

P3 Joist I-Joists
EACOM Timber Corporation.

PR-L261(C)
Revised October 10, 2021

Products: PJI Prefabricated Wood I-Joists
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1. Basis of the product report:
 - 2015 National Building Code of Canada (NBCC): Clause 1.2.1.1 of Division A and Clauses 4.1, 4.3.1.1, and 9.23.4.2 of Division B
 - CAN/CSA O86-14 (reprinted May 2016) Engineering Design in Wood
 - ASTM D5055-13e recognized by CAN/CSA O86-14
 - APA PRI-400, Performance Standard for Residential I-Joists
 - APA Reports T2001P-41, T2002P-3, T2002P-19, T2003P-32, T2003P-53, T2003P-64B, T2005P-54, T2005P-56, T2005P-102, T2007P-105B, and T2008P-68, and T2019P-65, T2021P-17, and other qualification data
2. Product description:

P3 Joist[®] I-Joists covered by this report, as described in Table 1, are made with lumber flanges and oriented strand board (OSB) webs in accordance with the in-plant manufacturing standard approved by APA, as documented in CCMC 13053-R.
3. Design properties:

Tables 2 and 3 list the factored resistances for P3 Joist I-Joists. The design spans for P3 Joist I-Joists shall be in accordance with the recommendations provided by the manufacturer (<http://www.eacom.ca/wp-content/uploads/2018/02/Eacom-P3-Product-Guide-CAN.pdf>) and with APA EWS Standard PRI-400 Performance Standard for APA EWS I-Joists (Limit States Design, Form EWS E720CA (www.apawood.org/resource-library) for depths contained in the PRI Series.
4. Product installation:

P3 Joist I-Joists shall be installed in accordance with the recommendations provided by the manufacturer (see link above) and APA *I-Joist Construction Details – Canadian Limit States Design – Performance Rated I-Joists in Floor and Roof Framing*, Form E715CA (see link above). Permissible web holes and cantilever reinforcements shall be in accordance with the recommendations provided by the manufacturer, and with APA E715CA.
5. Fire-rated assemblies:

Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer (see link above), APA Product Report PR-S261 (see link above), or NBC Table 9.10.3.1.-B.
6. Limitations:
 - a) P3 Joist I-Joists shall be designed in accordance with the code using the design properties specified in this report.
 - b) P3 Joist I-Joists are limited to dry service conditions as defined in CSA O86, at which the average equilibrium moisture content of solid-sawn lumber over a year is 15 percent or less and does not exceed 19 percent.

- c) P3 Joist I-Joists are produced at EACOM's facility under a quality assurance program audited by APA.
- d) This report is subject to re-examination in one year.

7. Identification:

The P3 Joist prefabricated wood I-joists described in this report are identified by a label bearing the manufacturer's name (EACOM) and/or trademark, the APA assigned plant number (1058), the I-joist depth and series, the APA logo, the report number PR-L261 (or PR-L261C), and a means of identifying the date of manufacture.

Table 1. Description of PJI-40, 60, 65, 80, and 90 Series I-joists ^(a)

Joist Series	Joist Depths, mm (in.)	Flanges			Web	
		Material	Dimension		Material	Thickness, mm (in.)
			Depth, mm (in.)	Width, mm (in.)		
PJI-40	241 – 406 (9-1/2 – 16)	Proprietary SPF	38 (1-1/2)	64 (2-1/2)	OSB	9.5 (3/8)
PJI-60	241 – 406 (9-1/2 – 16)	MSR SPF	38 (1-1/2)	64 (2-1/2)	OSB	9.5 (3/8)
PJI-65	302 – 406 (11-7/8 – 16)	Proprietary SPF	38 (1-1/2)	89 (3-1/2)	OSB	9.5 (3/8)
PJI-80	241 – 610 (9-1/2 – 24)	MSR SPF	38 (1-1/2)	89 (3-1/2)	OSB	11.1 (7/16)
PJI-90	302 – 610 (11-7/8 – 24)	MSR SPF	38 (1-1/2)	89 (3-1/2)	OSB	11.1 (7/16)

^(a) Referenced dimensions are nominal. Tolerances are as specified in the in-plant quality manual.

