



GENERAL PROVISIONS

1. Scope

The purpose of grading rules is to maintain a standard or measure of value between mills manufacturing the same or similar woods so that uniform qualities will be the result.

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2. Interpretations

The interpretations of these rules are vested in the National Lumber Grades Authority.

Written Interpretations of these rules have been prepared by the National Lumber Grades Authority in order to promote the uniform application of these rules.

A copy of the Interpretations are included at the back of this grade rule book for your convenience.

3. Lumber

Lumber is a manufactured product derived from a log in a sawmill or planing mill, which when rough shall have been sawed, edged, and trimmed at least to the extent of showing saw marks or other marks made in the conversion of logs to lumber on the four longitudinal surfaces of each piece for its overall length, and which has not been further manufactured other than by cross-cutting, ripping, resawing, joining crosswise and/or endwise in a flat plane surfacing with or without end matching and working.

4. American and Canadian Standard Lumber

Lumber manufactured and measured according to the provisions of these rules may be regarded as American and/or Canadian Standard Lumber meeting the provisions of PS 20 and/or CSA 0141 and may be so designated. (Commonly referred to as ALS and/or CLS Lumber.)

5. Original Grading

The grade of lumber, as determined by the grader, applies to the size, form, condition or degree of seasoning at time of original grading.

6. Remanufacturing

Except in the case of such items as factory lumber, material supplied in accordance with these rules is not graded with the intent that it be suitable for remanufacturing to smaller sizes.



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7. Species Covered

The provisions of the NLGA Standard Grading Rules apply to the following softwood and hardwood lumber species grown and manufactured in Canada.

Softwood Lumber Species

Commercial Name	Botanical Name	Grade Stamp Identification
Eastern White Cedar or Northern White Cedar	<i>Thuja occidentalis</i>	East White Cedar (N) or EW Cedar (N)
Western Red Cedar or Red Cedar	<i>Thuja plicata</i>	WR Cedar (N)
Yellow Cedar or Yellow Cypress	<i>Cupressus</i> (<i>Chamaecyparis</i>) <i>nootkatensis</i>	Y Cedar (N)
Alpine Fir or Subalpine Fir	<i>Abies lasiocarpa</i>	Alpine Fir (N) or Ap Fir (N)
Amabilis Fir or Pacific Silver Fir	<i>Abies amabilis</i>	Am Fir (N)
Balsam Fir	<i>Abies balsamea</i>	B Fir (N)
Grand Fir	<i>Abies grandis</i>	G Fir (N)
Eastern Hemlock	<i>Tsuga canadensis</i>	East Hemlock (N) or E Hem (N)
Western Hemlock or Pacific Coast Hemlock	<i>Tsuga heterophylla</i>	W Hem (N)
Tamarack or Eastern Larch	<i>Larix laricina</i>	Tam (N)
Western Larch	<i>Larix occidentalis</i>	Larch (N)
Douglas Fir	<i>Pseudotsuga menziesii</i>	D Fir (N)
Eastern White Pine	<i>Pinus strobus</i>	East White Pine or EW Pine (N)
Jack Pine	<i>Pinus banksiana</i>	J Pine (N)
Lodgepole Pine	<i>Pinus contorta</i>	L Pine (N)
Ponderosa Pine or Yellow Pine	<i>Pinus ponderosa</i>	P Pine



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Red Pine	<i>Pinus resinosa</i>	R Pine
Western White Pine or Idaho White Pine	<i>Pinus monticola</i>	WW Pine
Whitebark Pine	<i>Pinus albicaulis</i>	WB Pine
Black Spruce	<i>Picea mariana</i>	B Spr (N)
Coast Sitka Spruce or Sitka Spruce	<i>Picea sitchensis</i>	C Sitka
Engelmann Spruce	<i>Picea engelmannii</i>	E Spr (N)
Red Spruce	<i>Picea rubens</i>	R Spr (N)
White Spruce	<i>Picea glauca</i>	W Spr (N)
Western White Spruce		WW Spr
Norway Spruce *	<i>Picea abies</i>	N Spr (N)

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* **Note:** Norway spruce does not have design values for structural use in Canada or the U.S. and therefore may not be intermingled with structural lumber of any species that have design values, nor shall it be grade-stamped to any grade within the NLGA Grade Rules that have design values.

