WESTERN RED CEDAR

Family: CUPRESSACEAE (gymnosperm)

Scientific name(s): Thuja plicata

Commercial restriction: no commercial restriction

Note: This species, appreciated for its durability, comes from the US west coast and from Canada. It is subject of an active silviculture and is regularly exported. Plantations are also found in Great-Britain and New-Zealand.

WOOD DESCRIPTION

Color: red brown

Sapwood: clearly demarcated

Texture: medium

Grain: straight

Interlocked grain: absent

Note: The texture for plantation woods is often less fine and wood may have numerous small knots.

LOG DESCRIPTION

Diameter: from 50 to 120 cm

Thickness of sapwood: from 2 to 4 cm

Floats: yes

Log durability: good

PHYSICAL PROPERTIES

Physical and mechanical properties are based on mature heartwood specimens. These properties can vary greatly depending on origin and growth conditions.

	Mean	Std dev.
Specific gravity *:	0,38	
Monnin hardness *:	1,1	
Coeff. of volumetric shrinkage:	0,29 %	
Total tangential shrinkage (TS):	5,5 %	
Total radial shrinkage (RS):	2,2 %	
TS/RS ratio:	2,5	
Fiber saturation point:	24 %	

Stability: moderately stable to stable

Note: WESTERN RED CEDAR wood tends to split.

MECHANICAL AND ACOUSTIC PROPERTIES

	Mean	Std dev.
Crushing strength *:	33 MPa	
Static bending strength *:	59 MPa	
Modulus of elasticity *:	8800 MPa	

(*: at 12% moisture content, with 1 MPa = 1 N/mm²)

NATURAL DURABILITY AND TREATABILITY

Fungi and termite resistance refers to end-uses under temperate climate. Except for special comments on sapwood, natural durability is based on mature heartwood. Sapwood must always be considered as non-durable against wood degrading agents.
E.N. = Euro Norm

Funghi (according to E.N. standards): class 2 - durable

Dry wood borers: durable - sapwood demarcated (risk limited to sapwood)

Termites (according to E.N. standards): class S - susceptible

Treatability (according to E.N. standards): class 3-4 - poorly or not permeable

Use class ensured by natural durability: class 3 - not in ground contact, outside

Species covering the use class 5: No

Note: This species is listed in the European standard NF EN 350-2.
Use class 3 is only for wood components without sapwood.
Plantation woods, which are exploited younger, are less resistant to fungi (Class 3: moderately durable).
According to the European standard NF EN 335, performance length might be modified by the intensity of end-use exposition.

REQUIREMENT OF A PRESERVATIVE TREATMENT

Against dry wood borer attacks: does not require any preservative treatment

In case of risk of temporary humidification: does not require any preservative treatment

In case of risk of permanent humidification: use not recommended

DRYING

Drying rate: normal

Risk of distortion: no risk or very slight risk

Risk of casehardening: no

Risk of checking: slight risk

Risk of collapse: yes

Possible drying schedule: 2

	Temperature (°C)		
M.C. (%)	dry-bulb	wet-bulb	Air humidity (%)
Green	50	47	84
40	50	45	75
30	55	47	67
20	70	55	47
15	75	58	44

This schedule is given for information only and is applicable to thickness lower or equal to 38 mm.
It must be used in compliance with the code of practice.
For thickness from 38 to 75 mm, the air relative humidity should be increased by 5 % at each step.
For thickness over 75 mm, a 10 % increase should be considered.

SAWING AND MACHINING

Blunting effect: normal

Sawteeth recommended: stellite-tipped

Cutting tools: ordinary

Peeling: good

Slicing: nood

Note: Use of stellite-tipped saw blades is recommended for green woods sawing. The presence of chemical corrosive agents has a highly blunting effect.

ASSEMBLING

Nailing / screwing: poor

Gluing: correct

Note: High tendancy to split: pre-holes are needed for nailing and screwing. For uses in humid areas and because of wood's acidity, it is recommended to have stainless nails or screws.

COMMERCIAL GRADING

Appearance grading for sawn timbers: According to "Export R-List Rules" (2003)
Possible grading: # 2 & Better Clear, # 4 Clear
According to NLGA rules (January 2008)
Possible grading: Grade Clear Heart, Grade A, Grade B
Possible other grading: Select Knotty, Quality Knotty

FIRE SAFETY

Conventional French grading: Thickness > 18 mm : M.3 (moderately inflammable)
Thickness < 18 mm : M.4 (easily inflammable)

Euroclasses grading: D s2 d0
Default grading for solid wood, according to requirements of European standard EN 14081-1 annex C (April 2009). It concerns structural graded timber in vertical uses with mean density upper 0.35 and thickness upper 22 mm.