Table 2. Factored Resistances of P3 Joist I-Joists (a)

Depth (mm)	Joist Series Designation	Also Qualified for	EI (b) (10 ⁶ kN-mm ²)	M _r (c) (kN-mm)	V _r (d) (kN)	VL _r (e) (kN/m)	K (f) (kN)
235	PJI-40	N.A.	519	6,065	7.58	42.3	21,390
241	PJI-40	PRI-40	554	6,167	9.83	42.3	21,970
	PJI-60	PRI-60	663	8,523	9.83	42.3	21,970
	PJI-80	N.A.	921	12,120	9.87	42.3	21,970
286	PJI-40	N.A.	829	7,650	9.45	42.3	26,020
302	PJI-40	PRI-40	947	7,994	11.38	42.3	27,490
	PJI-60	PRI-60	1,136	11,049	11.38	42.3	27,490
	PJI-65	PRI-60	1,303	11,205	11.38	42.3	27,490
	PJI-80	PRI-80	1,570	15,717	11.59	42.3	27,490
	PJI-90	N.A.	1,725	19,200	11.59	42.3	27,490
356	PJI-40	PRI-40	1,383	9,628	12.75	42.3	32,380
	PJI-60	PRI-60	1,676	13,293	12.75	42.3	32,380
	PJI-65	PRI-60	1,905	13,495	12.75	42.3	32,380
	PJI-80	PRI-80	2,301	18,918	13.10	42.3	32,380
	PJI-90	N.A.	2,517	23,125	13.10	42.3	32,380
406	PJI-40	PRI-40	1,885	11,162	14.04	42.3	37,010
	PJI-60	PRI-60	2,293	15,412	14.04	42.3	37,010
	PJI-65	PRI-60	2,586	15,655	14.04	42.3	37,010
	PJI-80	PRI-80	3,134	21,940	14.54	42.3	37,010
	PJI-90	N.A.	3,406	26,820	14.54	42.3	37,010
457	PJI-80	N.A.	4,055	24,804	17.20	42.3	41,630
	PJI-90	N.A.	4,437	30,315	17.20	42.3	41,630
508	PJI-80	N.A.	5,137	27,464	17.91	36.4	46,260
	PJI-90	N.A.	5,616	33,565	17.91	36.4	46,260
559	PJI-80	N.A.	6,353	30,080	18.61	30.5	50,890
	PJI-90	N.A.	6,942	36,765	18.61	30.5	50,890
610	PJI-80	N.A.	7,711	32,673	19.31	29.4	55,510
	PJI-90	N.A.	8,420	39,935	19.31	29.4	55,510

For Imperial: 1 mm = 0.0394 in., 1 N = 0.2248 lbf, 1 kN/m = 5.71 lbf/in.

- (a) All factored resistance values include the resistance factor specified in CAN/CSA-O86. The tabulated values are for the standard term of load duration (K_D = 1.0). All values, except for EI and K, are permitted to be adjusted for other load durations as permitted by the code.
- (b) Bending stiffness (EI) of the I-joist.
- (c) Factored moment resistance (M_r) of the I-joist, which shall not be increased by any system effect factor.
- (d) Factored shear resistance (V_r) of the I-joist.
- (e) Factored vertical load resistance (VL_r) of the I-joist.
- (f) Coefficient of shear deflection (K). For calculating uniform load and center-point load deflections of the Power Joist® in a simple-span application, use Eqs. 1 and 2.

$$\text{Uniform Load: } \delta = \frac{5 \omega L^4}{384 EI} + \frac{\omega L^2}{K} \quad [1]$$

$$\text{Center-Point Load: } \delta = \frac{PL^3}{48 EI} + \frac{2 PL}{K} \quad [2]$$

where δ = calculated deflection (mm), ω = uniform load (kN/mm),
 P = concentrated load (kN), L = design span (mm),
 EI = bending stiffness of the I-joist (kN-mm²), and K = coefficient of shear deflection (kN).