Hardwood Lumber Species

Commercial Name	Botanical Name	Grade Stamp Identification
Aspen Poplar or Aspen or Trembling Aspen	<i>Populus tremuloides</i>	Aspen (N)
Large-tooth Aspen	<i>Populus grandidentata</i>	
Black Cottonwood	<i>Populus trichocarpa</i>	B Cot
Balsam Poplar	<i>Populus balsamifera</i>	B Pop
Red Alder **	<i>Alnus rubra</i>	Alder (N)
White Birch **	<i>Betula papyrifera</i>	W Birch

** **Note:** In the U.S., Red Alder and White Birch do not have approved design values for structural use. For shipments to the U.S., therefore, these species may not be intermingled with structural lumber of any species that have design values, nor shall they be grade-stamped to any grade within the NLGA Grading Rules that have design values.



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7a. Species Combinations

A number of Canadian timber species that are grown together and are jointly harvested, manufactured and marketed, have similar performance properties which make them interchangeable in use. For the purposes of identification in the marketplace (because some species cannot be visually separated in lumber form) and standardization of assigned lumber design values, certain species are given a common grade stamp designation.

The various species combinations which may be grade-stamped with a common designation are listed below:

Species Combination	Commercial Designation	Combination Grade Stamp Identification
Douglas Fir Western Larch	Douglas Fir - Larch	D Fir-L (N)
Western Hemlock Amabilis Fir	Hem-Fir (North)	Hem-Fir (N)
White Spruce Engelmann Spruce Black Spruce Red Spruce Lodgepole Pine Jack Pine Alpine Fir Balsam Fir	S-P-F or Spruce-Pine-Fir	S-P-F or Spruce-Pine-Fir
Any Canadian lumber species covered by the NLGA Grading Rules <u>except</u> for Norway Spruce in Canada and Norway Spruce, Red Alder & W. Birch in the U.S.	Northern Species	North Species or N. Species
Eastern Hemlock Tamarack	Eastern Hemlock-Tamarack (North)	Hem-Tam (N)
Yellow Cedar Western Red Cedar	Western Cedars (North)	W Cedar (N)



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Aspen Poplar Largetooth Aspen Balsam Poplar	Northern Aspen	N. Aspen
D Fir-L Hem-Fir Coast Sitka Spruce	Coast Species	Coast Species

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Since the composition of species in timber stands varies and there is no practical way to determine the species percentage that might be included in a particular shipment, lumber marked with a combination grade stamp may be all of any one species or some mixture of any of the species in the combination.

7b. Structural Design Values

In Canada, even though the individual species of a combination group may be separately identified by the grade stamp, structural design values for dimension lumber and timbers are only published (CSA O86 Engineering Design in Wood) for four Canadian species combinations: S-P-F, D Fir-L (N), Hem-Fir (N) and North Species. This is because the first three combinations, which are specified and used as combinations, were sampled and tested as coherent groups. The fourth combination, North Species, is a bracket group for any Canadian species covered by the NLGA Grading Rules except for Norway Spruce in Canada and Norway Spruce, Red Alder and White Birch in the U.S.

In the U.S., for Dimension Lumber, as listed under NLGA Standard Grading Rules, Section 900 and published in the American Wood Council (AWC) National Design Specification (NDS) Supplement, the exceptions to the structural lumber design value combination groups are Coast Sitka Spruce and Yellow Cedar, individual species which have separate, species specific, assigned design values.

In the U.S., for Timbers (Beams and Stringers & Posts and Timbers), as per NLGA Standard Grading Rules, Tables 905n and 905o and published in the AWC NDS Supplement, design values for North Species are not assigned, but rather, in addition to S-P-F, D Fir-L (N) and Hem-Fir (N), the following species or combinations have separate assigned design values: Coast Sitka Spruce, Hem-Tam (N), Ponderosa Pine, Red Pine, Western Cedars (N), Western Hemlock (N) and Western White Pine.





