

## Cryptomeria

**Family.** Taxodiaceae

**Botanical Name(s).**

*Cryptomeria japonica*

*Cupressus japonica* (synonymous)

**Continent.** Asia-Oceania

**CITES.** This species is not listed in the CITES Appendices (Washington Convention 2023).

**Notes.** *Cryptomeria japonica* is native to Japan; some vast forest stands are available in the island of Hondo; it is also located in the southern and central regions of China, and in Korea. *Cryptomeria japonica* has been widely used for afforestation in Taiwan and continental China. Outside its natural range of distribution, this species was introduced into the Archipelago of the Azores, and especially into the island of Réunion where some forests stands are presently mature and begin to be logged.

The information and data supplied in this technical description correspond to results from tests performed on *Cryptomeria* from the island of Réunion (tests on 8 stands aged between 32 and 51).

### Description of logs

**Diameter.** From 25 to 65 cm

**Thickness of sapwood.** From 3 to 5 cm

**Floats.** Yes

**Log durability.** Moderate (treatment recommended)

### Description of wood

**Colour reference.** Pinkish brown

**Sapwood.** Clearly demarcated

**Texture.** Fine

**Grain.** Straight

**Interlocked grain.** Absent

**Notes.** Light yellow sapwood, heartwood pinkish brown with darker shades, sometime up to brown or black.

### Physics and mechanics

*The properties indicated are for mature wood. These properties may vary significantly depending on the origin and growing conditions of the wood.*

Property	Average value
Specific gravity <sup>1</sup>	0.38
Monnin hardness <sup>1</sup>	1.0
Coefficient of volumetric shrinkage	0.33 % per %
Total tangential shrinkage (St)	6.9 %
Total radial shrinkage (Sr)	2.6 %
Ratio St/Sr	2.7
Fibre saturation point	28 %



Flat sawn



Quarter sawn

Thermal conductivity ( $\lambda$ )	0.14 W/(m.K)
Lower heating value	19,650 kJ/kg
Crushing strength <sup>1</sup>	33 MPa
Static bending strength <sup>1</sup>	55 MPa
Modulus of elasticity <sup>1</sup>	8,900 MPa

<sup>1</sup> At 12 % moisture content, with 1 MPa = 1 N/mm

**Notes.** The tests performed on Cryptomeria from the island of Réunion give the following results (average values given for each property, standard deviation in brackets):

- Parallel Brinell hardness (N/mm<sup>2</sup>): 25 (s.d.: 12.7)
- Perpendicular Brinell hardness (N/mm<sup>2</sup>): 13 (s.d.: 5.8)
- Dynamic bending strength (Nm/cm<sup>2</sup>): 3.3 (s.d.: 1.1)
- Longitudinal tensile strength (MPa): 43 (s.d.: 9)
- Longitudinal modulus of elasticity in traction (MPa): 6400 (s.d.: 1984)
- Flat bending strength: 57.5 (s.d.: 15,5)
- Modulus of elasticity in longitudinal flat bending (MPa): 4965 (s.d.: 2089)

## Natural durability and preservation

**Resistance to fungi.** Classe 2 (v) - durable ("v" = variable)

**Resistance to dry wood borers.** Class D - durable (sapwood demarcated, risk limited to sapwood)

**Resistance to termites.** Class S - susceptible

**Treatability.** Class 2(v)-3(v) - poorly to moderately permeable ("v" = variable)

**Use class ensured by natural durability.**

Class 3 - not in ground contact, outside

**Notes.** This species is listed in the European standard NF EN 350 (2016). Treatability and heartwood durability highly variable.

## Requirement of a preservative treatment

**Against dry wood borer.** Does not require any preservative treatment

**In case of temporary humidification.** Does not require any preservative treatment

**In case of permanent humidification.** Requires appropriate preservative treatment

## Drying

**Drying rate.** Normal to slow

**Risk of distorsion.** Slight risk

**Risk of casehardening.** No known specific risk

**Risk of checking.** Slight risk

**Risk of collapse.** Yes

**Notes.** According to the tests performed on Cryptomeria from the island of Réunion, this species dries well up to 70°C. Collapse could occur at higher temperatures. For 45mm thickness, drying duration is around 12 days.

