

AJS Series I-Joists
Boise Cascade Wood Products L.L.C.

PR-L310C
Revised January 28, 2018

Products: AJS[®] 110, 150v, 20v, 24, 25v and 190 Series I-Joists
Boise Cascade Wood Products L.L.C., 70 rue Industrielle, St. Jacques, New Brunswick E7B 1T1
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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
 - CSA O86-14 (reprint May 2016) Engineering Design in Wood
 - ASTM D5055-13e1 recognized by CSA O86-14
 - University of New Brunswick Wood Science and Technology Centre Reports WSTC2011-018 and WSTC2012-014
 - APA Reports T2013P-25, T2014P-40, T2015P-08, and T2016P-47, and other qualification data
2. Product description:

The AJS[®] Series I-joists covered by this report, as described in Table 1, are made with lumber flanges and OSB webs in accordance with the in-plant manufacturing standard approved by APA.
3. Design properties:

Table 2 lists the factored resistances for AJS Series I-joists. The design spans for AJS Series I-joists covered by this report shall be in accordance with the recommendations provided by the manufacturer (www.bc.com/wood/ewp).
4. Product installation:

AJS Series I-joists covered by this report shall be installed in accordance with the recommendations provided by the [manufacturer](#). 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](#) or as shown in [APA Product Report PR-S201](#), or the applicable assemblies permitted in 2015 NBCC Table 9.10.3.1.-B.
6. Limitations:
 - a) AJS Series I-joists covered by this report shall be designed in accordance with the code using the design properties specified in this report.
 - b) AJS Series I-joists covered by this report 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) AJS Series I-joists covered by this report are produced at the Boise Cascade Wood Products L.L.C. facility in St. Jacques, New Brunswick under a quality assurance program audited by APA.
 - d) This report is subject to re-examination in one year.
7. Identification:

The AJS Series prefabricated wood I-joists described in this report are identified by a label bearing the manufacturer's name (Boise Cascade Wood Products L.L.C.) and/or trademark,

the APA assigned plant number (1108), the I-joist series, the APA logo, the report number PR-L310, and a means of identifying the date of manufacture. AJS-150, AJS-20, AJS-24, and AJS-25 are permitted to be labelled as NJ40H, NJ60H, NJ40U and NJ60U, respectively.

Table 1. Description of AJS 110, 150, 150v, 20, 20v, 24, 25, 25v and 190 Series I-joists ^(a)

Joist Series	Joist Depths, mm (in.)	Flanges			Web	
		Material	Dimension		Material	Thickness, mm (in.)
			Depth, mm (in.)	Width, mm (in.)		
AJS 110	235 – 406 (9-1/4 – 16)	Proprietary SPF	38 (1-1/2)	64 (2-1/2)	OSB	9.5 (3/8)
AJS-150	235 – 406 (9-1/4 – 16)	Proprietary SPF	38 (1-1/2)	64 (2-1/2)	OSB	9.5 (3/8)
AJS 150v	235 – 406 (9-1/4 – 16)	Proprietary SPF	38 (1-1/2)	64 (2-1/2)	OSB	9.5 (3/8)
AJS 20	235 – 406 (9-1/4 – 16)	Proprietary SPF	38 (1-1/2)	64 (2-1/2)	OSB	9.5 (3/8)
AJS 20v	235 – 406 (9-1/4 – 16)	Proprietary SPF	38 (1-1/2)	64 (2-1/2)	OSB	9.5 (3/8)
AJS 24	235 – 406 (9-1/4 – 16)	Proprietary SPF	38 (1-1/2)	89 (3-1/2)	OSB	9.5 (3/8)
AJS 25	235 – 406 (9-1/4 – 16)	Proprietary SPF	38 (1-1/2)	89 (3-1/2)	OSB	9.5 (3/8)
AJS 25v	235 – 406 (9-1/4 – 16)	Proprietary SPF	38 (1-1/2)	89 (3-1/2)	OSB	9.5 (3/8)
AJS 190	457 – 508 (18 – 20)	Proprietary SPF	38 (1-1/2)	64 (2-1/2)	OSB	11 (7/16)

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

Table 2. Factored Resistances of AJS Series I-Joists (a)