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Mills may separate individual species of dimension lumber for manufacturing or marketing purposes, although there is no advantage in such separation for design values. In Canada, where individual species of dimension lumber, other than those species in S-P-F, D Fir-L (N) or Hem-Fir (N) combination groups, are shipped alone or in combination, the design values of North Species apply. As noted previously, for the U.S. only, Coast Sitka Spruce and Yellow Cedar are exceptions to this rule and if grade-stamped separately the design values are assigned as listed under the NLGA Grading Rules, Section 900 and published in the AWC NDS Supplement.

Where shipments include species from two or more combination groups, which are not separated, the lowest design values of these species combinations shall apply.

8. A Lumber Grade

A lumber grade is a minimum standard describing the extent and limitations of the characteristics permitted in a piece of lumber having regard to the end use for which the grade is intended. Since no two pieces of lumber are identical, complete uniformity in grades or shipments is impossible. A shipment of a specific grade shall not be made up only of pieces containing characteristics of the maximum number or size permitted. It is recognized that grades or specifications may overlap and that producers of lumber may utilize other grading rules or specifications and may sort their lumber accordingly; and therefore, nothing in these rules precludes or prohibits the selection of pieces of lumber meeting the requirements of more than one grade or specification for use in any of the grades or specifications for which it qualifies.

9. Freedom of Contract

The right to freedom of contract between buyer and seller is recognized and any of the provisions of these rules may be set aside by special agreement. However, if the lumber is grade stamped it must still meet or exceed the minimum provisions of the grade as defined in the rules.

'Out of Contract' situations are identified in Para 410.3.

10. Inspection

The inspection of lumber is the visual analysis of lumber.





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11. Grading

The grading of lumber is the application of a grading rule to lumber for the purpose of determining the grade of a piece of lumber based on inspection and/or on non-destructive mechanical methods.

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12. Grade Checking

The grade checking of lumber is the inspection of lumber for the supervision control made by an Accredited Agency on its graders' performance.

13. Re-Inspection

The re-inspection of lumber is the verification made upon a claim, of a shipment or an item of a shipment. Refer to Para. 400 for details.

14. Faces Graded

Unless otherwise specified the following standard procedure will apply:

Dimension, timbers and similar items are graded for strength; characteristics on all four sides and both ends are considered in relation to their effect on the strength of the piece. The principal factors which govern the strength of a piece of lumber are the slope of grain, size of knots and their location. It is primarily on the basis of these factors that the stress value of any grade is assigned. Other characteristics of wood which have a lesser effect on strength, such as shake, splits, etc., are then restricted or not permitted so that the assigned values for the grades are assured. Some characteristics such as pitch streaks, pitch pockets and wane may be restricted merely for the sake of appearance. Knots not firmly fixed, unsound knots and knot holes, which have no more effect on strength than sound knots, are restricted in most grades in order to improve appearance.

Other yard lumber, when rough or surfaced, is graded from the face or best side unless otherwise specified. The reverse face may have characteristics approximately one grade lower than the face.

Factory lumber is graded from the poorer face.





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15. Grade of Piece

The grade of each piece is determined by the application of the rule to the sum of all its characteristics.

Each grade description lists the major characteristics which may be acceptable and usually limits them as to location, type, area, size or number.

16. Equivalent Characteristics

When characteristics are not described they are appraised in relation to the characteristics permitted or limitations prescribed for the grade under consideration and are allowed if judged by the grader or inspector to be equivalent in effect to those described.

17. Maximum Combination of Characteristics

All or nearly all of the permissible characteristics of the grade are rarely present in maximum size or number in any one piece. Any piece with an unusual combination of characteristics which seriously affects normal serviceability is excluded from the grade under consideration.

