# SAPIN



Family: PINACEAE (gymnosperm)

Scientific name(s): Abies alba
Abies pectinata (synonymous)

Commercial restriction: no commercial restriction

Note: European species, FIR appreciates cool climates where atmospheric humidity is high.
In France, COMMON SPRUCE (Picea excelsa) is often falsely called "SAPIN" (Abies alba).

## WOOD DESCRIPTION

Color: creamy white
Sapwood: not demarcated
Texture: medium
Grain: straight
Interlocked grain: absent

## LOG DESCRIPTION

Diameter: from 50 to 80 cm
Thickness of sapwood:
Floats: pointless
Log durability: moderate (treatment recommended)

Note: FIR wood is creamy white, a little bit dull, sometimes slightly reddish-brown. Rings are well visible. Texture is fine to medium according to growing speed.

## 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 *: | 0,49 | 0,05 |
| Monnin hardness *: | 2,5 | 0,7 |
| Coeff. of volumetric shrinkage: | 0,44 % | 0,07 % |
| Total tangential shrinkage (TS): | 8,7 % | 2,3 % |
| Total radial shrinkage (RS): | 4,0 % | 1,1 % |
| TS/RS ratio: | 2,2 | |
| Fiber saturation point: | 29 % | |

Stability: moderately stable

## MECHANICAL AND ACOUSTIC PROPERTIES

| | Mean | Std dev. |
|---|---|---|
| Crushing strength *: | 41 MPa | 3 MPa |
| Static bending strength *: | 80 MPa | 9 MPa |
| Modulus of elasticity *: | 14300 MPa | 3000 MPa |

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

Musical quality factor: 71,4 measured at 2928 Hz

## 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 4 - poorly durable
Dry wood borers: susceptible
Termites (according to E.N. standards): class S - susceptible
Treatability (according to E.N. standards): class 2-3 - poorly to moderately permeable
Use class ensured by natural durability: class 1 - inside (no dampness)
Species covering the use class 5: No

Note: This species is listed in the European standard NF EN 350-2.
Prone to blue stain. FIR wood is used with sapwood. Hence a preservative treatment is imperative.

## REQUIREMENT OF A PRESERVATIVE TREATMENT

Against dry wood borer attacks: requires appropriate preservative treatment
In case of risk of temporary humidification: requires appropriate preservative treatment
In case of risk of permanent humidification: use not recommended

## DRYING

Drying rate: rapid
Risk of distortion: high risk
Risk of casehardening: no
Risk of checking: high risk
Risk of collapse: no

Possible drying schedule: 3

| M.C. (%) | Temperature (°C) dry-bulb | wet-bulb | Air humidity (%) |
|---|---|---|---|
| Green | 60 | 56 | 81 |
| 30 | 68 | 58 | 61 |
| 20 | 74 | 60 | 51 |
| 15 | 80 | 61 | 41 |

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: ordinary or alloy steel
Cutting tools: ordinary
Peeling: good
Slicing: not recommended or without interest
Note: The quality of surface depends on the grain regularity and the possible presence of knots or areas of compression wood.

## ASSEMBLING

Nailing / screwing: poor
Gluing: correct
Note: FIR wood tends to split. Risk of split when nailing.

## COMMERCIAL GRADING

Appearance grading for sawn timbers: According to European standard EN 1611-1 (October 1999)
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"

Visual grading for structural applications: Traded timber with CE marking. Possible strength classes: C18, C24 or C30 related to the European standard EN 14081 (May 2006).