Joist Series	Permitted to be labelled as	Joist Depth mm (in.)	EI ^(b) (x10 ⁶ kN-mm ²)	M _r ^(c) (kN-mm)	V _r ^(d) (N)	End Reaction ^(e, n) (N)				Intermediate Reaction ^(g, n) (N)				V _{Lr} ^(h) (kN/m)	K ⁽ⁱ⁾ (kN)
						38 mm (1-1/2 in.) Brg. Length		89 mm (3-1/2 in.) Brg. Length		89 mm (3-1/2 in.) Brg. Length		133 mm (5-1/4 in.) Brg. Length			
						w/o Brg. Stiff	w/Brg. Stiff	w/o Brg. Stiff	w/Brg. Stiff	w/o Brg. Stiff	w/Brg. Stiff	w/o Brg. Stiff	w/Brg. Stiff		
AJS 110	NA	235 (9-1/4)	387	3,985	7,898	6,670	8,636	8,214	10,391	16,499	17,201	16,499	17,201	45.6	22,300
		241 (9-1/2)	413	4,110	8,144	6,670	8,706	8,249	10,391	16,499	17,201	16,499	17,201	45.6	23,000
		286 (11-1/4)	626	5,015	9,829	6,705	9,197	8,460	11,198	16,780	19,659	16,780	19,659	40.9	27,400
		302 (11-7/8)	712	5,335	10,461	6,705	9,373	8,530	11,198	16,780	19,659	16,780	19,659	40.9	29,000
		356 (14)	1,053	6,425	12,567	6,740	9,970	8,776	11,935	16,956	21,976	16,956	21,976	36.5	34,400
		406 (16)	1,446	7,295	14,498	6,810	10,531	9,022	12,638	17,131	24,117	17,131	24,117	32.6	39,400
AJS 150	NJ40H	241 (9-1/2)	556	6,360	8,144	6,670	8,706	8,249	10,391	16,499	17,201	16,499	17,201	45.6	23,100
		302 (11-7/8)	952	8,240	10,461	6,705	9,373	8,530	11,198	16,780	19,659	16,780	19,659	40.9	29,400
		356 (14)	1,401	9,915	12,567	6,740	9,970	8,776	11,935	17,061	21,976	17,061	21,976	36.5	34,700
		406 (16)	1,909	11,465	14,498	6,810	10,531	9,022	12,638	17,307	24,117	17,307	24,117	32.6	39,600
AJS 150v ^(k)	NA	235 (9-1/4)	523	6,180	7,935	7,550	7,550	7,865	7,865	16,500	17,200	20,010	20,710	48.7	22,700
		241 (9-1/2)	556	6,370	8,145	7,550	7,550	8,040	8,040	16,500	17,200	20,010	20,710	48.7	23,100
		286 (11-1/4)	839	7,775	9,830	8,250	8,250	9,515	9,515	17,555	19,660	21,065	22,820	48.7	27,600
		302 (11-7/8)	954	8,275	10,460	8,250	8,250	10,005	10,005	17,555	19,660	21,065	22,820	48.7	29,400
		356 (14)	1,405	9,960	12,570	8,250	8,250	10,355	11,690	17,555	22,115	21,065	24,575	48.7	34,700
		406 (16)	1,909	11,525	14,500	8,250	8,250	10,355	13,235	17,555	24,575	21,065	24,575	48.7	39,600
AJS 20	NJ60H	241 (9-1/2)	664	7,685	8,144	6,670	8,706	8,249	10,391	16,499	17,201	16,499	17,201	45.6	23,100
		302 (11-7/8)	1,135	9,985	10,461	6,705	9,373	8,530	11,198	16,780	19,659	16,780	19,659	40.9	29,400
		356 (14)	1,667	12,020	12,567	6,740	9,970	8,776	11,935	17,061	21,976	17,061	21,976	36.5	34,700
		406 (16)	2,259	13,900	14,498	6,810	10,531	9,022	12,638	17,307	24,117	17,307	24,117	32.6	39,600
AJS 20v ^(l)	NA	235 (9-1/4)	625	8,295	7,935	7,550	7,550	7,865	7,865	16,500	17,200	20,010	20,710	48.7	22,700
		241 (9-1/2)	664	8,545	8,145	7,550	7,550	8,040	8,040	16,500	17,200	20,010	20,710	48.7	23,100
		286 (11-1/4)	999	10,430	9,830	8,250	8,250	9,515	9,515	17,555	19,660	21,065	22,820	48.7	27,600
		302 (11-7/8)	1,135	11,105	10,460	8,250	8,250	10,005	10,005	17,555	19,660	21,065	22,820	48.7	29,400
		356 (14)	1,667	13,365	12,570	8,250	8,250	10,355	11,690	17,555	22,115	21,065	24,575	48.7	34,700
		406 (16)	2,259	15,460	14,500	8,250	8,250	10,355	13,235	17,555	24,575	21,065	24,575	48.7	39,600
AJS 24	NJ40U	235 (9-1/4)	726	8,755	7,898	6,670	8,636	8,214	10,391	18,255	20,010	18,255	20,010	45.6	23,100
		241 (9-1/2)	771	9,020	8,144	6,670	8,706	8,249	10,391	18,255	20,010	18,255	20,010	45.6	23,600
		286 (11-1/4)	1,158	11,010	9,829	6,705	9,197	8,460	11,198	18,886	22,397	18,886	22,397	40.9	28,000
		302 (11-7/8)	1,316	11,720	10,461	6,705	9,373	8,530	11,198	18,886	22,397	18,886	22,397	40.9	29,800
		356 (14)	1,928	14,115	12,567	6,740	9,970	8,776	11,935	19,448	24,574	19,448	24,574	36.5	35,100
		406 (16)	2,609	16,330	14,498	6,810	10,531	9,022	12,638	20,010	26,680	20,010	26,680	32.6	40,500

Table continues on following page.