18. Variation in Grading

The grading of lumber cannot be considered an exact science because it is based on a visual inspection of each piece and the judgement of the grader. The provisions of the NLGA Grade Rules and NGR are, however, sufficiently explicit to establish a maximum of five (5) percent below grade as a reasonable variation between graders.

19. Percentage of Volume

Except as otherwise specified, all percentages referred to herein are applicable to volume (FBM).

20. Basic Size

The number and/or size of the characteristics permitted in a grade varies as the area of the piece increases or decreases in relation to basic size specified.





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21. Basis for Rough Lumber

Characteristics permitted and limitations for rough lumber are the same as those for dressed lumber of like kind and grade. In addition, such characteristics which are likely to disappear in dressing rough lumber to standard sizes are allowed, however, when rough lumber is graded for shipment in the rough no such allowance is permitted unless otherwise specified.

22. Manufacture Classification

- a) Rough Lumber
- b) Dressed Lumber
- c) Worked Lumber
- d) Product of Lumber

a) **Rough Lumber** - Lumber that has not been dressed (surfaced), but which has been sawed, edged and trimmed at least to the extent of showing saw marks or equivalent on the four longitudinal surfaces of each piece for its overall length.

b) **Dressed (Surfaced) Lumber** - Lumber that has been dressed by a planing machine (for purposes of attaining smoothness of surface and uniformity of size) on one side (S1S), two sides (S2S), one edge (S1E), two edges (S2E), or a combination of sides and edges - S1S1E, S1S2E, S2S1E or S4S.

c) **Worked Lumber** - Lumber which in addition to being dressed has been matched, shiplapped or patterned.

i) **Matched Lumber** - Lumber that has been worked with a tongue on one edge of each piece and a groove on the opposite edge to provide a close tongue-&-groove joint by fitting two pieces together. When end matched the tongue and groove are worked on the ends also.

ii) **Shiplapped Lumber** - Lumber that has been worked or rabbeted on both edges of each piece to provide a close lapped joint by fitting two pieces together.

iii) **Patterned Lumber** - Lumber that is shaped to a pattern or to a moulded form, in addition to being dressed, matched or shiplapped, or any combination of these workings.





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d) Product of Lumber - The term “**Product of**” denotes that a facility has ripped, resawn or patterned the material from standard grades of lumber, and;

- i)** design values do not apply when using a “**Product of**” designation; and
- ii)** lumber with “**Product of**” designation shall not be intermingled with lumber having design values.

23. Basis of Measurement

Board measure is the standard basis of measuring lumber under these rules. The board measurement of lumber, rough or dressed, is based on the corresponding nominal dimension.

24. Unit of Measurement

Board foot is the unit of measurement of lumber. A board foot is the quantity of lumber contained in or derived by drying, dressing or working from a piece of rough green lumber 1 inch thick, 1 foot wide, and 1 foot long, or its equivalent in thicker, wider, narrower or longer lumber.



25. Board Measure

The number of board feet in a piece of lumber is obtained by multiplying the nominal thickness in inches or fraction of an inch by nominal width in feet by the length in feet.



26. Thin Lumber

For lumber with a nominal thickness less than one (1) inch, the number of board feet equals the product of the nominal width in feet by the length in feet.

27. Stick Tally

In lumber specified to be measured with a board rule (stick) on actual widths, pieces measuring to the even half-foot are alternately counted as of the next higher and lower foot count; fractions below the half-foot are dropped and fractions above the half-foot are counted as of the next higher foot.

28. Standard Sizes Tally

Standard lumber should be tallied board measure. The invoices for lumber of standard sizes shall show the number of pieces of each nominal size and length as well as the net thickness and width of such lumber.





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29. Non-Standard Sizes Tally

Lumber finished to non-standard sizes should be tallied board measure as of either the rough or the nominal size necessarily used in its manufacture, and the actual thickness and width of such lumber should be shown on the invoice.

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30. Standard (Dressed) Sizes

Standard thicknesses and widths are shown in Section 12 of these rules. The dressed thickness and widths, as shown, are considered standard for corresponding nominal sizes as shown. Lumber of any size, rough or dressed, is described by its nominal dimensions in customary use and in these rules.