## FIRE SAFETY

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

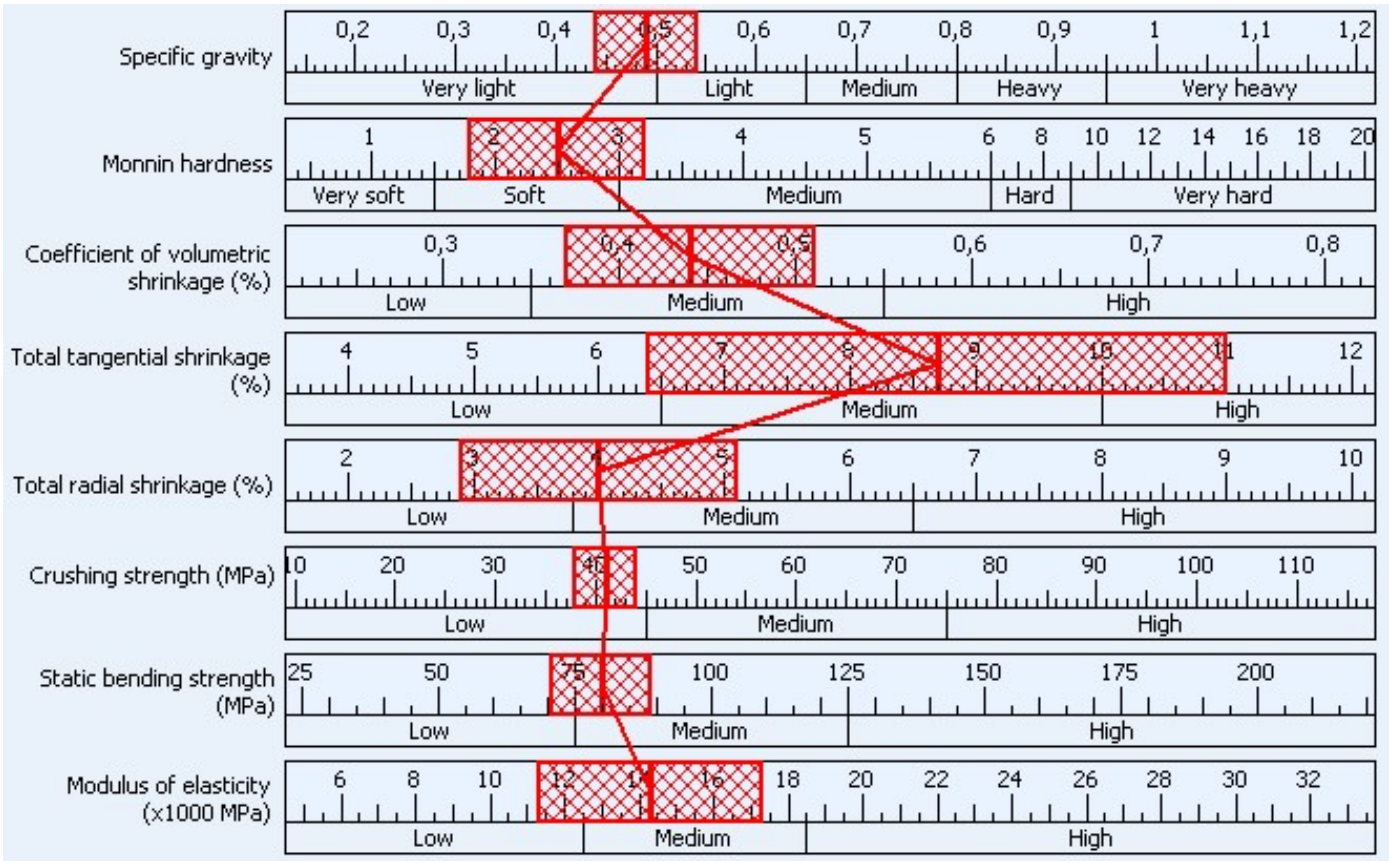
Euroclasses grading: D s2 d0
Default grading for solid wood, according to requirements of European standard EN 14081-1 annex C (April 2009). It concerns structural graded timber in vertical uses with mean density upper 0.35 and thickness upper 22 mm.

