



Ponderosa Pine

Pinus ponderosa





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Introduction

Western White pines often have a special place in the hearts of those who love wood. The combination of their resinous odour and light colour often reminds us of farmhouses, time-worn furniture and mountain cabins or ski resorts. However, these commercially important pines are the dominant choice for wood windows, a multitude of wood moulding and millwork items, and endless volumes of furniture, shelving and panelling throughout the world. Pine boards are available in many grades, from virtually clear to utility levels of quality.

While Ponderosa Pine (*Pinus ponderosa*), Sugar Pine (*Pinus lambertiana*) and Idaho White Pine (*Pinus monticola*) are valued primarily for their appearance and workability, the fourth pine in this group, Lodgepole (*Pinus contorta*), is valued also for its strength. It is the archetypal pole of the American West and the “pine” species in the SPF⁵ (Spruce-Pine-Fir, South) species combination for dimension timber.

In U.S. timber species, the Western White pines are distinctly different from the Southern Yellow pines. Southern pines more coarsely grained, denser, all widely used for structural applications, and generally harvested in short rotations for use in dimension timber sizes.

Western pines are prized for the beauty of the wood. These pines are managed in natural stands, on long rotations, and generally selectively harvested. The large trees yield substantial volumes of creamy white to straw-yellow sapwood, with relatively

few, widely spaced knots, and a minimal amount of heartwood which is generally a light, reddish-brown. Wood is soft-textured with a typically straight, close and uniform grain that is delicately figured after dressing. Among these pines, Ponderosa leads in volume and availability.

Forestry

Ponderosa Pine thrives from Canada to Mexico and from the Pacific Coast eastward to the Black Hills of South Dakota, an area that stretches over more than 35 percent of the area of the United States. The typical site for this abundant species is on semi-arid plateaus and slopes, often surrounded by juniper and sage, with its rate of growth dependent on altitude, soil, temperature and rainfall.

Mature Ponderosa Pines are easily identified by their distinctive orange-brown bark, arranged in large plates. Trees average 30 to 49 metres in height, with some exceeding 60 metres; diameter ranges from .6 to 2.4 metres. The dark, yellow-green needles are 127 mm to 254 mm long and grow in clusters of three. The cones, similar in colour to the bark, are 76 – 152 mm long and 51 – 102 mm in diameter. Seeds are 9 – 9.5 mm long with a 19 – 25 mm wing.

Most trees grow, mature and survive for about 125 years before they are lost to natural causes such as rot, insect damage, fires or wind throw. Occasionally, a lone specimen will survive for nearly 200 years. Ponderosa for timber production are selectively harvested to remove the most mature trees, leaving younger ones to thrive and re-seed.



Above: Ponderosa Pines grow to more than 50 metres in height and from .9 – 2.4 metres in diameter. Stands cover approximately 11 million hectares of land in the United States. The large plates of orange-brown bark distinguish mature Ponderosa from other pines; needles grow in clusters of three.

Left: Ceiling panelling is a combination of Sugar and Ponderosa Pines, windows trimmed in Ponderosa, the columns are Douglas Fir. Selected boards reveal Sugar Pine's high degree of contrast between the heartwood and sapwood colours. Ponderosa pine has uniform grain with little colour variation.

Western White Pines

	Ponderosa	Sugar	Lodgepole	Idaho White
Height Range	38 - 60m	48 - 76m	14 -26 m	45 - 54 m
Diameter Range	0.9 -2.4 m	1.2 - 3.5 m	0.3- 0.5 m	0.6 – 1.2 m
Specific Gravity ¹	0.40	0.33	0.41	0.36
Mean Weight ²	458 kg	408 kg	474 kg	440kg

¹ Specific gravity at 12 % moisture content. Range for softwoods is 0.31 - 0.55.

² Mean weight per cubic metre at 12 % moisture content. Softwood range is 376 - 670 kg; 425 kg is average for White pines.



Painted Ponderosa wainscot panelling and casement windows in contemporary bathroom and treated Ponderosa Pine decking.

Ponderosa flooring, panelling and trim add warmth to spacious home office.

Production

Oregon, California, and Washington account for the major share of annual harvesting; however, Idaho, Montana, and South Dakota are also important areas with lesser amounts coming from Wyoming, Arizona, and New Mexico.

The annual production of Ponderosa Pine, 4.51 million cubic metres in 1999, ranks third in volume after Douglas Fir and Hem-Fir, but the second in total value. Oregon is the nation's leading supplier of Ponderosa Pine, producing 1.27 million cubic metres in 1999. California is second with slightly more than 920 thousand cubic metres. The volume of Western White pines exported in 1999 was 415 thousand cubic metres.

