

XLam CLT Panel

Product Data Sheet



XLam Cross Laminated Timber - CLT

XLam Cross Laminated Timber (CLT) Panels are structural timber panels made with layers of finger jointed Radiata Pine lamellas arranged at right angles or parallel to one another, laminated together with a moisture cured polyurethane glue applied to the face under pressure. The 90-degree cross lamination of alternate layers provides dimensional stability, strength, and rigidity.

Uses

XLam CLT Panels are structural building components for floors, roofs, stairs, soffits, balconies, internal and external walls. XLam CLT Panels can be used in most AS/NZS 4364:2010 Service Class 1 and 2 environments for structural applications subject to project specific design requirements. XLam CLT Panels need to be installed as part of a complete envelope or roof design with adequate protection from the elements and consideration of long-term moisture control. Where XLam CLT Panels may be exposed to periodic moisture episodes such as balconies, soffits and wet areas, the use of lamellas treated with Hyne T3 Plus treatment is advised. XLam CLT Panels must be installed in accordance with the XLam Site Guide.

Manufacture

XLam CLT Panels are a bespoke product, made to order based on detailed drawings which have been developed through extensive consultation with the customer see the XLam Shop Drawing Guide for more information. Note to maximise efficiency the billet size should be reviewed in the design phase.

Design

XLam CLT Panels are to be designed by an appropriately qualified structural engineer. XLam Solutions provides a range of design services (for a fee). From initial project scoping to reviewing the suitability of CLT for a project, through to complete project design and documentation of the timber including LVL, GL and CLT elements to ensure design efficiency is maximised.

XLam CLT Panel Thickness, Mass, Thermal & Acoustic Property Summary

Panel	Panel	Layup mm	+Mass kg/m ²	*R Value m ² K/w	# Acoustic Properties				
					R _w + C _{tr}	STC	L _{n,w}	C _i	IIC
CL3/90	90	30/30/30	45	0.75	31	34	92	-5	18
CL3/100	100	32.5/35/32.5	50	0.83	31	35	91	-5	19
CL3/110	110	32.5/45/32.5	55	0.92	32	35	90	-5	20
CL3/120	120	42.5/35/42.5	60	1.00	33	36	89	-5	21
CL3/130	130	42.5/45/42.5	65	1.08	33	36	89	-5	21
CL5/140	140	32.5/20/35/20/32.5	70	1.17	34	37	88	-5	22
CL5/155	155	32.5/35/20/35/32.5	78	1.29	34	38	87	-5	23
CL5/170	170	32.5/35/35/35/32.5	85	1.42	35	39	86	-5	24
CL5/190	190	42.5/35/35/35/42.5	95	1.58	36	40	85	-5	25
CL5/200	200	42.5/35/45/35/42.5	100	1.67	36	40	85	-6	25
CL5/220	220	42.5/45/45/45/42.5	110	1.83	37	41	84	-5	26
CL7/240	240	32.5/35/35/35/35/35/32.5	120	2.00	38	42	83	-5	27
CL7/260	260	42.5/35/35/35/35/35/42.5	130	2.17	38	42	83	-6	27
CL7/270	270	42.5/35/35/45/35/35/42.5	135	2.25	39	43	82	-5	28
CL7/290	290	42.5/35/45/45/45/35/42.5	145	2.42	39	43	82	-6	28
CL7/310	310	42.5/45/45/45/45/42.5	155	2.58	40	44	81	-6	29
DL8/345	345	42.5/42.5/45/42.5/42.5/45/42.5/42.5	172.5	NA	NA	NA	NA	NA	NA
DL8/350	350	42.5/42.5/45/45/45/42.5/42.5	175	NA	NA	NA	NA	NA	NA

* Thermal Properties: Total System R values can be modelled in Speckel see <https://speckel.io/> & <https://nz.speckel.io/>

