Wood Data Sheet

Piñon Pine

By David G. Bueche

The Colorado Wood Utilization and Marketing Assistance Center is a collaborative between Colorado State University, the Colorado State Forest Service, and the US Forest Service. Its mission is to contribute to the improvement and maintenance of healthy forests conditions in Colorado through extension and outreach in the areas of wood science, forest products and business assistance. It was designed to help communities and businesses utilize the wood products made available from fuel reduction and forest restoration thinning activities in Colorado.

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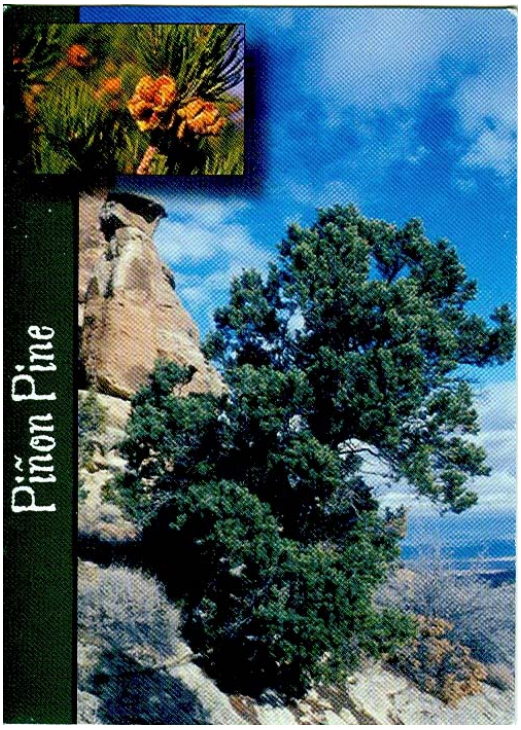
Colorado Woods

Piñon Pine

Pinus edulis

Description

The word *pinus* is the classical Latin name. The word *edulis* means edible, referring to the large seeds, known as pinyon nuts, pine nuts, and pinones.



The Tree: Piñons generally are small trees, growing less than 35 ft tall, with diameters less than 18 in. Piñons are long lived, growing for 75 to 200 years, with dominant trees being 400 years old. Piñons 800 to 1,000 years old have been recorded.

Bark: Gray, smooth and thin when young; red-brown, rough and furrowed into scaly ridges at maturity.

Leaves: Evergreen needles are stout and light green; 1 to 1½ inches long; 2 in a bundle.

Fruit: Cones are yellow-brown, unique, short and squatty; 1½ to 2 inches long. Each cone contains 10-20 large edible, oily seeds.

Elevation: 5,200 to 9,000 feet.

Habitat: Open woodlands, alone or with junipers on dry rocky foothills, mesas and plateaus.

Relation to Fire: Easily killed by fire due to thin bark, relatively flammable foliage and accumulation of dead lower branches.

General Wood Characteristics

The Wood: Piñon is moderately heavy compared with other pines. It is slow grown and often knotty, pitchy and blue stained, but strong and hard. The heartwood is yellow. Common uses include firewood, novelties, mine timbers, pulp, and charcoal. The nuts are a culinary delicacy, and the trees have been used as commercial Christmas trees.

Minute Anatomy: The members of the genus *Pinus* are readily separated from all other conifers by their resin canals, which have thin-walled epithelium cells. Specific identification is generally not possible, however, the genus can be subdivided into five groups on the basis of the ray tracheids and the type of cross-field pitting. Piñon ray tracheids are nondentate with cross-field pitting piceoid. These anatomical characteristics are shared by Mexican pinyon (*P. cembroides* Zucc.); piñon (*P. edulis* Engelm.); singleleaf pinyon (*P. monophylla* Torr. & Frem.); and Parry pinyon (*P. quadrifolia* Parl.).

Physical and Mechanical Properties

Property	Moisture Content Green	(12%)	Ovendry
SG	0.50	0.53	0.57
Weight (lb/ft^3)	51	37	NA
MOE (lb/in^2)	650,000	1,140,000	—
MOR (lb/in^2)	4,800	7,800	—
C (lb/in^2)	2,590	6,400	—
C ⊥ (lb/in^2)	480	1,520	—
WML (in-lb/in^3)	7.6	4.7	—
Shear (lb/in^2)	920	NA	—
Tension ⊥ (lb/in^2)	—	—	—
Toughness (in-lb)	—	—	—
Hardness (lb)	600	860	—
Heat of combustion (Btu/lb)	7325	9155	—
Shrinkage*			
Tangential (%)	—	—	5.2
Radial (%)	—	—	4.6
Volumetric (%)	—	—	9.9

*Percentage of shrinkage (green to final moisture content)

The values reported in this table are the results of tests on small clear specimens with moisture contents (MC) in the green, airdry and ovendry conditions. MC is the total amount of water in a given piece of wood and is expressed as a percentage of the ovendry weight of the wood. The ovendry weight is used as a basis because it is an indication of the amount of solid substance present. Solid wood substance is heavier than water, its specific gravity being about 1.5 regardless of species. Variation among species in the size of cells and in the thickness of cell walls affects the amount of solid wood substance present and, therefore, the specific gravity. Thus, specific gravity of wood is a measure of its solid wood substance and an index of its strength properties. Specific gravity is based on weight when ovendry and volume when green or at 12% moisture content.

Definition of properties: Modulus of elasticity measured from a simply supported, center-loaded beam, on a span depth ratio of 14/1. To correct for shear deflection, the modulus can be increased by 10%. impact bending is height of drop that causes complete failure, using 0.71-kg (50-lb) hammer; compression parallel to grain is also called maximum crushing strength; compression perpendicular to grain is fiber stress at proportional limit; shear is maximum shearing strength; tension is maximum tensile strength; and side hardness is hardness measured when load is perpendicular to grain.

Working Properties: Piñon pine is easy to work with tools, easy to glue, average in paint-holding ability, holds nails or screws moderately well, and clogs sandpaper easily in sanding operations because of its high pitch content.

Preservation: The heartwood is one of the most permeable of all wood species and easy to treat with preservatives.

Toxicity: In general, working with pine wood can cause dermatitis, allergic bronchial asthma, or rhinitis in some individuals.

Durability: It is not durable under conditions that favor decay and should be treated with a preservative. The wood can be susceptible to attack by dry wood termites, ambrosia (pinhole borer) beetles, longhorn beetles, and Buprestid beetles.

Selected Characteristics of Colorado Woods

Wood species	Paint-holding characteristic: Oil based paint	Latex paint	Heartwood: Weathering: Resistance to cupping	Decay resistance	Ease of treating	Color of heartwood	Ease of machining	Resistance to splitting in nailing and screwing	Nail and screw holding ability	Ease of bonding
Aspen	2	3	3	1	3	Pale brown	3	4	2	4
Douglas-fir	1	3	3	2	1	Pale red	3	3	4	3
Engelmann Spruce	2	3	3	1	2	White	3	4	2	4
Limber Pine				1						
Lodgepole Pine				1	2	Pale yellow	3	3	2	3
Piñon Pine	3	3	2	1	4	Yellow	4	3	3	4
Ponderosa Pine	2	3	3	1	4	Cream	4	4	2	4
Plains Cottonwood	2	3	1	1	3	White	1	4	2	2
Subalpine Fir	2	4	3	1	1	Pale tan	2	4	2	4
White Fir	2	4	3	1	2	White	2	4	3	4

Excellent 4 Very Good 3 Good 2 Fair 1