Valsain Pine

Pinus sylvestris L. Syn. - *P. rubra* Mill = *P. borealis* Salib. = *P. binatofolio* Gilibert.

Commercial names:

English:	Redwood (Northern Europe), Scots pine (United Kingdom), Pine (Germany, Austria).
Spanish:	Pino silvestre, Pino Flandes, Pino Norte, Pino Nórdico and Pino Suecia (From Sweden and Finland), Pino ruso (From Russia).
French:	Pin commun, Pin Sylvestre, Pin blanc, Pin Rouge, Pin sauvage.
Italian:	Pino silvestre.
Portuguese:	Pinheiro silvestre.
German:	Föhre weiss, Gemeine kiefer, Wald kiefer.

Common names:

Gredos Mountain Range:	Pino Serrano.
Cuenca, Soria y Burgos:	Pino albar, Pino Soria.
Western Guadarrama Mountain Range:	Pino albar, Pino Soria.
Valsaín:	Pino Valsaín (1).
Aragon Pyrenees :	Pino rojo.
Aragón and Mediterranean region:	Pi rojal.
Catalonia:	Pi blancal, Pi bord, Pi rodal.

(1) The name "Pino Valsaín" is a registered trademark only applicable to wood from the Valsain forest (Segovia).

Physical properties:

Density:			500-520-540 Kg/m³	
Shrinkage:			Stable	
Shrinkage values:		Total	Unitary	
	Spain		Rest	
Volumetric:	12.9%	(0.34)	12-15%	(0.35-0.50)
Tangential:	6.8%	(0.21)	-	(0.20-0.35)
Radial:	3.8%	(0.12)	-	(0.11-0.20)
Hardness:		2.0	Semi-hard	

Mechanical properties (Wood free of defects)

Static bending:		90-110/79-100 N/mm²
Modulus of elasticity:		8,600-10,000/10,800-13,000 N/mm²
Compression parallel to grain:	42-47	45-55 N/mm²
Compression perpendicular to grain:		9.2 N/mm²
Shear:	10-11	7.2-11.2 N/mm²
Toughness:	2.25	4.0-7.0 J/cm²

Structural lumber:

The ME-1 and ME-2 grades from the UNE 56.444-1997 Spanish standard correspond to C30 and C18 strength grades res-pectively. The S13, S10 and S7 grades from the DIN 4074 standard (from central, northern and eastern Europe) correspond res-pectively to strength grades C30, C24 and C16. Grades T3, T2, T1 and T0 from the INSTA 142 standard (from northern and northeastern Europe) correspond respectively to the strength grades C30, C24, C18 and C 14. Grades SS and GS from the BS 4978 standard (from central, northern, and eastern Europe) correspond to strength grades C24 and C16 respectively.

Origin and availability:

This tree is widely distributed throughout northern Asia and in Europe (Spain, Scotland, Norway, Sweden, Finland, Russia, and the Maritime Alps of France). In Spain there are large extensions of woodland in the Pyrenees, the Iberian Cordillera, and the Central Cordillera. Wood pro-duction is greatest in the com-munities of Castille-Leon, Aragon and Catalonia. The principal suppliers to Spain are Sweden, Finland and Russia.

Wood production and export are stable.

Wood description:

The sapwood is a pale yellow and the heartwood is reddish. The differ-ence between the two zones is more marked in quartersawn wood where the different tonalities can be seen. The growth rings are clearly defined in latewood and are from 1.5 to 3mm thick. This last informa-tion refers to wood from Spain, but it can vary depending on the origin. The wood is straight-grained, and the texture of the grain can be fine or medium. The wood displays pitch streaks. It can cause allergies in the mucous membranes.

Drying:

The lumber air dries rapidly with no deterioration in quality, but due to a tendency towards blue stain, it should undergo a preventive treatment or be dried very quickly after harvesting, especially in the early spring or late fall (autumn). Air drying of boards 27mm thick can take from three to five months, and air drying of dimension lumber 50mm thick can take as long as 6 to 10 months.

During artificial drying there is less risk of blue stain. The kiln drying time of recently lumbered wood with a moisture content of up to 12% can be around 4 to 6 days in 27mm thick boards and as long as 10 to 12 days for dimension lumber with a thickness of 50 mm. The recommended dry-ing schedules are number 10 from the CTBA; T5-E6 (4/4) and T5-E5 (8/4) as a less agressive schedule and T5-F6 (4/4) andT5-F5 (8/4) as a more severe schedule from the FPLM; and the L schedule from the PRL.

Natural durability and ease of penetration:

The wood is graded as slightly durable, with a great diversity of behav-ior, against the degrading action of fungi, and susceptible to anobiids, cerambycids and termites.The sapwood is penetrable and the heart-wood is not penetrable. In both cases there is a wide range of behavior.

Technological properties:

Sawing is not difficult and conventional equipment can be used. The wood is suitable for rotary-cut veneer and sliced veneer. In order to facil-itate cutting through knots in rotary cutting a moderate steam treat-ment (80ºC) is recommended. Machining does not usually present prob-lems, although greater o lesser working ease depends upon the size and number of knots and the amount of resin in the wood. Planing and moulding should be done with very sharp tools, since wavy irregular sur-faces can appear due to the different densities of wood growth. The wood has good gluing properties using any type of adhesive. However, if the wood is very resinous and it has not undergone kiln drying with temperatures of over 70ºC, it is better to use alkaline adhesives such as casein glues, phenol glues or resorcinol glues rather than adhesives that harden in an acid environment such as urea-formaldehyde glues. Whatever the case, working with fresh (recently planed) wood surfaces is recommended. Nailing and screwing are not difficult, and they offer high withdrawal resistance. There are no finishing problems and the wood easily permits the use of paint, varnish and dyes. The presence of resin can impair finishing quality since exudations due to exposure to the sun or to heat can occur. If the lumber has been dried at tempera-tures over 70ºC these defects do not appear.

Applications:

Decorative veneer./ Plywoods: structural, decorative./ Interior carpentry: doors, stairs, flooring, plank floors, Mouldings, base boards, paneling, friezes. / Exterior Carpentry. / furniture and cabinetwork. / Structual framing. / Glulam. / Posts. / Fences. It is one of the main woods used for structural framing, and can be found in old structures.