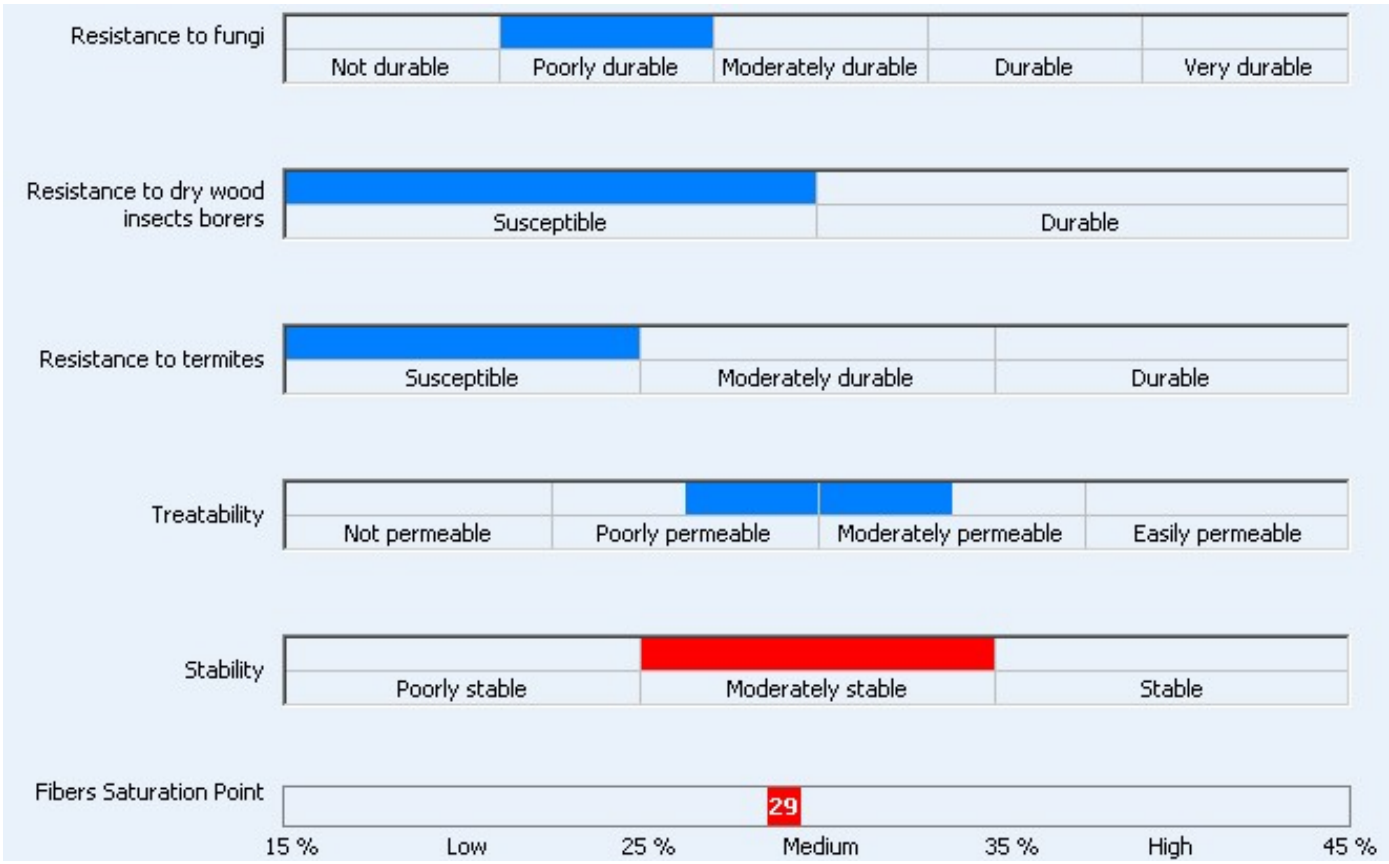
## END-USES

Heavy carpentry
Wood frame house
Pit props
Interior panelling
Moulding
Fiber or particle boards
Boxes and crates
Musical instruments
Light carpentry
Poles
Glued laminated
Interior joinery
Current furniture or furniture components
Pulp
Shingles

## MAIN LOCAL NAMES

| Country | Local name | Country | Local name |
|---|---|---|---|
| Germany (temperate timber) | TANNE | Spain (temperate timber) | ABETE COMUN |
| France (temperate timber) | SAPIN | Italia (temperate timber) | ABETE |
| United Kingdom (temperate timber) | FIR | | |


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
29
15 %
Low
25 %
Medium
35 %
High
45 %