gum, blue, southern *Eucalyptus globulus*	S	NR	3	2	4
gum, blue, Sydney *Eucalyptus saligna*	S	NR	3	2	3
gum, grey *Eucalyptus canaliculata* *Eucalyptus major* *Eucalyptus propinqua* *Eucalyptus punctata*	NS	R	1	1	2
gum, grey, mountain *Eucalyptus cypellocarpa*	S	NR	3	2	4
gum, Maiden's *Eucalyptus maidenii*	S	NR	3	2	4
gum, manna Eucalyptus viminalis	S	NR	4	3	4
gum, mountain *Eucalyptus dalrympleana*	S	NR	4	3	4
gum, pink *Eucalyptus fasciculosa*	S	NR	3	—	4
gum, poplar *Eucalyptus alba*	—	NR	3	3	4
gum, red, forest *Eucalyptus blakelyi* *Eucalyptus tereticornis*	NS	R	1	1	2
gum, red, narrow-leaved *Eucalyptus seeana*	S	R	2	—	—
gum, red, river *Eucalyptus camaldulensis*	S	R	2	1	2
gum, rose *Eucalyptus grandis*	NS	NR	3	2	4

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
gum, round-leaved *Eucalyptus deanei*	S	—	3	—	—
gum, salmon *Eucalyptus salmonophloia*	NS	R	2	1	—
gum, scribbly *Eucalyptus haemastoma* *Eucalyptus micrantha* *Eucalyptus racemosa* *Eucalyptus rossii* *Eucalyptus sign*ata	NS	R	3	2	—
gum, shining *Eucalyptus nitens*	S	NR	4	3	4
gum, spotted *Corymbia maculata* *Corymbia citriodora* *Eucalyptus henryi*	S	R	2	1	4
gum, sugar *Eucalyptus cladocalyx*	S	R	1	1	—
gum, swamp *Eucalyptus camphora*	S	NR	4	—	4
gum, white, Dunn's *Eucalyptus dunnii*	S	—	4	—	4
gum, yellow *Eucalyptus leucoxylon*	S	R	2	2	—
hardwood, Johnston River *Backhousia bancroftii*	S	NR	3	2	4
hemlock, western *Tsuga heterophylla*	NS	NR	4	4	4
hollywood, yellow *Premna lignum-vitae*	NS	—	1	1	—
ironbark, Caley's *Eucalyptus caleyi*	S	R	—	1	—
ironbark, grey *Eucalyptus drepanophylla* *Eucalyptus paniculata* *Eucalyptus siderophloia*	NS	R	1	1	3
ironbark, gum-topped *Eucalyptus decorticans*	NS	R	1	1	—
ironbark, red *Eucalyptus sideroxylon*	S	R	1	1	2
ironbark, red, broad-leaved *Eucalyptus fibrosa* subsp. *fibrosa*	NS	R	1	1	—
ironbark, red, narrow-leaved *Eucalyptus crebra*	NS	R	1	1	—

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
ironbark, silver-leaved *Eucalyptus melanophloia*	NS	R	1	1	—
ironwood, Cooktown *Erythrophloeum chlorostachys*	S	R	1	1	—
jam, raspberry *Acacia acuminata*	NS	R	1	1	2
jarrah *Eucalyptus marginata*	S	R	2	2	3
jelutong *Dyera costulata*	S	—	4	—	4
kamarere *Eucalyptus deglupta*	S	NR	4	—	4
kapur *Dryobalanops* spp.	NS	NR	3	2	4
karri *Eucalyptus diversicolor*	NS	NR	3	2	4
kauri, New Zealand *Agathis australis*	NS	—	2	—	4
kauri, Queensland *Agathis atropurpurea* *Agathis microstachya* *Agathis robusta*	NS	NR	4	4	4
kempas *Koompassia malaccensis*	S	NR	3	—	4
keruing *Dipterocarpus* spp.	S	NR	3	3	4
kwila (merbau) *Intsia bijuga*	S	R	3	1	3
laurel, camphor *Cinnamonum camphora*	S	—	—	—	—
lumbayau (mengkulang) *Heritiera* spp.	S	NR	4	—	4
mahogany, African *Khaya* spp.	S	—	3	—	—
mahogany, American *Swietenia mahogani*	S	—	3	—	—
mahogany, brush *Geissois benthamii*	S	NR	4	—	4
mahogany, red *Eucalyptus pellita* *Eucalyptus resinifera*	S	R	2	1	2
mahogany, red, Philippine, *Shorea* spp.	S	NR	4	3	4

