

MAXIMUM PERMISSIBLE BOW AND SPRING

L (M)	Width (mm) for spring / Thickness (mm) for bow												
	38	50	75	100	125	150	175	200	225	250	275	300	350
1.8	10	10	7	5	4	3	3	3	2	2	1	1	1
2.4	20	15	12	9	7	6	5	4	4	4	3	3	3
3.0	35	25	19	14	11	9	8	7	6	6	5	5	4
3.6	50	35	25	20	16	13	12	10	9	8	7	7	6
4.2	60	45	28	25	22	18	16	14	12	11	10	9	8
4.8	70	50	30	30	29	24	21	18	16	14	13	12	10
5.4	75	55	40	40	36	30	26	23	20	18	17	15	13
6.0	80	60	45	45	45	37	30	28	25	22	20	19	16
6.6	85	65	50	45	45	45	39	34	30	27	25	23	19
7.2	90	70	55	50	50	50	46	40	36	32	29	27	23

MAXIMUM PERMISSIBLE TWIST

Length (nom. - M)	Thickness (nom. - mm)	Width (nom. - mm)			
		Up to 100	101 - 150	151 - 200	201 - 300
Up to 2.4	Up to 50	5	7	10	15
	51 - 75	4	6	8	11
	over 75	2	4	6	8
2.7 to 3.0	Up to 50	7	10	14	20
	51 - 75	5	8	11	15
	over 75	3	5	8	11
3.3 to 3.6	Up to 50	8	13	18	25
	51 - 75	6	9	13	19
	over 75	4	6	9	13
3.9 to 4.2	Up to 50	9	15	21	29
	51 - 75	7	11	15	22
	over 75	5	7	10	15
4.5 to 4.8	Up to 50	10	16	23	33
	51 - 75	7	12	17	24
	over 75	5	8	11	16
5.1 to 5.4	Up to 50	11	18	26	37
	51 - 75	8	14	19	27
	over 75	6	9	13	18
5.7 and over	Up to 50	12	20	28	40
	51 - 75	9	15	21	30
	over 75	6	10	14	20

CUP – Maximum 1 mm per 50 mm of width

SIZES AND TOLERANCES –

- *unseasoned:* +3 mm on width and thickness
- *seasoned, or MC specified:* + 5, - 0 mm on width and thickness
- *consistency:* maximum variation of 2 mm between all pieces
- *dressed:* +2, - 0 on width and thickness
- *tolerance on squareness:* ± 2 degrees

Downloaded from the *Wood Technology Learning Resource* at: www.buildinglearning.com.au. For details on how to interpret this card, go to Section 5 of the website and follow the prompts.

Visually stress-graded SOFTWOOD

Ready-reckoner for Australian Standard 2858-2008

INTRODUCTION - This ready-reckoner provides a summary of the basic grading rules for visually stress-graded softwood, other than cypress pine, hoop pine, and heart-in studs. It is not designed to be used in place of the Australian Standard document, and should not be relied upon as a formal statement of the grade requirements. For a full and accurate description of all grade requirements, please consult the source document: AS 2858-2008.

COMBINATION OF CHARACTERISTICS – Characteristics must be assessed in combination when the distance between them is less than twice the width of the piece or 150 mm, whichever is the lesser. The distance is measured parallel to the length of the piece. Characteristics may not necessarily appear on the same side of the piece. A combination is permitted if the aggregate size is less than one characteristic of maximum permissible size.

CHARACTERISTICS CLOSE TO AN ARRIS – May be assessed as for want or wane, with the exception of enclosed termite galleries.

MOISTURE CONTENT – Where seasoned timber is specified, 90% of pieces must have a MC of 15% maximum, with none at more than 18%, at the time of production.

STRUCTURAL APPEARANCE GRADES – The same limitations apply for structural grades, except that the following are not permitted: loose, unsound or defective knots; holes; termite galleries; pith on exposed surfaces; resin pockets, bark pockets, overgrowths of injury; checks wider than 1 mm; decay; want or wane; damage caused by hooks or ropes; stain or discolouration.

STRUCTURAL GRADES AND STRESS GRADES – Stress grades for several softwood species have been established using in-grade testing procedures on full size structural scantlings. The following table lists some of the commonly used species.