Acoustic Properties: XLam has conducted acoustic tests on a range of different construction details according to ISO 10140-2:2010, ISO 10140-3:2010, ISO 717-1:2013, ASTM E413, ISO 717-2:2013 & ASTM E989 for further information refer to the XLam Acoustic Design Guide

+ Mass values based on 500kg/m³, please allow adequate safety factors when designing lifting strategies

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Technical Data

Width CLT Panel	2.4 - 3.4m
Width Band Beam Applications	600mm-1700mm
Length	6 – 15.7m
Thickness CLT Panel	90-310mm
Thickness Band Beam Applications	240-350mm
Layup options CLT Panel	Three, five, seven
Layup options Band Beam Applications	Seven or eight
Wood Species	Radiata Pine
Moisture Content (MC)	12% ±3%
Density Mean	500kg/m ³
Bonding Adhesive	Henkel Purbond Loctite HBS Polyurethane - formaldehyde free
Thermal Resistance	0.12 W/mK at 12% moisture content
Dimensional Stability	0.2-0.25% per % change in MC across the thickness of a Panel 0.01-0.02% per % change in MC longitudinally
Surface Quality	Industrial or Natural refer to XLam Product Guide for full details
Treatment Options	XLam CLT Panels are available as either untreated or treated with Hyne T3 Plus for protection against mould & termite attack
Global Warming Potential	-492 kg CO ₂ -eq. per m ³
Formaldehyde Emissions	Less than 0.1 mg/m ² /hr when tested to ASTM D5116:2017
Joint Group	JD5 - unless product specific testing has been conducted
Strength Group	SD6
Timber Source	PEFC Certified, 100% Australian plantation grown & processed
Declare Red List Status	Declare Red List Free for both treated & untreated panels
Specific Heat Capacity	1400 J/kg K

Physical Properties of Radiata Pine Lamellas

Structural Property	XGP1	XGP2
Modulus of Elasticity (parallel to the grain)	10,000 MPa	6,000 MPa
Bending Strength (parallel to the grain) $F_{b,0}$	17 MPa	12 MPa
Compression Strength (parallel to the grain) $F_{c,0}$	18 MPa	15 MPa
Compression Strength (perpendicular to the grain) $F_{c,90}$	10 MPa*	6 MPa*
Tension Strength (parallel to the grain) $F_{t,0}$	7.7 MPa	4.0 MPa
Shear Strength (parallel to the grain) $F_{s,0}$	2.6 MPa	2.1 MPa
Rolling Shear Strength (perpendicular to the grain) $F_{s,90}$	1.4 MPa	1.4 MPa
Shear Modulus (parallel to the grain) G_0	670MPa	400MPa
Rolling Shear Modulus G_r	45Mpa	29Mpa
Mean Density ρ	#500kg/m ³	#475kg/m ³
Characteristic Density ρ	400 kg/m ³	380 kg/m ³

*For structural calculation purposes as noted in "Technical Note 5.2 Sample Structural Calculations Floor and Wall Design" the value of 3MPa should be used.