31. Nominal and Actual Sizes

The use of "Nominal" sizes in the language of these rules is for convenience purposes only and follows the practice of the industry. No inference should be drawn that the "nominal" sizes are actual sizes.

32. Rough Sizes



The minimum rough thickness of dry and green lumber 1 or more inches in nominal thickness shall be not less than $\frac{1}{8}$ " (3mm) thicker than the corresponding minimum standard dressed thickness, except that up to 20 percent of a shipment shall be not less than $\frac{3}{32}$ " (2mm) thicker than the corresponding standard dressed thickness. The minimum rough widths shall not be less than $\frac{1}{8}$ " (3mm) wider than the corresponding standard dressed width.



33. Resawn or Ripped Surface Lumber

When ripping or resawing surfaced lumber a maximum tolerance of $\frac{1}{32}$ " over or under in thickness or $\frac{1}{16}$ " over or under in width will be permitted in the occasional piece.

34. Average Width

There are two methods of calculating average width:

a) The Standard Average Method

The average width in inches of a shipment of lumber is computed by dividing the total board feet by the total length in feet and multiplying the result by 12; but if thicker than one (1) inch, the total board foot tally is divided first by the nominal thickness as expressed in inches and fractions of an inch.



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b) The Board Foot Method

The average nominal width of a shipment is computed by multiplying the board feet of each width by the width and dividing the total number of board feet times the width, by the total board feet.

35. Standard Lengths

Standard lengths are multiples of 1', but some items are customarily shipped in multiples of 2'. In all items longer lengths than those listed may be included at shipper's option.

36. Trimmed Length

Unless otherwise stated in the contract of purchase, lumber under these rules is trimmed for the removal of sniped, splintered or uneven log lengths. It must be trimmed full to length specified and **a) if 2" or less** - not more than 3" over length; **b) 3" and 4"** - not more than 4" over length; and **c) 5" and thicker** - not more than 6" over length.



37. Average Length

The average length in feet of a shipment of lumber is computed by dividing the total length in feet by the total number of pieces in the shipment.



38. Grade Stamped Lumber

Standard lumber (rough or dressed) in the species covered by these rules may be available grade stamped under the direction of agencies accredited by the CLSAB, or for the U.S. market by the ALSC Board of Review.

39. Grade Stamps

A certified grade stamp is the buyer's assurance that the lumber involved has been carefully inspected by a qualified grader who is regularly supervised for grading efficiency in accordance with the requirements of CSA Standard 0141 and/or PS 20, and that the lumber was graded under a grading rule approved by the CLSAB and/or the ALSC Board of Review.





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Each grade stamp shows the:

- a) registered symbol of the certified agency
- b) mill and/or grader identity usually by number
- c) grading rule used where applicable
- d) grade
- e) species or species group

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In addition some indications relating to sizes, moisture content and heat-treatment (HT) may be added to the grade stamps.

40. Grading Rule

When lumber is graded in accordance with the NLGA grade rules, grade stamps of a CLSAB accredited Canadian agency, shall contain the abbreviation "**NLGA**". Accredited agencies may also be approved to grade under other rules.

41. Grade

The lumber grade is identified by the appropriate grade name or grade name abbreviation as shown in these rules.

Mixed grades – Grade stamping other than the two (2) highest established grades for each grading rule category shall not be permitted. When the two (2) highest established grades are grade stamped using a combination grade stamp, the design values for the lowest grade in the combination are applicable except when specific values have been assigned to the mixed grade (i.e. NO. 1 & Btr D Fir-L (N)).

The grade stamp for boards must show the paragraph number of the pertinent paragraph if the grade name is the same or similar to that used in any other board grade.

When grade-stamping boards whose surfaced thickness is in excess of $1\frac{5}{16}$ " , the grade stamps shall include in addition the word "**BOARD**" to indicate that the piece of lumber is a board and not stress graded.

42. Species

The species or species combination is identified on the grade stamp by species name, by approved abbreviation or by approved group identification.