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
mahogany, southern *Eucalyptus botryoides*	NS	R	3	2	—
mahogany, white *Eucalyptus acmenoides* *Eucalyptus tenuipes* *Eucalyptus umbra* subsp. *Carnea*	NS	R	1	1	2
malas *Homalium foetidum*	NS	NR	3	—	4
mallet, brown *Eucalyptus astringens*	NS	R	2	1	—
malletwood *Rhodamnia argentea* *Rhodamnia costata*	NS	NR	3	—	4
malletwood, brown *Rhodamnia rubescens*	NS	NR	3	—	4
malletwood, silver *Rhodamnia acuminata*	NS	NR	3	—	4
mangrove, grey *Avicennia marina*	NS	NR	4	—	4
maple, Queensland *Flindersia brayleyana*	NS	NR	4	—	4
maple, rose *Cryptocarya erythroxylon*	S	NR	4	—	4
maple, scented *Flindersia laevicarpa*	NS	NR	3	—	4
maple, sugar (rock) *Acer saccharum*	S	—	4	—	4
marri *Corymbia calophylla* *Eucalyptus calophylla*	S	NR	3	3	4
medang tabak *Dactylocladus stenostachys*	NS	NR	—	—	—
meranti, bakau *Shorea* spp.	S	NR	4	—	4
meranti, dark-red *Shorea* spp.	S	NR	4	3	4
meranti, light-red *Shorea* spp.	S	NR	4	4	4
meranti, white *Shorea* spp.	S	NR	4	—	4
meranti, yellow *Shorea* spp.	S	R	4	—	4
mersawa *Anisoptera* spp.	S	NR	4	3	4

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
messmate *Eucalyptus obliqua*	S	NR	3	3	4
messmate, Gympie *Eucalyptus cloeziana*	NS	R	1	1	—
mulga *Acacia aneura*	—	—	2	—	—
myall *Acacia pendula*	NS	NR	2	—	—
nyatoh *Palaquium* and *Payena* spp.	NS	—	4	—	4
oak, bull *Allocasuarina luehmannii*	NS	R	1	1	—
oak, European *Quercus* spp.	S	—	2	—	—
oak, silky, northern *Cardwellia sublimis*	S	NR	4	—	4
oak, silky, southern *Grevillea robusta*	S	—	—	—	—
oak, tulip, blush *Argyrodendron actinophyllum*	S	NR	4	—	4
oak, tulip, brown *Argyrodendron polyandrum* *Argyrodendron trifoliolatum*	S	NR	4	—	4
oak, tulip, red *Argyrodendron peralatum*,	S	NR	4	—	4
oak, white, American *Quercus alba*	S	NR	4	—	4
Paulownia *Paulownia* spp.	S	NR	4	4	4
penda, brown *Xanthostemon chrysanthus*	NS	R	2	1	2
penda, red *Xanthostemon whitei*	NS	R	2	1	2
penda, southern *Xanthostemon, oppositifolius*	NS	NR	2	1	2
penda, yellow *Ristantia pachysperma*	NS	NR	3	—	2
peppermint, black *Eucalyptus amygdalina*	S	NR	4	3	4
peppermint, broad-leaved *Eucalyptus dives*	S	NR	3	2	4