F GRADES: UNSEASONED (SEASONED in brackets)

Species	Str. No. 1	Str. No. 2	Str. No. 3	Str. No. 4	Str. No. 5
Douglas fir - oregon	F11 (F11)	F8 (F11)	F7 (F8)	F5 (F7)	F4 (F5)
- from North America	F8 (F11)	F7 (F11)	F5 (F8)	F4 (F7)	- (F5)
- from elsewhere					
Radiata pine	F8 (F8)	F7 (F8)	F5 (F7)	F4 (F5)	- (F4)
Slash pine	F11 (F14)	F8 (F14)	F7 (F11)	F5 (F8)	F4 (F7)
W. hemlock - C. pine	F8 (F11)	F7 (F11)	F5 (F8)	F4 (F7)	- (F5)
WRC - from Canada	F5 (F8)	F4 (F7)	- (F5)	- (F4)	- -
- from USA	F7 (F8)	F5 (F7)	F4 (F5)	- (F4)	- -

CHARACTERISTIC	GRADES AND MAXIMUM PERMISSIBLE LIMITS				
	Structural Grade No. 1	Structural Grade No. 2	Structural Grade No. 3	Structural Grade No. 4	Structural Grade No. 5
KNOTS ¹ - face and edge - other	Cent. ½ W or T, KAR 25% KAR 15%	Cent. ½ W or T, KAR 40% KAR 25%	Cent. ¾ W or T, KAR 50% KAR 30%	Cent. ¾ W or T, KAR 60% KAR 40%	Cent. ¾ W or T, KAR 70% KAR 45%
OCCLUDED BRANCH STUBS	Not permitted			As for knots	
BORER HOLES ² - up to 3 mm diameter - 3 mm to 10 mm	10 holes per 100 x 100 mm 1 hole per 100 x 100 mm	20 holes per 100 x 100 mm 2 holes per 100 x 100 mm	30 holes per 100 x 100 mm 4 holes per 100 x 100 mm	Unlimited if separated by at least 2 times the diameter 6 holes per 100 x 100 mm	
TERMITE GALLERIES	Not permitted		Enclosed: not permitted Not enclosed (fully visible): as for want and wane		
SLOPE OF GRAIN ³	1 in 15	1 in 10	1 in 8	1 in 6	1 in 5
WIDTH OF GROWTH RINGS	6 mm max. within 50 mm of centre of pith		10 mm max. within 50 mm of centre of pith	20 mm max. within 50 mm of centre of pith	
HEART SHAKES	Not permitted			Not exceeding the limits for checks or end splits	
RESIN POCKETS BARK POCKETS OVERGROWTHS OF INJURY ⁴	Not permitted	<i>Individual length:</i> lesser of 300 mm or 3 W <i>Width - one surface only:</i> lesser of 20 mm or 1/3 surface - one surface to another - not intersecting an end: lesser of 12 mm or 1/4 surface - intersecting an end: as for end splits			
END SPLITS ⁵	: Not permitted		<i>Individual length:</i> ½ width	<i>Individual length:</i> width	<i>Individual length:</i> 1½ width
	<i>Aggregate length at each end:</i> lesser of 2 times width or 200 mm				
CHECKS OTHER THAN INTERNAL	<i>Individual length:</i> 450 mm <i>Width:</i> 2 mm		<i>Individual length:</i> 600 mm <i>Width:</i> 2 mm		<i>Individual length:</i> 600 mm <i>Width:</i> 3 mm
DECAY	Not permitted			<i>Width:</i> ¼ surface or 25mm; <i>depth:</i> 6mm; <i>length:</i> unlimited	
WANT OR WANE - area - in pieces up to and including 38 mm - in pieces over 38 mm thick	1/10 cross sectional area 1/7 face or edge 1/2 face, 1/3 edge	1/5 cross sectional area 1/4 face or edge 1/2 face, 1/3 edge			
STAIN	Unlimited				
SAPWOOD	Unlimited				
	<i>In all grades – pieces must be free from compression failures, other fractures and splits (other than end splits)</i>				

MACHINE GRADED PINE (MGP) – MGP material may be substituted for F-grade specified material as follows: MGP 10 (F5); MGP 12 (F8); MGP 15 (F11)

The following visual over-rides apply to all Machine Stress Graded Softwoods. Note that these specifications are found in AS 1748:2006. For a full description, consult the Australian Standard.

Note that AS 1748 uses a simplified table for bow, spring and twist, which is not identical to AS 2858.

<i>Resin streaks, resin pockets, bark pockets</i>	not one surface to the opposite surface if longer than the width of the piece
<i>Heart shakes</i>	not one surface to the opposite surface, max. width: 3 mm
<i>Cross shakes, splits other than end splits</i>	not permitted
<i>End splits</i>	max. individual length: 1/2 width of the piece, aggregate length: 2 times width or 200 mm
<i>Knots</i>	to the limits allowed to meet the strength and MOE
<i>Want and wane</i>	1/2 face, 1/3 edge maximum

1. KNOTS include knots that are tight or loose, sound or unsound, intergrown, round or oval, single or in clusters, knot holes and all holes other than insect holes, and any associated bark encasement

2. BORER HOLES are measured at 90 degrees to the longitudinal direction of the hole.

3. SLOPE OF GRAIN is measured over a distance sufficient to determine the general slope. Grain deviation around knots, and localised variations of less than ½ surface width can be disregarded.

4. RESIN POCKETS, BARK POCKETS and OVERGROWTHS OF INJURY are measured radially for width, and parallel to the length of the piece for length.

5. END SPLITS are measured parallel to the length of the piece on the *shortest* side.