HALDU

Family: RUBIACEAE (angiosperm)
Scientific name(s): Haldina cordifolia
Adina cordifolia (synonymous)
Commercial restriction: no commercial restriction

WOOD DESCRIPTION

Color: yellow
Sapwood: not clearly demarcated
Texture: fine
Grain: straight
Interlocked grain: absent
Note: Very wide sapwood.
Yellow wood darkening to yellow brown with age. Lustrous surface.

LOG DESCRIPTION

Diameter: from 50 to 100 cm
Thickness of sapwood:
Floats: yes
Log durability: moderate (treatment recommended)

PHYSICAL PROPERTIES

MECHANICAL AND ACOUSTIC 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 *:	0,70	
Monnin hardness *:	4,5	
Coeff. of volumetric shrinkage:	0,45 %	
Total tangential shrinkage (TS):	6,8 %	
Total radial shrinkage (RS):	3,4 %	
TS/RS ratio:	2,0	
Fiber saturation point:		
Stability:	moderately stable	

	Mean	Std dev.
Crushing strength *:	55 MPa	
Static bending strength *:	90 MPa	
Modulus of elasticity *:	12770 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 3 - moderately durable
Dry wood borers: susceptible - sapwood not or slightly demarcated (risk in all the wood)
Termites (according to E.N. standards): no information available
Treatability (according to E.N. standards): class 4 - not permeable
Use class ensured by natural durability: class 2 - inside or under cover (dampness possible)
Species covering the use class 5: No

REQUIREMENT OF A PRESERVATIVE TREATMENT

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

DRYING

Drying rate: normal
Risk of distortion: slight risk
Risk of casehardening: no
Risk of checking: high risk
Risk of collapse: no
Note: Some tendency to split during air drying.

Possible drying schedule: 4

M.C. (%)	Temperature (°C) dry-bulb	wet-bulb	Air humidity (%)
Green	42	39	82
50	48	43	74
40	48	43	74
30	48	43	74
15	54	46	63

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: nood
Note: Sometimes, irritant sawdust.

ASSEMBLING

Nailing / screwing: good
Gluing: correct

COMMERCIAL GRADING

Appearance grading for sawn timbers: According to MGR grading rules (2009)
Possible grading: Prime, Select, Standard, Serviceable, Utility

FIRE SAFETY

Conventional French grading: Thickness > 14 mm : M.3 (moderately inflammable)
Thickness < 14 mm : M.4 (easily inflammable)

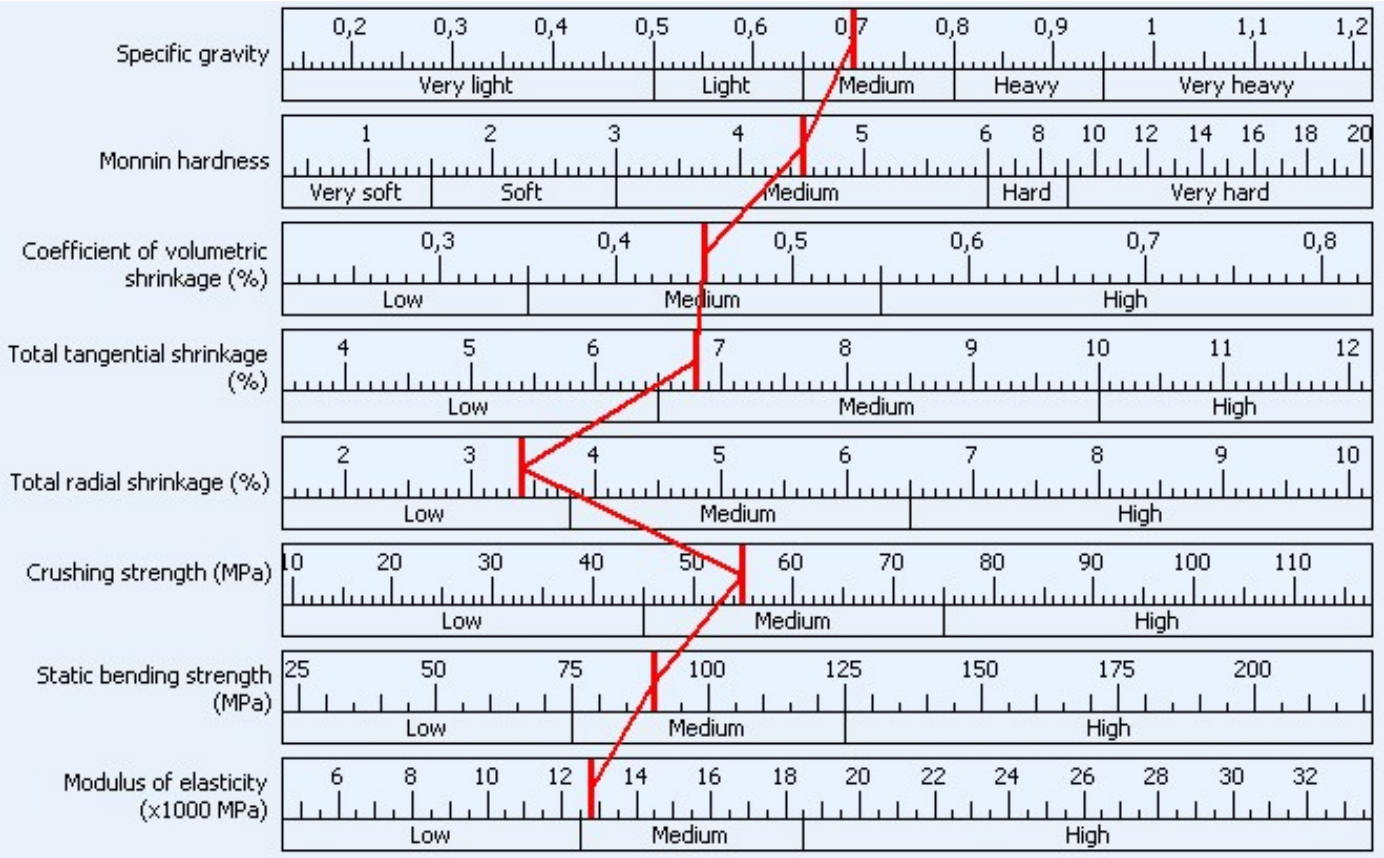
Euroclasses grading: D s2 d0
Default grading for solid wood, according to requirements of European standard EN 14081-1 annex C (April 2009). It concerns structural graded timber in vertical uses with mean density upper 0.35 and thickness upper 22 mm.