43. Sizes

If lumber is dressed to a size below minimum American and Canadian Standard Lumber requirements, the stamp shall show the size.





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44. Moisture Content Standards

The moisture content of wood is the weight of water in wood expressed as a percentage of the weight of the wood from which all water has been removed (oven dry). Moisture is removed from lumber by air drying, by use of dry kilns or by other artificial means.

Dry Lumber - is lumber which has been dried to a moisture content of **19% or less**.

Green Lumber - is lumber having a moisture content of **over 19%**.

a) Boards & Dimension



Any 4" and thinner Boards or Dimension lumber surfaced at a moisture content (MC) of 19% or less may be stamped "**S-DRY**" or if kiln dried to a maximum moisture content of 19% it may be stamped "**KD**". Except as otherwise provided, any lumber surfaced at a moisture content of 15% or less may be stamped "**MC15**" or if kiln dried to a maximum MC of 15%, it may be stamped "**KD15**". It is also permissible to stamp as "**S-DRY**" or "**KD**" if kiln dried, lumber surfaced at a moisture content of 15% or less. However, if such lumber is invoiced as "**MC15**" or "**KD15**" or some lesser moisture content and reinspection is made, the invoice provisions shall prevail for purposes of reinspection.

Grade stamps for 4" & thinner Boards or Dimension surfaced at a moisture content over 19% will show "**S-GRN**" on the stamp.

b) Clears, Selects, Factory Lumber & Moulding Stock

All grades 2" or less in thickness sold as DRY (seasoned) shall be dried to 15% maximum moisture content, stock over 2" thick may be dried to 19% maximum moisture content.

Orders for lumber of a moisture content varying from the above shall be subject to special agreement.

c) Lumber over 4" Thick

Moisture content of lumber over 4" thick shall be subject to special agreement.

d) Shrinkage and Expansion

All lumber shrinks and expands within narrow limits with changes in moisture content much as most other materials swell or shrink with changes in temperature.



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Natural shrinkage or expansion in width and thickness may average approximately 4% from fibre saturation point (*approximately 30%*) to normal dry service conditions. Individual pieces may have more or less shrinkage.

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When lumber is further dried after surfacing an allowance may be made of 1% (0.7% for Western Red and Eastern White Cedar) reduction in size for each 4% reduction in moisture content based on the actual moisture content of the dry items and on 30% moisture content for unseasoned items. The same tolerance will be applied to dry items subject to re-absorption.

Shrinkage or expansion percentages are average values. Shrinkage and expansion of individual pieces may vary. In large sizes, where it is impractical to establish the moisture content, any allowance for shrinkage or expansion must be left to the judgement of experienced personnel.

Note: *The range of shrinkage of individual pieces from experimental observation is from 2% to 7%. Variables that affect measurement and shrinkage of lumber are: density, species, grain orientation and allowable grade characteristics. See Forintek Canada Corp. - Jessome, A.P. 2000 SP-514 Report or the U.S. Forest Products Laboratory Research Reports 15 and 30.*



45. Supplementary Provisions

All provisions outlined in the preceding paragraphs, where appropriate, supplement the specific provisions for the various items outlined in these rules.

46. Specified Species

All grades in this rule apply to all species unless otherwise specified. Although some paragraphs are identified with particular species, this does not preclude other species being graded under these paragraphs on request.

47. Reprints from Other Rules

a) Paras. 112, 113, 151, 160, 161 and 162 are reprinted from WWPA rules; **b)** Para. 195 is reprinted from WCLIB rules; and **c)** Para 164 is reprinted from NELMA rules.



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48. Design Values

For use in Canada, design values are assigned to the grades by the CSA Technical Committee on Engineering Design in Wood.

Design values are published in the current edition of CSA O86.

For use in the U.S. design values are included in Para. 900 and published in the AWC NDS Supplement.

Note: *The ALSC Board of Review does not approve design values for use in Canada and the CSA Technical Committee on Engineering Design in Wood does not approve design values for use in the U.S.*





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