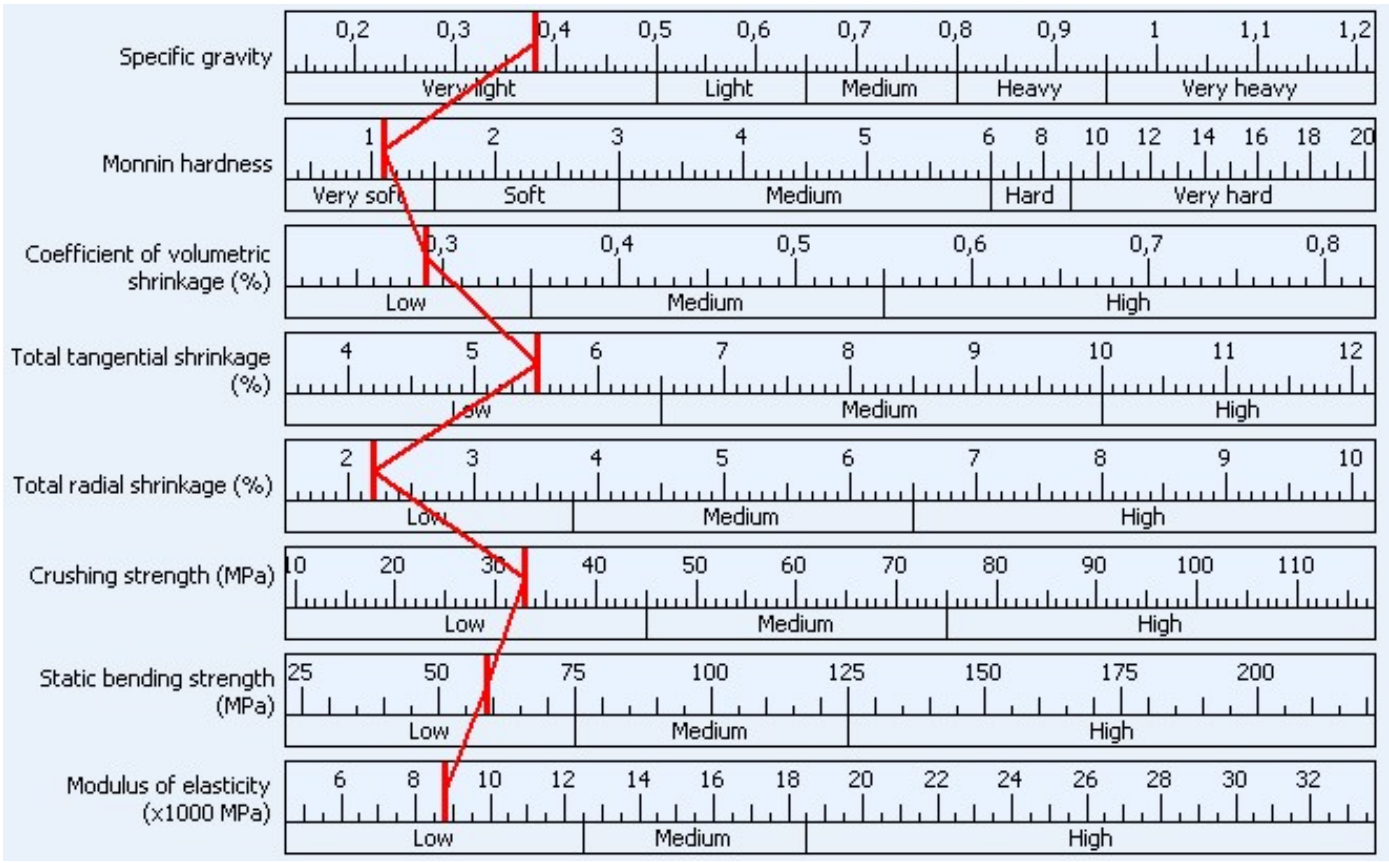
END-USES

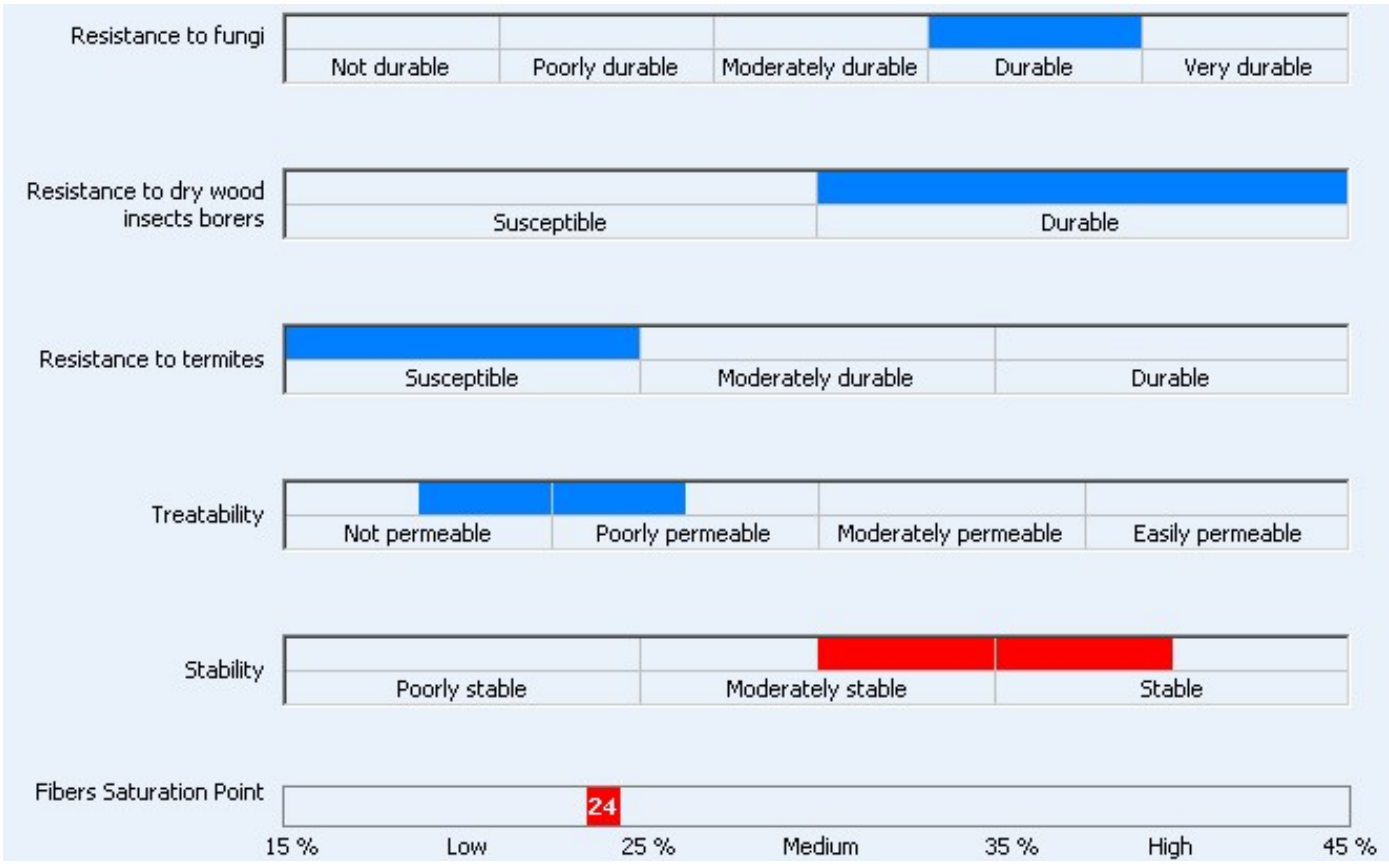
Exterior panelling
Exterior joinery
Interior joinery
Moulding
Stringed instruments
Open boats
Wood-ware
Shingles
Poles
Interior panelling
Light carpentry
Musical instruments
Sculpture

Note: Wood used for outside fittings: terrace, playing ground, pool surround, ... (low density and sensitive to stamping but offering interesting mechanical properties and durability).

MAIN LOCAL NAMES

Country	Local name	Country	Local name
Germany (temperate timber)	RIESENLEBENSBAUM	Spain (temperate timber)	CEDRO CANADIENSE
France (temperate timber)	CEDRE ROUGE D'AMERIQUE	United States (temperate timber)	WESTERN RED CEDAR


Specific gravity
0,2 0,3 0,4 0,5 0,6 0,7 0,8 0,9 1 1,1 1,2
Very light
Light
Medium
Heavy
Very heavy
Monnin hardness
1 2 3 4 5 6 8 10 12 14 16 18 20
Very soft
Soft
Medium
Hard
Very hard
Coefficient of volumetric shrinkage (%)
0,3 0,4 0,5 0,6 0,7 0,8
Low
Medium
High
Total tangential shrinkage (%)
4 5 6 7 8 9 10 11 12
Low
Medium
High
Total radial shrinkage (%)
2 3 4 5 6 7 8 9 10
Low
Medium
High
Crushing strength (MPa)
10 20 30 40 50 60 70 80 90 100 110
Low
Medium
High
Static bending strength (MPa)
25 50 75 100 125 150 175 200
Low
Medium
High
Modulus of elasticity (x1000 MPa)
6 8 10 12 14 16 18 20 22 24 26 28 30 32
Low
Medium
High


Resistance to fungi
Not durable
Poorly durable
Moderately durable
Durable
Very durable
Resistance to dry wood insects borers
Susceptible
Durable
Resistance to termites
Susceptible
Moderately durable
Durable
Treatability
Not permeable
Poorly permeable
Moderately permeable
Easily permeable
Stability
Poorly stable
Moderately stable
Stable
Fibers Saturation Point
24
15 %
Low
25 %
Medium
35 %
High
45 %