Table 2. Factored Resistances of AJS Series I-Joists ^(a) (Continued)

Joist Series	Permitted to be Labelled as	Joist Depth mm (in.)	EI ^(b) (x10 ⁶ kN-mm ²)	M _r ^(c) (kN-mm)	V _r ^(d) (N)	End Reaction ^(e, n) (N)				Intermediate Reaction ^(g, n) (N)				VL _r ^(h) (kN/m)	K ⁽ⁱ⁾ (kN)
						38 mm (1-1/2 in.) Brg. Length		89 mm (3-1/2 in.) Brg. Length		89 mm (3-1/2 in.) Brg. Length		133 mm (5-1/4 in.) Brg. Length			
						w/o Brg. Stiff	w/Brg. Stiff	w/o Brg. Stiff	w/Brg. Stiff	w/o Brg. Stiff	w/Brg. Stiff	w/o Brg. Stiff	w/Brg. Stiff		
AJS 25	NJ60U	241 (9-1/2)	921	12,095	8,144	6,670	8,706	8,249	10,391	18,255	20,010	18,255	20,010	45.6	23,600
		302 (11-7/8)	1,569	15,720	10,461	6,705	9,373	8,530	11,198	18,886	22,397	18,886	22,397	40.9	29,800
		356 (14)	2,295	18,925	12,567	6,740	9,970	8,776	11,935	19,448	24,574	19,448	24,574	36.5	35,100
		406 (16)	3,099	21,895	14,498	6,810	10,531	9,022	12,638	20,010	26,680	20,010	26,680	32.6	40,500
AJS 25v ^(m)	NA	235 (9-1/4)	867	11,735	7,935	7,550	7,550	7,865	7,865	18,255	20,010	21,765	23,520	48.7	23,600
		241 (9-1/2)	921	12,095	8,145	7,550	7,550	8,040	8,040	18,255	20,010	21,765	23,520	48.7	24,000
		286 (11-1/4)	1,382	14,765	9,830	8,775	8,775	9,620	9,620	19,380	22,470	22,820	25,980	48.7	28,500
		302 (11-7/8)	1,569	15,715	10,460	8,775	8,775	10,110	10,110	19,380	22,470	22,820	25,980	48.7	30,200
		356 (14)	2,295	18,920	12,570	8,775	8,775	10,460	11,795	21,205	24,575	24,575	28,085	48.7	35,600
		406 (16)	3,099	21,890	14,500	8,775	8,775	10,460	13,340	21,205	26,680	24,575	28,085	48.7	40,500
AJS 190	NA	457 (18)	3,154	18,135	21,133	--	13,803 ^(f)	--	18,393	--	30,635	--	33,139	65.7 ⁽ⁱ⁾	53,800
		508 (20)	4,023	20,275	22,748	--	13,803 ^(f)	--	20,907	--	30,635	--	35,875	65.7 ⁽ⁱ⁾	60,100

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

- ^(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 except that the adjusted end and intermediate reaction values shall not exceed the factored compressive resistance perpendicular to grain (Q_c) of the bearing plate supporting the I-joist in accordance with CSA O86.
- ^(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) Interpolation of the end reaction between 38- and 89-mm bearing, with or without bearing stiffeners, respectively, shall be permitted.
- ^(f) Factored end reaction resistance is for a minimum 44-mm (1-3/4-inch) bearing.
- ^(g) Interpolation of the intermediate reaction between 89- and 133-mm bearing, with or without bearing stiffeners, respectively, shall be permitted.
- ^(h) Factored uniform vertical load resistance (VL_r) of the I-joist.
- ⁽ⁱ⁾ Web stiffeners shall be required at each end of the I-joist when used as a blocking panel. Web stiffener installation shall be as prescribed by the manufacturer. The distance between stiffeners must not exceed 610 mm (24 inches).
- ^(j) Coefficient of shear deflection (K). For calculating uniform load and center-point load deflections of the I-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 = uniform load (kN/mm),
 ℓ = design span (mm), P = concentrated load (kN),
 EI = bending stiffness of the I-joist (kN-mm²), K = coefficient of shear deflection (kN).

- ^(k) AJS 150v meets PRI-40 series design values at 241 mm (9-1/2-inch), 302 mm (11-7/8-inch), 356 mm (14-inch) and 406 mm (16-inch) depths.
- ^(l) AJS 20v meets PRI-60 series design values at 241 mm (9-1/2-inch), 302 mm (11-7/8-inch), 356 mm (14-inch) and 406 mm (16-inch) depths.
- ^(m) AJS 25v meets PRI-80 series design values at 302 mm (11-7/8-inch), 356 mm (14-inch) and 406 mm (16-inch) depths.

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