PRODUCT REPORT®
CANADA
www.apawood.org

AcuJoist ACJ® Series I-Joists
AcuTruss Industries 1996, Ltd.

PR-L342(C)
Revised June 14, 2023

Products: AcuJoist ACJ® Series I-Joists
AcuTruss Industries 1996, Ltd., 2003 43rd Street, Vernon, BC V1T 6K7, Canada
(250) 545-3215
www.acutruss.com

1. Basis of the product report:
   - 2020 National Building Code of Canada (NBC): Clause 1.2.1.1 of Division A, and Clauses 4.1, 4.3.1.1, and 9.23.4.2 of Division B
   - CAN/CSA O86-19 Engineering Design in Wood
   - ASTM D5055-16 recognized in CAN/CSA O86-19
   - APA PRI-400 CA Performance Standard for Residential I-Joists (Limit States Design)
   - APA PRI-405 Performance Standard for Commercial I-Joists
   - APA Reports T2021P-23, T2022P-14, and T2023P-25, and other qualification data

2. Product description:
   AcuJoist ACJ® I-joists are described in Table 1 in accordance with the in-plant manufacturing standard approved by APA.

3. Design properties:
   Tables 2, and 3 list the design properties for ACJ Series I-joists. The permissible spans for ACJ Series I-joists shall be in accordance with the recommendations provided by the manufacturer (www.acutruss.com) and with APA PRI-400 CA, *Performance Standard for Residential I-Joists (Limit States Design)* (www.apawood.org/resource-library), for ACJ Series I-joists that are also qualified as the PRI.

4. Product installation:
   AcuJoist ACJ Series I-Joists shall be installed in accordance with the recommendations provided by the manufacturer (see link above). Permissible web holes and cantilever reinforcements shall be in accordance with the recommendations provided by the manufacturer.

5. Fire-rated assemblies:
   Fire-rated assemblies shall be constructed in accordance with the recommendations provided by the manufacturer (see link above), APA Design/Construction Guide: *Fire-Rated Systems*, Form W305 (see link above), or Table 9.10.3.1.-B of the NBC or the calculation method specified in Appendix D-2.3 of the NBC.

6. Limitations:
   a) AcuJoist ACJ Series I-Joists shall be designed in accordance with the code using the design properties specified in this report.
   b) AcuJoist ACJ Series 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% or less and does not exceed 19%.
   c) All AcuJoist ACJ Series I-Joists are produced at Kelowna, BC, Canada under a quality assurance program audited by APA.
   d) This report is subject to re-examination in one year.

7. Identification:
The AcuJoist ACJ Series prefabricated wood I-joists described in this report are identified by a label bearing the manufacturer's name (AcuTruss Industries 1996, Ltd.) and/or trademark, the APA assigned plant number 1138, the I-joist depth and series, the APA logo, the report number PR-L342 or PR-L342C, and a means of identifying the date of manufacture.

Table 1. Description of AcuJoist ACJ Series I-Joists[(a)]

I-Joist Series	Also Qualified for	I-Joist Depths, mm (in.)	Flanges				Web	
			Material	G	Dimension		Material	Thickness, mm (in.)
					Depth, mm (in.)	Width, mm (in.)		
ACJ-40	PRI-40	241 – 406 (9-1/2 – 16)	Proprietary SPF	0.42	38 (1-1/2)	64 (2-1/2)	OSB	9.5 (3/8)
ACJ-80	PRI-80	302 – 406 (11-7/8 – 16)	MSR SPF	0.46	38 (1-1/2)	89 (3-1/2)	OSB	9.5 (3/8)
	C1	457 (18)	MSR SPF	0.46	38 (1-1/2)	89 (3-1/2)	OSB	9.5 (3/8)

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

Table 2. Factored Resistances of AcuJoist ACJ Series I-Joists[a]

I-Joist Depth, mm (in.)	I-Joist Series	Permitted to Be Labelled as	EI[b], 10^6 kN-mm^2 (10^6 lbf-in.^{2})	M_r[c], N-m (lbf-ft)	V_r[d], kN (lbf)	VLC_r[e], kN/m (plf)	K[f], kN (10^6 lbf)
241 (9-1/2)	ACJ-40	PRI-40	528 (184)	6,167 (4,549)	7.86 (1,768)	42.3 (2,900)	21,973 (4.94)
302 (11-7/8)	ACJ-40	PRI-40	898 (313)	7,994 (5,896)	9.97 (2,241)	42.3 (2,900)	27,489 (6.18)
	ACJ-80	PRI-80	1,487 (518)	15,649 (11,543)	9.97 (2,241)	42.3 (2,900)	27,489 (6.18)
356 (14)	ACJ-40	PRI-40	1,317 (459)	9,854 (7,268)	12.01 (2,699)	42.3 (2,900)	32,381 (7.28)
	ACJ-80	PRI-80	2,169 (756)	18,852 (13,904)	12.01 (2,699)	42.3 (2,900)	32,381 (7.28)
406 (16)	ACJ-40	PRI-40	1,794 (625)	11,432 (8,432)	13.83 (3,109)	42.3 (2,900)	37,007 (8.32)
	ACJ-80	PRI-80	2,939 (1,024)	21,851 (16,116)	13.83 (3,109)	42.3 (2,900)	37,007 (8.32)
457 (18)	ACJ-80	C1	3,814 (1,329)	24,578 (18,129)	17.55 (3,946)	37.0 (2,538)	51,241 (11.52)

