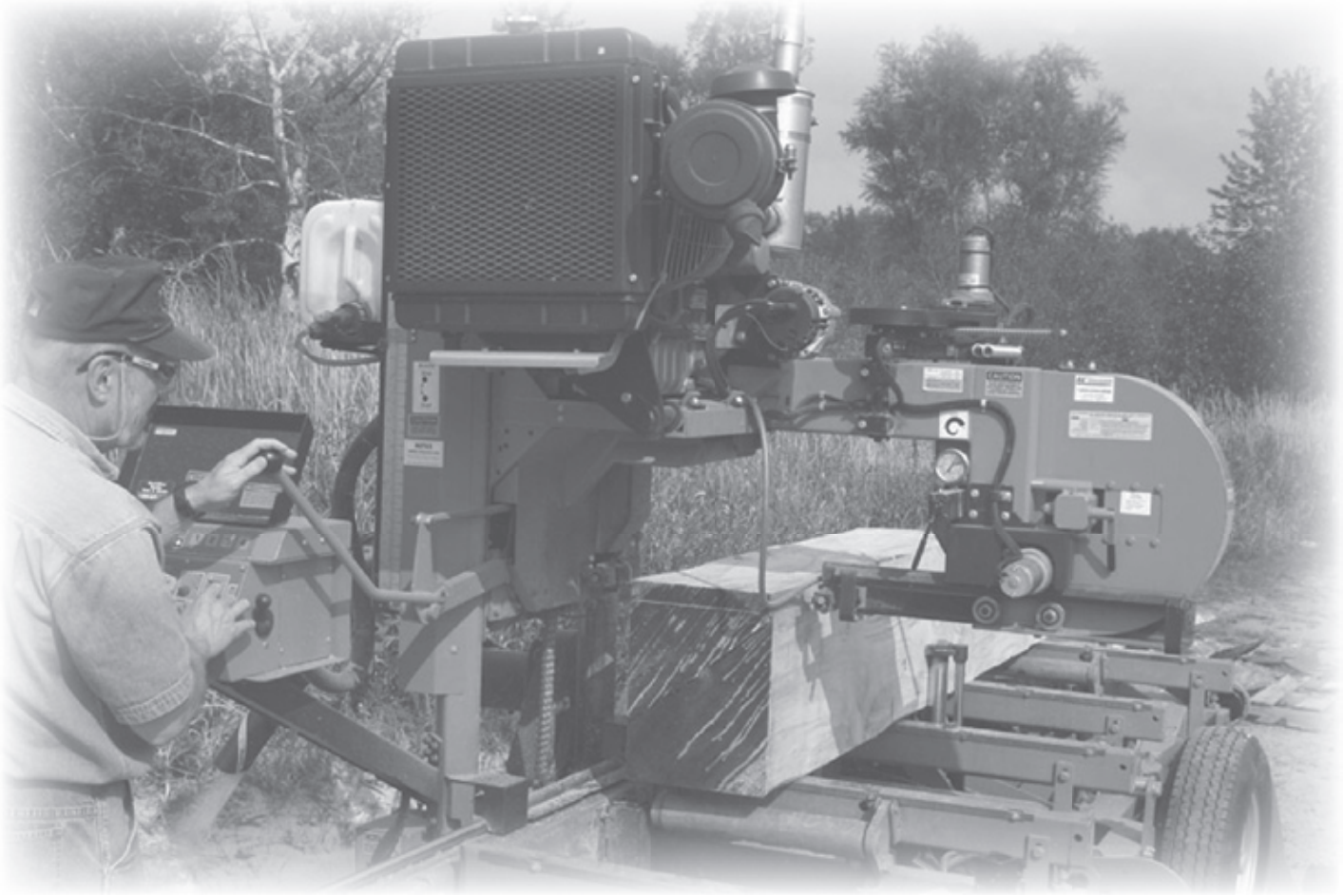

WISCONSIN LOCAL-USE DIMENSION LUMBER GRADING

By Dr. Robert Govett,

Professor and Forest Products Outreach Specialist
College of Natural Resources, University of Wisconsin-Stevens Point

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Purpose, Authority and Responsibilities

On April 7, 2008 Governor Doyle signed into law 2007 WISCONSIN ACT 208, an act to renumber and amend 101.977; to amend 101.66 (1); and to create 36.25 (47), 101.66 (1m) and 101.977 (2) of the statutes; relating to: exemption from construction standards for certain load-bearing dimension lumber and establishing a training program in the grading of lumber. (2007 WISCONSIN ACT 208 is Appendix #1)

2007 WISCONSIN ACT 208 established that: The forest products outreach program at the University of Wisconsin-Stevens Point, in cooperation with the Department of Natural Resources, shall establish a basic lumber grading training program for individuals and establish the general requirements for successfully completing the training program, including requirements for initial certification and recertification. This document was developed for that purpose, establishing the requirements for the Wisconsin Local Use Dimension Lumber Grades and the foundation for the training program. 2007 WISCONSIN ACT 208 further established (they) shall develop and establish the content of the training program and shall determine the certification requirements for instructors teaching the training program. The department, in cooperation with the board, shall establish a procedure under which the department determines successful completion of the training program and issues certifications of accomplishment to the individuals who are certified or recertified as having successfully completed the training program.

The purpose of this training program is to permit in very limited circumstances that dimension lumber (that has not been grade-stamped under the authority of a lumber grading bureau) may be used in the construction of a dwelling. For this to be allowed under 2007 WISCONSIN ACT 208, the person milling the lumber must sell the lumber directly to the person who will inhabit the dwelling (or to a person acting on his or her behalf) and for whom a building permit has been issued for the dwelling. Further, 2007 WISCONSIN ACT 208 requires this dimension lumber shall be milled so that it meets or exceeds the requirements of the one and two family dwelling code, and that the person milling the lumber shall provide to the person receiving the lumber a written certification that the lumber meets or exceeds these requirements. The person milling lumber who is to provide the written certification regarding the lumber, is required to have been issued (within the last five years) a certificate of accomplishment evidencing certification or recertification under the lumber grading training program. They are required to attach a copy of his or her certificate of accomplishment to the written certification. In a final oversight the building inspector may authorize the use of the lumber, reject the use of the lumber, or authorize its use subject to more restrictive construction requirements, including requirements as to size, spacing, length of spans, and design. (And it should be noted that this grouping of three parties being involved, including the occupying owner purchasing the lumber, the manufacturer milling the lumber for that person, and this being performed in clear view of the building inspector with appropriate documentation. This is exactly what the limitations within 2007 WISCONSIN ACT 208 require. This does not apply to other circumstances.)

2007 WISCONSIN ACT 208 establishes that some individuals may be exempt from the training program, an example being for someone with a level of experience or background in understanding wood properties, construction, and design that is determined to be equivalent to the level of understanding held by an individual who successfully completes the training program. A clear example of such a person would be someone who has had prior training, and certification as a dimension lumber grader who was allowed to apply the grade stamp for any established grading bureau involved in the grading of dimension lumber (such as NeLMA,

Northeastern Lumber Manufactures Association). This is in simple recognition that persons with appropriate prior experience and training may reference some specifics required within the certification program under 2007 WISCONSIN ACT 208 and with demonstration of such specific knowledge would have the ability to perform at least at a level of individuals who have simply successfully completed the training program without additional prior training. It needs to be clearly understood that completion of the training program cannot make any person a certified lumber inspector of any established lumber grading bureau (such as the Northern Softwood Lumber Bureau or the Western Wood Products Association). Will the specific knowledge requirements within the certification program under 2007 WISCONSIN ACT 208 represent the much broader scope of knowledge required to be a qualified lumber inspector under any established lumber grading bureau that grade stamps dimension lumber. The completion of the training program does not allow any person to apply the grade stamp of any established lumber grading bureau.

History and Background

In a common sense test it must be recognized from the beginning that all parties concerned have a vested interest in ensuring that lumber used in residential construction in Wisconsin be of appropriate quality to perform in use at least as well as lumbar with a grade stamp. The homeowner who will occupy the dwelling has a clear vested interest, but the manufacturer of the lumber also has an interest that the product sold to that homeowner will perform at least as well as is expected for use in the construction of the homeowner's dwelling since the manufacturer would typically be expected to have greater knowledge of that quality than the homeowner purchasing the product. In the role of providing appropriate oversight of the construction, the building inspector clearly needs to have a level of comfort that materials used should reasonably ensure adequate performance to design standards.

These vested interests are all good reasons for the use of grade-stamped lumber in residential construction. However, it must be recognized that it is impractical to obtain grade stamp authority for what is commonly called "local-use lumber" which is manufactured and used in a local (typically rural). The producing mills tend to be small mills, with levels of production that would make obtaining and maintaining the ability to grade-stamp cost prohibitive. At the same time it must be recognized that Wisconsin has a long, rich tradition of using "local-use lumber" in construction – punctuated only for a few years with statewide enforcement of the code requiring use of grade-stamped lumber – with no apparent problems resulting from such use of lumber that had not been grade stamped. There are good practical reasons why some people would like to continue using "local-use lumber". We clearly have experience over many years that "local-use lumber" can perform adequately in residential construction. It is reasonable to assume that if "local-use lumber" was simply sorted by someone with a reasonable knowledge of wood properties, lumber, and structural design, with only the better pieces selected for use (and the poorer pieces rejected), then "local-use lumber" could be expected to be at least as good, and perhaps better than grade-stamped lumber of the (minimum) required grade for use in the dwelling. However, it must also be recognized that in some circumstances an unacceptably large number of below-grade pieces could be included within "local-use lumber" than would reasonably be expected with grade-stamped lumber.

It is recognized (and typically noted within grade rules of lumber inspection bureaus) that the visual grading of lumber cannot be considered an exact science because it is based on the judgment of the grader using a visual inspection of each piece. Generally it is considered that 5% below grade is a reasonable variation between graders in the grading of dimension lumber. In the case of a re-inspection, each item in a shipment is typically considered as being "on-grade" if no more than 5% of the pieces are below grade. It is unrealistic to assume that every piece of grade-stamped lumber that is present in a shipment unit of lumber on a residential construction building site in Wisconsin will exactly meet all requirements of the grade as established by the inspection bureau's grading rules with no pieces below grade.

Consequently, it is ridiculous to pretend that perfection can be expected in the assessment for use of "local-use lumber." Neither is realistic to expect every piece of "local-use lumber" considered by someone who has attended a basic lumber grading training program as required under 2007 WISCONSIN ACT 208 can (or even should) achieve a level of conformance to established lumber grades that a certified lumber inspector cannot be expected to do.

Just as it is recognized that some small fraction of grade-stamped lumber may be expected to be below grade. It must also be recognized that the characteristics permitted within the requirements for a grade establish the minimum threshold of a number of characteristics establishing minimum requirements (or worst possible manifestation of the various characteristics allowed) within the grade. Only a very small fraction of the pieces of lumber within a grade will manifest most or all of the various grading characteristics at the low end of minimum requirements of the various characteristics within that grade. The lumber within that grade will also include lumber for which all except one of the grading characteristics actually exceed the minimum requirements for the next higher grade, and everything in between.

The interpretation of grade is not to be in a circumstance that considers just this lowest possible grouping of pieces barely meeting grade (or only the highest possible grouping of pieces) being sent out on any shipment unit. It includes all lumber that would grade between the next higher grade (above) and the next lower grade (below). To this end, it is clearly inappropriate to sub-sort a grade, selecting the best specimens for some special market or purpose and aggregating the poorest pieces that barely make grade and then to represent (misrepresent) those pieces as being a normal grade mix of lumber. However, it is common to aggregate all higher grade lumber with lumber in a grade and represent it as such.

Common examples of this would be when lumber is sold as "Standard and Better" or "Number 2 and Better". This is commonly done where special markets for (or volume of) the higher grades of lumber does not warrant further segregation. In such sorts, the buyer recognizes that some tiny fraction of the lumber could still reasonably be expected to be below grade, the mix of lumber received should include some pieces that would have graded above the specified grade of "Standard" or "Number 2" (as would be expected in a normal woods-run mix) but those higher grade pieces have not been segregated out for sale separately. (When lumber is sold as "Standard and Better" or "Number 2 and Better" the manufacturer/seller is not allowed to remove the higher grade lumber.) Consequently in purchasing such lumber, the buyer reasonably expects that the lumber received should be of better average quality because it includes the higher grade pieces that would normally be included in a separate (higher) grade. While recognizing that this does nothing to preclude some small fraction of the lumber being below grade.

2007 WISCONSIN ACT 208 and Wisconsin Local Use Dimension Lumber Grades Relationship to Other Grading Rules and Standards

Given the underlying objectives of 2007 WISCONSIN ACT 208, it is by design that the Wisconsin Local Use Dimension Lumber Grades and many practices closely approximate industry practices. This should not be confused to be interpreted that lumber graded within the requirements for the Wisconsin Local Use Dimension Lumber Grades is in any way "Grade Mark" or "Grade Stamp" lumber and may not be represented as such by anyone within the written certification provided with the lumber or by any other means. Regardless of the best intentions of the sawmills producing Wisconsin Local Use Dimension Lumber Grades under 2007 WISCONSIN ACT 208, the product is not produced under an accredited lumber grading agency.

There is no accredited agency that maintains a supervisory inspection service under which the mill authorized to certify lumber produced under 2007 WISCONSIN ACT 208.They are not inspected regularly as to grading efficiency and conformity to all the agency established rules for grade marking and other requirements. There is no special distinguishable mark to be affixed to the lumber that is registered and symbolizing grading supervision under the Wisconsin Local Use Dimension Lumber Grades under 2007 WISCONSIN ACT 208. Pieces and/or bundles of a given grade produced under 2007 WISCONSIN ACT 208 may be marked in some fashion to indicate the appropriate grade (such as a color of end paint) or by some simple locally produced grade mark used by the mill. Stamps affixed to lumber may not be any kind of facsimiles of the grade marks of any grading and inspection agencies.

Care should be taken to ensure that confusion is not created where someone may believe lumber produced under 2007 WISCONSIN ACT 208 is produced under the authority of an accredited agency. In an effort to avoid confusion, some standardized terminology required in certification for Wisconsin Local Use Dimension Lumber Grades is intentionally slightly different from standardized markings for grading and inspection agencies, (such as standard markings and terminology for surfaced green, surfaced dry and kiln dried lumber). This helps to avoid the likelihood that any mill markings could become facsimiles of the grade marks of any grading and inspection agencies.

For anything not specified within this document and related tables and companion information developed for the instructional program under 2007 WISCONSIN ACT 208, the Voluntary Product Standard PS 20-05

American Softwood Lumber Standard shall be the reference authority. This Standard establishes standard sizes and requirements for development and coordination of the lumber grades of the various species, the assignment of design values when called for, and the preparation of grading rules applicable to each species. It establishes principal trade classifications and lumber sizes for structural, factory and shop use and provides for the classification and measurement of rough and dressed sizes of lumber items. Terms and procedures are defined to provide a basis for the use of uniform methods in the grading, inspection, measurement and description of softwood lumber.

Underlying Principles in Development of the Wisconsin Local Use Dimension Lumber Grades

Considering these factors and the underlying objectives of 2007 WISCONSIN ACT 208 and the methods by which this is to be accomplished, with the lumber milled so that it meets or exceeds the requirements of the one and two family dwelling code as established by the written certification of the person milling the lumber which can be made based on a current (within the last five years) certificate of accomplishment under a State required lumber grading training program. Some realities come quickly to light in how this can reasonably be accomplished while ensuring adequate safeguards. These are some underlying principles (and their implications) in the concept and development of what can be a workable system.

1) The basic lumber grading training program required for individuals under 2007 WISCONSIN ACT 208 must be reasonable in scope and depth. The terminal learning objectives of the program could reasonably be delivered in an appropriate format – such as a highly focused one-day short course (or equivalent). This requires the delivery of information not just related to lumber grading requirements, but also some basic elements of wood science and technology including a basic understanding of wood structure, wood moisture relations and drying, wood shrinkage, and mechanical properties of wood, among other things.

