



**USDA Forest Service**  
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## Wood Technical Fact Sheet

Casuarina spp.

### **Casuarina**

**Casuarinaceae** The genus *Casuarina* contains about 70 species native to the Old World Tropics. The name casuarina comes from the appearance of the drooping branches looking like a cassowary bird (*Casuarinus* spp.). The main species planted in the United States is *Casuarina equisetifolia*. *Casuarina collina* Bois de fer, bois de fer de Bord River, bois de fer de riviere, filao de la Nouvelle Hollande, tietang.

*Casuarina cunninghamiana* Australian beefwood, Australian pine, beefwood, bois de fer, bois de fer riviere, casuarina, casuarina, cavalinha, chowku, ironwood, Cunningham casuarina, pino australiano, pino de Australia, river oak, river she oak, river-oak casuarina, roble hembra.

*Casuarina deplancheana* Faux bois de fer.

*Casuarina equisetifolia* Ago, agoho, agoo, agoso, aial, aito, angin laut, aroho, aroo, arr, aru, Australian beefwood, Australian pine, balau, beach casuarina, beach she oak, beefwood, bois de fer, bois de filao, casuarina, casuarine, cau, cazuarina, cemara, chavuku, chouk, chow, chowku, cipres, duong, duong lieu, eru, filao, filao du senegal, filao pays, gago, gagu, goago, horsetail beefwood, horsetail casuarina, horsetail she oak, horsetail-tree, inya, ironwood, kabwi, karamutan, kayu aru, knotsboom, malabohok, manoui, mantaga, marabohok, mvindya, mvinje, mwinja, nach, nakure, namane, nanearr, naru, nas, neier, nerr, neuru, ngas, ngasu, niar, niaro, niel, nierr, nokonoko, nul, oak-tree, oru, phi lao, pin d'Australie, pinle-kabwe, pino, pino australiano, pino de Australia, pino-maritimo, polynesian ironwood, qaro, rarau, rhu laut, ru, sauce, serva, serve, she oak, shortleaf ironwood, son, sura, swamp oak, tinyu, tjamara, tjemara, tjemara taut, toa, weeping willow, weku, whistling pine, yar, yorsed.

*Casuarina glauca* Ailla, casuarina, filao multipliant, grey bull oak, grey bull-oak, longleaf casuarina, longleaf ironwood, marsh she oak, salt-marsh ironwood, she oak, swamp oak, swamp she oak.

*Casuarina junghuhniana* Caqueu, cemara, son, sonpradipat, tjemara gunung.

*Casuarina lepidophloia* Australian pine, belah, belar, casuarina, pino australiano, pino de Australia, scalybark casuarina.

*Casuarina littoralis* Black oak, black she oak, oak, she oak.

*Casuarina montana* Berg-casuarine.

*Casuarina nobilis* Agoho, empilor, jempilau, ru, ru ronang, sempilau, sempilau laut.

*Casuarina nodiflora* Agoho, agoho del monte, bois de fer, cau, caukuro, kucau, mountain agoho, ru, sampalag, tamarin, thaukuro, velau.

*Casuarina obesa* Swamp she oak.

*Casuarina papuana* She oak.

*Casuarina poissoniana* Bois de fer de montagne, petit bois de fer de montagne.

*Casuarina* spp. Abun darod, amun, beru, bois de fer de riviere, bois de fer jaune, caukalou, caukuru, Fijian beech, filaos, ironwood, jaauw, jauw, kayu embun, kayu ru, kitan, mara, oru, ouain, ouani, rhu rongang, she oak, tjamara, tjumara.

*Casuarina stricta* Casuarina, highland ironwood, pao ferro.

*Casuarina sumatrana* Ambon, antur mangan, casuarina, cemara, cemara gunung, cemara sumatera, ironwood, maribuhok, rhu, rhu bukit, rhu ronang, ru, ru gunung, ru ronang, ru ronang, rurorang, sempilau, sempilau bukit, tjemara, tjemara gunung, tjemara sumatra.

**Distribution:** Malay Peninsula, Burma, Australia, Philippines, and islands of the Pacific. Widely cultivated throughout the tropics. *C. equisetifolia* is particularly favored along seashores.

**The Tree:** A rapidly growing tree that may reach a height of 120 to 150 ft with trunk diameters up to 24 in. Bole is often fluted, straight, and cylindrical.

**General Wood Characteristics:** Heartwood light red to reddish brown, becoming darker in older trees; sapwood buff colored, usually distinct from heartwood. Texture fine, grain straight to interlocked; luster is low; without distinctive odor or taste. Species with wide rays have an attractive figure when quartered.