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 CSA-O86. The tabulated values are for the standard term of load duration (K_D = 1.0). All values, except for EI, VL_r, 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.

[d] Factored shear resistance (V_r) of the I-joist.

[e] Factored uniform vertical load resistance (VLC_r) of the I-joist.

[f] Coefficient of shear deflection (K). For calculating uniform load and center-point load deflections of the I-joists in a simple-span application, use Eqs. 1 and 2.

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

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

where δ = calculated deflection (mm or in.), ω = unfactored uniform load (kN/mm or lbf/in.),
P = unfactored concentrated load (kN or lbf), L = design span (mm or in.),
EI = bending stiffness of the I-joist (kN-mm^2 or lbf-in.^{2}), and K = coefficient of shear deflection (kN or lbf).

Table 3. Additional Factored Resistances of AcuJoist ACJ Series I-Joists[a,b,c]

I-Joist Depth, mm (in.)	I-Joist Series	Permitted to Be Labelled as	Factored End Reactions, kN (lbf)				Factored Intermediate Reactions, kN (lbf)
			44 mm (1-3/4 in.) Bearing		102 mm (4 in.) Bearing		89 mm (3-1/2 in.) Bearing
			No Brg. Stiffeners	With Brg. Stiffeners	No Brg. Stiffeners	With Brg. Stiffeners	No Brg. Stiffeners
241 (9-1/2)	ACJ-40	PRI-40	7.58 (1,705)	7.58 (1,705)	7.86 (1,768)	7.86 (1,768)	15.16 (3,409)
302 (11-7/8)	ACJ-40	PRI-40	8.42 (1,894)	8.42 (1,894)	9.97 (2,241)	9.97 (2,241)	17.55 (3,946)
	ACJ-80	PRI-80	8.99 (2,020)	8.99 (2,020)	9.97 (2,241)	9.97 (2,241)	19.38 (4,356)
356 (14)	ACJ-40	PRI-40	8.42 (1,894)	8.42 (1,894)	10.88 (2,447)	12.01 (2,699)	17.55 (3,946)
	ACJ-80	PRI-80	8.99 (2,020)	8.99 (2,020)	10.88 (2,447)	12.01 (2,699)	21.20 (4,767)
406 (16)	ACJ-40	PRI-40	8.42 (1,894)	8.42 (1,894)	10.88 (2,447)	13.83 (3,109)	17.55 (3,946)
	ACJ-80	PRI-80	8.99 (2,020)	8.99 (2,020)	10.88 (2,447)	13.83 (3,109)	21.20 (4,767)
457 (18)	ACJ-80	C1	9.83 (2,210)	14.29 (3,212)	11.41 (2,565)	16.81 (3,780)	23.55 (5,296)

For Imperial: 1 mm = 0.0394 in., 1 N = 0.2248 lbf

(a) The tabulated values in Table 3 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 E715 CA.

APA – The Engineered Wood Association is an approved national standards developer accredited by American National Standards Institute (ANSI). APA publishes ANSI standards and Voluntary Product Standards for wood structural panels and engineered wood products. APA is an accredited certification body under ISO/IEC 17065 by Standards Council of Canada (SCC), an accredited inspection agency under ISO/IEC 17020 by International Code Council (ICC) International Accreditation Service (IAS), and an accredited testing organization under ISO/IEC 17025 by IAS. APA is also an approved Product Certification Agency, Testing Laboratory, Quality Assurance Entity, Validation Entity, and Product Evaluation Entity by the State of Florida, and an approved testing laboratory by City of Los Angeles.

APA – THE ENGINEERED WOOD ASSOCIATION
HEADQUARTERS
7011 So. 19th St. ▪ Tacoma, Washington 98466
Phone: (253) 565-6600 ▪ Fax: (253) 565-7265 ▪ Internet Address: www.apawood.org

PRODUCT SUPPORT HELP DESK
(253) 620-7400 ▪ *E-mail Address*: help@apawood.org

DISCLAIMER