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Ficha Técnica

PINO INSIGNIS (*PINUS RADIATA*)

The radiata pine (*Pinus radiata* D. Don) is a serotinous pine native to the Pacific Coast of North America.

The place where radiata pine stands in Euskadi is a low elevation land (up to 600 m) exposed to a temperate-humid climate of oceanic influence. According to the latest Forest Inventory, radiata pine occupy approximately about 150,000 ha, of which 98% are in the Cantabrian area, i.e. the 55% of the total forested area of the mentioned watershed..



Pinus radiata distribution in Euskadi

Forest area (ha)	137.466
Standing timber volume (m ³)	26.328.723

2005 data for *Pinus radiata* in Euskadi



Pinus radiata

Technical specifications of *Pinus radiata*

Mechanical properties	Standard	Units	12%	18%	Green	Classification
Compression parallel to grain	UNE 56535	Kg/cm ²	434	293	201	Medium
Static bending	UNE 56537	Kg/cm ²	875	660	479	Medium
Elastic bending modulus	UNE 56537	Kg/cm ²	90.000	80000	75000	Flexible
Shear parallel to grain (Radial)	UNE 56543	Kg/cm ²	97	82	54	Medium
Shear parallel to grain (Tg)	UNE 56543	Kg/cm ²	107	93	66	Medium
Tension perpendicular to grain	UNE 56538	Kg/cm ²	23,5	-	-	Medium
Cleavage (tangential)	UNE 56539	Kg/cm ²	10,6	-	-	low
Impact bending	UNE 56536	Kgm/cm ²	0,37	0,49	0,7	low
Hardness (Monnin)	UNE 56534		1,8	1,1	-	Medium (softwood)

Mechanical properties of *Pinus radiata* (tests on Small clear specimens)

Physic properties	Standard	Units	12%	Various	Green	Calification
Density	NFB 51005	Kg/m ³	500	-	900	Medium (softwood)
Total volumetric shrinkage		%	-	14,5	-	
Radial shrinkage		%	-	4,2	-	
Tangential shrinkage		%	-	7,5	-	
Specific heat	-	J/Kg·°C	1650	-	-	Medium
Charring rate	UNE 23093	mm/min	0,83	-	-	High

Physical properties of *Pinus radiata* (tests on Small clear specimens)

Visual Grades (UNE 56544:2007)	Units	ME-1	ME-2	MEG
Mean density	Kg/m ³	504	484	515
Characteristic density	Kg/m ³	426	400	450
Characteristic bending strength	N/mm ²	29,6	18,0	22,6
Mean modulus of elasticity in bending	N/mm ² · 10 ³	11264	11077	10483
Strength classes assignment (EN 338)	-	C24	C18	C22
Grading yields	%	21	42	46

Structural properties of *Pinus radiata* (estructural sizes)

Strength classes (prEN338:2012)	Units	C18	C22	C24
Bending	N/mm ²	18	22	24
Tensile parallel to the grain	N/mm ²	11	13	14
Tensile perpendicular to the grain	N/mm ²	0,4	0,4	0,4
Compression parallel to the grain	N/mm ²	18	20	21
Compression perpendicular to the grain	N/mm ²	2,2	2,4	2,5
Shear	N/mm ²	3,4	3,8	4,0
Mean modulus of elasticity parallel to the grain (bending)	N/mm ² · 10 ³	9,0	10,0	11,0
Modulus of elasticity parallel to the grain (5 ^o percentil)	N/mm ² · 10 ³	6,0	6,7	7,4
Mean modulus of elasticity parallel to the grain (tensile)	N/mm ² · 10 ³	8,3	9,2	10,1
Mean modulus of elasticity perpendicular to the grain	N/mm ² · 10 ³	0,30	0,33	0,37
Mean modulus of strength	N/mm ² · 10 ³	0,56	0,63	0,69
Characteristic density	Kg/m ³	320	340	350
Mean density	Kg/m ³	380	410	420

Natural durability				Impregnability		Sapwood width
Fungi	Hylotropes	Beetles	Termite	Heartwood	Sapwood	
4-5	S	SH	S	2-3	1	1 (>10 cm)
Poorly durable; Non-durable	Sensitive	Heartwood also sensitive	Sensitive	Medium-low Impregnability	Easily impregnable	