2) The 2007 WISCONSIN ACT 208 clearly focuses on dimension lumber, consequently this already greatly simplifies the training requirements as it excludes a host of lumber products such as the various special board grades, timbers, beams. As per Voluntary Product Standard PS 20-05 of U.S. Department of Commerce (National Institute of Standards & Technology Voluntary Product Standard PS 20-05): Dimension Lumber 3.4.2 (is) from nominal 2- inch to, but not including, nominal 5-inch thickness, and of nominal 2-inch or greater width. Dimension is also designated as framing, joists, planks, rafters, or studs. (Note: See Table #1 for thickness and width size conversions in inches in fractions, decimals and metric conversions. Also see Table #2 standard thickness and width dimension lumber sizes and Tables #3 and #3A for board foot contents of common dimension lumber sizes.) 2007 WISCONSIN ACT 208 does not include reference to Timbers (3.4.3 Timbers - Lumber of nominal 5-inch or greater in least dimension. Timbers are also designated as beams, stringers, posts, caps, sills, girders, or purlins.) or Boards (3.4.1 Boards--Lumber of less than nominal 2-inch thickness and of nominal 2-inch or greater width. Lumber of less than nominal 2-inch thickness and of less than nominal 6-inch width is designated as strips or boards.)

3) Further, where the objective of 2007 WISCONSIN ACT 208 clearly focuses on being able to have local-use lumber produced that meets or exceeds the requirements of the one and two family dwelling code. It is clear that any minimum characteristic requirements established for lumber to be used in place of grade stamped lumber typically required in the one and two family dwelling code must at least meet the basic characteristic requirements of the grade-stamped lumber to be replaced and higher requirements could be established.

4) This also implies is that where the objective of 2007 WISCONSIN ACT 208 clearly focuses on being able to have local-use lumber produced that meets or exceeds the requirements of the one and two family dwelling code. It is not essential to focus on all possible grades of dimension lumber. Rather it is possible to focus on a structuring of grading requirements to replace the lumber that would be specified within the requirements of the one and two family dwelling code. It is clear that the establishment of training to specify what is to be the equivalents of common grades within lumber grade stamps can meet this objective and not every possible dimension lumber grade needs to be considered with an equivalent established for this purpose.

Considering these underlying principles and implications the basic lumber grading training program required for individuals under 2007 WISCONSIN ACT 208 will focus on three basic grades of dimension lumber, specifically they are Wisconsin Local Use Dimension Lumber Number 2 and Better, Stud and Number 3 Grades.

For purposes of requirements for use within the certification program under 2007 WISCONSIN ACT 208 which requires the dimension lumber produced for use under 2007 WISCONSIN ACT 208 shall be milled so that it meets or exceeds the requirements of the one and two family dwelling code. The grades under the Wisconsin Local Use Dimension Lumber grading system and the common grades for which they shall be substitute equivalents are as follows:

* The **Wisconsin Local Use Dimension Lumber Number 2 and Better Grade** shall be the substitute equivalent of the "Number 2 Grade" within the Structural Light Framing Structural Joists and Planks Grades and also at least equal to the "Standard Grade" within the Light Framing Grades within accepted Bureau grade rules for grade-stamped lumber used in residential construction in Wisconsin.

* The **Wisconsin Local Use Dimension Lumber Stud Grade** shall be the substitute equivalent of the "Stud Grade" within accepted Bureau grading rules for grade-stamped lumber used in residential construction in Wisconsin.

* The **Wisconsin Local Use Dimension Lumber Number 3 Grade** shall be the substitute equivalent of the "Number 3 Grade" within the Structural Light Framing Structural Joists and Planks Grades, and also at least equal to the "Utility Grade" within the Light Framing Grades within accepted Bureau grading rules for grade-stamped lumber used in residential construction in Wisconsin.

* The **Wisconsin Local Use Dimension Lumber Economy Grouping** is **NOT** a lumber grade, and it is not intended that lumber included within this grouping is to be used in residential construction. Rather this grouping is included because it is recognized that in mill run production of dimension lumber there will be lumber that does not meet the minimum requirements of the Wisconsin Local Use Dimension Lumber Number 3 Grade. It may have some other lower-end use (in total or in reasonable part) to encourage the marketing and use of such lumber as may be appropriate and possible.

The following pages include specific definitions and descriptions of the Wisconsin Local Use Dimension Lumber Grades of Number 2 and Better Grade, Stud Grade and Number 3 Grade, and the Economy Grouping including their individual characteristics permitted and limiting provisions, for each individual grade and for the Economy grouping. Following this are definitions and explanations regarding the specifics of characteristics permitted and the limiting provisions, including a table (see Table #4) for limits of crook, bow, cup and twist for different piece sizes in various grades. Information regarding minimum allowed sizes based upon conditions of lumber being surfaced in the green or dry condition, or rough (also see Table #3). Table summary of some key limiting provisions (see Table #5). Some published design values for the substitute equivalent grades of the Wisconsin Local Use Dimension Lumber Grades for various species groups (including both softwoods and hardwoods) that may likely be used to produce Wisconsin Local Use Dimension Lumber (see Table #6).

In considering a piece of dimension lumber under Wisconsin Local Use Dimension Lumber Grades, the entire piece of lumber must be considered. This means that both wide faces and both narrow faces and defect apparent on any face that is in excess of the individual characteristics permitted and limiting provisions for the grade will keep that piece of lumber out of the grade. No more than 5% of the pieces of lumber in a shipment unit (or in an individual sale) can be below grade in any aspect.

Number 2 and Better Grade - Wisconsin Local Use Dimension Lumber
2" to 4" thick, 2" and wider -
Characteristics permitted and limiting provisions shall be:

* ***Knots*** – Sound, firm, encased and pith knots if tight and well spaced, are permitted in sizes not to exceed the equivalent of one-fourth (25%) of the nominal width of the wide face of the piece. (Knots appearing on the thickness faces of the piece are permitted in the same quality and size.)

* ***Holes*** (any cause and includes unsound wood except wane, unsound knots, loose knots and not firmly fixed knots) Not to exceed the equivalent of one-fourth (25%) of the nominal width of the piece or equivalent smaller holes per 2 lineal feet. (Holes appearing on the thickness faces of the piece (including unsound wood except wane, unsound knots, loose knots and not firmly fixed knots) are permitted in the same size or equivalent smaller.)

* ***Unsound wood*** (except wane) – Not permitted in thicknesses over 2 inches. In 2 inch lumber to be considered as holes and included within the limiting provisions for holes.

* ***White speck and honeycomb*** – Considered as holes and included within the limiting provisions for holes.

* ***Wane*** – 1/3 the thickness and 1/3 the width, full length, or equivalent, on each face, combined not to exceed 1/2 the thickness or 1/2 the width at any point.

* ***Shake*** – Shake through at ends, limited as splits. Away from ends, shakes including through shakes up to 2 feet long permitted.

* ***Splits*** – Equal in length to twice the width of the piece.

* ***Checks*** – Seasoning checks not limited. Through checks at end are limited as splits.

* ***Slope of grain*** – 1 in 8.

* ***Warp*** – Light. (See table for limits of crook, bow, cup and twist for different piece sizes.)

* ***Skips (or Scant)*** – Heavy. (Lumber may be completely or partly surfaced, or entirely rough. If surfaced, may have skips in places up to 1/8 inch deep, or if rough, may be scant in places up to 1/8 inch scant. The areas of skip (or scant) are not to exceed 2 feet in length in any one place.)

* ***Manufacture*** – Manufacturing Imperfections Allowed – Admits heavy torn grain, heavy raised grain, heavy loosened grain; heavy machine bite; heavy machine gouge; heavy machine offset; heavy chip marks; knife and saw marks; heavy wavy dressing and sawing variation; and heavy mismatch.)

* ***Pitch and pitch streaks*** – Not limited.

* ***Pockets*** – Pitch or Bark – Not limited.

* ***Stain*** – Stained wood not limited.

* Lumber included in the ***Wisconsin Local Use Dimension Lumber Number 2 and Better Grade*** is to reasonably represent the mill-run of dimension lumber produced at least meeting these requirements and limiting provisions, without sort-out removal of higher grade dimension lumber. (This is not to constrain the simultaneous production of appearance grade boards and other lumber products other than dimension.)

Stud Grade - Wisconsin Local Use Dimension Lumber
2" to 4" thick, 2" and wider - Characteristics permitted and limiting provisions shall be:

* ***Knots*** – Well spaced knots of any quality are permitted in sizes not to exceed the equivalent of one-third (33.3%) of the nominal width of the wide face of the piece. (Knots appearing on the thickness faces of the piece are permitted in the same quality and size.)

* ***Holes*** (any cause – and includes unsound wood except wane) - Not to exceed the equivalent of one-third (33.3%) of the nominal width of the piece or equivalent smaller holes per 2 lineal feet. (Holes appearing on the thickness faces of the piece (including unsound wood except wane) are permitted in the same size or equivalent smaller.)

* ***Unsound wood (except wane)*** – Considered as holes and included within the limiting provisions for holes.

* ***White speck and honeycomb*** – Considered as holes and included within the limiting provisions for holes.

* ***Wane*** – 1/3 the thickness and 1/2 the width, full length, or equivalent, on each face, combined not to exceed 1/2 the thickness or 3/4 the width at any point.

* ***Shake*** – Surface shakes permitted. If shake through at ends, limited as splits. Elsewhere through shakes permitted up to 1/3 the length, scattered along the length.

* ***Splits*** – Equal in length to twice the width of the piece.

* ***Checks*** – Seasoning checks not limited. Through checks at end are limited as splits.

* ***Slope of grain*** – 1 in 4.

* ***Warp*** – Light. (See table for limits of crook, bow, cup and twist for different piece sizes.)

* ***Skips (or Scant)*** – Heavy. (Lumber may be completely or partly surfaced, or entirely rough. If surfaced, may have skips in places up to 1/8 inch deep, or if rough, may be scant in places up to 1/8 inch scant. The areas of skip (or scant) are not to exceed 2 feet in length in any one place.)

* ***Manufacture*** – Manufacturing Imperfections Allowed – Admits heavy torn grain, heavy raised grain, heavy loosened grain; heavy machine bite; heavy machine gouge; heavy machine offset; heavy chip marks; knife and saw marks; heavy wavy dressing and sawing variation; and heavy mismatch.)

* ***Pitch and pitch streaks*** – Not limited.

* ***Pockets – Pitch or Bark*** – Not limited.

* ***Stain*** – Stained wood not limited.

* Lumber included in the ***Wisconsin Local Use Dimension Lumber Stud Grade*** is to reasonably represent the mill-run of dimension lumber produced at least meeting these requirements and limiting provisions, with the typical removal of ***Wisconsin Local Use Dimension Lumber Number 2 and Better Grade***. (This is not to constrain the simultaneous production of appearance grade boards and other lumber products other than dimension.)

Number 3 Grade - Wisconsin Local Use Dimension Lumber
2" to 4" thick, 2" and wider - Characteristics permitted and limiting provisions shall be:

* ***Knots*** – Well spaced knots of any quality are permitted in sizes not to exceed the equivalent of one-third (33.3%) of the nominal width of the wide face of the piece. (Knots appearing on the thickness faces of the piece are permitted in the same quality and size.)

* ***Holes*** (any cause and includes unsound wood except wane) Not to exceed the equivalent of one-third (33.3%) of the nominal width of the piece or equivalent smaller holes per 2 lineal feet. (Holes appearing on the thickness faces of the piece (including unsound wood except wane) are permitted in the same size or equivalent smaller.)

* ***Unsound wood (except wane)*** – Considered as holes and included within the limiting provisions for holes.

* ***White speck and honeycomb*** – Considered as holes and included within the limiting provisions for holes.

* ***Wane*** – 1/2 the thickness and 1/2 the width, full length, or equivalent, on each face, combined not to exceed 3/4 the thickness or 3/4 the width at any point.

* ***Shake*** – Surface shakes permitted. If shake through at ends, limited as splits. Elsewhere through shakes permitted up to 1/3 the length, scattered along the length.

* ***Splits*** – Equal in length to twice the width of the piece.

* ***Checks*** – Seasoning checks not limited. Through checks at end are limited as splits.

* ***Slope of grain*** – 1 in 4.

* ***Warp*** – Medium. (See table for limits of crook, bow, cup and twist for different piece sizes.)

* ***Skips (or Scant)*** – Heavy. (Lumber may be completely or partly surfaced, or entirely rough. If surfaced, may have skips in places up to 1/8 inch deep, or if rough, may be scant in places up to 1/8 inch scant. The areas of skip (or scant) are not to exceed 2 feet in length in any one place.)

* ***Manufacture*** – Manufacturing Imperfections Allowed – Admits heavy torn grain, heavy raised grain, heavy loosened grain; heavy machine bite; heavy machine gouge; heavy machine offset; heavy chip marks; knife and saw marks; heavy wavy dressing and sawing variation; and heavy mismatch.)

* ***Pitch and pitch streaks*** – Not limited.

* ***Pockets – Pitch or Bark*** – Not limited.

* ***Stain*** – Stained wood not limited.

* Lumber included in the ***Wisconsin Local Use Dimension Lumber Number 3 Grade*** is to reasonably represent the mill-run of dimension lumber produced at least meeting these requirements and limiting provisions, with the typical removal of ***Wisconsin Local Use Dimension Lumber Number 2 and Better and Stud Grades***. (This is not to constrain the simultaneous production of appearance grade boards and other lumber products other than dimension.)

ECONOMY GROUPING –
NOT a Wisconsin Local Use Dimension Lumber Grade
2" to 4" thick, 2" and wider -
Characteristics permitted and limiting provisions shall be:

Dimension lumber of the **ECONOMY** Dimension Lumber grouping is not a specific "Grade" as it is **NOT** to be considered suitable for any use where strength and appearance are factors, but may be suitable for bracing, crating, cribbing, blocking, and for remanufacturing for other purposes such as production of pallet parts. The inclusion of **ECONOMY Dimension Lumber grouping** within the Wisconsin Local Use Dimension Lumber Grade system is provided only to allow for a commonly understood and easily identifiable mechanism for the aggregation of dimension lumber that **does not meet the minimum requirements of the Wisconsin Local Use Dimension Lumber Number 3 Grade but that may have some other lower-end use** Mixed species/groups and mixed sizes are to be expected in ECONOMY except as otherwise specified, therefore all buyers/sellers of ECONOMY are advised to clearly establish within orders if only certain species/groups and sizes of lumber are to be included within an order, or if any species/groups and sizes of lumber are to be excluded from an order.

* ***Knots*** – any quality are permitted in any sizes with their displacement at any point not to exceed the equivalent of two-thirds (66.7%) of the nominal width of the width of the piece. (Knots appearing on the thickness faces of the piece are permitted in the same quality and size.)

* ***Holes*** (any cause – and includes unsound wood except wane) - permitted in any sizes with their displacement at any point not to exceed the equivalent of half (50%) of the width of the piece. (Holes appearing on the thickness faces of the piece (including unsound wood except wane) are permitted in the same size or equivalent smaller.)

* ***Unsound wood (except wane)*** – Considered as holes and included within the limiting provisions for holes.

* ***White speck and honeycomb*** – Considered as holes and included within the limiting provisions for holes.

* ***Wane*** – 2/3 the thickness and 2/3 the width, full length, or equivalent, on each face, combined not to exceed 3/4 the thickness or 3/4 the width for more than 2 continuous feet of length.

* ***Shake*** – Surface shakes permitted. Through shakes limited as splits.

* ***Splits*** – Equal to 1/3 the length of the piece.

* ***Skips (or Scant)*** – May be completely or partly surfaced or entirely rough, all pieces may be scant up to 1/8 inch (.0125 inch) full length, and up to 20% of pieces may be scant up to 1/4 inch full length.

* ***Usability*** – if any characteristic or any combination of characteristics makes the piece unusable full length, then at least half of the total length shall be usable, full width, in one or two sections which are at least one third the total length.

* Lumber included in the ***ECONOMY Dimension Lumber grouping*** is to reasonably represent most of the mill-run of dimension lumber produced that does not in one or more respects meet in the requirements and limiting provisions of ***Wisconsin Local Use Dimension Lumber Number 3 Grades*** but is still usable where strength and appearance are not important factors, or for remanufacturing for other purposes such as production of pallet parts.