Manufacturing

Seasoning

All Ponderosa Pine is dried before surfacing to assure uniformity of the finished size. It is seasoned in temperature and humidity-controlled dry kilns or stacked and air-dried until the moisture content reaches the desired level – from 12 percent to 19 percent.

As with other pines, Ponderosa can be subject to blue stain if a felled tree or green lumber becomes too warm before it is dried. Blue stain does not affect strength and is admissible in some of the lower grades. It can be hidden with paint or enhanced with clear finishes depending upon user preference.

Shipping

Ponderosa Pine is usually milled and shipped as a single species and can be specified and bought as such. However, it is sometimes mixed with other species of similar design characteristics, such as Ponderosa Pine – Sugar Pine, or Ponderosa Pine – Lodgepole Pine. It is also marketed under the name "White Woods," which can include a mix of Engelmann Spruce, true firs (*Abies* species), Hemlock and any of the Western pines.

Grading & Quality Control

Grading

Timber grading rules assure consistent standards of quality, regardless of which mill produces the timber. In the 12 Western states, the primary growth area for Ponderosa Pine, the

largest percentage of pine production is graded under the supervision of Certified Inspectors from the Western Wood Products Association (WWPA), a grading and quality control agency accredited by the American Lumber Standard Committee, Inc., under the U.S. Department of Commerce. The most widely produced grades are SELECTS, COMMONS and Factory & Shop products intended for remanufacturing. Special grades are available through buyer/seller agreements.

Appearance Grades

Ponderosa Pine products are graded primarily on appearance for a multitude of applications. Under the WWPA **Western Lumber Grading Rules**, there are three grades of **SELECTS** (for clear and nearly clear products) and five grades of **COMMONS** (for general-purpose products where a variety of knots and other characteristics are allowed). Many WWPA Member mills also produce products according to rules published by the West Coast Lumber Inspection Bureau (WCLIB). These **Standard Grading Rules** provide for five grades under the **BOARD** rules, each with specific limitations on the number, size and type of knots as well as other characteristics.

Structural Grades

Ponderosa Pine structural grades are used where light to moderate strength levels are required. The 2X4 and 2X6 sizes are especially popular as a decking material, once the timber has been pressure treated with preservatives for outdoor in-ground or above-ground applications.

Factory & Shop Grades

Factory & Shop grade timber products are intended specifically for remanufacturing into furniture, doors, windows and shutters. Such wood is selected to be almost completely free from pitch and resin pockets, has an even grain, and is dimensionally stable. The grades have evolved on the basis of millwork cutting sizes and are defined in the grading rules by the number of clear, standard-size *cuttings* that can be obtained by ripping and cross cutting the various products. These grades are often referred to the "economical clears" of the timber industry. They are used throughout the world for an endless array of products that require various sized pieces of clear wood.



COURTESY OF MARVIN MANUFACTURING CO.



Living room: Ponderosa Pine doors, windows, moulding, panelling, soffits and fascia with clear finish to enhance natural colour and characteristics.

Bay window: Wood window manufacturers prefer Ponderosa Pine for its workability, appearance and performance. Windows are typically manufactured from Factory & Shop grades.

Kitchen: Ponderosa cabinets and flooring; Lodgepole Pine columns.

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Kitchen: Whitened Ponderosa Pine kitchen cabinets contrast well with granite, ceramic tiles, or stainless steel. The species resists scuffing and splitting and performs well under movement for cabinets, drawers, doors, and windows.

Stairwell: Ponderosa stair railings with fascia on posts and beams.

Attic: Beaded-ceiling panelling, casework, shutters, window and trim. A light stain, with ultra-violet blockers, helps prevent Ponderosa from darkening over time.

Characteristics and Best Uses

When freshly sawn or surfaced, Ponderosa Pine's pleasant smell is reminiscent of the forests where it grows. The large trees have a minimal amount of reddish-brown heartwood and an exceptionally wide sapwood which is honey-toned or straw-like in colour. This yields products suitable for any application that requires a light to moderately strong, splinter-free wood with a minimum of knots, resin or other unwanted characteristics.

The timber is prized for mouldings and doors, windows, frames and drawers where durability under movement is essential. Its ability to withstand scuffs, shocks and jars without splintering makes Ponderosa a premier wood for sashes, jambs, shutters, screens, columns, stairwork and fascia. Ponderosa ranks in the top 25 percent for ease of gluing and is used for all types of glued-up construction.

Dimensional Stability

All woods shrink and swell to some degree as their moisture content fluctuates with atmospheric conditions. However, Ponderosa Pine has a uniform cell structure and shrinks only a moderate amount in comparison to other softwood species. It seasons beautifully with minimal splitting, cupping or warping and seldom develops raised grain. When surfaced, its straight, uniform grain machines to exceptional smoothness. It is valuable for work that requires close-fitting joints because it is extremely workable and relatively unaffected by changes in humidity after seasoning.

