#### WFP<sup>TM</sup> ENGINEERED PRODUCTS





## Glulam Technical Resource & Product Guide





## **WFP<sup>™</sup> Engineered Products** Experience & Products You Can Trust

The practical, cost-effective, and renewable choice.



WFP<sup>™</sup> Engineered Products, Calvert Division brings more than 65 years of experience producing high-quality glued laminated products. Our two manufacturing plants in the Pacific Northwest – Washougal and Vancouver, Washington – produce glulam for industrial, commercial and residential projects around the world.

Our production capabilities provide customers with great flexibility and versatility. Products include straight beams and columns for commercial projects, curved and arched glulam for custom applications, stock beams, highstrength GL3000 beams for engineered floor systems, fabricated beams and glulam trusses, high-quality export beams, turned round columns, and many other custom products. Our glulam experts are one call away for your next project.

As one of the oldest continuous glulam manufacturers in the U.S., we are proud of our long-standing reputation for good service and high quality. As a member of APA – Engineered Wood Systems (APA-EWS), all beams are produced to the highest quality requirements of the American National Standards Institute (ANSI) Standard A190.1. We are also JAS and CSA certified. Our facility is chain of custody certified to both the Forest Stewardship Council ® (FSC®) and the Programme for the Endorsement of Forest Certifications (PEFC) schemes. This gives us the option to sell our product as FSC and PEFC certified. In addition, our products are approved for usage in local jurisdictions including the cities of Los Angeles, Seattle, and others.

## **Douglas-Fir Glulam**

Found along the southern mainland coast of British Columbia and across Vancouver Island, coastal Douglas-fir is known to reach impressively large heights and produce **one of the strongest softwoods available.** 

Product	Straight Glulam		Curve & Arc Glula
Grade		24F 24F 26F 26F	-V4 -V8 -V1 -V2
Length		Up to	o 85'
Width/Diameter		Upto	o 24"
Depth		Up to custom sizes m	0 55" Iay be availa

### True Strength, Natural Beauty

With excellent staining qualities and pronounced grain pattern, using Douglas-fir is beneficial for structural purposes and when visual appeal is essential to a project's design. As a finished product, the prominent grain pattern of finished Douglas-fir lends the feeling of warmth and authenticity created by real wood.

#### Resistant to Earthquakes and Fire

Douglas-fir is an excellent choice for structural wood applications and is often used in many construction and architectural projects.

Glulam's fire safety is well established, and it has more than 70 years of in-service use in commercial and residential buildings, combined with extensive testing. In the event of a fire, our glulam products form a naturally protective charring layer while retaining strength.

# **High-quality Douglas-fir glue-laminated timber** (glulam) for industrial, commercial and residential projects.

Well known for immense strength, glulam products made from Douglas-fir exhibit high strength at a fraction of the weight of alternative materials such as steel or concrete. This makes Douglas-fir an excellent choice for heavy structural applications like glulam beams and roof trusses.

### A Cost-Effective Solution

Douglas-fir glulam's favorable strength-to-weight ratio offers cost efficiencies in transportation and installation. Douglas-fir glulam can also reduce costs through off-site prefabrication and lighter foundation requirements.

Douglas-fir is prized for its strength. It has exceptional structural performance and can be used in some of your project's most crucial components.



### Manufacturing Information

WFP Engineered Products is certified by APA to make glued structural laminated Douglas-fir timbers under the following standards:

- ANSI A190.1 American National Standard for Structural Glued Laminated Timber.
- CSA Standard O122 Structural Glued Laminated Timber.
- CSA Standard O177 Qualification Code for Manufacturers of Structural Glued Laminated Timber.
- · Japanese Agricultural Standard for Structural Glulam.

#### Protection and Delivery:

- Individual packaging, bundle packaging, load packaging.
- $\cdot$  Special edge protection and crate packaging available.
- $\cdot$  On-site export container loading.

#### Adhesive:

• WFP uses a waterproof glue designed for exterior use, urea free and compliant with ANSI 405 standards. PRF is standard and clear melamine adhesive is available.