Moisture Contents, Surface Conditions and Standard Sizes and Tally Practices for Wisconsin Local Use Dimension Lumber

In most circumstances the grade stamped dimension lumber found in Wisconsin's retail lumber yards will be softwood lumber (usually shipped from Canada, or from the western or southern United States). The lumber will typically have been kiln dried and then surfaced on four sides to standard thickness and widths as specified within American Softwood Lumber Standard Voluntary Product Standard PS 20-05. This lumber is typically kiln dried as an integral part of the manufacturing process, for various reasons, including the reduction of weight prior to shipment. However use of green lumber (i.e. lumber that is with moisture above 19% MC, such as it is sawn from the log) in the surfaced condition is very common in some areas (such as parts of the western United States) and in some cases, some hardwoods may be manufactured into dimension lumber. Although both dry and green lumber are suitable for use in construction, it must be noted that it is not advised to mix green and dry lumber (e.g. Surfaced Dry and Surfaced Green lumber) within a horizontal framing system such as floor joists as they acclimate at different rates in reaching equilibrium with the environmental conditions. Both softwoods and hardwoods (as individual species and in groupings) may be used to produce Wisconsin Local Use Dimension Lumber and the lumber may be sold for use in either the dry or the green condition in a surfaced or rough condition. The minimum required sizes appropriate for conditions are consistent as specified within American Softwood Lumber Standard Voluntary Product Standard PS 20-05. The following discussion will explain these elements of conditions, and some key considerations for both manufacturers and purchasers, and the standard sizes to be used based upon conditions.

Wood Moisture Content and Drying

Dimension lumber is generally termed as being "dry" if it has been seasoned or dried to a maximum moisture content (MC) of 19% as measured on the ovendry basis (OD basis). Lumber moisture content in the United States is (unless otherwise specified) expressed on the OD basis, and reflects the weight of water in the piece expressed as a percentage of the bone dry weight of wood (i.e. the weight of wood with no moisture what-so-ever). Because not every piece of lumber will dry at exactly the same rate, not every piece of lumber in the shipment unit will have exactly the same moisture content. In practice, for dimension lumber to be considered as "dry" this means that 95% of the pieces of lumber in the shipment unit are (on average) at or below 19% MC, and no more than 5% of the lumber in the shipment unit may be at a moisture content in excess of 19% MC. The average moisture content of the shipment unit is likely to be something less than 19% MC, commonly about 15% to 17% MC. This lumber that is considered to be in the dry condition still contains some moisture (that could equal almost 15% or 16% of its total weight in the dry condition) which is equivalent to there still being about two thirds of the bound water that was in the wood in the tree at time of harvest However, at this moisture content (of around 19% MC), considerable moisture has already been removed in the seasoning or drying process (such that water removed could equal up to about 40% of the total weight of wood (with moisture) at the time of harvest). The seasoning or drying process will effectively remove all the free water (i.e. primarily water that is in the cell lumen) in the wood, and also about a third of the bound water (i.e. water in the cell wall itself, that is bound to the wood by H-OH bonds at the molecular level). It is this removal of bound water that causes wood to shrink in the drying process. The cell wall material of the wood is no longer bulked up by the presence of H-OH bound water and the prior occupied H-OH bonding sites of the cellulose molecules in the cell can form additional H-OH bonds with other cellulose molecules (which can help to lead

to an increase in most strength properties for dry as compared to green lumber). Shrinkage begins as water is removed from wood that is at or below its fiber saturation point (FSP), which is the moisture content at which the wood has all the bound water it is capable of holding (at moisture contents above FSP the wood has both free and bound water, and when at or below FSP the wood has only bound water). Since water migrates from the inner core to the outer shell and is then given up to the air, wood may commonly have a moisture gradient. An excellent example of which would be as wood is drying, the core of the wood will have a much higher moisture content than the outer area of the piece where the water is rapidly being given up to the air. As wood is held in conditions of uniform temperature and humidity over time the difference in moisture between the shell and the core of the wood will be greatly reduced.

There is a relatively common misconception that once lumber is "dry" its moisture content does not change. Wood is constantly gaining water from the atmosphere or giving up water to the atmosphere as it seeks moisture content to bring it into equilibrium in relation to the relative humidity and temperature of its environment A good example of this is where the wood in homes in Wisconsin gains moisture and swells in the summer, sometimes causing drawers or doors to stick. Then loses moisture in the winter, sometimes causing joints to come loose as they shrink. Lumber moisture content may be estimated in a variety of ways, but for construction purposes its moisture may be easily "measured" using a handheld moisture meter (which actually measures electrical resistance but displays the result directly as wood moisture content). These meters are reasonably priced, readily available, and work reasonably well for dimension lumber in construction. These moisture meters do not accurately reflect true moisture content at very high or very low moisture contents, but they perform adequately in the ranges of interest. High moisture contents cannot be accurately measured by these handheld moisture meters, they do reliably indicate that wood moisture content is high (i.e. well above 19% MC). When the wood is at or above Fiber Saturation Point (FSP) or that wood moisture content is very low for moisture contents below 6% MC, these moisture meters are not accurate. Handheld moisture meters work reasonably well in the range of interest (i.e. near 19% MC).

As noted earlier, most grade stamped dimension lumber sold in Wisconsin is surfaced after kiln drying. The considerable weight of water removed in the drying process reduces the weight shipped (which is one important reason for drying). Dimension lumber can be air dried or kiln dried, but kiln drying is commonly done as it is much faster than air drying. The negative aspect of this is the need for the lumber manufacturer to invest in kilns and associated equipment (such as boilers), offset by the reduction in inventory that would be held in an air drying yard. Dry kilns allow for good control of temperature, relative humidity and air flow, which translates to allowing for greater control in the drying process. In the case of drying dimension lumber, the practice is typically to dry the lumber as fast as is reasonably possible without excessive degrade, and generally there is little effort (if any real effort) to relieve or reverse stresses associated with the drying process (as this would greatly reduce the volume of lumber that could be dried annually by increasing the time of each charge in the kiln). Usually this (stress or case hardening) does not represent a problem where dimension lumber is typically used full thickness and full width (as compared to factory lumber and shop grades that are cut up prior to end use). In contrast, the slow pace of air drying does not generally result in stresses to be built up the same degree (with less extreme conditions). In Wisconsin this can be a very slow process where much of the year is not well suited to air drying. Using good practices, sawmills can do a good job with air drying, particularly with well designed and well operated drying yards. It is very easy to do a bad job of drying lumber in a kiln, so it is inaccurate to say that kiln dried lumber is automatically "better" than air-dried lumber, or that air-dried lumber is not as high a quality as kiln dried lumber. It would be correct that kiln drying offers an opportunity for greater control of the process.

Two aspects that may be of importance in this regard are that in kiln drying it is possible to "set" resin and to kill insects and their larvae. For resinous species, such as some kinds of pine, it is often considered desirable to "set" the resin (e.g. so it will not be sticky to handle or cause pitch to be built up on saws or in planers) This is a time temperature relationship where if the wood is held at a temperature for a long enough period, the resin will "set" and after that point it will no longer "flow" if the temperature does not later exceed that temperature. The resin being "set" and not "flowing" would simply mean the wood would not be sticky to the touch, and if set at a high enough temperature (e.g. about 160 °F), the pitch should not build up as the wood is run through

planers and moulders. In the case of insects, insects and larvae can be killed at high temperature in a relatively short period of time, or at lower temperatures over a longer time. (Note: Heat treated (HT) lumber (common for material that might be used for pallets and packaging for export markets) is a special designation for lumber having undergone a process specifically targeted to kill insect larvae in which the lumber is heated in a closed chamber, with or without moisture content reduction, until it achieves a minimum core temperature of 56 °C (about 133 °F) for a minimum of 30 minutes.) A good example of where this might be of interest in Wisconsin would be the Sawyer Beetle – which commonly is "in-flight" in summer – when it will attack fresh-cut softwood logs (and severely weakened living trees) and deposit its eggs that hatch and grow to become adults over the course of a year, emerging the following year and in the process producing their characteristic exit holes. These small holes do not significantly weaken the lumber, but it would not be desirable from the perspective of most homeowners to have an insect emerge through a wall which is the problem that could occur if these insects are living in wood that is used in residential construction. In the case of the Sawyer Beetle, the larvae could be killed by kiln drying or by some other mechanism, so if the lumber were kiln died this would likely not be a concern, otherwise it might be prudent to ensure the risk of having the larvae present would be reduced by harvesting healthy trees when the beetle is not in flight, or ensuring that the beetle has had the time to emerge before using the lumber.

Dimension Lumber Standard Sizes and Wood Surface Conditions

The grade stamped dimension lumber found in Wisconsin's retail lumber yards is typically dried and then surfaced on four sides to standard thickness and widths as specified within American Softwood Lumber Standard Voluntary Product Standard PS 20-05, and is ready for use in residential construction. Even persons with little experience in wood products or construction typically realize that the common size of dimension lumber we refer to as a 2 X 4 (in referencing its nominal dimensions) actually measures 1 1/2 by 3 1/2 inches in the dry surfaced condition (as specified within American Softwood Lumber Standard Voluntary Product Standard PS 20-05). However, a 2 X 4 (in referencing its nominal dimensions) in the green surfaced condition does not measure the same 1 1/2 by 3 1/2 inches as in the dry surfaced condition, instead it measures 1 9/16 by 3 9/16 inches (as specified within American Softwood Lumber Standard Voluntary Product Standard PS 20-05), with the slightly larger sizing to provide an allowance for shrinkage, such that both pieces would be expected to be approximately the same dimensions after reaching equilibrium with the environmental conditions. Put simply, if the lumber in the green surfaced condition was sized exactly the same as in the dry surfaced condition (which has already had some significant shrinkage), then once the pieces both reached equilibrium with the environment, the piece that had been green surfaced would be smaller than the dry surfaced piece. The green surfaced piece would have had relatively much more shrinkage after surfacing than the dry surfaced piece. Green surfacing of dimension lumber allows the (more) precise sizing of lumber that will be used in construction in the green condition. An alternative method of achieving this same end (for sawmills capable of holding fairly precise sawing tolerances) is to directly saw to the standard green surfaced dimensions This is called Sawn-To-Size (STS) and the practice is permitted for the Wisconsin Local Use Dimension Lumber Grades as an alternative to green surfacing. If Sawn-To-Size lumber is to be produced as an alternate to green surfaced lumber within the Wisconsin Local Use Dimension Lumber Grades, that shall be indicated as a part of the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208.

It should be noted that within the Wisconsin Local Use Dimension Lumber Grades that references to dressed sizes for dimension lumber are consistent with the National Institute of Standards &

Technology American Softwood Lumber Standard Voluntary Product Standard PS 20-05. The (actual) dressed sizes which are specified in American Softwood Lumber Standard Voluntary Product Standard PS 20-05 are minimum sizes, and the same applies to the (actual) dressed sizes which are specified for the Wisconsin Local Use Dimension Lumber Grades. This means that for any or all nominal sizes produced for the Wisconsin Local Use Dimension Lumber Grades, the (actual) dressed sizes produced can exceed the specified dressed sizes because these sizes are stated minimums. The (actual minimum) dry dressed sizes (in thickness and width) as specified in American Softwood Lumber Standard Voluntary Product Standard PS 20-05 and which is specified for the Wisconsin Local Use Dimension Lumber Grades is 0.5 inch (1/2 inch) less than the nominal dimension for nominal dimensions of 6 inches and less, and is 0.75 inch (3/4 inch) less than the nominal dimension for nominal dimensions that are greater than 6 inches. If sold in the dry rough condition, the minimum dry rough dimensions (both thickness and width) must be at least 0.125 inch (1/8 inch) greater than the standard dry surfaced size to allow for the removal of wood in surfacing. If sold in the green surfaced condition, the minimum green surfaced dimensions (both thickness and width) are slightly larger than the specified dry surfaced dimensions, to allow for shrinkage, but not by a uniform constant, because shrinkage will be a fraction of the dimension, and the wide face will typically have proportionately much more shrinkage than the thickness face. All of these minimum required thickness and widths for the Wisconsin Local Use Dimension Lumber Grades are specified in Table #2 for the various conditions. If lumber is to be sold in the dry rough condition, or in the dry surfaced condition, then the size that lumber is sawn, to must be large enough to allow for shrinkage. So that after shrinkage it will be at least still meet the required dry surfaced sizes. The required oversizing above the desired dry rough size is a function of the expected shrinkage that varies by species (and to what moisture content the lumber is to be dried to on average), and should be calculated for the species being sawn. Assuming the lumber is going to be dried to 19% MC, shrinkage of about one-third of the tangential shrinkage for the species could be expected, and possibly more if the lumber is dried to a lower moisture content. As a rule of thumb, approximately a 2% to 3% increase in both thickness and width should generally be adequate, and a 4% increase in both thickness and width above the minimum required dry rough sizes is a generous allowance that should work in almost all circumstances. If lumber is to be sold in the green rough condition, then the green target sizes used (for all thickness and widths in the shipment unit) shall be specified on the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208.

Although it is clearly permitted that lumber produced within the Wisconsin Local Use Dimension Lumber Grades can exceed the thickness and width standards that are specified. In many cases customers will expect that sizes they receive will be equal to the minimums specified in American Softwood Lumber Standard Voluntary Product Standard PS 20-05. For this reason, to reduce confusion to the degree possible. If lumber is to be produced to sizes greater than the stated standard sizes (i.e. the minimum sizes as included in tables for the Wisconsin Local Use Dimension Lumber Grades), that should be stated in the purchase agreement and the actual sizes for each nominal size (for all thickness and widths in the shipment unit) shall be specified on the written certification that the person milling the lumber provides to the person receiving the lumber under 2007 WISCONSIN ACT 208. It should be noted that if lumber is surfaced (or sawn to a specific size) in the green condition and the lumber begins to lose moisture below the fiber saturation point, then shrinkage will occur. That shrinkage which occurs after dressing to standard green size is typically recognized through the allowance of a tolerance below minimum standard green sizes on a basis of 1 percent shrinkage for each four percentage points of moisture content below 30 MC.

The standard lengths of lumber sold under the Wisconsin Local Use Dimension Lumber Grades shall be produced in even two foot length multiples of 8 feet and greater (i.e. 8, 10, 12, 14, 16 etc.) unless the purchase agreement specifically stipulates the use of one foot standard length multiples (e.g. 8, 9, 10, 11 etc.) and/or allowing any standard lengths less than 8 feet. All standard lengths less than 8 feet that are allowed and any standard length allowed that is not a nominal even two foot length multiple must be specified. Unless otherwise stated in the purchase agreement, lumber sold under the Wisconsin Local Use Dimension Lumber Grades shall be trimmed for the removal of excessive spur and splintered ends, but the lumber does not have to be double-end-trimmed. If double-end-trimmed, the minimum length of lumber sold under the Wisconsin Local Use Dimension Lumber Grades shall be not less than the nominal length, and if not double-end-

trimmed, there shall be at least sufficient overlength to easily square-trim the lumber to nominal length. Overlength shall not exceed 12 inches in excess of nominal length, unless otherwise stated in the purchase agreement. If lumber is to be Precision-End-Trimmed (PET) to a special non-standard length, then that should be stated in the purchase agreement and the tolerance (if other than 1/16 inch in length) shall also be specified. For purposes of tally, the standard length of PET lumber shall be the next higher one foot standard length multiple, or may be specified in the purchase agreement as being the actual length in feet. Any variances in standard length as noted above that should be included in the purchase agreement shall also be specified on the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208.

Tally Practices for Wisconsin Local Use Dimension Lumber

The vast majority of lumber sold under the Wisconsin Local Use Dimension Lumber Grades should be of standard sizes given the intended use of such lumber under 2007 WISCONSIN ACT 208. Further, given the nature of the transaction envisioned where the person milling the lumber must sell the lumber directly to the person who will inhabit the dwelling. The desirability for simplicity in tally practices that will minimize confusion is obvious. For this reason, the invoices for lumber of standard sizes should show the number of pieces of each nominal size (thickness and width) and (standard) length (as well as the actual thickness and width of such lumber if other than (minimum specified) standard size as has been noted) and the total board feet. Given this tally by nominal thickness and width and standard length, the total board feet in the shipment unit is easily calculated. The board feet content for pieces of various nominal thickness and widths and standard length is provided in Table #3 and Table #3A, showing the total board feet of lumber in the piece (rounded to the nearest 1/10 of a board foot). In the tally of dimension lumber sold under the Wisconsin Local Use Dimension Lumber Grades, the standard practice shall be the rounding of the board feet of lumber in the piece being rounded to the nearest 1/10 of a board foot. Because in the case of dimension lumber it is relatively common to have a fairly large number of pieces be of the same dimensions, having a cumulative effect in the errors of rounding. For any sizes of dimension lumber sold under the Wisconsin Local Use Dimension Lumber Grades for which board foot contents are not listed in the table, the formula for the board foot contents of a piece is calculated by taking the nominal width (in inches), multiplied by the nominal thickness in inches, multiplied by the nominal (standard) length in feet, and then dividing this total by 12 and rounding the result to the nearest 1/10 board foot. As an example, a 2 X 4 of 8 foot standard length would be (2 X 4 X 8)/12 = 5.33 = 5.3 board feet of lumber for the piece. In the event the purchase agreement specifies that lumber is to be finished to nonstandard sizes, the lumber shall be tallied in board measure of the nominal size that was used in its manufacture. For lumber sold under the Wisconsin Local Use Dimension Lumber Grades that is being used in the construction of a dwelling (i.e. sold directly to the person who will inhabit the dwelling) the lumber may be sold on either a piece price or a price per board foot or per thousand board feet (MBF), and if the lumber is being custom sawn from logs owned by the purchaser that is to be used in a dwelling, this does not prohibit an agreement for custom sawing services performed on an hourly basis or any other normal arrangement. As part of the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208, there shall be included a tally of total lumber sold, based upon the number of pieces per nominal thickness, width and standard length, in each grade/grouping in the transaction, and the total board feet, including the total in each grade/grouping. This same requirement applies with regard to the written certification if the transaction is in the custom cutting of the purchaser's logs if the lumber is sawn under the Wisconsin Local Use Dimension Lumber Grades to be used to by that person to construct a dwelling they will inhabit.