Residential Construction

Appropriate applications for Ponderosa Pine include light framing, spaced sheathing, floor and roof decking. It is easily pressure treated with preservatives and superb for decks and other outdoor projects. Although it is not as strong as some of the denser softwoods, Ponderosa's combination of dimensional stability, strength and workability is well adapted to most light-framing applications including joists, studs, rafters, plates and soffits. The wood resists splitting when nailed, which allows for the use of larger nails and increases nail retention.

Traditional outlets, such as retail lumber yards and home improvement centers, usually carry an extensive inventory of Ponderosa Pine products. Both amateur and professional remodelers find many applications for this species in home repairs, retrofitting, room additions, renovations, panelling and decks.

Panelling

Pine panelling is often associated with a rustic décor for kitchens, family rooms, dens and bedrooms. However, new finishing techniques and patterns make it appropriate for both contemporary or traditional settings.

Ponderosa Pine, in clear (SELECTS) and knotty (COMMON or BOARD) grades, is available in a range of panelling patterns. The grade of the run-to-pattern panelling often reflects the grade name of starting 1x material. A few of the standard pattern profiles are shown page 11. Many patterns are reversible, offering a choice of pattern or surface finish in a single panel. However, it's important to remember that panelling boards are inspected and graded on the patterned or face side; the back or reverse side may have characteristics which would make it a lower grade, but desirable for a specific design effect.

Most lumber dealers carry a limited selection of panelling patterns, but can special order any of the standard patterns. Some dealers and stockists will arrange to have a unique pattern custom milled.

For additional information on WWPA pattern options, in profile, refer to WWPA's *Standard Patterns* or contact the Wood Moulding and Millwork Producers Association on the Internet at www.wmmpa.com.

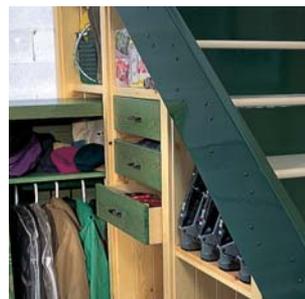
Woodworking and Furniture

Many of the properties that make Ponderosa Pine a first choice for panelling also put it at the top of the list for furniture and architectural woodwork such as built-in bookcases, benches, cupboards, desks and kitchen cabinets. SELECT, COMMON, BOARD and/or Factory & Shop grades may be used as appropriate for the application.

Cabinetmakers and woodworkers appreciate the wood's uniform cell structure, scarcity of resin pockets, and resistance to splitting. Finished parts fit together snugly without binding. The timber is easy to work with either hand or machine tools and converts readily into fine mouldings and cabinet work.



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Ponderosa with painted, pigmented stain or clear finishes fits into many decors. Some naturally occurring "blue stain" is apparent in the side boards of the lower cabinet in the upper photo.



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Deck: Treated Ponderosa Pine, is a safe, economical alternative to the naturally durable species for a multitude of outdoor projects.

Laundry room: The whitening stain enhances the slight "blue stain" apparent in some of the Ponderosa boards of the cabinets. Under stairs at right: Ponderosa Pine BOARD grades are ideal for shelves and built-in home improvement projects.

In the past few years there has been a resurgence in the popularity of pine furniture – antique pieces, new pieces from old pine and new pieces from new timber. Honey-toned Ponderosa Pine is a natural accompaniment to many design schemes; simply-styled bleached pine is appearing with increasing frequency in contemporary furnishings. Ponderosa Pine furniture is available both finished and unfinished, in a variety of styles and qualities.

Finishing

Ponderosa Pine takes most finishes beautifully, including paint, stain, lacquer and varnish. Unlike some of the heavier woods, paints and stains do not raise the grain; however, knots should be sealed before painting to prevent them from bleeding through the finished surface.

Treated Products for Outdoor Projects

Treated Ponderosa Pine is commonly used for outdoor applications in the western and upper mid-western parts of the United States and abroad. These treated products may be used for fences, planters, storage sheds, play structures, decking, deck railings, benches and other outdoor projects.

The large proportion of sapwood in Ponderosa makes it well suited to pressure treating because the preservatives can penetrate the sapwood cells deeply and uniformly. Ponderosa Pine may be treated for above-ground or in-ground contact, and unlike some softwoods, it can be pressure treated for in-ground use without incising (perforating) the wood. The treated product holds up well in storage, making it easy to yard for distributors and stockists.

In addition to products in standard dimensions, treated Ponderosa Pine is also available in two WWPA radius-edged decking grades, **PATIO I and II**, which are milled expressly for use as outdoor decking. These products are surfaced dry to either 25 mm thick or 29 mm thick by 140 mm wide with 6.4 mm radius edges.