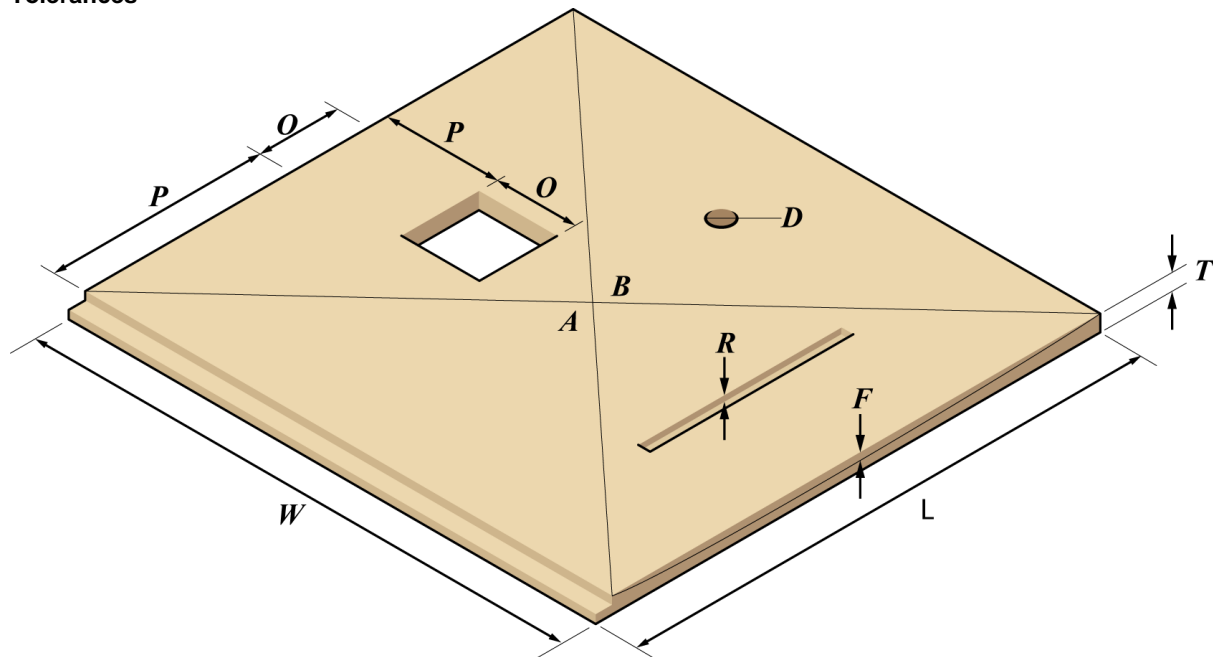
#For structural connection calculations at the edge the characteristic density should be used, for reviewing lifting strategy is advised to use 500kg/m³ and to allow an adequate safety factor. Masses will vary as timber is a natural product, moisture content will also have an impact on overall mass.

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Tolerances



Thickness (T)	±2mm	Lap Width	±2mm of target dimension
Width (W)	±2mm	Opening Location (P)	±2mm of target dimension
Length (L)	±2mm	Opening Size (O)	±2mm of target dimension
Squareness (A-B)	±2mm of difference between two dimensions	Hole diameter (D)	±1mm (≤150mm)
Flatness (F)	±5mm under 3mm straight edge	Rebates/Recesses (R)	±2mm thickness
Lap Depth	±2mm of target dimension m	Lamella Thickness	±1mm

Fixings and Fittings

Use fasteners and other hardware which comply with building code requirements for the AS/NZS 4364:2010 Service Class environment as per fixings and fittings manufacturers specifications. Hyne T3 Plus treatment does not increase corrosion risk to fixings and fittings.

Fire Penetration & Mass Timber Connection Details

Penetrations through fire rated wall or floor systems require fire stops to maintain the integrity and insulation ratings of the building element. XLam CLT floor and wall systems have been subjected to fire penetration testing in accordance with AS 1530.4. A summary of these results and allowable variations as assessed and certified by an accredited testing laboratory is available in the Fire Design Guide & Technical Note 6.3. For copies of test reports please contact XLam, noting some of the testing is the intellectual property of third-party suppliers.

Connections utilised as part of mass timber construction may require testing and or assessment to show they will provide structural stability for the desired FRL period in accordance with AS 1530 and or AS 1720.4. XLam CLT has a range of mass timber connection details assessed and certified by an accredited testing laboratory based on testing to AS 1530.4. A summary of these results is available in the Fire Design Guide. For a copy of the test report please contact XLam.

In all instances it is the responsibility of the Project Fire Engineer to review and certify the proposed detail meets the requirements of either NZBCC or NCC under the estimated fire load. Penetration & connection details should be considered as part of the overall design and included in drawings which are handed to XLam for production as per the XLam Shop Drawing Guide. Failure to do this may lead to additional costs in testing, assessments and XLam personnel time for coordinating additional certification requirements, drawings and may lead to a delay in manufacture and hence delivery.