Cubic measure of lumber shall not be permitted for sale of Wisconsin Local Use Dimension Lumber to any non-commercial end-user. Specifically this means that cubic measure of lumber shall not be permitted for tally of Wisconsin Local Use Dimension Lumber under 2007 WISCONSIN ACT 208 for any transaction where the person milling the lumber is selling the lumber directly to the person who will use it to construct a dwelling they will inhabit (i.e. for which 2007 WISCONSIN ACT 208 was intended). However, where it is recognized that lumber produced under the Wisconsin Local Use Dimension Lumber Grades may change hands in industry (e.g. sale of lower grades to secondary manufacturers or pallet producers), and cubic measure for such trade may be preferred, cubic measure may be allowed in such circumstances if specified on the invoice.

Designation of Moisture Content and Type of Drying/Heat Treating for Wisconsin Local Use Dimension Lumber Written Certification

As a part of the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208 shall be a clear indication as to the moisture content conditions of the lumber (at the time the lumber is sold). Designation of lumber in the shipment unit as either "**Green Lumber**" or "**DRY Lumber**" is required, the amplifications are optional. Definitions are as follows:

Green Lumber – simply "Green lumber" is lumber of less than nominal 5-inch thickness which has moisture content in excess of 19 percent. Included in this broad designation is lumber that is sawn directly from freshly cut logs of very high moisture content, to the other extreme of lumber that has been stickered and has started to dry and may perhaps be well below fiber saturation point but still at a moisture content of 19% MC as measured on the ovendry basis, and everything in between.

PAD Lumber – PAD or Partially Air-Dried Lumber is "Green lumber" for which the seasoning process has begun, but the lumber still has moisture content in excess of 19 percent. The designation of **PAD Lumber** may be used (if desired) as an amplification to the **Green Lumber** designation provided in the certification, the seller may (if appropriate) provide the additional specification of "PAD" or "Partially Air-Dried Lumber" meaning the lumber has been seasoned on stickers in an air drying yard using appropriate air drying practices (including the use of pile covers at a minimum). Included on the written certification, the person milling the lumber shall also indicate the approximate air drying time and season (e.g. PAD approximately from February to May in 2009).

DRY Lumber – meaning the lumber has been seasoned or dried to a maximum moisture content of 19% MC as measured on the ovendry basis (at least 95% of the pieces in the shipment unit should meet this condition and no more than 5 % of the pieces should have a moisture content in excess of 19% MC) Lumber sold as **DRY Lumber** under 2007 WISCONSIN ACT 208 may be either kiln dried or air dried, as long as it meets the moisture content requirements.

Kiln dried (KD) – meaning the lumber that has been seasoned in a chamber to a predetermined moisture content by applying heat. The designation of ***Kiln dried (KD)*** may be used (if desired) as amplification to the ***DRY Lumber*** designation provided in the certification. To do this the seller may (if appropriate) provide the additional specification of "Kiln dried" or "KD" or "Kiln dried (KD)" meaning the lumber has been seasoned or dried in a chamber to a predetermined moisture content by applying heat. The lumber with this designation shall be dried to a maximum moisture content of 19% MC (or other clearly specified lower MC) as measured on the ovendry basis (at least 95% of the pieces in the shipment unit should meet this condition and no more than 5 % of the pieces should have a moisture content in excess of 19% MC, or other clearly specified lower MC). Where much of the lumber likely to be produced under 2007 WISCONSIN ACT 208 may be coming from small mills without large steam-fired boilers, if a designation of "Kiln dried" or "KD" or "Kiln dried (KD)" is included on the written certification, the person milling the lumber shall also indicate the basic type of kiln used (e.g. steam, hot water, dehumidification, gas-fired, solar) and the maximum temperature the lumber was exposed to and for what continuous time in hours (e.g. heated to a maximum temperature of 160 °F for 48 continuous hours).

Heat Treated (HT) – meaning lumber or other wood products that have been heated in a closed chamber, with or without moisture content reduction, until it achieves a minimum core temperature of 56 °C for a minimum of 30 minutes. This amplification designation may be included as a part of the written certification that the person milling the lumber provides and may only be included if the lumber has been treated by a certified heat treating facility

Designation of Wood Surface Conditions, Lumber Standard Sizes and Tally for Wisconsin Local Use Dimension Lumber Written Certification

As a part of the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208 shall be a clear indication as to the surface conditions of the lumber (at the time the lumber is sold). A clear designation of the lumber in the shipment unit as "**Surfaced Lumber**" or as "**Sawn-To-Size Lumber**" or as "**Rough Lumber**" is required. Amplifications that standard lengths in 2 foot long multiples, 8 foot minimum length, and the (actual) dressed sizes equal the minimum thicknesses and widths for surfaced or sawn-to-size lumber within the Wisconsin Local Use Dimension Lumber Grades (consistent with the National Institute of Standards & Technology American Softwood Lumber Standard Voluntary Product Standard PS 20-05 (actual) dressed sizes) are optional. Any deviation from use of these size conventions in standard lengths or actual sizes are to be noted as a part of the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208 or in a prepared attachment to the certification. Definitions are as follows:

Surfaced Lumber – Surfaced lumber (or dressed lumber) is generally considered to be lumber that has been surfaced by a machine (to attain 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, S4S). Lumber surfaced S1E, S2E, S1S, S2S, S1S1E, S1S2E, S2S1E, and S4S is classified as dressed (surfaced) lumber in the surfaced width or thickness and lumber that surfaced on one edge (S1E), two edges (S2E), one side (S1S), or two sides (S2S) is classified as rough lumber in the unsurfaced width or thickness. Unless otherwise specifically noted, with specific amplification, the term "**Surfaced Lumber**" as used within the Wisconsin Local Use Dimension Lumber Grades refers to lumber that is S4S (surfaced four sides), typically to the (actual) dressed sizes equal the minimum thicknesses and widths for surfaced lumber within the Wisconsin Local Use Dimension Lumber Grades (usually this is accomplished using a knife-type planer that sizes the lumber in both thickness and width within a single pass). As an example, lumber that was surfaced on both edges to a precise width (usually the minimum width for surfaced lumber), and with the thickness faces still rough and in thickness at least equal to the required minimum, that should be referred to on the written certification with the amplification as S2E-Surfaced Lumber.

Sawn-To-Size Lumber – is a designation specific to the Wisconsin Local Use Dimension Lumber Grades that is similar in most respects to what would commonly be termed as either "Saw-sized lumber". Which is lumber uniformly sawn to the dressed size for surfaced lumber, and not planed on the faces, for uses requiring a rough texture, or as "Sized lumber" – which is lumber uniformly manufactured to dressed surfaced sizes that may be rough, surfaced or partially surfaced on one or more faces. This designation specific to the Wisconsin Local Use Dimension Lumber Grades recognizes that some producers may hold tolerance well and are capable of producing saw-sized lumber. In some circumstances some of the very small manufacturers producing the lumber are unlikely to have planer equipment allowing them to produce S4S or even S2E. For these producers it is expected they would saw to actual thickness at least equaling the required minimum thicknesses for the green condition without excessive concern for variation. However, excess variation in width could be a problem, so the lumber may in many circumstances be resawn (in either the green or dry condition), on one or two edges to achieve a uniform and precise width. The "***Sawn-To-Size Lumber***" designation specific to the Wisconsin Local Use Dimension Lumber Grades means the lumber has been initially sawn (if stated without amplification) or resawn (in either the dry or rough condition) to achieve a uniformity of sizes, in width, or width and thickness, and if resawn it should use the same amplifications as for surfaced lumber, as to what has been sawn (versus surfaced) as one edge (S1E), two edges (S2E), one side (S1S), or two sides (S2S) or combination of (S1S1E, S1S2E, S2S1E, S4S). As an example, lumber that was resawn on one edge to a achieve a uniform width and with the thickness faces still rough and in thickness at least equal to the required minimum, that should be referred to on the written certification with the amplification as S1E-Sawn-To-Size Lumber.

Rough Lumber – Rough lumber is typically recognized as lumber which has not been dressed (surfaced) but which has been sawed, edged and trimmed at least to the extent of showing saw or other primary manufacturing marks (such as from a chipping head) in the wood on the four longitudinal surfaces of each piece for its over-all length (and as noted earlier, lumber surfaced on one edge (S1E), two edges (S2E), one side (S1S), or two sides (S2S) is classified as rough lumber in the unsurfaced width or thickness). Specific to the Wisconsin Local Use Dimension Lumber Grades, the designation of "**Rough Lumber**" as a part of the written certification that the person milling the lumber provides is deemed to be a clear indication the lumber should not be considered to be sized the same as Sawn-To-Size Lumber (which it may resemble in appearance). Rough lumber should not be considered as ready for use in construction. The differences could include the lumber is oversized to allow for shrinkage, or to allow surfacing, or to allow for both shrinkage and surfacing, and/or it may not be intended by the person milling the lumber that the lumber is sawn to an appropriate uniformity of size for sawn-to-size lumber. It should be clearly understood that the designation of "**Rough Lumber**" as a part of the written certification that the person milling the lumber provides is deemed to be a clear indication the lumber is intended for further processing prior to use, to include surfacing or resawing to uniform size conditions, and possibly to include drying prior to that. If "**Rough Lumber**" is to be sold as "**DRY Lumber**", the minimum dry rough dimensions (both thickness and width) must be at least 0.125 inch (1/8 inch) greater than the standard (minimum) dry surfaced size to allow for the removal of wood in surfacing. If "**Rough Lumber**" is to be sold as "**Green Lumber**", then the green target sizes used (for all thickness and widths in the shipment unit) shall be specified on the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208.

Standard Sizes – Thickness and Width - specific to the Wisconsin Local Use Dimension Lumber Grades, the standard sizes (actual thickness and width) of "**Surfaced Lumber**" and "**Sawn-To-Size Lumber**" are to be considered to be what is specified as the actual minimum sizes as specified for the Wisconsin Local Use Dimension Lumber Grades and in American Softwood Lumber Standard Voluntary Product Standard PS 20-05 for the lumber that is surfaced in the dry or green condition as appropriate (see Table #2). Somewhat larger sizes may be used for the nominal thickness, the nominal width, or both, but that (larger size) shall be clearly specified on the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208. If "**Rough Lumber**" is to be sold as "**DRY Lumber**", the minimum dry rough dimensions (both thickness and width) must be at least 0.125 inch (1/8 inch) greater (see Table #2) than required for the standard (minimum) size for dry surfaced size (this is to allow for the removal of wood in surfacing). If "**Rough Lumber**" is to be sold as "**DRY Lumber**" has the minimum dry rough dimensions (both thickness and width) that are at least 0.125 inch (1/8 inch) larger than the dry surfaced size, then the rough lumber meets the standard size requirements. For any "**Rough Lumber**" that is to be sold as "**Green Lumber**", the actual green target sizes the lumber is sawn to (for all thickness and widths in the shipment unit) shall be specified on the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208 - the person receiving the lumber must consider if the oversizing is sufficient for surfacing, uniform sizing and any drying that is to be accomplished prior to using the lumber (see Table #2 for suggested sizes that should be sufficient in most circumstances).

Standard Sizes – Length - specific to the Wisconsin Local Use Dimension Lumber Grades, the standard lengths of lumber shall be 8 feet and greater in even two foot length multiples, (i.e. 8, 10, 12, 14, 16 etc.). Unless the purchase agreement specifically stipulates the use of one foot standard length multiples (e.g. 8, 9, 10, 11 etc.) and/or allowing any standard lengths less than 8 feet. All standard lengths less than 8 feet that are allowed must be specified. All standard lengths allowed that are not a nominal even two foot length multiple must be specified. Any variances in standard length as noted above that should be included in the purchase agreement shall also be specified on the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208.

Standard Sizes – Trim Requirements - specific to the Wisconsin Local Use Dimension Lumber Grades, the standard trim requirements (unless otherwise stated in the purchase agreement) is that lumber shall be trimmed for the removal of excessive spur and splintered ends, but the lumber does not have to be double-end-trimmed. If double-end-trimmed, the minimum length of lumber sold under the Wisconsin Local Use Dimension Lumber Grades shall be not less than the nominal length. If not double-end-trimmed, there shall be at least sufficient overlength to easily square-trim the lumber to

nominal length. Overlength shall not generally exceed 12 inches in excess of nominal length, unless otherwise stated in the purchase agreement. Any variances in trim practices as noted above that should be specified on the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208.

Tally Reporting Requirements - For lumber sold under the Wisconsin Local Use Dimension Lumber Grades that is being used in the construction of a dwelling (i.e. sold directly to the person who will inhabit the dwelling) the lumber may be sold on either a piece price or a price per board foot or per thousand board feet (MBF). Consequently, as part of the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208, there shall be included a tally of total lumber sold, based upon the number of pieces per nominal thickness, width and standard length, in each grade/grouping in the transaction, and the total board feet, including the total in each grade/grouping. This same requirement applies with regard to the written certification if the transaction is in the custom cutting of the purchaser's logs if the lumber is sawn under the Wisconsin Local Use Dimension Lumber Grades to be used to by that person to construct a dwelling they will inhabit. The formula for calculating the board foot contents of a piece is calculated by taking the nominal width (in inches), multiplied by the nominal thickness (in inches), multiplied by the nominal (or standard) length in feet, and then dividing this total by 12 and rounding the result to the nearest 1/10 board foot. (The board foot contents of common sizes of dimension lumber are provided in a Table #3 and Table #3A.) Cubic measure of lumber shall not be permitted for sale of Wisconsin Local Use Dimension Lumber to any non-commercial end-user. It is recognized that lumber produced under the Wisconsin Local Use Dimension Lumber Grades may change hands in industry (e.g. sale of lower grades to secondary manufacturers or pallet producers). Cubic measure for such trade may be preferred, cubic measure may be allowed in such circumstances if specified on the invoice and include as part of the written certification that the person milling the lumber provides. When a shipment unit of lumber is sold under a single written certification under 2007 WISCONSIN ACT 208 that includes lumber in more than one grade, a description of how the lumber is marked to differentiate the different grades (e.g. paint on the end representing a grade) should be noted.

Appropriate Interpretation of How to Include the Required Information for Wisconsin Local Use Dimension Lumber Written Certification

A number of items are included as requirements that are to be a part of the written certification that the person milling the lumber provides (to the person receiving the lumber) under 2007 WISCONSIN ACT 208. These requirements include the specification of the moisture content conditions, the surface conditions, the use of non-standard sizes etc. Although necessary to provide clarity to the certification document, the intention in these requirements is not impose a difficult or unnecessary burden for the person milling the lumber. To this end, the required information can be provided directly as part of the written certification, or as a hand-written note on the certification, or in the form of an attachment (or attachments), that may include the purchase agreement, pre-printed forms where information may be included in a "fill-in-the-blank" or "circle-as-appropriate" format, or may be pre-printed tables of lumber sizes or other information. Examples for easy ways of including this information will be included as part of the training program for the grading of Wisconsin Local Use Dimension Lumber.

Additional Definitions and Explanations

Knots

A knot is a portion of a branch or a limb that is overgrown by the tree and has become incorporated into the piece of lumber, that is further classified as to occurrence, form, quality and size as being:

A ***sound knot*** contains no decay while and ***unsound knot*** contains decay.