**Weight**

		Weight	
Moisture content	Specific gravity	kg/m <sup>3</sup>	lb/ft <sup>3</sup>
<b><i>C. cambagei</i></b>			
12%	NA	1153	72a
<b><i>C. cunninghamiana</i></b>			
12%	1.09b	769	48a

Ovendry	0.87b	NA	NA
<b><i>C. equisetifolia</i></b>			
12%	0.88 $\varphi$ □ 0.95c	897 977	56 $\varphi$ □ 61c
12%	0.70 $\varphi$ □ 0.94d	1153	72f
12%	0.79 $\varphi$ □ 1.22e	1025	64f
12%	0.83h	995	62.1g
12%	0.96h	1201	75g
12%	0.82h	945	59g
12%	0.95h	NA	NA
12%	0.88h	NA	NA
<b><i>C. fraseriana</i></b>			
12%	NA	673	42a
<b><i>C. glauca</i></b>			
12%	NA	897	56a
<b><i>C. inophloia</i></b>			
12%	NA	1057	66a
<b><i>C. luehmanni</i></b>			
12%	NA	1193	74.5a
<b><i>C. spp.</i></b>			
12%	NA	857 1070	53.5 $\varphi$ □ 66.8i
<b><i>C. stricta</i></b>			
12%	NA	1001	62.5a
<b><i>C. suberosa</i></b>			
12%	NA	921	57.5a
<b><i>C. sumatrana</i></b>			
12%	NA	1139	71.1g
<b><i>C. torulosa</i></b>			
12%	NA	1073	67a

aReference (2). bReference (29). cReference (24). dReference (15). eReference (27).

fReference (19). gReference (5). hReference (16). iReference (6).

**Mechanical Properties**

Property	Green		Dry	
<b><i>C. cunninghamiana</i></b>				
MOE	NA	NA	12.61 GPa	1.83 $\times 10^6$ lbf/in <sup>2</sup>
MOR	NA	NA	185 MPa	26.88 $\times 10^3$ lbf/in <sup>2</sup>
C <sub>1</sub>	NA	NA	83.36 MPa	12.09 $\times 10^3$ lbf/in <sup>2</sup>
C <sub>2</sub>	NA	NA	13.65 MPa	1.98 $\times 10^3$ lbf/in <sup>2</sup>
Hardness	NA	NA	904.00 N	1993 lbf
Shear	NA	NA	12.96 MPa	1.88 $\times 10^3$ lbf/in <sup>2</sup>
<b><i>C. cunninghamiana</i></b>				
MOE	NA	NA	11.51 GPa	1.67 $\times 10^6$ lbf/in <sup>2</sup>
MOR	NA	NA	99.28 MPa	14.4 $\times 10^3$ lbf/in <sup>2</sup>

<b>C. equisetifoliac</b>				
MOE	NA	NA	15.10 GPa	2.19 $\times 10^6$ lbf/in <sup>2</sup>
MOR	NA	NA	101.00 MPa	14.65 $\times 10^3$ lbf/in <sup>2</sup>
C <sub>1</sub>	NA	NA	65.50 MPa	9.5 $\times 10^3$ lbf/in <sup>2</sup>
<b>C. equisetifoliad</b>				
MOE	NA	NA	11.24 GPa	1.63 $\times 10^6$ lbf/in <sup>2</sup>
C <sub>1</sub>	NA	NA	32.06 MPa	4.65 $\times 10^3$ lbf/in <sup>2</sup>
Hardness	NA	NA	676.76 N	1492 lbf
Shear	NA	NA	11.31 MPa	1.64 $\times 10^3$ lbf/in <sup>2</sup>
<b>C. equisetifoliae</b>				
MOE	13.03 GPa	1.89 $\times 10^6$ lbf/in <sup>2</sup>	22.82 GPa	3.31 $\times 10^6$ lbf/in <sup>2</sup>
MOR	99.28 MPa	14.4 $\times 10^3$ lbf/in <sup>2</sup>	172.37 MPa	25.0 $\times 10^3$ lbf/in <sup>2</sup>
C <sub>1</sub>	45.57 MPa	6.61 $\times 10^3$ lbf/in <sup>2</sup>	75.84 MPa	11.0 $\times 10^3$ lbf/in <sup>2</sup>
C <sub>2</sub>	19.72 MPa	2.86 $\times 10^3$ lbf/in <sup>2</sup>	8.07 MPa	1.17 $\times 10^3$ lbf/in <sup>2</sup>
Hardness	1450.13 N	3197 lbf	1010.15 N	2227 lbf
Shear	18.34 MPa	2.66 $\times 10^3$ lbf/in <sup>2</sup>	NA	NA
<b>C. equisetifoliae</b>				
MOE	16.34 GPa	2.37 $\times 10^6$ lbf/in <sup>2</sup>	17.72 GPa	2.57 $\times 10^6$ lbf/in <sup>2</sup>
MOR	115.83 MPa	16.8 $\times 10^3$ lbf/in <sup>2</sup>	162.03 MPa	23.5 $\times 10^3$ lbf/in <sup>2</sup>
C <sub>1</sub>	NA	NA	44.61 MPa	6.47 $\times 10^3$ lbf/in <sup>2</sup>
C <sub>2</sub>	17.51 MPa	2.54 $\times 10^3$ lbf/in <sup>2</sup>	11.10 MPa	1.61 $\times 10^3$ lbf/in <sup>2</sup>
Hardness	1716.39 N	3748 lbf	1010.15 N	2227 lbf
Shear	10.69 MPa	1.55 $\times 10^3$ lbf/in <sup>2</sup>	NA	NA
<b>C. equisetifoliae</b>				