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Fire Hazard Properties

AS 5637 Group Number: XLam CLT Panels achieve a Group 3 Rating, with an Average Extinction Area less than 250m²/kg. Where Group 1 or Group 2 ratings are required, CLT Panels will need to be lined with plasterboard or painted with an intumescent paint system.

AS 1530.3 Fire Hazard Indices: XLam CLT Panels achieve a Spread-of-Flame Index – 8 & Smoke-Developed Index – 3.

AS ISO 9239.1 Critical Heat Flux: XLam CLT Panels achieve a Critical Radiant Flux greater than or equal to 2.2 and less than 4.5 kW/m².

Fire Resistance AS 1530.4

The NCC and NZBC specify the Fire Resistance Rating (FRR NZ, FRL Australia) a building system must meet based on the building's height, occupation use and type, inclusion of sprinklers, escape pathways and other factors. To show compliance to NCC Specification 1 Fire-resistance of building elements requirements, the FRL of building systems must be based on testing to AS 1530.4. To show compliance to the NZBC the FRL of building systems must be based on testing to either NZS/BS 476:20:1987 or AS 1530.4. XLam has conducted extensive testing and assessments on our CLT Panels with accredited testing laboratories to AS 1530.4. A summary of available systems based on these tests is provided below.

These summary tables are indicative and may be used in initial project scoping only, for full details see the XLam Fire Design Guide. To be valid these systems must be installed according to the certified construction details including materials and with due consideration of span and load limitations. The Fire Load Capacity kN/m of walls will vary with wall height and CLT Panel thickness. The maximum span of floors will vary with live load, dead load and CLT Panel & thickness. The project engineer is responsible for determining what loads will be applied and ensuring the XLam CLT Panel specified meets NCC/NZBC requirements. The FRL of Band Beams will vary depending on thickness of panel & exposure time see the Fire Design Guide for further details. The project fire engineer is responsible for confirming and certifying all NCC/NZBC fire performance requirements are met by the design. The project's relevant building surveyor is responsible for ensuring the design as documented by the fire engineer has been implemented.

Summary of XLam's Systems FRL/FRR CLT Panel

Layup	Standard Configuration+				Blade Wall [^]		
	Bare Walls Australia	Bare Walls New Zealand	Bare Floors Australia & New Zealand	Protected Walls & Floors Australia & New Zealand	Bare	PB One Side	PB Both Sides
CL3/100	60/60/60	60/60/60	60/60/60	120/120/120	30/30/30	120/120/120	120/120/120
CL3/110	60/60/60	60/60/60	#90/90/90	120/120/120	30/30/30	120/120/120	120/120/120
CL3/120	60/60/60	60/60/60	#90/90/90	120/120/120	30/30/30	120/120/120	120/120/120
CL3/130	60/60/60	60/60/60	#90/90/90	120/120/120	60/60/60	120/120/120	120/120/120
CL5/140	*90/90/90	90/90/90	#90/90/90	120/120/120	60/60/60	120/120/120	120/120/120
CL5/155	*90/90/90	90/90/90	#90/90/90	120/120/120	60/60/60	120/120/120	120/120/120
CL5/170	*90/90/90	120/120/120	90/90/90	120/120/120	60/60/60	120/120/120	120/120/120
CL5/190	120/120/120	120/120/120	90/90/90	120/120/120	60/60/60	120/120/120	120/120/120
CL5/200	120/120/120	120/120/120	#120/120/120	120/120/120	90/90/90	120/120/120	120/120/120
CL5/220	120/120/120	120/120/120	#120/120/120	120/120/120	90/90/90	120/120/120	120/120/120
CL7/240	120/120/120	120/120/120	120/120/120	120/120/120	90/90/90	120/120/120	120/120/120
CL7/260	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120
CL7/270	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120
CL7/290	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120
CL7/310	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120	120/120/120

+ Based of CSIRO assessments FCC 3336 & FCC 3337

[^] Based on Warringtonfire assessment FAS 220370

*90/90/90 only applies to walls with CLT floor above and below for other floor options is limited to 60/60/60

120/120/120 only applies to floors with spline joints, lap joints limited to 90/90/90

Protection for walls one layer of 16mm or two layers of 13mm Boral FIRESTOP or GIB Fyrelite on both sides side, direct fix.