A ***firm knot*** is solid across its face but contains incipient decay

An ***encased knot*** is a knot which is not intergrown with the growth rings of the surrounding wood

A ***pith knot*** is sound in all respects except that it contains a pith hole that is not more than 0.25 inch in diameter

A ***tight knot*** is so fixed (by growth, shape or position) that it retains its place (or is held in place) in the piece, while a ***loose knot or a not firmly fixed knot*** is one which is not so fixed (by growth, shape or position) such that it will not be held tightly in place in the piece,

Well spaced knots means that the sum of the sum of the sizes of all knots in any 6 inch length cannot exceed twice the size of the largest permitted knot, more than one knot of maximum size cannot be in any 6 inch piece, and the combination of knots must not be serious, and in considering the combination of knots being serious, and specifically the presence of ***knot clusters*** where two or more knots are grouped together as a single unit (i.e. knots adjacent to each other) with the fibers of wood deflected around the entire unit should be considered as serious (in meeting the requirements for well spaced knots) if the area of the knot cluster contained within a surrounding wood area would begin to approach the size limit for well spaced knots within a six inch piece (a group of single knots which are not represented as a unit are not a knot cluster)

Well scattered knots are not in clusters and occur where each knot is separated from another knot by at least a distance equal to the diameter of the smaller of the two knots

A ***round knot*** occurs as the result of the limb being cut in the manufacture of the board such that the limb is approximately at right angles to the long axis of the board (and the knot will appear as a cross-section on the face that is more or less "round"), while a ***spike knot*** occurs as the result of the limb being cut either lengthwise or diagonally (and the limb will appear as a cross-section on the face that resembles a "spike" that is significantly greater in one dimension that n the other), and an **oval knot** is something between these two extremes which occurs as the limb being cut in the manufacture of the board such that the limb is slightly more than a right angles to the long axis of the board (and the knot will appear as a cross-section on the face, as more or less "oval").

A ***red knot*** occurs as the result of the tree overgrowing a living branch and is intergrown with the surrounding wood, and an ***intergrown knot*** is one in which growth rings are partially or completely intergrown on at least one side with the surrounding wood, while a ***watertight knot*** is one in which growth rings are completely intergrown on one surface of the piece and the knot is sound on that surface. In contrast to a ***black knot*** occurs as the result of the tree overgrowing a dead branch and is consequently not intergrown with the surrounding wood.

A ***star-checked knot*** has radial checks.

The ***size of a knot*** is measured directly as the diameter (in inches) for a round knot, and for other than round knots (e.g. spike knots and oval knots) the equivalent diameter size is estimated by averaging the measurements (in inches) of the maximum width of the knot on its narrow axis and the maximum length on its long axis

A ***pin knot*** is not over 0.5 inches in diameter, a (larger) ***small knot*** is not over 0.75 inches in diameter, a (larger still) ***medium knot*** is not over 1.5 inches in diameter, and a ***large knot*** is over 1.5 inches in diameter.

Holes

A hole may extend completely or partially through the piece. A hole may result from various causes including mechanical actions, but are very commonly caused by insects in the case of smaller holes, and the sloughing of loose (black) knots. The sizes of holes are measured in the same fashion as knots. Size classification of holes is as follows:

A ***pin hole*** is not more than 1/16 inch (0.0625 inch) in diameter.

A ***medium hole*** is larger than a pin hole but not more than 1/4 inch (0.25 inch) in diameter.

A ***large hole*** is larger than a medium hole but not more than 1 inch in diameter.

A ***very large hole*** is more than 1 inch in diameter.

Unsound Wood (decay)
Results from the attack of wood by any of a number of wood destroying fungi that leaves wood in a disintegrated condition (typically reflected by a loss of hardness and the softening of the wood fibers). Some examples include:

Heart center decay forms in the vicinity of the pith in a living tree, does not progress further after the tree is cut.

White speck small white (or sometimes brown) spots caused by the fungus "Fomes pini" that forms in the living tree, does not progress further in wood in service.

Honeycomb is very similar to white speck but larger in area.

Incipient decay is simply the very early stage of decay where disintegration of the fibers has just begun and the wood has discolored but has not yet disintegrated to the point that it is significantly softened. Incipient decay may be difficult to distinguish from stain, and if sound and not expected to advance or progress in stage to a more disintegrated state, it is not considered as unsound for purposes of grading classification within the Wisconsin Local Use Dimension Lumber Grades . In contrast, the onset of decay of any kind that leaves wood in a disintegrated condition (typically reflected by a loss of hardness and the softening of the wood fibers) must be considered as unsound wood.

WANE
Bark or the absence of wood from any cause (except eased edges) but commonly at what would be the absence of wood due to the cambium layer (or the wood/bark surface interface) being included on the edge or a face of a piece of lumber. Wane extending up to full width is allowed in an occasional piece in any Wisconsin Local Use Dimension Lumber Grade if it does not exceed the 1/8 inch depth limits for skips/scant, is away from the ends, and it is less than one foot in length .

Shake
is a lengthwise separation of the wood (primarily along the longitudinal axis) that occurs commonly between or sometimes across the growth rings (i.e. separation along the long axis between or across the annual growth rings).

A ***surface shake*** occurs on only one surface of the piece of lumber.

A ***through shake*** will extend from one surface face to an opposite or adjoining surface (e.g. completely through from one wide face to another, or from a wide face to an edge face).

Splits
A split is a separation of the wood due to the tearing apart of the wood cells that occurs through the piece to the opposite or an adjacent surface.

Checks
A check is a separation of the wood that normally occurs across or through the wood growth rings (i.e. normally in the tangential or radial dimension), usually as a result of the drying (seasoning) process.

A ***surface check*** occurs on a wide or thickness face of a piece.

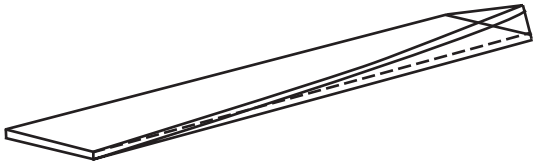
A ***through check*** will extend from one surface face to an opposite or adjoining surface (e.g. completely through from one wide face to another, or from a wide face to an edge face).

Slope of Grain
Is the deviation of the wood fiber from a line that is parallel to the edges of the piece (i.e. the grain of the wood is not parallel to the edge of the piece). The slope of grain deviation is expressed as a ratio, such as 1 in 8, representing there is 1 inch in deviation between the grain of the wood and the line parallel for every 8 inches of length.

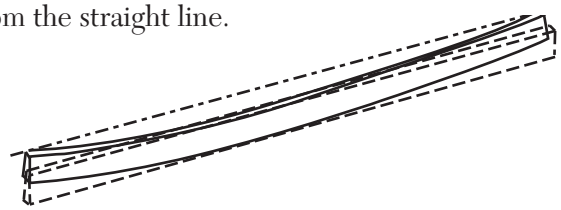
Warp
Is any deviation from a true (or flat plane) surface. It includes twist, crook, bow and cup, separately or in combination. Warp restrictions are based on average form as it normally occurs, and variations from the average form (such as short kinks) should be considered and appraised according to equivalent effect. Two or more forms of warp in a single piece should be appraised according to combined effect. The Wisconsin Local Use Dimension Lumber Grades allow different amount of warp for different types between the different grades and sizes of dimension lumber. Depending on the Wisconsin Local Use Dimension Lumber Grade, warp that is termed as "Light" or "Medium" may be allowed, for the Number 2 and Better and the Stud Grades as compared to the Number 3 Grade. But what is allowed as "Light" warp (for the Number 2 and Better and the Stud Grades) as compared to "Medium" warp (for the Number 3 Grade) varies according to type of warp and lumber dimensions. Allowed limits for twist vary according to Grade and lumber length and width; allowed limits for crook vary according to Grade and lumber length

and width; allowed limits for bow vary according to Grade and lumber length and thickness; and allowed limits for cup vary according to width. These specific warp limits are included in Table #4. The different types of warp considered within the Wisconsin Local Use Dimension Lumber Grades are as follows:

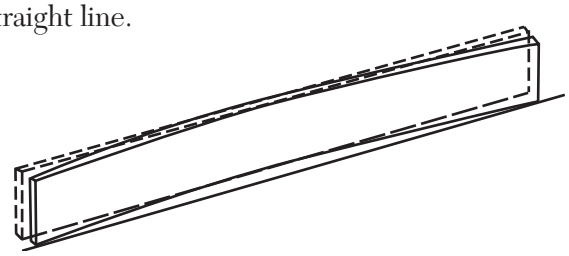
Twist is a deviation flatwise or a combination of flatwise and edgewise, in the form of a curve or spiral. It is measured as the point of distance that the edge of a piece is raised above a flat surface where both edges of the opposite end of the same piece are resting against the same flat surface.



Crook is a deviation edgewise from a straight line drawn from end to end of the piece (i.e. a straight line from end to end along an edge or a thickness face). It is measured as the point of greatest distance from the straight line.



Bow is a deviation flatwise from a straight line drawn from end to end of the piece (i.e. a straight line from end to end along a wide face). It is measured as the point of greatest distance from the straight line.



Cup is a deviation in the face of a piece, from a straight line drawn from edge to edge of the piece (i.e. a straight line from edge to edge across the wide face). It is measured as the point of greatest distance from the straight line.

Skips occur in places in surfaced lumber in areas where the piece has failed to surface cleanly.

Heavy skip is skip that is not more than 1/8 inch (0.125 inches) deep.

Scant

May occur in green or dry and in rough or surfaced lumber where (for a variety of reasons) the lumber is slightly less than the standard or required size. Within the Wisconsin Local Use Dimension Lumber Grades for "rough" (i.e. unsurfaced) dry or green lumber that is intended to be sawn-to-size for use without surfacing, some scant undersize may occur in some places on the piece (e.g. as a result of sawing variation) and it is allowed in the same fashion, and to the same degree (i.e. not to exceed 1/8 inch in depth and not to exceed 2 feet in length in any one place) for which skip is allowed in surfaced lumber.

Manufacture

All of the Wisconsin Local Use Dimension Lumber Grades allow manufacturing imperfections of a modified Standard "F" which is to say that it is a modified version of the least restrictive of the standards of Standard "A" through Standard "F". This recognizes that sawn-to-size lumber in the green condition and other lumber that has not been kiln-dried and that has not been surfaced four sides will routinely be included in lumber sold under the Wisconsin Local Use Dimension Lumber Grades. Also it is recognizing the nature of the mills that will likely produce such lumber and their limitations with regard to machine centers that will typically produce this lumber and simplifies the limitations for manufacturing imperfections. Comparison of the overall requirements and limitations of Wisconsin Local Use Dimension Lumber Grade requirements within grades to the substitute equivalent grades of the standard grading rules of various bureaus will quickly underscore that, although the Wisconsin Local Use Dimension Lumber Grade requirements have been simplified in many cases, they are typically at least as restrictive (examples would be for shake, split, checks and slope of grain) and in some cases more restrictive than their counterpart grades (examples would be with regard to the permitted and limiting provisions for knots, holes, unsound wood and wane). However, in the case of manufacturing imperfections, the Wisconsin Local Use Dimension Lumber Grade requirements are in most cases very similar to the Standard "F" provisions used by bureaus for substitute equivalent grades, and in other cases simplified and relaxed for ease of use. This simplification and relaxation of requirements will primarily be reflected in a cosmetic difference

with little or no appreciable impact on strength. Specifics for the characteristics of manufacturing imperfections permitted under the Wisconsin Local Use Dimension Lumber Grades modified Standard "F" are as follows:

Heavy torn grain allowed not more than 1/8 inch (0.125 inch) in deep (torn grain is a surface irregularity where wood has been torn or broken out by surfacing).

Heavy raised grain allowed not more than 1/8 inch (0.125 inch) high (raised grain is a surface irregularity where latewood (or summerwood) rises above the earlywood (or springwood)).

Heavy loosened grain allowed not more than 1/8 inch (0.125 inch) separation (loosened grain is a grain separation or loosening between latewood and earlywood).

Heavy machine bite allowed not more than 1/8 inch (0.125 inch) deep (machine bite is a depressed cut of the machine knives at the end of the piece).

Heavy machine gouge allowed not more than 1/8 inch (0.125 inch) deep (machine gouge is a groove cut by the machine below the desired line).

Heavy machine offset allowed not more than 1/8 inch (0.125 inch) deep (machine offset is an abrupt dressing variation in the edge of the piece, usually near the end of the piece, that does not reduce the width of the wide surface).

Heavy chip marks allowed not more than 1/8 inch (0.125 inch) deep (chip marks are shallow depressions typically caused by shavings (i.e. "chips") getting imbedded in the surface during the surfacing process).

Knife marks and saw marks allowed as readily visible and uneven to the touch (knife marks and saw marks are imprints of machine knives or saw blades on the surface of the piece).

Heavy wavy dressing and sawing variation allowed not more than 1/8 inch (0.125 inch) deep (wavy dressing is uneven dressing and sawing variation is thickness variation in a piece resulting from the variation of the saw and other elements of the machine centers within the sawmill).

Heavy mismatch allowed not more than 1/8 inch (0.125 inch) deep (mismatch is an uneven fit in worked lumber when adjoining pieces do not meet tightly at all points of contact, and also where the surfaces of adjoining pieces are not in the same plane).

Pitch

Is an accumulation of resinous material.

A ***pitch streak*** is a well-defined accumulation of pitch in a streak.

Pocket

Is a well-defined opening between annual growth rings, developed as the tree grows, that typically contains pitch or bark.

Stain

Is a marked variation from the natural color of the wood. Stains usually occur in irregular patches as opposed to natural color that is more uniformly distributed. Firm Red Heart or Stained Heartwood is typically quite different from the wood's natural color (ranging from pink to brown) and is actually an incipient stage of decay where the wood is discolored (affecting appearance) but still sound and not in a disintegrated condition. Stained sapwood may assume a very different color from the heartwood of the same tree but does not significantly affect strength. Wood that is considered to be "stained" under the Wisconsin Local Use Dimension Lumber Grade requirements, regardless if such discoloration may actually be caused by a staining fungi, or if the discoloration may in fact be caused by an incipient stage of decay, the wood must be sound. In differentiation between stain and decay under the Wisconsin Local Use Dimension Lumber Grade requirements, if the wood appears to be in a disintegrated condition (typically reflected by a loss of hardness and the softening of the wood fibers) then it must be considered as unsound wood. The standard of what constitutes "loss of hardness and the softening of the wood fibers" as an indicator of decay should not be construed as requiring evidence of disintegration that is obvious but not quite so extreme as to allow crumbling under thumb pressure, or allowing pieces to be easily picked out. Rather the standard of what constitutes "loss of hardness and the softening of the wood fibers" is simply an easily recognizable difference from what is normal or typical for that species. If the wood has apparently suffered from a loss of hardness and the softening of the wood fibers, it should be considered as unsound wood. If the wood is discolored, affecting appearance, but not resulting in any appreciable or significant loss of hardness or softening of the wood fibers, and with no apparent reason to expect that whatever is causing the discoloration is seriously compromising the strength of the wood, then the discoloration may be treated as stain.

Some Basic Questions and Answers Regarding
The Wisconsin Local Use Dimension Lumber Grading System
The Training Program And Required Documentation For
Wisconsin Local Use Dimension Lumber Written Certification

Under 2007 WISCONSIN ACT 208, how can lumber that is not grade-stamped under an accredited lumber grading agency be used in residential construction?

Dimension lumber that is graded under the Wisconsin Local Use Dimension Lumber grading system can be used in place of grade-stamped dimension lumber for which the Wisconsin Local Use Dimension Lumber grade is indicated as being a substitute equivalent – ***if certain special conditions are met.***

What are those "certain special conditions" that must be met?

The person milling the lumber must sell the lumber directly to the person who will inhabit the dwelling (or to a person acting on his or her behalf) and for whom a building permit has been issued for the dwelling. The person milling lumber must provide a written certification that the lumber meets the requirements established for the grade under the Wisconsin Local Use Dimension Lumber grading system. The person milling lumber must also provide a copy of their certificate of accomplishment evidencing their certification or recertification under the Wisconsin Local Use Dimension Lumber grading system for training that has been issued no more than five years prior to the date of the sale. In a final oversight, the building inspector may authorize the use of the lumber, reject the use of the lumber, or authorize its use subject to more restrictive construction requirements, including requirements as to size, spacing, length of spans, and design.

Does this mean I could purchase lumber for use in residential construction and have it rejected by the building inspector?