MOE	13.79 GPa	2.0 $\times 10^6$ lbf/in <sup>2</sup>	NA	NA
MOR	94.46 MPa	13.7 $\times 10^3$ lbf/in <sup>2</sup>	NA	NA
<b><i>C. glaucab</i></b>				
MOE	NA	NA	14.27 GPa	2.07 $\times 10^6$ lbf/in <sup>2</sup>
MOR	NA	NA	118.38 MPa	17.17 $\times 10^3$ lbf/in <sup>2</sup>
<b><i>C. torulosa</i></b>				
MOE	NA	NA	14.41 GPa	2.09 $\times 10^6$ lbf/in <sup>2</sup>
MOR	NA	NA	118.45 MPa	17.18 $\times 10^3$ lbf/in <sup>2</sup>

aReference (29). bReference (2). cReference (24). dReference (5). eReference (16).

Janka side hardness 1,980 lb for green material and 3,200 lb for dry. Amsler toughness 182 in.-lb at 12% moisture content (2-cm specimen).

#### Drying and shrinkage

Type of shrinkage	Percentage of shrinkage (green to final moisture content)		
	0%MC	6%MC	15%MC
<b><i>C. cunninghamiana</i></b>			
Tangential	13	NA	NA
Radial	5.5	NA	NA

Volumetric	15.1	NA	NA
<b>C. equisetifoliab</b>			
Tangential	10.6	NA	3.9
Radial	4.7	NA	2.2
Volumetric	NA	NA	NA
<b>C. spp.</b>			
Tangential	NA	NA	8.2
Radial	NA	NA	2.4
Volumetric	NA	NA	NA

aReference (29).

bReference (5).

#### Kiln drying schedulea

Condition	4/4, 5/4, 6/4 stock	8/4 stock	British Schedule 4/4, 5/4, 6/4 stock
Standard	T2-C2	NA	A

aReference (4).

The wood dries at a moderate rate but usually with considerable warp and checking.

**Working Properties:** Saws with difficulty and also difficult to work with hand and machine tools because of the high density, finishes smoothly.

**Durability:** Heartwood is generally reported as nondurable. In Puerto Rico the wood is rated as susceptible to dry-wood termites; but in the Philippines, it is rated as resistant.

**Preservation:** Sapwood is readily treated; heartwood absorption is irregular and only 5 pcf when treated by a full-cell schedule.

**Uses:** Construction under cover, tool handles, turnery, posts, poles and shingles (treated), charcoal, tanbark, tests in India indicate the wood is suitable for chemical and semi-chemical pulps. Noted as "the best firewood in the world"(20).

**Toxicity:** No information available at this time.



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products of  
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4/4	nominal 1-inch (standard 25.4-mm) thickness	lbf	pound-force
5/4	nominal 1-1/4-inch (standard 32-mm) thickness	m	meter
6/4	nominal 1-1/2-inch (standard 38-mm) thickness	MC	moisture content
8/4	nominal 2-inch (standard 51-mm) thickness	MOE	modulus of elasticity
10/4	nominal 2-1/2-inch (standard 64-mm) thickness	MOR	modulus of rupture
12/4	nominal 3-inch (standard 76-mm) thickness	Mpa	megapascal (10 <sup>6</sup> Pa)
16/4	nominal 4-inch (standard 102-mm) thickness	N	newton
C <sub>  </sub>	compression parallel to grain, maximum crushing strength	NA	information not available
C <sub>⊥</sub>	compression perpendicular to grain, stress at proportional limit	Pa	pascal
Dry	12 percent moisture content	Shear <sub>  </sub>	shear parallel to grain, maximum shearing strength
Gpa	gigapascal (10 <sup>9</sup> Pa)	SG	specific gravity
Hardness	side hardness	WML	work to maximum load
kJ	kilojoule (10 <sup>3</sup> J)		

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