All treated lumber should have a quality control mark from an American Lumber Standard Committee (ALSC)-approved agency to assure compliance with industry standards. Look for the CheckMark™ to indicate ALSC accreditation in the quality mark, stamp or end tag on treated

wood products. Approved treating agencies in the western U.S., along with their trademarks are as follows:

ALSC* Accredited Agencies in the West



Bode Inspection



Timber Products Inspection



Canadian Softwood Inspection, Inc.



California Lumber Inspection Service



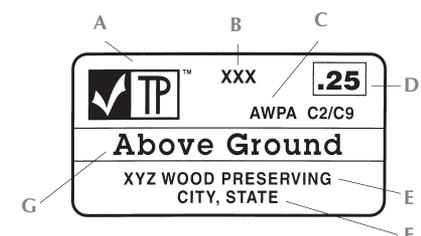
McCUTCHEAN Inspection Services

*The American Lumber Standard Committee is responsible for the oversight and accreditation of third party inspection agencies for treated wood.

Only seasoned (dried) timber is used in the treating process. After treatment, the wood should be allowed to reach equilibrium moisture content with the surrounding atmosphere before it is installed in its permanent location. The waterborne preservatives leave a clean, dry, odourless surface ready for paint or stain.

Since treating standards and related building codes vary by country, region and even city by city, the Western Wood Preservers' Association (www.wwpinstitute.org) may be contacted for additional information. Or, refer to the publication, **Wood That Works, Wood That Lasts**, on the Softwood Export Council's website at www.softwood.org.

Interpreting a Quality Mark for Preservative Pressure-Treated Wood



- A – Trademark of ALSC accredited agency
- B – Preservation used
- C – AWPA Standard
- D – Retention level
- E – Treating company
- F – Plant location
- G – Proper exposure condition



C & BETTER SELECT products offer large sections of clear, blemish-free wood. **C & BTR BOARDS** are in demand as a top quality interior finishing material and for cabinet work.



Figure 1

NO. 2 COMMON is widely used for shelving, knotty pine panelling, siding, cornice soffits and fascia, as well as a wide range of other uses where a knotty type of timber with a fine appearance is required.



Figure 2

NO. 3 COMMON is used for a variety of building purposes. Characteristics are limited to assure a pleasing appearance combined with a high degree of serviceability. It is often specified and sold as **3 & BTR COMMON** which includes primarily **NO. 3 COMMON** with some **NO. 2 COMMON** and occasionally **NO. 1 COMMON** mixed in.



Figure 3

STUD grade is one of four available in the **Light Framing** grading classification (2X2 thru 4X4 & 2X6 STUD). Ponderosa Pine has approximately two-thirds the strength of Douglas Fir in the same size and same grade. **STUD** grade is intended for vertical framing applications.



Figure 4

Figure 5

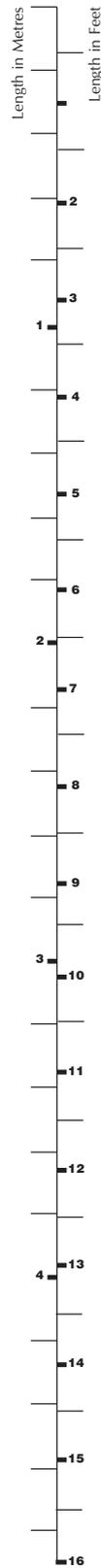


Figure 6



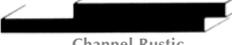
Above left, this page: examples of 5/4 & Thicker **RWL FACTORY SELECT NO. 3 CLEAR**. This grade of factory lumber is intended to be ripped and cross cut into pieces for doors. Lines indicate recommended cuts for the maximum recovery of clear and nearly clear cuttings.

Above right examples of 4/4 **S4S NO. 2 SHOP**. Factory or Shop grades are an excellent choice of product when small, high-quality pieces are required.



In the log above, the transition from springwood to summerwood (the growth rings) is barely perceptible. As a result, the clear timber from a Ponderosa Pine log often looks virtually grainless.

Popular standard panelling patterns.

-  Beaded Ceiling
-  Tongue & Groove CM
-  Channel Rustic
-  Profile Pattern WP-4
-  Profile Pattern WP-6
-  Profile Pattern WP-2
-  Profile Pattern WP-11
-  CV Ceiling

ADDITIONAL INFORMATION

Additional information and the titles referenced in this publication are available for purchase from WWPA. For a full description of technical publications available and an Order Form to download and print, please go to the WWPA website at www.wwpa.org. Alternatively, you may receive an Order Form for literature via fax through the WWPA Fax Delivery Service. Simply telephone 1-732-544-2876 and follow the instructions in the automated message (in English only).

Additional publications, in multiple languages and with full-colour photographs, are available from the Softwood Export Council website: www.softwood.org.

For information on treated Ponderosa Pine products, visit the Western Wood Preservers Institute website at www.wwpinstitute.org.



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