Yes. The building inspector has final authority. The building inspector may authorize the use of the lumber, reject the use of the lumber, or authorize its use subject to more restrictive construction requirements, including requirements as to size, spacing, length of spans, and design. There is no good reason to expect a building inspector would wish to reject suitable lumber which is as good as the grade-stamped lumber which would be clearly allowed by code, so this was considered in developing the requirements for the Wisconsin Local Use Dimension Lumber grading system.

How would Wisconsin Local Use Dimension Lumber in a substitute equivalent grade be expected to compare to lumber that has been grade-stamped under an accredited lumber grading agency?

The requirements established for dimension lumber that is graded under the Wisconsin Local Use Dimension Lumber grading system is in most cases approximately the same or is actually stricter as compared to the requirements for grade-stamped dimension lumber for which the Wisconsin Local Use Dimension Lumber grade is indicated as being a substitute equivalent. Generally the requirements established for dimension lumber that is graded under the Wisconsin Local Use Dimension Lumber grading system would reasonably be considered as being stricter with regard to the characteristics or limiting provisions for knots, holes, unsound wood and wane. Most other characteristics or limiting provisions are similar or identical with the exception of some differences in cosmetic features for which the Wisconsin Local Use Dimension Lumber grading system recognizes the differences in the products and typical manufacturing equipment used and is in some cases slightly less restrictive.

Why are there these kinds of differences in how would Wisconsin Local Use Dimension Lumber in a substitute equivalent grade be expected to compare to lumber that has been grade-stamped under an accredited lumber grading agency?

2007 WISCONSIN ACT 208 specifically requires that the lumber (Wisconsin Local Use Dimension Lumber) shall be milled so that it meets or exceeds the requirements of the one and two family dwelling code, and in a practical sense this requires that dimension lumber that is graded under the Wisconsin Local Use Dimension Lumber grading system should be as good as grade-stamped dimension lumber for which the Wisconsin Local Use Dimension Lumber grade is indicated as being a substitute equivalent. Recognizing that the small sawmill operator who could be expected to produce lumber under 2007 WISCONSIN ACT 208 will not have the same level of training or experience as a certified dimension lumber grader for an accredited agency. The Wisconsin Local Use Dimension Lumber grading system has been intentionally simplified with regard to number of grades and the grading requirements, and the simplification and some other elements have intentionally been crafted to provide a slightly greater cushion for possible errors. Generally the requirements established for dimension lumber that is graded under the Wisconsin Local Use Dimension Lumber grading system would reasonably be considered as being stricter with regard to the characteristics or limiting provisions for knots, holes, unsound wood and wane. This would be expected to result in what would be an improved product of greater strength, all other things being equal. Most other characteristics or limiting provisions are similar or identical with the exception of some differences in what are primarily cosmetic features for which the Wisconsin Local Use Dimension Lumber grading system recognizes the differences in the products and typical manufacturing equipment used and is in some cases slightly less restrictive. Grade-stamped dimension lumber is typically produced to standard sizes as a commodity product in large-scale production. In the case of the Wisconsin Local Use Dimension Lumber grading system which is created to serve a very different market niche it is recognized that the product may be sold in different forms which are also allowed but are less common.

Does this mean that Wisconsin Local Use Dimension Lumber that can be used in residential construction is something that will not be available for purchase from a retail lumber yard?

Yes, Wisconsin Local Use Dimension Lumber that can be used in residential construction will not generally be available for purchase from a retail lumber yard. This is because 2007 WISCONSIN ACT 208 clearly establishes a requirement that, "The lumber has been milled at the request of the person owning the lumber for use in the construction of the dwelling, and the dwelling will be inhabited by the person owning the lumber." Consequently, the only way in which Wisconsin Local Use Dimension Lumber that could be used in residential construction could appear to be available for purchase from a retail lumber yard would be in circumstances where a sawmill is operating a retail lumber yard on their site. 2007 WISCONSIN ACT 208 very clearly established that for use in residential construction, Wisconsin Local Use Dimension Lumber must be directly sold by the person milling the lumber directly to the person who will inhabit the dwelling (or to a person acting on his or her behalf) and for whom a building permit has been issued.

Is it possible for a landowner to have logs from their own trees custom sawn into Wisconsin Local Use Dimension Lumber that the landowner can then use in construction of their own home?

Yes, that can be done, but the requirements established in 2007 WISCONSIN ACT 208, ***"those "certain special conditions" that must be met"*** all still must be met (including providing all certifications). In this circumstance, the person doing the custom sawing is the person milling the lumber, and the lumber is being milled directly for the landowner who is purchaser (and is also who will be using the lumber in construction of their own residence). The only thing making the custom sawing situation unique or different from the general circumstance is that the transaction price the parties would agree to would be considered by them to represent primarily the manufacturing costs (only) and not have a component representing log costs.

What kinds of information is required as part of certifications that must be provided with Wisconsin Local Use Dimension Lumber that the buyer intends to use in construction of their home?

The person milling lumber provides a written certification that the lumber being sold meets the requirements of the specific Wisconsin Local Use Dimension Lumber grades as appropriate. The grade of grade-stamped dimension lumber for which the Wisconsin Local Use Dimension Lumber grade is considered to be a substitute equivalent will also be indicated. A copy of the seller's certification (or recertification) under the lumber grading training program (that must have been issued within the last five years) must be provided. In addition, documentation shall be provided with regard to the tally of lumber being sold, including the number of pieces per nominal thickness, width and standard length, in each grade/grouping in the transaction, and the total board feet, including the total in each grade/grouping. There shall be documentation regarding the condition of the lumber being sold, to include a clear indication as to the moisture content conditions of the lumber (at the time the lumber is sold), as either "Green Lumber" or "DRY Lumber". There shall also be a clear designation of the lumber in the shipment unit as "Surfaced Lumber," or as "Sawn-To-Size Lumber," or as "Rough Lumber". For "Surfaced Lumber" or as "Sawn-To-Size Lumber", if the (actual) sizes are not equal to the minimum thicknesses and widths for surfaced or sawn-to-size lumber (within the Wisconsin Local Use Dimension Lumber Grades) that must be explicitly specified and the actual sizes are to be specified. If rough lumber in the dry condition is less than the required minimum size, and for rough lumber in the green condition the actual sizes are to be specified. If lumber is sold in anything other than in standard lengths in 2 foot long multiples, with a 8 foot minimum length; this must be explicitly specified. The required information in addition to the copy of certificate of grading training can be provided directly as part of the written certification of lumber meeting grade requirements, or as a hand-written note on the certification, or in the form of an attachment (or attachments), that may include the purchase agreement, pre-printed forms where information may be included in a "fill-in-the-blank" or "circle-as-appropriate" format, or may be pre-printed tables of lumber sizes or other information.

How does a sawmill get the (lumber grading) certification to produce Wisconsin Local Use Dimension Lumber?

2007 WISCONSIN ACT 208 clearly stipulates that a person providing the written certification has to have been issued a certificate of accomplishment evidencing certification or recertification under a lumber grading training program (and that program was created with specification in the act). The training program is held at least annually by specially certified instructors. The seller (i.e. the producing sawmill) of the dimension lumber that is graded under the Wisconsin Local Use Dimension Lumber grading system must have completed this program. In the case of a small one-person operation (such as with a portable sawmill custom sawing), this "person" is that individual. If that individual ceases operations and the sawmill machine for such an operation is sold to another person, the certificate is void. For somewhat larger (such as fixed-site) operations that have more than the one (owner-operator) employee (such as family operations, partnerships or other small companies) the certificate is listed to the company, and the specific individual who received the training is also noted on the certificate. The certification provided by the seller is actually provided by the company which has legal liability. These companies may be expected to send additional persons for training at intervals less than the required maximum 5 year interval for recertification. A new certificate is issued when a new person is trained. Therefore the timeline of the 5 year recertification interval for that company is "reset" with the new certification. If an employee of a company who received certification training leaves that company (for whatever reason) the certificate does not accompany the employee. If that employee were the only currently trained individual under the certification system, the company would need to have another person be certified at the next possible training class.

Date of enactment: **April 7, 2008**

2007 Senate Bill 28 Date of publication*: **April 21, 2008**

2007 WISCONSIN ACT 208

AN ACT ***to renumber and amend*** 101.977; ***to amend*** 101.66 (1); and ***to create*** 36.25 (47), 101.66 (1m) and 101.977 (2) of the statutes; **relating to:** exemption from construction standards for certain load–bearing dimension lumber and establishing a training program in the grading of lumber.

The people of the state of Wisconsin, represented in senate and assembly, do enact as follows:

SECTION 1b. 36.25 (47) of the statutes is created to read:

36.25 **(47)** LUMBER GRADING TRAINING PROGRAM. (a) In this subsection:

1. "Department" means the department of natural resources.

2. "Department employee" means an employee of the department who is knowledgeable in the marketing of forest products and who is selected by the secretary to act under this subsection.

(b) The forest products outreach program at the University of Wisconsin–Stevens Point, in cooperation with the department, shall establish a basic lumber grading training program for individuals and establish the general requirements for successfully completing the training program, including requirements for initial certification and recertification. The training program shall be offered in the extension on an annual basis. The faculty at the forestry outreach program, in cooperation with the department employee, shall develop and establish the content of the training program and shall determine the certification requirements for instructors teaching the training program. Instructors shall be certified by the department.

(c) The department, in cooperation with the board, shall establish a procedure under which the department determines successful completion of the training program and issues certifications of accomplishment to the individuals who are certified or recertified as having successfully completed the training program. Under the procedure, the department employee may delegate to the program instructors the process of determining successful completion and issuing certificates of accomplishment.

(d) An individual holding an initial certificate of accomplishment shall be recertified under the training program every 5 years.

(e) The department employee may exempt from the training program an individual who has any of the following:

1. A bachelor's or postgraduate degree in forest products or wood science and technology.

2. A degree that is equivalent to a degree specified in subd. 1.

3. A level of experience or background in understanding wood properties, construction, and design that the department employee determines to be equivalent to the level of understanding held by an individual who successfully completes the training program.

* Section 991.11, WISCONSIN STATUTES 2005–06 : Effective date of acts. "Every act and every portion of an act enacted by the legislature over the governor's partial veto which does not expressly prescribe the time when it takes effect shall take effect on the day after its date of publication as designated" by the secretary of state [the date of publication may not be more than 10 working days after the date of enactment].

(f) The department employee shall issue a certificate of accomplishment to each individual who meets the requirement under par. (e). A certificate of accomplishment issued under this subdivision applies only to the initial certification requirement and an individual receiving such a certificate must be recertified as required under par. (d).

SECTION 1m. 101.66 (1) of the statutes is amended to read:

101.66 **(1)** ~~Every~~ Except as provided in sub. (1m), every builder, designer, and owner shall use building materials, methods, and equipment which are in conformance with the one– and 2–family dwelling code.

SECTION 2. 101.66 (1m) of the statutes is created to read:

101.66 **(1m)** (a) No person may use in a one– or 2–family dwelling load–bearing dimension lumber that has not been tested and approved for conformance as required by the department unless the lumber is approved for use under par. (c) and one of the following applies:

1. The lumber has been milled at the request of the person owning the lumber for use in the construction of the dwelling, and the dwelling will be inhabited by the person owning the lumber.

2. The person milling the lumber sells the lumber directly to a person who will inhabit the dwelling or to a person acting on his or her behalf and for whom a building permit has been issued for the dwelling.

(b) The lumber shall be milled so that it meets or exceeds the requirements of the one– and 2–family dwelling code. The person milling the lumber shall provide to the person receiving the lumber a written certification that the lumber meets or exceeds these requirements. The department shall design and provide forms for this purpose.

(bn) A person may not provide a written certification under par. (b) unless the person has been issued a certificate of accomplishment evidencing certification or recertification under the lumber grading training program under s. 36.25 (47) and the person has received the certificate within the 5 years before providing the written certification. The person shall attach to the written certification a copy of his or her certificate of accomplishment.

(c) Upon receipt of a copy of the certification required under par. (b) an inspector who is certified under sub. (2) may either authorize the use of the lumber, reject the use of the lumber, or authorize its use subject to more restrictive construction requirements, including requirements as to size, spacing, length of spans, and design.

SECTION 3. 101.977 of the statutes is renumbered 101.977 (1) and amended to read:

101.977 **(1)** ~~A~~ Except as provided in sub. (2), a person who constructs a multifamily dwelling shall use building materials, methods, and equipment that are in conformance with the standards prescribed under s. 101.973 (1).

SECTION 4. 101.977 (2) of the statutes is created to read:

101.977 **(2)** (a) No person may use in a multifamily dwelling load–bearing dimension lumber that has not been tested and approved for conformance as required by the department unless the lumber is approved for use as provided under par. (c) and if one of the following applies:

1. The lumber has been milled at the request of the person owning the lumber for use in the construction of the multifamily dwelling, a dwelling unit of which will be inhabited by that person.

2. The person milling the lumber sells the lumber directly to a person who will inhabit the dwelling unit in the multifamily dwelling, or to a person acting on his or her behalf and for whom a building permit has been issued for the multifamily dwelling.

(b) The lumber shall be milled so that it meets or exceeds the requirements of the standards prescribed in s. 101.973. The person milling the lumber shall provide to the person receiving the lumber a written certification that the lumber meets or exceeds these requirements. The department shall design and provide forms for this purpose.

(bn) A person may not provide a written certification under par. (b) unless the person has been issued a certificate of accomplishment evidencing certification or recertification under the lumber grading training program under s. 36.25 (47) and the person has received the certificate within the 5 years before providing the written certification. The person shall attach to the written certification a copy of his or her certificate of accomplishment.

(c) Upon receipt of a copy of the certification required under par. (b), an inspector who inspects multifamily dwellings for compliance with this subchapter may either authorize the use of the lumber, reject the use of the lumber, or authorize its use subject to more restrictive construction requirements, including requirements as to size, spacing, length of spans, and design.

Table #1: EQUIVALENT SIZES FOR CONVERSIONS - FRACTIONS TO DECIMAL AND METRIC
(FOR CONVERSIONS WITH WISCONSIN LOCAL USE DIMENSION LUMBER)

FRACTIONS TO DECIMALS INCHES AND MILLIMETERS					FEET TO METERS	
INCHES SIXTEENTHS	INCHES EIGHTHS	INCHES DECIMAL	MILLIMETERS		FEET	METERS
1/16 inch		0.0625	1.5875		1	0.3048
2/16 inch	1/8 inch	0.1250	3.1750		2	0.6096
3/16 inch		0.1875	4.7625		3	0.9144
4/16 inch	2/8 or 1/4inch	0.2500	6.3500		4	1.2192
5/16 inch		0.3125	7.9375		5	1.5240
6/16 inch	3/8 inch	0.3750	9.5250		6	1.8288
7/16 inch		0.4375	11.1125		7	2.1336
8/16 inch	4/8 or 1/2inch	0.5000	12.7000		8	2.4384
9/16 inch		0.5625	14.2875		9	2.7432
10/16 inch	5/8 inch	0.6250	15.8750		10	3.0480
11/16 inch		0.6875	17.4625		11	3.3528
12/16 inch	6/8 or 3/4 inch	0.7500	19.0500		12	3.6576
13/16 inch		0.8125	20.6375		13	3.9624
14/16 inch	7/8 inch	0.8750	22.2250		14	4.2672
15/16 inch		0.9375	23.8125		15	4.5720
16/16 inch	8/8 or 4/4 or 1 inch	1.0	25.4		16	4.8768
		2.0	50.8		17	5.1816
		3.0	76.2		18	5.4864
		4.0	101.6		19	5.7912
		5.0	127.0		20	6.0960
		6.0	152.4			
		7.0	177.8			
		8.0	203.2			
		9.0	228.6			
		10.0	254.0			
		11.0	279.4			
		12.0	304.8			
		13.0	330.2			
		14.0	355.6			
		15.0	381.0			
		16.0	406.4			

