

FRERES Mass Plywood Panel
Freres Lumber Co., Inc.

PR-L325C

Revised September 30, 2020

Products: Freres Mass Plywood Panel
Freres Lumber Co., Inc., 40519 Cedar Mill Road, PO Box 276, Lyons, Oregon 97358
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1. Basis of the product report:
 - 2015 National Building Code of Canada (NBC): Clause 1.2.1.1 of Division A and Clauses 4.1, 4.3.1.1, and 9.23 of Division B
 - CAN/CSA O86-19 Engineering Design in Wood
 - ANSI/APA PRG 320-2019 Performance Rated Cross-Laminated Timber
 - ANSI/APA PRG 320-2018 recognized in CSA O86-19
 - APA Reports T2018P-21, T2019P-50, and T2019P-69, and other qualification data
2. Product description:

Freres Mass Plywood Panel (MPP) is manufactured with 25-mm-thick (1-inch-thick) Freres 1.6E or 1.0E Douglas-fir LVL recognized in APA Product Report PR-L324 in accordance with custom layouts of ANSI/APA PRG 320 through product qualification and mathematical models using principles of engineering mechanics. The LVL layers are parallel laminated, bonded with qualified structural adhesives, and pressed to form a solid panel. Freres MPP can be used in floor, roof, and wall applications, and is manufactured in a plank billet with nominal widths of 51 to 3658 mm (2 to 144 inches), thicknesses of 51 to 305 mm (2 to 12 inches), and lengths up to 14.6 m (48 feet).
3. Design properties:

Freres MPP shall be designed with the design properties and capacities provided in Table 1, or recommendations provided by the manufacturer. The design adjustment factors shall be in accordance with Chapter 8 of CSA O86 or based on the recommendations provided by the manufacturer and approved by the engineer of record. The lateral resistance of Freres MPP, when used as shearwalls or diaphragms, shall be permitted to be designed in accordance with Clause 11.9 of CSA O86 in consultation with the manufacturer and approved by the engineer of record.
4. Product installation:

Freres MPP shall be installed in accordance with the recommendations provided by the manufacturer and the engineering drawing approved by the engineer of record. Permissible details shall be in accordance with the engineering drawing.
5. Fire-rated assemblies:

Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer. Procedures specified in Annex B of CSA O86 shall be permitted for use in the fire design of Freres MPP when approved by the authority having jurisdiction.
6. Limitations:
 - a) Freres MPP shall be designed in accordance with principles of engineering mechanics using the design properties specified in this report or provided by the manufacturer.
 - b) Freres MPP products shall be limited to dry service conditions where the average equilibrium moisture content of solid-sawn lumber over a year is 15 percent or less and does not exceed 19 percent.

- c) Design properties for Freres MPP, when used as beams or lintels with loads applied parallel to the face-bond gluelines, are beyond the scope of this report.
 - d) Freres MPP shall be manufactured in accordance with proprietary Freres MPP manufacturing specifications documented in the in-plant manufacturing standard approved by APA.
 - e) Freres MPP is produced at the Freres facility in Lyons, Oregon under a quality assurance program audited by APA.
 - f) Properties shown in this report are limited to MPP manufactured with 25-mm-thick (1-inch-thick) Freres 1.6E or 1.0E Douglas-fir LVL, as recognized in APA Product Report PR-L324.
 - g) This report is subject to re-examination in one year.
7. Identification:
Freres MPP described in this report is identified by a label bearing the manufacturer's name (Freres) and/or trademark, the APA assigned plant number (1121), the product standard (ANSI/APA PRG 320), the APA logo, the MPP thickness, the report number PR-L325, and a means of identifying the date of manufacture.

Table 1. LSD Flatwise Bending Stiffness and Unfactored Resistance Values^(a,b) for Freres MPP (For Use in Canada)

MPP Grade ^(c)	Layup ID	Thickness, t_p (mm)	Major Strength Direction				Minor Strength Direction			
			$(F_bS)_{eff,f,0}$ (10^6 N-mm/m)	$(EI)_{eff,f,0}$ (10^9 N-mm ² /m)	$(GA)_{eff,f,0}$ (10^6 N/m)	$V_{s,0}$ (kN/m)	$(F_bS)_{eff,f,90}$ (10^6 N-mm/m)	$(EI)_{eff,f,90}$ (10^9 N-mm ² /m)	$(GA)_{eff,f,90}$ (10^6 N/m)	$V_{s,90}$ (kN/m)
F16	F16-2	51	9.1	151	12	51	1.7	26	2.5	16
	F16-3	76	15	480	18	51	2.9	85	3.8	16
	F16-4	102	27	1,149	24	69	5.2	198	5.0	22
	F16-5	127	43	2,241	30	86	8.1	395	6.3	27
	F16-6	152	62	3,860	36	103	12	678	10	33
	F16-7	178	84	6,139	39	120	16	1,073	12	38
	F16-8	203	110	9,160	44	137	21	1,601	13	44
	F16-9	229	139	13,040	50	154	26	2,278	15	49
	F16-10	254	171	17,888	55	171	32	3,135	17	54
	F16-11	279	207	23,810	61	188	39	4,171	19	60
	F16-12	305	246	30,909	67	205	47	5,414	20	65
	F10	F10-2	51	5.5	69	5.5	30	5.1	46	4.1
F10-3		76	12	235	8.5	36	5.7	169	6.0	23
F10-4		102	22	545	11	48	10	395	8.0	31
F10-5		127	34	1,071	14	60	16	771	10	38
F10-6		152	50	1,852	17	72	23	1,325	12	46
F10-7		178	68	2,933	20	83	31	2,105	14	54
F10-8		203	88	4,380	22	96	40	3,139	16	62
F10-9		229	112	6,241	25	107	51	4,474	18	69
F10-10		254	138	8,553	28	119	63	6,138	20	77
F10-11		279	167	11,392	31	131	76	8,177	22	84
F10-12		305	199	14,785	34	143	91	10,612	24	92

For Imperial: 1 mm = 0.0394 in.; 1 m = 3.28 ft; 1 N = 0.2248 lbf

- (a) Tabulated values are unfactored Limit States design values and not permitted to be increased for the lumber size adjustment factor in accordance with CSA O86.
- (b) Tabulated values are limited to F16 and F10 MPP manufactured with 25-mm-thick (1-inch-thick) Freres 1.6E and 1.0E Douglas-fir LVL, respectively, as recognized in APA Product Report PR-L324.
- (c) The CLT layups are developed based on ANSI/APA PRG 320, as permitted by the standard.

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**APA – THE ENGINEERED WOOD ASSOCIATION
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