


Power Joist[®] I-Joists
Anthony-Domtar, Inc.

PR-L261C 
Revised October 7, 2009

Products: ADI-40, -60, and -80 Prefabricated Wood I-Joists
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1. Basis of the product report:
 - 2005 National Building Code of Canada (NBCC): Clause 1.2.1.1 of Division A and Clauses 4.1, 4.3, and 9.23.9 of Division B
 - CAN/CSA O86-09
 - ASTM D 5055-08a recognized by CAN/CSA O86-09
 - Performance Standard for APA EWS I-Joists, PRI-400
 - 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
2. Product description:

Power Joist[®] I-Joists are made with lumber flanges and OSB web in accordance with the in-plant manufacturing standard approved by APA.
3. Design properties:

Tables 1 and 2 list the factored resistances for Power Joist[®] I-Joists. The design spans for Power Joist[®] I-Joists shall be in accordance with the recommendations provided by the manufacturer (www.anthonyforest.com/pdfs/CanadaUserGuide.pdf) and with APA *Performance Rated I-Joists*, Form Z725 (www.apawood.org/publications) for depths contained in the PRI Series.
4. Product installation:

Power Joist[®] I-Joists shall be installed in accordance with the recommendations provided by the manufacturer (www.anthonyforest.com/pdfs/CanadaUserGuide.pdf) and APA *I-Joist Construction Details – Canadian Limit States Design – Performance Rated I-Joists in Floor and Roof Framing*, Form E715CA (www.apawood.org/publications). 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 (www.anthonyforest.com/pdfs/CanadaUserGuide.pdf), and with APA Design/Construction Guide: *Fire-Rated Systems*, Form W305 (www.apawood.org/publications).
6. Limitations:
 - a) Power Joist[®] I-Joists shall be designed in accordance with the code using the design properties specified in this report.
 - b) Power Joist[®] I-Joists are limited to dry service conditions where the average moisture content of sawn lumber is less than 16 percent.
 - c) Power Joist[®] I-Joists are produced at Anthony Domtar's facility under a quality assurance program audited by APA.
 - d) This report is subject to re-examination in one year.

7. Identification:

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

Table 1. Factored Resistances of Power 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)
241	ADI-40	PRI-40	554	6,167	7.86	48.7	21,970
	ADI-60	PRI-60	663	8,523	7.86	48.7	21,970
302	ADI-40	PRI-40	947	7,994	9.97	48.7	27,490
	ADI-60	PRI-60	1,136	11,049	9.97	48.7	27,490
	ADI-80	PRI-80	1,570	15,649	9.97	48.7	27,490
256	ADI-40	PRI-40	1,383	9,628	12.01	48.7	32,380
	ADI-60	PRI-60	1,676	13,293	12.01	48.7	32,380
	ADI-80	PRI-80	2,301	18,851	12.01	48.7	32,380
406	ADI-40	PRI-40	1,885	11,162	13.83	48.7	37,010
	ADI-60	PRI-60	2,293	15,412	13.83	48.7	37,010
	ADI-80	PRI-80	3,134	21,850	13.83	48.7	37,010
457	ADI-80	N.A.	4,055	24,804	17.20	48.7	41,630
508	ADI-80	N.A.	5,137	27,464	17.76	41.9	46,260
559	ADI-80	N.A.	6,353	30,080	18.36	35.1	50,890
610	ADI-80	N.A.	7,711	32,673	18.92	33.8	55,510

- (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.

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

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

Where:

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

Table 2. Factored Reaction Resistances for Power Joist® I-Joists ^(a)

Depth (mm)	Joist Series Designation	Factored IR _r ^(b) (N)				Factored ER _r ^(c) (N)			
		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
241	ADI-40	19,340	20,360	22,780	22,780	7,580	7,860	7,860	7,860
	ADI-60	19,340	20,360	22,780	22,780	7,580	7,860	7,860	7,860
302	ADI-40	19,340	21,380	22,780	23,700	8,420	9,200	9,970	9,970
	ADI-60	19,340	21,380	22,780	23,700	8,420	9,200	9,970	9,970
	ADI-80	19,380	23,170	22,850	25,170	8,990	9,970	9,970	9,970
356	ADI-40	19,340	22,290	22,780	24,470	8,420	10,390	10,880	12,010
	ADI-60	19,340	22,290	22,780	24,470	8,420	10,390	10,880	12,010
	ADI-80	21,200	24,260	24,120	26,290	8,990	12,010	10,880	12,010
406	ADI-40	19,340	23,170	22,780	25,240	8,420	11,510	10,880	13,830
	ADI-60	19,340	23,170	22,780	25,240	8,420	11,510	10,880	13,830
	ADI-80	22,920	25,270	25,270	27,380	8,990	12,950	10,880	13,830
457	ADI-80	22,470	27,730	25,630	30,540	8,780	14,390	11,580	17,200
508	ADI-80	22,470	27,730	25,630	30,540	8,780	14,390	11,580	17,760
559	ADI-80	22,470	27,730	25,630	30,540	8,780	14,390	11,580	18,360
610	ADI-80	22,470	27,730	25,630	30,540	8,780	14,390	11,580	18,920

- ^(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. Bearing stiffeners shall be installed in accordance with the recommendations provided by the manufacturer and APA E715CA.
- ^(b) Interpolation of the factored intermediate reaction resistances between 89- and 140-mm bearing lengths is permitted.
- ^(c) Interpolation of the factored end reaction resistances between 44- and 102-mm bearing lengths is permitted.

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APA – THE ENGINEERED WOOD ASSOCIATION

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