Table #2 NOMINAL AND MINIMUS (STANDARD) REQUIRED SIZES(THICKNESS AND WIDTH) FOR WISCONSIN LOCAL USE DIMENSION LUMBER

THICKNESS THICKNESS DIMENSION NOMINAL and ACTUAL MINIMUM (STANDARD) SIZES						WIDTH WIDE DIMENSION NOMINAL and ACTUAL MINIMUM (STANDARD) SIZES				
	MINIMUM (STANDARD) THICKNESS			SUGGESTED			MINIMUM (STANDARD) THICKNESS			SUGGESTED
	MINIMUM (STANDARD) DRY Lumber	MINIMUM (STANDARD) Green Lumber	MINIMUM (STANDARD)	MINIMUM SUGGESTED			MINIMUM (STANDARD) DRY Lumber	MINIMUM (STANDARD) Green Lumber	MINIMUM (STANDARD)	MINIMUM SUGGESTED
Nominal Thickness	Surfaced or Sawn-To-Size	Surfaced or Sawn-To-Size	DRY Lumber Rough	Green Lumber Rough		Width	Surfaced or Sawn-To-Size	Surfaced or Sawn-To-Size	Dry Lumber Rough	Green Lumber Rough
in Inches	in inches	in inches	in inches	in inches		in Inches	in inches	in inches	in inches	in inches
2.0	1.5	1.5625	1.625	1.690		2.0	1.50	1.5625	1.625	1.690
2.5	2.0	2.0625	2.125	2.210		2.5	2.00	2.0625	2.125	2.210
3.0	2.5	2.5625	2.625	2.730		3.0	2.50	2.5625	2.625	2.730
3.5	3.0	3.0625	3.125	3.250		3.5	3.00	3.0625	3.125	3.250
4.0	3.5	3.5625	3.625	3.770		4.0	3.50	3.5625	3.625	3.770
4.5	4.0	4.0625	4.125	4.290		4.5	4.00	4.0625	4.125	4.290
						5.0	4.50	4.6250	4.625	4.810
						6.0	5.50	5.6250	5.625	5.850
						8.0	7.25	7.5000	7.375	7.670
						10.0	9.25	9.5000	9.375	9.750
						12.0	11.25	11.5000	11.375	11.830
						14.0	13.25	13.5000	13.375	13.910
						16.0	15.25	15.5000	15.375	15.990

Table #3: BOARD FOOT CONTENT TABLE FOR COMMON SIZES OF WISCONSIN LOCAL USE DIMENSION LUMBER

BOARD FOOT CONTENT TABLE FOR 2 INCH NOMINAL THICKNESSES, COMMON LENGTHS AND WIDTHS

Board feet lumber (to 1/10 board foot) for 6 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
2	2	6	**2.0**
2	4	6	**4.0**
2	6	6	**6.0**
2	8	6	**8.0**
2	10	6	**10.0**
2	12	6	**12.0**
2	14	6	**14.0**
2	16	6	**16.0**

Board feet lumber (to 1/10 board foot) for 12 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
2	2	12	**4.0**
2	4	12	**8.0**
2	6	12	**12.0**
2	8	12	**16.0**
2	10	12	**20.0**
2	12	12	**24.0**
2	14	12	**28.0**
2	16	12	**32.0**

Board feet lumber (to 1/10 board foot) for 8 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
2	2	8	**2.7**
2	4	8	**5.3**
2	6	8	**8.0**
2	8	8	**10.7**
2	10	8	**13.3**
2	12	8	**16.0**
2	14	8	**18.7**
2	16	8	**21.3**

Board feet lumber (to 1/10 board foot) for 14 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
2	2	14	**4.7**
2	4	14	**9.3**
2	6	14	**14.0**
2	8	14	**18.7**
2	10	14	**23.3**
2	12	14	**28.0**
2	14	14	**32.7**
2	16	14	**37.3**

Board feet lumber (to 1/10 board foot) for 10 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
2	2	10	**3.3**
2	4	10	**6.7**
2	6	10	**10.0**
2	8	10	**13.3**
2	10	10	**16.7**
2	12	10	**20.0**
2	14	10	**23.3**
2	16	10	**26.7**

Board feet lumber (to 1/10 board foot) for 16 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
2	2	16	**5.3**
2	4	16	**10.7**
2	6	16	**16.0**
2	8	16	**21.3**
2	10	16	**26.7**
2	12	16	**32.0**
2	14	16	**37.3**
2	16	16	**42.7**

BOARD FOOT CONTENT TABLE FOR 3 INCH NOMINAL THICKNESSES, COMMON LENGTHS AND WIDTHS

Board feet lumber (to 1/10 board foot) for 6 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
3	2	6	**3.0**
3	4	6	**6.0**
3	6	6	**9.0**
3	8	6	**12.0**
3	10	6	**15.0**
3	12	6	**18.0**
3	14	6	**21.0**
3	16	6	**24.0**

Board feet lumber (to 1/10 board foot) for 12 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
3	2	12	**6.0**
3	4	12	**12.0**
3	6	12	**18.0**
3	8	12	**24.0**
3	10	12	**30.0**
3	12	12	**36.0**
3	14	12	**42.0**
3	16	12	**48.0**

Board feet lumber (to 1/10 board foot) for 8 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
3	2	8	**4.0**
3	4	8	**8.0**
3	6	8	**12.0**
3	8	8	**16.0**
3	10	8	**20.0**
3	12	8	**24.0**
3	14	8	**28.0**
3	16	8	**32.0**

Board feet lumber (to 1/10 board foot) for 14 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
3	2	14	**7.0**
3	4	14	**14.0**
3	6	14	**21.0**
3	8	14	**28.0**
3	10	14	**35.0**
3	12	14	**42.0**
3	14	14	**49.0**
3	16	14	**56.0**

Board feet lumber (to 1/10 board foot) for 10 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
3	2	10	**5.0**
3	4	10	**10.0**
3	6	10	**15.0**
3	8	10	**20.0**
3	10	10	**25.0**
3	12	10	**30.0**
3	14	10	**35.0**
3	16	10	**40.0**

Board feet lumber (to 1/10 board foot) for 16 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
3	2	16	**8.0**
3	4	16	**16.0**
3	6	16	**24.0**
3	8	16	**32.0**
3	10	16	**40.0**
3	12	16	**48.0**
3	14	16	**56.0**
3	16	16	**64.0**

Table #3 continued: BOARD FOOT CONTENT TABLE FOR COMMON SIZES OF WISCONSIN LOCAL USE DIMENSION LUMBER

BOARD FOOT CONTENT TABLE FOR 4 INCH NOMINAL THICKNESSES, COMMON LENGTHS AND WIDTHS

Board feet lumber (to 1/10 board foot) for 6 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
4	2	6	**4.0**
4	4	6	**8.0**
4	6	6	**12.0**
4	8	6	**16.0**
4	10	6	**20.0**
4	12	6	**24.0**
4	14	6	**28.0**
4	16	6	**32.0**

Board feet lumber (to 1/10 board foot) for 8 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
4	2	8	**5.3**
4	4	8	**10.7**
4	6	8	**16.0**
4	8	8	**21.3**
4	10	8	**26.7**
4	12	8	**32.0**
4	14	8	**37.3**
4	16	8	**42.7**

Board feet lumber (to 1/10 board foot) for 10 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
4	2	10	**6.7**
4	4	10	**13.3**
4	6	10	**20.0**
4	8	10	**26.7**
4	10	10	**33.3**
4	12	10	**40.0**
4	14	10	**46.7**
4	16	10	**53.3**

Board feet lumber (to 1/10 board foot) for 12 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
4	2	12	**8.0**
4	4	12	**16.0**
4	6	12	**24.0**
4	8	12	**32.0**
4	10	12	**40.0**
4	12	12	**48.0**
4	14	12	**56.0**
4	16	12	**64.0**

Board feet lumber (to 1/10 board foot) for 14 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
4	2	14	**9.3**
4	4	14	**18.7**
4	6	14	**28.0**
4	8	14	**37.3**
4	10	14	**46.7**
4	12	14	**56.0**
4	14	14	**65.3**
4	16	14	**74.7**

Board feet lumber (to 1/10 board foot) for 16 foot standard length

Nominal Thickness (Inches)	Nominal Width (Inches)	Standard Length (Feet)	Board foot contents in piece
4	2	16	**10.7**
4	4	16	**21.3**
4	6	16	**32.0**
4	8	16	**42.7**
4	10	16	**53.3**
4	12	16	**64.0**
4	14	16	**74.7**
4	16	16	**85.3**

Table #3A: MATRIX OF BOARD FOOT CONTENTS FOR COMMON SIZES OF WISCONSIN LOCAL USE DIMENSION LUMBER

BOARD FOOT CONTENTS PER PIECE FOR 2 INCH NOMINAL THICKNESS LUMBER IN 1 FOOT LENGTH
Lumber width in inches - for even inch widths only - 2 inch nominal thickness

Length in feet	2	4	6	8	10	12	14	16
4	1.3	2.7	4.0	5.3	6.7	8.0	9.3	10.7
5	1.7	3.3	5.0	6.7	8.3	10.0	11.7	13.3
6	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0
7	2.3	4.7	7.0	9.3	11.7	14.0	16.3	18.7
8	2.7	5.3	8.0	10.7	13.3	16.0	18.7	21.3
9	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0
10	3.3	6.7	10.0	13.3	16.7	20.0	23.3	26.7
11	3.7	7.3	11.0	14.7	18.3	22.0	25.7	29.3
12	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0
13	4.3	8.7	13.0	17.3	21.7	26.0	30.3	34.7
14	4.7	9.3	14.0	18.7	23.3	28.0	32.7	37.3
15	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
16	5.3	10.7	16.0	21.3	26.7	32.0	37.3	42.7
17	5.7	11.3	17.0	22.7	28.3	34.0	39.7	45.3
18	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0
19	6.3	12.7	19.0	25.3	31.7	38.0	44.3	50.7
20	6.7	13.3	20.0	26.7	33.3	40.0	46.7	53.3

BOARD FOOT CONTENTS PER PIECE FOR 3 INCH NOMINAL THICKNESS LUMBER IN 1 FOOT LENGTH INCREMENTS
Lumber width in inches - for even inch widths only - 3 inch nominal thickness

Length in feet	2	4	6	8	10	12	14	16
4	2.0	4.0	6.0	8.0	10.0	12.0	14.0	16.0
5	2.5	5.0	7.5	10.0	12.5	15.0	17.5	20.0
6	3.0	6.0	9.0	12.0	15.0	18.0	21.0	24.0
7	3.5	7.0	10.5	14.0	17.5	21.0	24.5	28.0
8	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0
9	4.5	9.0	13.5	18.0	22.5	27.0	31.5	36.0
10	5.0	10.0	15.0	20.0	25.0	30.0	35.0	40.0
11	5.5	11.0	16.5	22.0	27.5	33.0	38.5	44.0
12	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0
13	6.5	13.0	19.5	26.0	32.5	39.0	45.5	52.0
14	7.0	14.0	21.0	28.0	35.0	42.0	49.0	56.0
15	7.5	15.0	22.5	30.0	37.5	45.0	52.5	60.0
16	8.0	16.0	24.0	32.0	40.0	48.0	56.0	64.0
17	8.5	17.0	25.5	34.0	42.5	51.0	59.5	68.0
18	9.0	18.0	27.0	36.0	45.0	54.0	63.0	72.0
19	9.5	19.0	28.5	38.0	47.5	57.0	66.5	76.0
20	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0

BOARD FOOT CONTENTS PER PIECE FOR 4 INCH NOMINAL THICKNESS LUMBER IN 1 FOOT LENGTH INCREMENTS
Lumber width in inches - for even inch widths only - 4 inch nominal thickness

Length in feet	2	4	6	8	10	12	14	16
4	2.7	5.3	8.0	10.7	13.3	16.0	18.7	21.3
5	3.3	6.7	10.0	13.3	16.7	20.0	23.3	26.7
6	4.0	8.0	12.0	16.0	20.0	24.0	28.0	32.0
7	4.7	9.3	14.0	18.7	23.3	28.0	32.7	37.3
8	5.3	10.7	16.0	21.3	26.7	32.0	37.3	42.7
9	6.0	12.0	18.0	24.0	30.0	36.0	42.0	48.0
10	6.7	13.3	20.0	26.7	33.3	40.0	46.7	53.3
11	7.3	14.7	22.0	29.3	36.7	44.0	51.3	58.7
12	8.0	16.0	24.0	32.0	40.0	48.0	56.0	64.0
13	8.7	17.3	26.0	34.7	43.3	52.0	60.7	69.3
14	9.3	18.7	28.0	37.3	46.7	56.0	65.3	74.7
15	10.0	20.0	30.0	40.0	50.0	60.0	70.0	80.0
16	10.7	21.3	32.0	42.7	53.3	64.0	74.7	85.3
17	11.3	22.7	34.0	45.3	56.7	68.0	79.3	90.7
18	12.0	24.0	36.0	48.0	60.0	72.0	84.0	96.0
19	12.7	25.3	38.0	50.7	63.3	76.0	88.7	101.3
20	13.3	26.7	40.0	53.3	66.7	80.0	93.3	106.7

Table #4: WARP TABLES FOR WISCONSIN LOCAL USE DIMENSION LUMBER

TWIST LIMITS BY LENGTH AND WIDTH							
		WIDTH IN INCHES (NOMINAL)					
Length in feet	TWIST	2 inch	3 & 4 inch	5 & 6 inch	8 inch	10 inch	12 inch and greater
4 & 6 foot	Light	0.1250	0.2500	0.3750	0.5000	0.6250	0.7500
	Medium	0.1875	0.3750	0.5000	0.7500	0.8750	1.1250
8 foot	Light	0.2500	0.5000	0.7500	1.0000	1.2500	1.5000
	Medium	0.3750	0.7500	1.1250	1.5000	1.8750	2.2500
10 foot	Light	0.3125	0.6250	0.8750	1.2500	1.5000	1.8750
	Medium	0.5000	0.8750	1.3750	1.8750	2.3750	2.7500
12 foot	Light	0.3750	0.7500	1.1250	1.5000	1.8750	2.2500
	Medium	0.5625	1.1250	1.6250	2.2500	2.7500	3.3750
14 foot	Light	0.4375	0.8750	1.2500	1.7500	2.1250	2.6250
	Medium	0.6250	1.2500	1.8750	2.6250	3.2500	3.8750
16 foot and greater	Light	0.5000	1.0000	1.5000	2.0000	2.5000	3.0000
	Medium	0.7500	1.5000	2.2500	3.0000	3.7500	4.5000

CROOK LIMITS BY LENGTH AND WIDTH							
		WIDTH IN INCHES (NOMINAL)					
Length in feet	CROOK	2 inch	3 & 4 inch	5 & 6 inch	8 inch	10 inch	12 inch and greater
4 & 6 foot	Light	0.2500	0.2500	0.1875	0.1250	0.0625	0.0625
	Medium	0.3750	0.3750	0.2500	0.1875	0.1250	0.1250
8 foot	Light	0.3750	0.3750	0.3125	0.2500	0.1875	0.1250
	Medium	0.5000	0.5000	0.5000	0.3750	0.2500	0.1875
10 foot	Light	0.7500	0.5000	0.4375	0.3750	0.2500	0.1875
	Medium	1.3750	0.7500	0.6250	0.5000	0.4375	0.3750
12 foot	Light	1.0000	0.6875	0.6250	0.5000	0.4375	0.3750
	Medium	1.5000	1.0000	0.8750	0.8125	0.7500	0.5625
14 foot	Light	1.2500	0.8750	0.7500	0.6250	0.5000	0.3750
	Medium	2.0000	1.2500	1.1250	1.0000	0.8750	0.7500
16 foot and greater	Light	1.6250	1.0000	0.8750	0.7500	0.6250	0.5000
	Medium	2.5000	1.5000	1.3750	1.1250	1.0000	0.8750

BOW LIMITS BY LENGTH AND THICKNESS							
		THICKNESS IN INCHES (NOMINAL)					
Length in feet	BOW	2 inch	3 and 4 inch				
4 & 6 foot	Light	0.5000	0.2500				
	Medium	0.7500	0.3750				
8 foot	Light	0.7500	0.3750				
	Medium	1.0000	0.5000				
10 foot	Light	1.5000	0.7500				
	Medium	2.7500	1.3750				
12 foot	Light	2.0000	1.0000				
	Medium	3.0000	1.5000				
14 foot	Light	2.5000	1.2500				
	Medium	4.0000	2.0000				
16 foot and greater	Light	3.2500	1.6250				
	Medium	5.0000	2.5000				

CUP LIMITS BY FACE WIDTH							
		WIDTH IN INCHES (NOMINAL)					
	CUP	2 inch	3 & 4 inch	5 & 6 inch	8 inch	10 inch	12 inch and greater
	Light	0.0625	0.0625	0.0625	0.1250	0.1875	0.2500
	Medium	0.0625	0.0625	0.1250	0.1875	0.2500	0.3750