## **DOUGLAS-FIR GLULAM** STRENGTH TABLE

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			Bending About X-X Axis (Loaded Perpendicular to Wide Faces of Laminations)										Bending About Y-Y Axis (Loaded Parallel to Wide Faces of Laminations)						lly Loaded	Fasteners	
			Extrem in Be	ne Fiber nding	Cor Perpend	mpression dicular to Grain														Specific Fastene	Gravity for er Design
Combination Symbols	Species Outer/ Core	Bal/ Unbal	Bottom of Beam Stressed in Tension (Positive Bending)	Top of Beam Stressed in Tension (Negative Bending)	Tension Face	Compression Face	Shear Parallel to Grain	Modul	lus of Ela	sticity		Extreme Fiber in Bending	Compression Perpendicular to Grain	Shear Parallel to Grain	Modulus of Elasticity		sticity	Tension Parallel to Grain	Compression Parallel to Grain	Top or Bottom Face	Side Face
			F <sub>bx</sub> + (psi)	F <sub>bx</sub> - (psi)		F <sub>c x</sub> (psi)	F <sub>vx</sub> (psi)	E <sub>x true</sub> (10 <sup>6</sup> psi)	E <sub>x app</sub> (10 <sup>6</sup> psi)	E <sub>x min</sub> (10 <sup>6</sup> psi)		F <sub>by</sub> (psi)	F <sub>cy</sub> (psi)	F <sub>vy</sub> (psi)	E <sub>y true</sub> (10 <sup>6</sup> psi)	E <sub>y app</sub> (10 <sup>6</sup> psi)	E <sub>y min</sub> (10 <sup>6</sup> psi)	F <sub>t</sub> (psi)	F <sub>c</sub> (psi)		G
24F-V4	DF/DF	U	2400	1850	650	650	265	1.9	1.8	0.95		1450	560	230	1.7	1.6	0.85	1100	1650	0.50	0.50
24F-V8	DF/DF	В	2400	2400	650	650	265	1.9	1.8	0.95		1550	560	230	1.7	1.6	0.85	1100	1650	0.50	0.50
26F-V1	DF/DF	U	2600	1950	650	650	265	2.1	2.0	1.06		1850	560	230	1.9	1.8	0.95	1350	1850	0.50	0.50
26F-V2	DF/DF	В	2600	2600	650	650	265	2.1	2.0	1.06		1850	560	230	1.9	1.8	0.95	1350	1850	0.50	0.50



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## Yellow Cedar Glulam

Grown in mid-and high-elevation forests in coastal British Columbia, yellow cedar is a resilient and slow-growing tree that produces some of **the most beautiful and durable wood on the planet.** 

# High-quality yellow cedar glue-laminated timber (glulam) for industrial, commercial, and residential projects.

Yellow cedar is prized worldwide for its smooth, rich texture and straight grain. When manufactured into glue-laminated timber (glulam), yellow cedar creates stunning structures where appearance is important and strength and durability are paramount. And because it's wood, you can be assured that it delivers environmental benefits and a lighter carbon footprint as one of the building materials grown naturally.

#### **Cost-Effective Solution**

Yellow Cedar glulam's favorable strength-to-weight ratio offers cost efficiencies in transportation and installation. Yellow cedar glulam can also reduce costs through off-site prefabrication and lighter foundation requirements.

Product	Straight Glulam	WH H	Curve & Arc Glula
Grade		20F- 20F- 22F-V 22F-V	-V12 -V13 //AC1 //AC2
Length		Upto	o 85'
Width/Diameter		Up to	o 24"
Depth		Up to custom sizes m	o 55" ay be availa

#### Versatile and Strong

Yellow cedar glulam is a beautiful, naturally durable cost-effective alternative to pressuretreated glulam beams, with products ranging from large, straight beams and columns for commercial projects; curved and arched glulam for custom applications; turned round columns; and many other custom products.