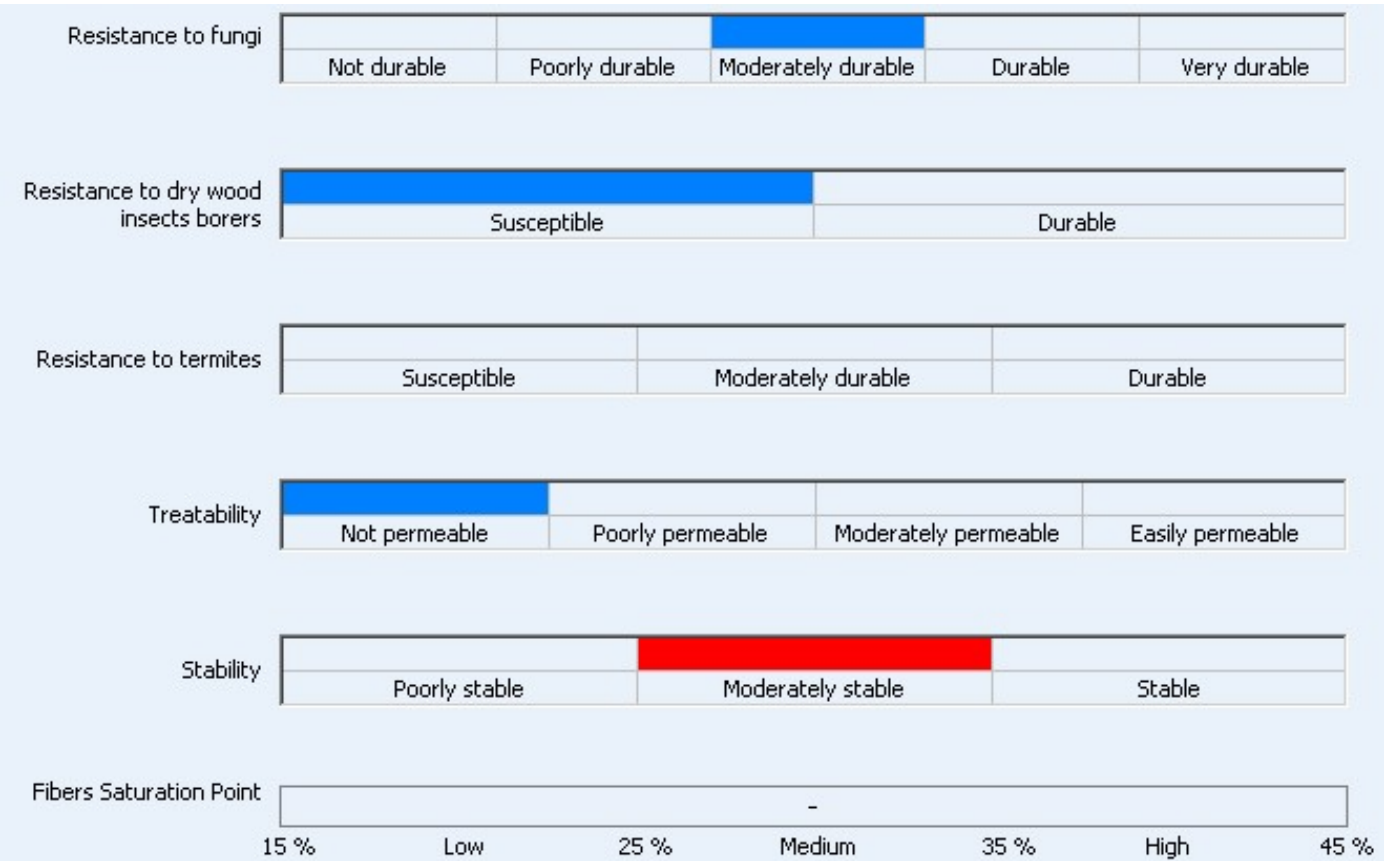
END-USES

Interior joinery
Flooring
Sliced veneer
Veneer for back or face of plywood
Turned goods
Pencils
Cigar boxes
Glued laminated
Stairs (inside)
Interior panelling
Veneer for interior of plywood
Cooperage
Current furniture or furniture components
Boxes and crates
Light carpentry
Resistant to one or several acids

MAIN LOCAL NAMES

Country	Local name	Country	Local name
Cambodia	KWAO	India	HALDU
Indonesia	LASI	Malaysia (islands)	MERAGA
Myanmar	HNAW	Philippines	ADINA
Sri Lanka	KOLON	Thailand	KWAO
Vietnam	GAO-VANG		


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