

Canadian SPF



THE STRONG CHOICE FOR CONCRETE FORMWORKS



Q

Quebec Wood
Export Bureau

Partner



Canada Wood
Produits de bois canadien

Eastern Canada is the perfect supplier of wood for concrete formworks. With years of experience, sawmills in the Province of Quebec have developed a product that is up to the job for the most demanding applications. The consistency and quality of our product enable the wood to be re-used and thus contribute to reducing overall construction costs.

Quebec's climate is especially harsh and as a result, tree growth is slow, grain is tight and knots are small. It takes many years for the trees to reach maturity and they are harvested after 65 to 150 years. These conditions create the strong wood required for demanding applications such as formwork.

Egypt and Saudi Arabia are two key markets for Spruce Pine Fir (SPF) formwork material supplied from Quebec

and our 75 x 75 mm post is the main product. Other sizes can also be supplied upon request. Although mainly used in vertical applications to hold up the formwork for the upper floor to be poured next, the post can also serve horizontally as a joist supporting the concrete sheets that make up the base of the concrete form. We produce two grades of the 75 x 75 mm posts. The "Moralie" is the best grade and this product is almost square-edged. It has a smoother surface and therefore a more exact size. It is the best grade for horizontal usage. The "Fillerie" is a standard grade that allows wane without compromising the strength of the piece. It is mainly used as a post.

The tables and photos below describe the two grades of 75 x 75 mm formwork posts supplied by companies in Quebec, Canada.

Moralie	Limiting provisions
Stained wood	Medium, natural or sapwood
Decay	Firm
Knots	50% of the cross section
Splits	In length, twice the width of the piece
Crook	Medium
Wane	Limited
Unsound wood	Not allowed
Dimensional tolerances/width and thickness	± 2 mm

Fillerie	Limiting provisions
Stained wood	Not limited
Decay	Firm
Knots	50% of the cross section
Splits	In length, twice the width of the piece
Crook	Medium
Wane	Permitted if not compromising strength
Unsound wood	Not allowed
Dimensional tolerances/width and thickness	± 2 mm
Heart pit	Heart centre on 75% of the length



Strength Properties of Wood from Different Countries

Wood to be used in concrete formworks requires good strength in the connection zone to maintain its properties after several cycles of nailing and un-nailing. Appropriate bending, shear and compression strength are other key factors.

A study was carried out at the Advanced Building Systems Department of FPIInnovations (FPI)¹. It compared the mechanical properties of wood species supplied by

different European countries with those of Canadian SPF. This comparison was based on internationally recognized technical data contained in the National Design Specification developed by the American Wood Council and referenced in the 2015 United States International Building Code.

The work carried out at FPI shows that SPF from Canada is stronger than most of the competing products from Europe. In Table 1 the strength is better or similar to the European average for all of the compared properties. In Table 2 you can find detailed data for SPF and all the other products in the comparison.

Table 1. Comparison between Canadian SPF and average of European wood species

Wood Species	Design values in Megapascal (MPa)							Specific Gravity	Grading Rules Agency
	Bending	Tension parallel to grain	Shear parallel to grain	Comp. perpendicular to grain	Comp. parallel to grain	Modulus of Elasticity			
	F _b	F _t	F _v	F _c	F _c	E	E _{min}		
Canadian SPF (Graded No. 2)	6.0	3.1	0.9	2.9	7.9	9700	3500	0.42	NLGA ²
European average (Graded No. 2)	5.1	2.2	1.0	2.3	6.6	8700	3100	0.45	WCLIB ³

Table 2. Graded No. 2 design value of Canadian SPF compared with different European wood species and origins

Wood Species	Design values in Megapascal (MPa)							Specific Gravity	Grading Rules Agency
	Bending	Tension parallel to grain	Shear parallel to grain	Comp. perpendicular to grain	Comp. parallel to grain	Modulus of Elasticity			
	F _b	F _t	F _v	F _c	F _c	E	E _{min}		
Canadian SPF	6.0	3.1	0.9	2.9	7.9	9700	3500	0.42	NLGA
Norway Spruce Estonia, Latvia, Lithuania	5.5	2.4	1.0	3.0	6.9	9000	3200	0.42	WCLIB
Norway Spruce Germany, France, Switzerland	5.0	2.2	1.2	2.4	6.6	8300	3000	0.42	WCLIB
Norway Spruce Finland	4.3	1.9	0.9	1.5	6.0	8300	3000	0.42	WCLIB
Norway Spruce Romania, Ukraine	5.0	2.2	0.7	1.9	6.6	8300	3000	0.38	WCLIB
Norway Spruce Sweden	4.7	2.1	1.2	2.0	6.4	8300	3000	0.42	WCLIB
Norway Spruce Austria	6.4	2.8	1.2	1.8	7.2	10300	3800	0.43	WCLIB
Scots Pine Finland	6.4	2.9	1.0	1.4	7.6	9000	3200	0.48	WCLIB
Scots Pine Sweden	4.0	1.7	0.8	2.8	5.7	8300	3000	0.47	WCLIB
Silver Fir Germany, France, Switzerland	5.0	1.5	0.9	2.8	6.6	9000	3200	0.43	WCLIB
Scots Pine Austria, Czech Republic, Romania, Ukraine	5.3	2.4	0.9	1.9	6.9	9700	3500	0.50	WCLIB
Scots Pine Estonia, Latvia, Lithuania	5.2	2.2	0.9	3.0	6.7	8300	3000	0.45	WCLIB
Scots Pine Germany	4.8	2.2	1.1	2.7	6.6	7600	2800	0.53	WCLIB

Source: American Wood Council, *National Design Specifications (NDS) for Wood Construction*, 2015

1. FPIInnovations (www.fpinnovations.ca) is a not-for-profit world leader in wood products research and product development and as such recognized for its high- and un-biased scientific standards in laboratories located in Vancouver, Montréal and Québec City.
2. National Lumber Grades Authority
3. West Coast Lumber Inspection Bureau



Quebec Wood Export Bureau

Canadian Wood is Responsible and Sustainable

Canada has the third largest forest area in the world with 347 million hectares of forest representing more than 9% of the world's forest cover. Canada also has the largest area of forests in the world that are third-party independently certified. As of the end of 2016, Canada had 168 million hectares of independently certified forest land. That represents 37% of all certified forests worldwide, the largest area of third-party-certified forests in any country.

For buyers, this confirms that the wood is sourced from sustainably managed forests. Throughout their long relationship with forests, Quebec wood manufacturers combine their long tradition and expertise to provide high quality and environmentally sound wood products all over the world.

Your Gateway to Wood Products

The mission of the Quebec Wood Export Bureau (QWEB) is to develop export markets for wood products from Quebec, ensure access for these products on markets and promote the use of wood in regional, provincial and national markets. QWEB has some 125 export member companies in five different groups: softwood lumber and value-added softwood; hardwood lumber and added value hardwood; wood flooring; wood construction; and wood pellets. QWEB provides importers with direct access to Quebec's vast array of wood products.

QWEB can:

- Put you in contact with suppliers that have what you want at the right price;
- Provide technical and promotional information about wood products and the companies that manufacture them;
- Tell you what you need to know about the characteristics and uses of wood products from Quebec;
- Inform you about codes and standards that apply to Quebec wood products
- Inform you about our activities via LinkedIn: www.linkedin/company/quebec-wood-export-bureau
- Link you to our members through our website at: www.quebecwoodexport.com

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