

# AMABILIS FIR

Botanical Name:  
*Abies amabilis* (Dougl. ex J. Forbes)

Amabilis fir is a tall straight tree found in coastal forests of British Columbia above 300 metres elevation, although in the north it may grow at sea level. While it grows all along the Coast, it is not found on the Queen Charlotte Islands. It can reach 50 metres in height and 1 metre in diameter, and is a shade-tolerant species. This tree is often found with western hemlock, and together the two species make up 60% of British Columbia's mature coastal forests.



AMABILIS FIR

## Common Uses

Amabilis fir is commonly sold and shipped together with Western Hemlock under the name Hem-Fir (also often referred to as Hem-Bal). Amabilis fir is used in structural products, due to its strength properties. Widely used in a range of residential and commercial construction in applications such as framing, sheathing, sub-flooring, concrete forms, decking, planking, beams, posts, and prefabricated buildings. Low-grade wood is used in both pulp and paper products, as well as for boxes and crates.

High-grade amabilis fir is used in interior applications as it is an attractive species with good working properties. Because of its light weight and colour and its clean appearance, the wood is used for doors and windows, furniture parts, mouldings, sauna panelling, and food containers.

Research has shown amabilis fir to be among the most treatable wood species in Canada. This provides an opportunity to add value to the species through pressure treating.

Amabilis fir lumber is dried according to end-use and customer specifications. Kiln drying inhibits natural staining of the wood, improves its strength and stiffness, enhances its appearance, and increases its resistance to decay and attack by insects.

PHYSICAL PROPERTIES		
DENSITY (kg/m <sup>3</sup> )	Green	360
	Air Dry	389
SPECIFIC GRAVITY (12% M.C.)	Standard	0.36
HARDNESS (N)	Side	1970
	End	3710
MOE (Mpa)	Green	9310
	Air Dry	11400
MOR (Mpa)	Green	37.8
	Air Dry	68.9
COMPRESSION PARALLEL (Mpa)	Air Dry	40.8
COMPRESSION PERPENDICULAR (Mpa)	Air Dry	3.61
SHEAR (Mpa)	Air Dry	7.54
CLEAVAGE (N/mm Width)	Air Dry	36.8
SHRINKAGE OD = oven dry air = air dry 12%	Radial (OD)	4.2%
	Tangential (OD)	8.9%
	Volumetric (OD)	12.5%
	Volumetric (air)	7.5%
	Tang / Rad ratio	2.1

VISUAL PROPERTIES	
COLOUR	
Heartwood	Creamy white to light gold.
Sapwood	Nearly white, similar to heartwood.
Heartwood / Sapwood Contrast	Little difference between heartwood and sapwood.
Latewood / Earlywood Contrast	Gradual transition, though distinct growth rings with fairly prominent brown latewood bands.
GRAIN	
Wood has a medium to fine texture and straight, even grain.	
FIGURE	
Plainsawn lumber or rotary-cut veneer: Conspicuous growth ring. Quartersawn lumber or quarter-sliced veneer: Faint growth ring stripe.	
KNOTS	
Contains small, sound black knots that are usually tight and dimensionally stable.	
OTHER	
Wood is non-resinous. Lustrous. "Birdpecks" or small bark pockets are often found in the lumber. Dark streaks are often found in the lumber. May contain ring shake.	



**WORKING PROPERTIES**

Amabilis fir has a high strength-to-weight ratio and is well known for its working properties. The wood dries moderately quickly with small dimensional movement and little tendency to check. It is relatively easy to work, with good machining qualities. It planes and shapes well and can be sanded to a smooth finish. The wood glues easily, has moderate nail and screw holding ability, and takes a good finish.

PROCESS	PERFORMANCE	COMMENTS
<b>MACHINING</b>		
Planing	Fair to good results	Recommended planer settings 20° hook angle and 20 kmpi (knife marks per inch). Typical defects: Fuzzy grain, raised grain, and torn grain. Sharp tools are needed in order to overcome the tendency for grain tearing.
Turning	Moderate to poor surface quality	Much better surface quality when rotary-knife lathe is used.
Sawing	Variable	Slight to moderate blunting effect.
Boring	Medium	Medium boring quality with brad point bits and poor quality with single twist bits.
Mortising	Moderate to good	Good mortising quality when using a hollow chisel mortise.
Shaping	Good shaping quality	Recommended: The use of a counter piece for end-grain shaping.
Veneering	N/A	
Sanding	Good	Sands smoothly.
<b>FASTENING</b>		
Screwing	Moderate	Average screw retention: 366 lb.
Nail Retention	Moderate to good	Good holding.
Lateral Nail Holding	N/A	
Gluing	Glues easily	Bonds very easily with adhesives of a wide range of properties and under a wide range of bonding conditions.
<b>FINISHING</b>		
Staining	Average to good	Wood is soft and produces a grainy appearance. Natural and light stains look the best. Dark stains appear blotchy.
Painting	Average to good paint holding ability	
Lacquering	Good	Multiple coats of clear or a clear coat with a high build is recommended.
Waxing	Good	Good results. Best results are obtained when using light- to mid-coloured waxes (e.g. Mellow Pine, Chestnut).
<b>DRYING</b>		
Ease of Drying	Moderately easy to moderately difficult	There is a wide variation in the moisture content of green western hemlock. Best results are obtained when sorting by moisture content is done. Due to the high moisture content of this wood, longer kiln drying times are required. When dried at high temperatures sapwood can turn a brownish colour.
<b>DURABILITY</b>		
Natural Decay Resistance	Non-durable to slightly durable	Not appropriate for prolonged outdoor exposure.
Treatability	Moderate	



## Commercial Availability

Amabilis fir is produced primarily as structural lumber for North America and Japan. In North America structural grades are in accordance with the National Lumber Grades Authority (NLGA) rules for dimension lumber. Select Structural, #2 and better, and stud grades are the most common grades produced for North America, with squares being the most common Japanese product. Specialty in-house grades, lamstock, and export grades such as E-120 in Japan are also marketed.

Appearance grades are also produced according to NLGA rules. Clears, shop lumber and moulding stock are most common, though there are many potential appearance grades that can be produced.

*\* Amabilis fir grows in association with western hemlock and is commonly marketed as structural lumber in the Hem-Fir (western hemlock - amabilis fir) species mix (also often referred to as Hem-Bal).*