Protection for floors one layer of 16mm or two layers of 13mm Boral FIRESTOP or GIB Fyrelite on the ceiling or fire exposed side, direct fix.

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Summary of XLam's Band Beam Systems FRL/FRR

Lay Up	Exposed both sides	1 layer of 16mm fire rated plasterboard	2 layers of 16mm fire rated
CL7/240	90/90/90	120/120/120	120/120/120
CL7/260	120/120/120	120/120/120	120/120/120
CL7/270	120/120/120	120/120/120	120/120/120
CL7/290	120/120/120	120/120/120	120/120/120
CL7/310	120/120/120	120/120/120	120/120/120
DL8/345	120/120/120	120/120/120	120/120/120
DL8/350	120/120/120	120/120/120	120/120/120

*Based on Warringtonfire assessment FAS 220370, for char depths refer to XLam Fire Design Guide or assessment report

Installation/Handling: A comprehensive installation sequence for XLam CLT Panels is developed as part of the design process. See the XLam Site Guide for further information.

Structural Properties: XLam has developed pre-analysis span tables based on vibration limits refer to the XLam Structural Guide. Specific calculations will need to be made for design of structural capacity of XLam CLT Panels for each project.

Appearance: XLam CLT Panels have two appearance grades: Industrial (IND) and Natural (NAT) a detailed description of these two grades is provided in the XLam Product Guide.

Operation & Maintenance: For advice of operation & maintenance of XLam CLT Panels refer to the XLam Operation & Maintenance Guide.

Treatment Options: XLam CLT Panels are available as either untreated or treated for protection against mould & termite attack.

Hygrothermal Properties: The transport of heat and moisture through envelopes containing XLam CLT Panels can be modelled in WUFI software see <https://www.wufi.com.au/> & in the Speckel platform <https://speckel.io/> & <https://nz.speckel.io/>.

Environmental Product Declaration: An EPD has been completed on XLam CLT Panels registration number S-P-02326 to ISO 14025 and EN 15804+A1 see [EPD Australasia \(epd-australasia.com\)](http://EPD Australasia (epd-australasia.com)).

Responsibly Sourced: PEFC Certified - XLam Australia and New Zealand operations and sales offices are certified to the chain of custody (COC) standards of the global forest and wood product certification scheme PEFC by SCS Global Services. Multi-site certificate number SCS-PEFC/COC-05795.

Certifications & Accreditations

CodeMark Certificate New Zealand CM70119 see [XLam CLT T3 Plus | Product certificate \(building.govt.nz\)](#)

CodeMark Certificate Australia CM40200 see [JAS ANZ \(jas-anz.org\)](#)

Declare Red List Free see [Declare - International Living Future Institute \(living-future.org\)](#)

PEFC see [PEFC - Programme for the Endorsement of Forest Certification](#)

EWPA Product Certification Scheme to ISO 16696-1:2019 Mill No 357 [X-Lam - Engineered Wood Products Association Of Australasia | EWPA](#)

Web Links

[Masterspec - Write Construction Specifications Online](#)

[Home | WoodSolutions](#)

[Wood Processors and Manufacturers Association of New Zealand - Home \(wpma.org.nz\)](#)

[Home - Engineered Wood Products Association Of Australasia | EWPA](#)

Additional Documents & Resources

[XLam Site Guide](#)

[XLam Shop Drawing Guide](#)

[XLam Technical Note 2.1 Standard Details](#)

[Formaldehyde Test Certificates](#)

[XLam Envelope Guide](#)

[XLam CLT Panel Safety Data Sheets](#)

Disclaimer

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