#### Resistant to Decay, Earthquakes and Fire

Yellow cedar is renowned for its durability. It has a resistance to decay, allowing it to be left exposed in outdoor applications.

Wood's natural elasticity, strength and lighter weight combined with good seismic design, give mass timber buildings, including those made with yellow cedar, an advantage during an earthquake.

Glulam's fire safety is well established by more than 70 years of in-service use in commercial and residential buildings, combined with extensive testing. In the event of a fire, our glulam products form a naturally protective charring layer while retaining strength.

Yellow cedar is renowned for its durability. It offers resistance to decay, allowing it to be left exposed in outdoor applications.



### Manufacturing Information

WFP Engineered Products is certified by APA to make glued structural laminated yellow cedar timbers under the following standards:

- ANSI A190.1 American National Standard for Structural Glued Laminated Timber.
- CSA Standard O122 Structural Glued Laminated Timber.
- CSA Standard O177 Qualification Code for Manufacturers of Structural Glued Laminated Timber.
- · Japanese Agricultural Standard for Structural Glulam.
- Protection and Delivery:
- Individual packaging, bundle packaging, load packaging.
- $\cdot$  Special edge protection and crate packaging available.
- On-site export container loading.

#### Adhesive:

• WFP uses a waterproof glue designed for exterior use, urea free and compliant with ANSI 405 standards. PRF is standard and clear melamine adhesive is available.



## YELLOW CEDAR GLULAM STRENGTH TABLE

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			Bending About X-X Axis (Loaded Perpendicular to Wide Faces of Laminations)									(Le	Bendin baded Parallel to	g About Y-Y Wide Faces		Axial	ly Loaded	Fasteners							
			Extrem in Ber	e Fiber nding	Cor Perpenc	npression licular to Grain														Specific ( Fastene	Gravity for r Design				
Combination Symbols	Species Outer/ Core	Bal/ Unbal	Bottom of Beam Stressed in Tension (Positive Bending)	Top of Beam Stressed in Tension (Negative Bending)	Tension Face	Compression Face	Shear Parallel to Grain	$El Modulus of Elasticity$ $E_{x true} \begin{bmatrix} E_{x app} \\ (10^6 psi) \\ psi \end{bmatrix} = E_{x min} \begin{bmatrix} E_{x min} \\ (10^6 psi) \end{bmatrix}$		Modulus of Elasticity		Aodulus of Elasticity		lodulus of Elasticity		Extreme Fiber in Bending	Compression Perpendicular to Grain	Shear Parallel to Grain	Modu	lus of Ela	asticity	Tension Parallel to Grain	Compression Parallel to Grain	Top or Bottom Face	Side Face
			F + (psi)	F <sub>bx</sub> - (psi)		F <sub>c x</sub> (psi)	F (psi)				F <sub>by</sub> (psi)	F <sub>cy</sub> (psi)	F <sub>vy</sub> (psi)	E <sub>y true</sub> (10 <sup>6</sup> psi)	E <sub>yapp</sub> (10 <sup>6</sup> psi)	E <sub>y min</sub> (10 <sup>6</sup> psi)	F <sub>t</sub> (psi)	F <sub>c</sub> (psi)	(	5					
20F-V12	AC/AC	U	2000	1400	560	560	265	1.6	1.5	0.79		1250	470	230	1.5	1.4	0.74	925	1500	0.46	0.46				
20F-V13	AC/AC	В	2000	2000	560	560	265	1.6	1.5	0.79		1250	470	230	1.5	1.4	0.74	950	1550	0.46	0.46				
22F-V/AC1	AC/AC	U	2200	1400	560	550	265	1.6	1.5	0.79		1250	470	230	1.5	1.4	0.74	975	1500	0.46	0.46				
22F-V/AC2	AC/AC	В	2200	2200	560	550	265	1.7	1.6	0.85		1450	470	230	1.5	1.4	0.74	1050	1600	0.46	0.46				



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## Hem-fir Glulam

# High-quality Hem-fir glue-laminated timber (glulam) for industrial, commercial and residential projects.

Hem-fir is considered a cost-effective option while maintaining high strength values. The combination of hem-fir's light color tone and high structural performance makes it the smart choice for projects where both robust strength and maintaining a budget are essential.