Table 3. Factored Reaction Resistances for P3 Joist I-Joists ^(a,b,c)

Depth (mm)	Joist Series Designation	Factored IR _r (kN)				Factored ER _r (kN)			
		89 mm Brg. Length		140 mm Brg. Length		44 mm Brg. Length		102 mm Brg. Length	
		With Brg. Stiffeners		With Brg. Stiffeners		With Brg. Stiffeners		With Brg. Stiffeners	
		No	Yes	No	Yes	No	Yes	No	Yes
235	PJI-40	18.96	20.22	19.63	22.68	7.58	7.58	7.58	7.58
241	PJI-40	19.34	20.36	22.79	22.79	8.39	8.95	8.85	9.83
	PJI-60	19.34	20.36	22.79	22.79	8.39	8.95	8.85	9.83
	PJI-80	19.38	21.94	22.79	23.87	9.16	9.87	9.87	9.87
286	PJI-40	19.34	21.14	22.79	23.45	8.43	9.20	9.45	9.45
302	PJI-40	19.34	21.38	22.79	23.70	8.43	10.25	10.04	11.38
	PJI-60	19.34	21.38	22.79	23.70	8.43	10.25	10.04	11.38
	PJI-65	19.73	23.17	22.86	25.17	8.43	10.25	10.04	11.38
	PJI-80	19.73	23.17	22.86	25.17	9.23	11.17	11.17	11.59
	PJI-90	19.73	23.17	22.86	25.17	9.23	11.17	11.17	11.59
356	PJI-40	19.34	22.29	22.79	24.47	8.43	11.38	11.10	12.75
	PJI-60	19.34	22.29	22.79	24.47	8.43	11.38	11.10	12.75
	PJI-65	21.21	24.26	24.12	26.30	8.43	11.38	11.10	12.75
	PJI-80	21.21	24.26	24.12	26.30	9.31	12.36	11.34	13.10
	PJI-90	21.21	24.26	24.12	26.30	9.31	12.36	11.34	13.10
406	PJI-40	19.34	23.17	22.79	25.24	8.43	12.29	12.08	14.04
	PJI-60	19.34	23.17	22.79	25.24	8.43	12.29	12.08	14.04
	PJI-65	22.93	25.28	25.28	27.38	8.43	12.29	12.08	14.04
	PJI-80	22.93	25.28	25.28	27.38	9.34	13.45	11.45	14.54
	PJI-90	22.93	25.28	25.28	27.38	9.34	13.45	11.45	14.54
457	PJI-80	22.47	27.73	25.63	30.54	9.41	13.52	11.59	17.20
	PJI-90	22.47	27.73	25.63	30.54	9.41	13.52	11.59	17.20
508	PJI-80	22.47	27.73	25.63	30.54	9.48	15.24	11.69	17.91
	PJI-90	22.47	27.73	25.63	30.54	9.48	15.24	11.69	17.91
559	PJI-80	22.47	27.73	25.63	30.54	9.52	16.96	11.83	18.61
	PJI-90	22.47	27.73	25.63	30.54	9.52	16.96	11.83	18.61
610	PJI-80	22.47	27.73	25.63	30.54	9.59	18.68	11.94	19.31
	PJI-90	22.47	27.73	25.63	30.54	9.59	18.68	11.94	19.31

For Imperial: 1 N = 0.2248 lbf

- (a) The tabulated values are for the standard term of load duration ($K_D = 1.0$). All values are permitted to be adjusted for other load durations as permitted by the code provided that the adjusted values do not exceed the factored compressive resistance perpendicular to grain (Q_r) of the bearing plate supporting the I-joist in accordance with CSA O86.
- (b) Interpolation between bearing lengths is permitted.
- (c) Bearing stiffeners shall be installed in accordance with the recommendations provided by the manufacturer and APA E715CA.

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