New Zealand Domestic and Export Log Grade Specifications and the Japanese Agricultural Standard (JAS) Cubic Metre

This document contains information on the New Zealand log grades and their specifications. It is based on: Maclaren, J.P. 2000, *How Much Wood Has Your Woodlot Got?*, Forest Research Bulletin No. 217, New Zealand Forest Research Institute Limited, Rotorua, ISSN: 1174–5096.

Log grades and their specifications

1a: Domestic grades

Log grade	Pruned?	Minimum small-end diameter mm	Maximum knot size mm	Sweep class*
P1	Pruned	400	0	1
P2	Pruned	300	0	1
S1	Not necessary	400	60	1
S2	Not necessary	300	60	1
S3	Not necessary	200	60	1
L1	Not necessary	400	140	1
L2	Not necessary	300	140	1
L3	Not necessary	200	140	1
Pulp	Not necessary	100	No limit	1 or 2

1b: Maximum permissible sweep*

	Log length			
Sweep class	**<3.7 m**	**3.7–4.8 m**	**4.9–7.6 m**	**>7.6 m**
Class 1	d/8	d/4	d/3	d/2
Class 2	d	2d	3d	4d

d = small-end diameter of log.
*Sweep is the maximum deviation from straightness along the length of the log.

2: Export grades

Log grade	Small-end diameter mm	Maximum large-end diameter mm	Maximum knot size mm	Length m	Percentage allowed*	Sweep
Pruned peelers	300+	No limit	0	4.0 6.0	Shipper's option	d/4
Japan A	200–340	800	d/3 up to 150 mm maximum. Excessive number of large knots not permitted	4.0 8.0 12.0	10% balance 50% minimum	d/4 d/2 d
Japan J	200–260	No limit	As above	4.0 8.0 12.0	As above	As above
Korea K	200–260	No limit	As above	3.6 5.4 7.3 11.0	10% maximum balance 40% minimum	As above
Pulp	100+	No limit	No limit	4.0 6.0 8.0	Shipper's option	No limit

d = small-end diameter.

For export grades, small-end diameter is measured at the wharf under Japanese Agricultural Standard (JAS) convention, that is, rounded down to the nearest even 2-centimetre interval.

* Export grades usually demand the longer lengths, favouring 11 metres or 12 metres. Such lengths of acceptable quality are hard to obtain in a typical stand, because the odd scattered large branch or other defect often downgrades the entire unpruned section of the tree or else results in trees being cut into shorter logs. "Shipper's option" refers to the necessity of stacking logs on a ship in such a way as to minimise wasted space and avoid movement at sea. Preferred lengths will vary with the vessels used.

Japan Agricultural Standard (JAS) cubic metre

One JAS cubic metre can be less than an actual cubic metre. The difference between a JAS cubic metre and an actual cubic metre is greatest in logs with large taper and small small-end diameter. For straight, large logs a JAS cubic metre can be greater than an actual cubic metre.

Generally it is not simple to convert an actual cubic metre to JAS cubic metre or vice versa. This is because the relationship depends on individual log's diameter, sweep, and length. The Japanese standards also involve special ways of assessing diameter and length.

Conversion factors for long logs of radiata pine, based on taper and small-end diameter, are in table 3. To convert actual cubic metres to JAS cubic metres for such logs, multiply the volume in actual cubic metres by the number shown in the table. And, to convert from JAS to actual cubic metres, divide JAS cubic metres by the number in the table.

3: JAS cubic metre conversion for radiata pine logs (log lengths from 9 to 11.9 metres)

Taper	**Small-end diameter**		
cm/m	**10–20 cm**	**20–30 cm**	**30–40 cm**
0.4–0.79	1.115	1.119	1.127
0.8–1.19	0.942	1.033	1.068
1.2–1.59	0.795	0.942	1.022
1.6–1.99	0.662	0.867	0.959
2.0–2.39	0.566	0.799	0.901

To measure small-end diameter (SED) for JAS purposes, the rule is to take the smallest diameter measurement, and round it down to the nearest whole centimetre. For example, if the smallest measurement of SED is 12.9 centimetres, the JAS SED would be 12 centimetres. The situation is more complex for SEDs equal to or greater than 14 centimetres. The shortest and longest diameters are recorded from the small-end of the log, and are rounded down to the nearest even 2-centimetres interval (eg 17.5 centimetres would become 16 centimetres).

To measure length of log for JAS, measure the straight-line difference between the log ends. For a swept log the straight-line distance is shorter than the distance along the log.

The above brief description shows that conversion from actual cubic metres to JAS cubic metres (or conversely) is complex. For more information on JAS cubic metre, see the source cited at the beginning of this document.

Information on NZ log grades and their specifications and on JAS is available from other sources also. For example, New Zealand Ministry of Forestry 1994, *Marketing A Small Forest*, The Small Forest Management Series 8, ISBN: 0–477–02139–5.