#### Visually Appealing Alternative

Hem-Fir is often considered by those seeking wood with a very light color. It is as light in color as other whitewood species with good strength characteristics. Hem-fir provides the versatility for projects that demand a product with an excellent mix of performance and value.

## Product Straight Glulam Gurved & Arched Clulam Grade 24F-EI5 24F-EI1

#### **Tailored Solutions**

Our manufacturing capabilities can be adapted to your project's needs, and include a range of products such as large, straight beams, and columns for commercial projects, curved and arched glulam for custom applications, turned round columns, and other custom options. Hemfir glulam stands out as a naturally durable and attractive alternative to building substitutes like concrete or steel.

#### Resistant to Decay, Earthquakes and Fire

Hem-fir's natural elasticity, strength and lighter weight combined with good seismic design, give mass timber buildings an advantage during an earthquake.

Glulam's fire safety is well established, and it has more than 70 years of in-service use in commercial and residential buildings, combined with extensive testing. In the event of a fire, our glulam products form a naturally protective charring layer while retaining strength.





Dimensions available upon request.

#### Manufacturing Information

WFP Engineered Products is certified by APA to make glued structural laminated hem-fir timbers under the following standard:

• ANSI A190.1 American National Standard for Structural Glued Laminated Timber.

#### Protection and Delivery:

- Individual packaging, bundle packaging, load packaging.
- $\cdot$  Special edge protection and crate packaging available.
- · On-site export container loading.

#### Adhesive:

• WFP uses a waterproof glue designed for exterior use, urea free and compliant with ANSI 405 standards. PRF is standard and clear melamine adhesive is available.



## HEM-FIR GLULAM STRENGTH TABLE

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Combination Symbols			Extrem in Bei	Extreme Fiber in Bending		mpression dicular to Grain														Specific Fastene	Gravity for er Design
	Species Outer/ Core	Bal/ Unbal	Bottom of Beam Stressed in Tension (Positive Bending)	Top of Beam Stressed in Tension (Negative Bending)	Tension Face	Compression Face	Shear Parallel to Grain	Modulus of Elasticity			Extreme Fiber in Bending	Compression Perpendicular to Grain	Shear Parallel to Grain	Modulus of Elasticity			Tension Parallel to Grain	Compression Parallel to Grain	Top or Bottom Face	Side Face	
			F_+ (psi)	F <sub>bx</sub> - (psi)		F <sub>c x</sub> (psi)	F <sub>vx</sub> (psi)	E <sub>x true</sub> (10 <sup>6</sup> psi)	E <sub>x app</sub> (10 <sup>6</sup> psi)	E <sub>x min</sub> (10 <sup>6</sup> psi)		F <sub>by</sub> (psi)	F <sub>cy</sub> (psi)	F <sub>vy</sub> (psi)	E <sub>y true</sub> (10 <sup>6</sup> psi)	E <sub>yapp</sub> (10 <sup>6</sup> psi)	E <sub>y min</sub> (10 <sup>6</sup> psi)	F <sub>t</sub> (psi)	F <sub>c</sub> (psi)		G
24F-E15	HF/HF	U	2400	1600	500	500	215	1.9	1.8	0.95		1200	375	190	1.6	1.5	0.79	975	1500	0.43	0.43
24F-E11	HF/HF	В	2400	2400	500	500	215	1.9	1.8	0.95		1550	375	190	1.6	1.5	0.79	1150	1550	0.43	0.43



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#### **SALES INQUIRIES**

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WARNING: Drilling, sawing, sanding or machining wood products can expose you to wood dust and chemicals known to the State of California to cause cancer. Avoid inhaling wood dust or use a dust mask or other safeguards for personal protection. Wood products can also expose you to chemicals, including methanol, which is known to the State of California to cause birth defects or other reproductive harm. For more information, go to www.P65Warnings.ca.gov/wood.

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