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
peppermint, narrow-leaved *Eucalyptus australiana* *Eucalyptus radiata* *Eucalyptus robertsonii*	S	NR	3	3	4
peppermint, Queensland *Eucalyptus exserta*	S	R	1	1	—
peppermint, river *Eucalyptus elata*	S	NR	4	3	4
peppermint, white *Eucalyptus pulchella*	S	NR	3	—	4
pine, black *Prumnopitys amara*	NS	—	4	—	—
pine, brown *Podocarpus elatus*	NS	—	—	—	3
pine, bunya *Araucaria bidwillii*	NS	NR	4	4	4
pine, Canary Island *Pinus canariensis*	NS	NR	4	4	4
pine, Caribbean *Pinus caribaea*	NS	R	4	4	4
pine, celery-top *Phyllocladus asplenifolius*	NS	R	3	2	—
pine, Corsican *Pinus nigra*	NS	—	4	4	4
pine, hoop *Araucaria cunninghamii*	NS	NR	4	4	4
pine, Huon *Lagarostrobos franklinii*	NS	R	3	3	4
pine, King William *Athrotaxis selaginoides*	NS	R	2	2	4
pine, klinki *Araucaria hunsteinii*	NS	NR	4	—	4
pine, loblolly *Pinus taeda*	NS	NR	4	4	4
pine, longleaf *Pinus palustris*	NS	NR	4	4	4
pine, maritime *Pinus pinaster*	NS	R	4	4	4
pine, NZ white (kahikatea) *Dacrycarpus dacrydioides*	NS	—	4	—	4
pine, patula *Pinus patula*	NS	—	4	4	4
pine, ponderosa *Pinus ponderosa*	NS	—	4	4	4

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
pine, radiata *Pinus radiata*	NS	NR	4	4	4
pine, Scots *Pinus sylvestris*	NS	—	4	—	4
pine, slash *Pinus elliottii*	NS	R	4	4	4
pine, slash, Caribbean hybrid *Pinus elliottii, P. caribaea*	NS	R	4	4	4
pine, white, western *Pinus monticola*	NS	—	4	—	4
planchonella *Planchonella chartacea*	S	NR	4	—	4
planchonia *Planchonia* spp.	NS	NR	—	—	—
poplar, balsam *Populus* spp.	S	NR	4	—	4
poplar, pink *Euroschinus falcata*	S	NR	4	—	4
quandong, silver *Elaeocarpus angustifolius* *Elaeocarpus grandis*	S	NR	4	—	4
ramin *Gonystylus* spp.	S	NR	4	4	4
redwood *Sequoia sempervirens*	NS	R	2	1	4
rimu *Dacrydium cupressinum*	NS	—	4	—	4
rosewood, New Guinea *Pterocarpus indicus*	S	R	3	2	—
rustyjacket *Eucalyptus peltata*	S	NR	2	2	—
saffronheart *Halfordia kendack* *Halfordia scleroxyla*	NS	R	1	1	—
sandalbox *Eremophila, mitchellii*	NS	R	1	1	—
sassafras *Daphnandra dielsii* *Daphnandra micrantha* *Daphnandra repandula* *Doryphora aromatica* *Doryphora sassafras*	NS	NR	4	—	4
sassafras, grey *Dryadodaphne novoguineensis*	NS	NR	—	—	—