(Note: In all tables above, 2 inch size includes 2.5 inch, 3 & 4 inch includes 3, 3.5, 4 & 4.5 inch sizes

Table #5: SUMMARY OF SOME KEY LIMITING PROVISIONS FOR WISCONSIN LOCAL USE DIMENSION LUMBER

MAXIMUM KNOT SIZE (OR EQUIVALENT)					
	Number 2 & Better Grade	**Stud Grade**	**Number 3 Grade**		**ECONOMY Grouping**
	sound, firm, encased & pith knots if tight and well spaced	***any quality permitted if well spaced***	***any quality permitted if well spaced***		***any quality permitted***
Nominal Width	**Maximum size or equivalent**	**Maximum size or equivalent**	**Maximum size or equivalent**		**Maximum size at any point**
in INCHES	**in inches**	**in inches**	**in inches**		**in inches**
2.0	0.50	0.67	0.67		1.33
2.5	0.63	0.83	0.83		1.67
3.0	0.75	1.00	1.00		2.00
3.5	0.88	1.17	1.17		2.33
4.0	1.00	1.33	1.33		2.67
4.5	1.13	1.50	1.50		3.00
5.0	1.25	1.67	1.67		3.34
6.0	1.50	2.00	2.00		4.00
8.0	2.00	2.66	2.66		5.34
10.0	2.50	3.33	3.33		6.67
12.0	3.00	4.00	4.00		8.00
14.0	3.50	4.66	4.66		9.34
16.0	4.00	5.33	5.33		10.67

MAXIMUM HOLE SIZE (OR EQUIVALENT SMALLER PER 2 LINEAL FEET) *(ALL UNSOUND WOOD EXCEPT WANE INCLUDED IN "HOLE" LIMITS)*					
	Number 2 & Better Grade	**Stud Grade**	**Number 3 Grade**		**ECONOMY Grouping**
	also includes unsound, loose and not firmly fixed knots				***not limited per 2 lineal feet***
Nominal Width	**Maximum size or equivalent**	**Maximum size or equivalent**	**Maximum size or equivalent**		**Maximum size at any point**
in INCHES	**in inches**	**in inches**	**in inches**		**in inches**
2.0	0.50	0.67	0.67		1.00
2.5	0.63	0.83	0.83		1.25
3.0	0.75	1.00	1.00		1.50
3.5	0.88	1.17	1.17		1.75
4.0	1.00	1.33	1.33		2.00
4.5	1.13	1.50	1.50		2.25
5.0	1.25	1.67	1.67		2.50
6.0	1.50	2.00	2.00		3.00
8.0	2.00	2.66	2.66		4.00
10.0	2.50	3.33	3.33		5.00
12.0	3.00	4.00	4.00		6.00
14.0	3.50	4.66	4.66		7.00
16.0	4.00	5.33	5.33		8.00

Table #5 continued: SUMMARY OF SOME KEY LIMITING PROVISIONS FOR WISCONSIN LOCAL USE DIMENSION LUMBER

MAXIMUM WANE (OR EQUIVALENT)					
	Number 2 & Better Grade	**Stud Grade**	**Number 3 Grade**		**ECONOMY Grouping**
	Maximum wane (or equivalent)	**Maximum wane (or equivalent)**	**Maximum wane (or equivalent)**		**Maximum wane (or equivalent)**
EACH FACE	1/3 thickness full length	1/3 thickness full length	1/2 thickness full length		2/3 thickness full length
EACH FACE	1/3 width full length	1/2 width full length	1/2 width full length		2/3 width full length
COMBINED FACES	maximum 1/2 thickness any point	maximum 1/2 thickness any point	maximum 3/4 thickness any point		maximum 3/4 thickness for < 2 feet
COMBINED FACES	maximum 1/2 width any point	maximum 3/4 width any point	maximum 3/4 width any point		maximum 3/4 width for < 2 feet
MAXIMUM SLOPE OF GRAIN					
	Number 2 & Better Grade	**Stud Grade**	**Number 3 Grade**		**ECONOMY Grouping**
	Maximum slope of grain	**Maximum slope of grain**	**Maximum slope of grain**		**Maximum slope of grain**
	1 in 8	***1 in 4***	***1 in 4***		***not limited***
MAXIMUM SPLITS					
	Number 2 & Better Grade	**Stud Grade**	**Number 3 Grade**		**ECONOMY Grouping**
	Maximum splits	**Maximum splits**	**Maximum splits**		**Maximum splits**
	length equal to twice	***length equal to twice***	***length equal to twice***		***length equal to 1/3***
	width of piece	***width of piece***	***width of piece***		***length of piece***

Table #6: PUBLISHED DESIGN VALUES IN KEY GRADES AND SIZES FOR SELECTED SPECIES AND SPECIES GROUPS
(AS GRADED UNDER VARIOUS AGENCY RULES)
FOR THE SUBSTITUTE EQUIVALENT GRADES TO WISCONSIN LOCAL USE DIMENSION LUMBER

EASTERN SOFTWOODS

Includes: Balsam fir, Black, Red and White Spruce, Eastern White, Red and Jack Pine, Tamarack and Eastern Hemlock

		DESIGN VALUE IN BENDING (Fb)				
GRADE	SIZE	Normal Duration	Snow Loading	7 Day Loading	Compression Perpendicular to Grain	Modulus of Elasticity
Number 2	2x4	990	1,140	1,240	335	1,100,000
Number 3	2x4	605	695	755	335	900,000
Stud	2x4	570	655	710	335	900,000
Number 2	2x6	860	990	1,075	335	1,100,000
Number 3	2x6	525	600	655	335	900,000
Stud	2x6	520	595	645	335	900,000
Number 2	2x8	795	915	990	335	1,100,000
Number 3	2x8	485	555	605	335	900,000
Number 2	2x10	725	835	910	335	1,100,000
Number 3	2x10	445	510	555	335	900,000
Number 2	2x12	660	760	825	335	1,100,000
Number 3	2x12	405	465	505	335	900,000

RED OAK

Includes: All Wisconsin species in the Red Oak Group

		DESIGN VALUE IN BENDING (Fb)				
GRADE	SIZE	Normal Duration	Snow Loading	7 Day Loading	Compression Perpendicular to Grain	Modulus of Elasticity
Number 2	2x4	1,380	1,585	1,725	820	1,200,000
Number 3	2x4	820	940	1,025	820	1,100,000
Stud	2x4	790	910	990	820	1,100,000
Number 2	2x6	1,195	1,375	1,495	820	1,200,000
Number 3	2x6	710	815	890	820	1,100,000
Stud	2x6	720	825	900	820	1,100,000
Number 2	2x8	1,105	1,270	1,380	820	1,200,000
Number 3	2x8	655	755	820	820	1,100,000
Number 2	2x10	1,010	1,165	1,265	820	1,200,000
Number 3	2x10	600	690	750	820	1,100,000
Number 2	2x12	920	1,060	1,150	820	1,200,000
Number 3	2x12	545	630	685	820	1,100,000

WHITE OAK

Includes: All Wisconsin species in the White Oak Group

		DESIGN VALUE IN BENDING (Fb)				
GRADE	SIZE	Normal Duration	Snow Loading	7 Day Loading	Compression Perpendicular to Grain	Modulus of Elasticity
Number 2	2x4	1,465	1,685	1,835	800	900,000
Number 3	2x4	820	940	1,025	800	800,000
Stud	2x4	820	945	1,030	800	800,000
Number 2	2x6	1,270	1,460	1,590	800	900,000
Number 3	2x6	710	815	890	800	800,000
Stud	2x6	750	860	935	800	800,000
Number 2	2x8	1,175	1,350	1,465	800	900,000
Number 3	2x8	655	755	820	800	800,000
Number 2	2x10	1,075	1,235	1,345	800	900,000
Number 3	2x10	600	690	750	800	800,000
Number 2	2x12	980	1,125	1,220	800	900,000
Number 3	2x12	545	630	685	800	800,000

BEECH-BIRCH-HICKORY

Includes: American Beech, Yellow Birch and Wisconsin Hickory species

		DESIGN VALUE IN BENDING (Fb)				
GRADE	SIZE	Normal Duration	Snow Loading	7 Day Loading	Compression Perpendicular to Grain	Modulus of Elasticity
Number 2	2x4	1,725	1,985	2,155	715	1,500,000
Number 3	2x4	990	1,140	1,240	715	1,300,000
Stud	2x4	980	1,125	1,225	715	1,300,000
Number 2	2x6	1,495	1,720	1,870	715	1,500,000
Number 3	2x6	860	990	1,075	715	1,300,000
Stud	2x6	890	1,025	1,115	715	1,300,000
Number 2	2x8	1,380	1,585	1,725	715	1,500,000
Number 3	2x8	795	915	990	715	1,300,000
Number 2	2x10	1,265	1,455	1,580	715	1,500,000
Number 3	2x10	725	835	910	715	1,300,000
Number 2	2x12	1,150	1,325	1,440	715	1,500,000
Number 3	2x12	660	760	825	715	1,300,000

Table #6 continued: PUBLISHED DESIGN VALUES IN KEY GRADES AND SIZES FOR SELECTED SPECIES AND SPECIES GROUPS
(AS GRADED UNDER VARIOUS AGENCY RULES)
FOR THE SUBSTITUTE EQUIVALENT GRADES TO WISCONSIN LOCAL USE DIMENSION LUMBER

MIXED MAPLE

Includes: Red, Silver, Sugar and Black Maple

		DESIGN VALUE IN BENDING (Fb)				
GRADE	SIZE	Normal Duration	Snow Loading	7 Day Loading	Compression Perpendicular to Grain	Modulus of Elasticity
Number 2	2x4	1,210	1,390	1,510	620	1,100,000
Number 3	2x4	690	795	865	620	1,000,000
Stud	2x4	695	800	870	620	1,000,000
Number 2	2x6	1,045	1,205	1,310	620	1,100,000
Number 3	2x6	600	690	750	620	1,000,000
Stud	2x6	635	725	790	620	1,000,000
Number 2	2x8	965	1,110	1,210	620	1,100,000
Number 3	2x8	550	635	690	620	1,000,000
Number 2	2x10	885	1,020	1,105	620	1,100,000
Number 3	2x10	505	580	635	620	1,000,000
Number 2	2x12	805	925	1,005	620	1,100,000
Number 3	2x12	460	530	575	620	1,000,000

RED MAPLE

Includes: Red Maple only

		DESIGN VALUE IN BENDING (Fb)				
GRADE	SIZE	Normal Duration	Snow Loading	7 Day Loading	Compression Perpendicular to Grain	Modulus of Elasticity
Number 2	2x4	1,555	1,785	1,940	615	1,500,000
Number 3	2x4	905	1,040	1,130	615	1,300,000
Stud	2x4	885	1,020	1,105	615	1,300,000
Number 2	2x6	1,345	1,545	1,680	615	1,500,000
Number 3	2x6	785	905	980	615	1,300,000
Stud	2x6	805	925	1,005	615	1,300,000
Number 2	2x8	1,240	1,430	1,555	615	1,500,000
Number 3	2x8	725	835	905	615	1,300,000
Number 2	2x10	1,140	1,310	1,425	615	1,500,000
Number 3	2x10	665	765	830	615	1,300,000
Number 2	2x12	1,035	1,190	1,295	615	1,500,000
Number 3	2x12	605	695	755	615	1,300,000

ASPEN

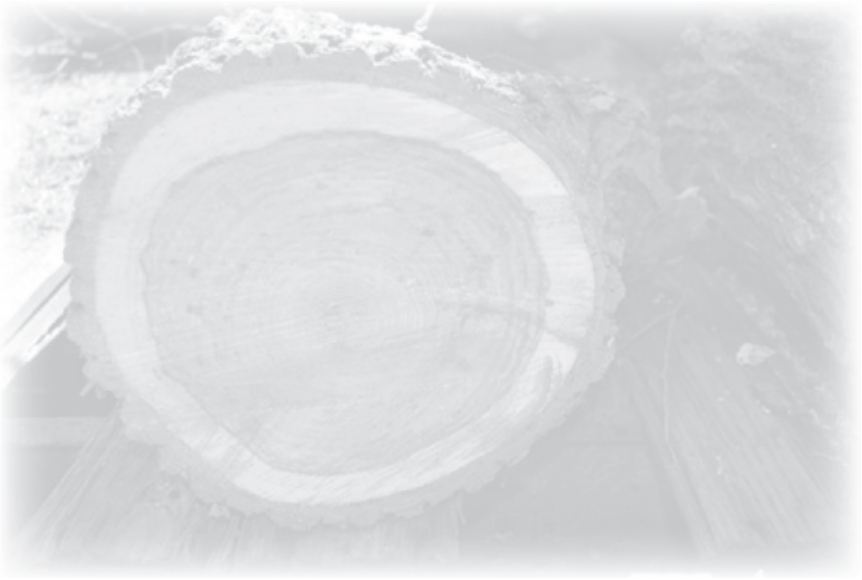
Includes: Big Tooth and Quaking Aspen

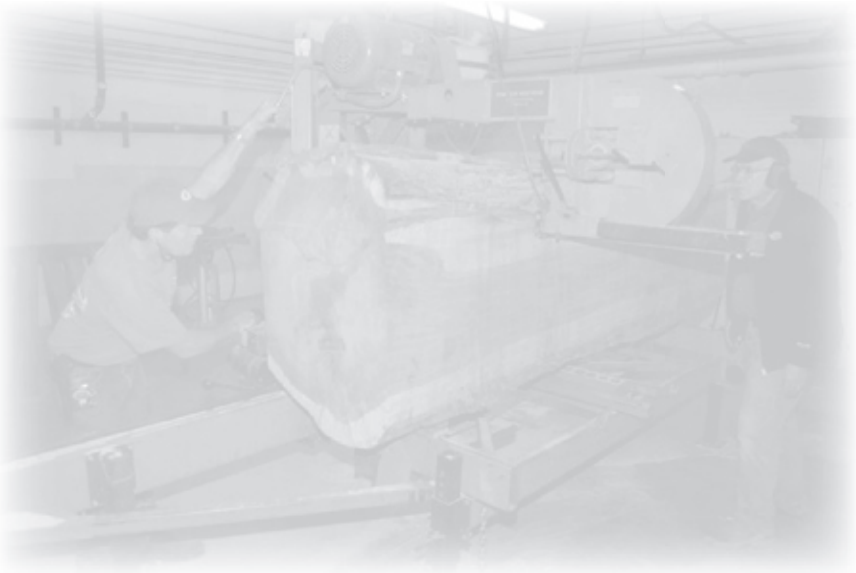
		DESIGN VALUE IN BENDING (Fb)				
GRADE	SIZE	Normal Duration	Snow Loading	7 Day Loading	Compression Perpendicular to Grain	Modulus of Elasticity
Number 2	2x4	1,035	1,190	1,295	265	1,000,000
Number 3	2x4	605	695	755	265	900,000
Stud	2x4	600	690	750	265	900,000
Number 2	2x6	895	1,030	1,120	265	1,000,000
Number 3	2x6	525	600	655	265	900,000
Stud	2x6	545	630	685	265	900,000
Number 2	2x8	830	950	1,035	265	1,000,000
Number 3	2x8	485	555	605	265	900,000
Number 2	2x10	760	875	950	265	1,000,000
Number 3	2x10	445	510	555	265	900,000
Number 2	2x12	690	795	865	265	1,000,000
Number 3	2x12	405	465	505	265	900,000

COTTONWOOD

Includes: Cottonwood only

		DESIGN VALUE IN BENDING (Fb)				
GRADE	SIZE	Normal Duration	Snow Loading	7 Day Loading	Compression Perpendicular to Grain	Modulus of Elasticity
Number 2	2x4	1,080	1,240	1,350	320	1,100,000
Number 3	2x4	605	695	755	320	1,000,000
Stud	2x4	600	690	750	320	1,000,000
Number 2	2x6	935	1,075	1,170	320	1,100,000
Number 3	2x6	525	600	655	320	1,000,000
Stud	2x6	545	630	685	320	1,000,000
Number 2	2x8	865	990	1,080	320	1,100,000
Number 3	2x8	485	555	605	320	1,000,000
Number 2	2x10	790	910	990	320	1,100,000
Number 3	2x10	445	510	555	320	1,000,000
Number 2	2x12	720	825	900	320	1,100,000
Number 3	2x12	405	465	505	320	1,000,000





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Steve Schmieding, USDA,FS, FPL

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