Suggested drying program.

Phases	Duration (H)	MC (%) probes	T (°C)	Rh (%)	UGL (%)
<b>Prewarm 1</b>		> 50	50	86	16.5
<b>Prewarm 2</b>	3	> 50	52	85	16.0
<b>Drying</b>		> 50	55	82	14.7
		50 - 40	55	80.0	13.8
		40 - 35	55	75.0	12.6
		35 - 30	56	73.0	12.0
		30 - 27	58	67.0	10.5
		27 - 24	60	58.0	8.9
		24 - 21	62	50.0	7.5
		21 - 18	64	45.0	6.8
		18 - 15	65	37.0	5.7
		15 - 12	65	34.0	5.3
		12 - 9	65	28.0	4.5
		9 - 6	65	24.0	4.0
<b>Conditioning</b>	6		58	(3)	(2)
<b>Cooling</b>	(1)		Stop	(3)	(2)

(1) ) Cooling: until the temperature inside the kiln no longer exceeds external temperature by more than 30 °C.

(2) UGL = final H% x 0,8 to 0,9.

(3) Subtract RH from the UGL determined in (2) and temperature, using the Hailwood-Horrobin equation.

## Sawing and machining

Blunting effect. Normal

Sawteeth recommended. Ordinary or alloy steel

Cutting tools. Ordinary

Peeling. Good

Slicing. Good

**Notes.** According to the tests performed in Réunion Island, this wood is very easy to machine using mode 90°/0 (surfacing, planing, moulding), giving surfaces a very good quality, even close to the knots. Consequently, sanding is not necessary which avoids dust emissions and related sanitary problems. However, this wood is soft and surfaces can be easily stamped; thus, chip extraction systems must be efficient and some uses are not recommended, like flooring or table top for instance. As most of the softwoods, Cryptomeria is not recommended for turning.

## Assembling

Nailing and screwing. Good when specific gravity over 0.35

**Notes.** Tests performed on Cryptomeria from Réunion show that this species has good bonding ability and allows the manufacture of glued products meeting the regulatory requirements of the carpentry and construction markets. The reliability, visual rendering (removal of defects) and dimensional stability of these products will be better than those of solid wood, while improving material yields (recovery of small pieces of wood). The advantages of this species when using this assembly technique are its ease of machining, the absence of extractables rising after machining, its good wettability, its low density, and its good dimensional stability during installation.

## Commercial grading

Appearance grading for sawn timbers.

Possible grading (on 2 sides): G2-0, G2-1, G2-2, G2-3, G2-4 Possible grading (on 4 sides): G4-0, G4-1, G4-2, G4-3, G4-4 according to European standard EN 1611-1 (October 1999)

### Visual grading for structural applications

According to French standard NF B 52-001-1 (2018), strength classes C14 and C18 can be provided by visual grading to Cryptomeria from Réunion Island.

### Fire safety

Conventional French grading.

Thickness > 18 mm: M3 (moderately inflammable)

Thickness < 18 mm: M4 (easily inflammable)

Euroclasses grading. D-s2, d0

Default grading for solid wood, according to requirements of European standard EN 14081-1+A1 (August 2019). It concerns structural graded timber in vertical uses and ceiling with mean density upper 0.35 and thickness upper 22 mm.

### End-uses

- Boxes and crates
- Cladding
- Current furniture or furniture components
- Exterior joinery
- Exterior panelling
- Formwork
- Glued laminated
- Interior joinery
- Interior panelling
- Light carpentry
- Moulding
- Pallet
- Shingles
- Sliced veneer
- Veneer for interior of plywood
- Wood frame house



Ceiling frame, La Réunion (France)

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**Main local names****Country**

China  
China  
France (importated tropical timber)  
Germany (importated tropical timber)  
Italia (importated tropical timber)  
Japan  
Japan  
Réunion Island (France)  
Spain (importated tropical timber)  
Taiwan  
Taiwan  
United Kingdom (importated tropical timber)

**Local name**

Liusan  
San-sugi  
Cryptomeria  
Japanische zeder  
Crittomeria giapponese  
Cryptomeria  
Sugi  
Cryptomeria  
Criptomeria japonesa  
Liusan  
San-sugi  
Japanese cedar