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
satinash, grey *Syzygium claviflorum* *Syzygium gustavioides*	S	NR	3	—	4
satinash, rose *Syzygium crebrinerve* *Eugenia francisii*	S	—	3	—	—
satinay *Syncarpia hillii*	NS	R	2	1	1
satinbox *Phebalium squameum*	NS	—	2	2	—
sepetir *Copaifera* spp. *Pseudosindora* spp. *Sindora* spp.	S	NR	4	—	4
sheoak, beach *Allocasuarina equisetifolia*	NS	—	3	—	—
sheoak, black *Allocasuarina littoralis*	NS	—	3	—	4
sheoak, river *Casuarina cunninghamiana*	NS	—	—	—	—
sheoak, rose *Allocasuarina torulosa*	NS	—	2	—	—
sheoak, swamp *Casuarina glauca*	NS	—	—	—	—
silkwood, maple *Flindersia pimenteliana*	NS	NR	4	—	4
spruce, Norway *Picea abies*	NS	—	4	—	4
spruce, Sitka *Picea sitchensis*	NS	—	4	—	4
stringybark, Blackdown *Eucalyptus sphaerocarpa*	NS	R	2	1	—
stringybark, blue-leaved *Eucalyptus agglomerata*	NS	NR	3	3	4
stringybark, brown *Eucalyptus baxteri* *Eucalyptus blaxlandii* *Eucalyptus capitellata*	NS	NR	3	2	4
stringybark, Darwin *Eucalyptus tetrodonta*	S	R	1	1	—
stringybark, diehard *Eucalyptus cameronii*	—	—	3	—	—
stringybark, red *Eucalyptus macrorhyncha*	S	R	3	2	3

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
stringybark, silvertop *Eucalyptus laevopinea*	NS	NR	3	3	4
stringybark, white *Eucalyptus eugenioides* *Eucalyptus globoidea* *Eucalyptus phaeotricha*	NS	R — —	3 2 —	2 — —	3
stringybark, yellow *Eucalyptus muelleriana*	NS	R	3	2	3
sycamore, silver *Cryptocarya glaucescens*	NS	NR	4	—	4
tallowwood *Eucalyptus microcorys*	S	R	1	1	3
taun *Pometia* spp.	S	NR	3	2	4
teak, Burmese *Tectona grandis*	S	R	2	1	—
tea-tree, broad-leaved *Melaleuca leucadendron* *Melaleuca quinquenervia* *Melaleuca viridiflora*	S	—	3	—	3
tea-tree, river *Melaleuca bracteata*	NS	—	3	—	—
tingle, red *Eucalyptus jacksonii*	NS	—	3	3	4
tingle, yellow *Eucalyptus guilfoylei*	NS	—	2	1	—
touriga, red *Calophyllum costatum*	NS	NR	4	—	4
tuart *Eucalyptus gomphocephala*	S	R	2	1	4
turpentine *Syncarpia glomulifera*	NS	R	2	1	1
vitex *Vitex cofassus*	NS	NR	—	—	—
walnut, New South Wales *Endiandra virens*	NS	—	4	—	4
walnut, Queensland *Endiandra palmerstonii*	S	—	4	—	4
walnut, yellow *Beilschmiedia bancroftii*	S	NR	4	—	4
wandoo *Eucalyptus wandoo*	NS	R	1	1	3
wandoo, powderbark *Eucalyptus accedens*	NS	R	1	1	—

(*continued*)

TABLE A1 (*continued*)

1	2	3	4		5
Standard common name and scientific/botanical name	**Lyctid susceptibility of sapwood**	**Termite resistance of heartwood (inside above ground—applicable to H2 in AS 1604 series)**	**Natural durability class of heartwood**		**Marine-borer resistance of heartwood**
			In-ground contact, D_{ig}	**Outside above ground, D_{ag}**	
wattle, ironwood *Acacia estrophiolata* *Acacia excelsa*	NS	—	2	—	—
woollybutt *Eucalyptus longifolia*	S	R	1	1	—
woollybutt, northern *Eucalyptus miniata*	S	NR	2	—	—
yapunyah *Eucalyptus ochrophloia*	S	—	1	1	—
yapunyah, mountain *Eucalyptus thozetiana*	NS	R	1	1	—
yarran *Acacia homalophylla*	NS	—	—	—	—
yate *Eucalyptus cornuta*	NS	—	2	1	—
yate, swamp *Eucalyptus occidentalis*	—	—	—	—	4
yertchuk *Eucalyptus consideniana*	NS	R	2	1	—

NOTES

NOTES

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