

GPI Series I-Joists
Georgia-Pacific Wood Products LLC

PR-L255
Revised August 19, 2011

Products: GPI 20, 40, 65, and 90 Series I-Joists
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www.gp.com/build/

1. Basis of the product report:
 - 2009 and 2006 International Building Code (IBC): Sections 104.11 Alternative Materials and 2303.1.2 Prefabricated wood I-joists
 - 2009 and 2006 International Residential Code (IRC): Sections R104.11 Alternative Materials and R502.1.4 Prefabricated wood I-joists
 - ASTM D5055-05 and D5055-04 recognized by the 2009 IBC and IRC, and 2006 IBC and IRC, respectively
 - APA Reports T1999P-07, T1999P-24, T2001M-1, T2001M-89, T2002M-60A, T2003M-43, T2003M-44A, T2003M-55, T2003M-78, T2004M-44, T2005M-10, T2005M-53, T2006M-71, T2007M-29, T2007M-65, T2007M-108, T2010M-45, T2011M-20, and other qualification data
2. Product description:

GPI 20, 40, 65, and 90 Series I-joists are made with laminated veneer lumber (LVL) flanges and an OSB web in accordance with the in-plant manufacturing standard approved by APA.
3. Design properties:

Table 1 lists the design properties for GPI 20, 40, 65, and 90 Series I-joists. The allowable spans for GPI Series I-joists covered by this report shall be in accordance with the recommendations provided by the manufacturer (<http://www.gp.com/build/product.aspx?pid=1390>).
4. Product installation:

GPI 20, 40, 65, and 90 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), and with APA Design/Construction Guide: *Fire-Rated Systems*, Form W305Y, dated June 2005 (www.apawood.org/publications).
6. Limitations:
 - a) GPI 20, 40, 65, and 90 Series I-joists shall be designed in accordance with the code using the design properties specified in this report.
 - b) GPI 20, 40, 65, and 90 Series I-joists are limited to dry service conditions where the average equilibrium moisture content of sawn lumber is less than 16 percent.
 - c) GPI 20, 40, 65, and 90 Series I-joists are produced at the Georgia-Pacific Wood Products LLC, Roxboro, North Carolina facilities under a quality assurance program audited by APA.
 - d) This report is subject to re-examination in one year.

7. Identification:

The GPI Series prefabricated wood I-joists described in this report are identified by a label bearing the manufacturer's name (Georgia-Pacific) and/or trademark, the APA assigned plant number (1027), the I-joist depth and series, the APA logo, the report number PR-L255, and a means of identifying the date of manufacture.

Table 1. Design Properties (Allowable Stress Design) for GPI Series I-Joists ^(a,b)

Joist Depth (in.)	Joist Series	Corresponding PRI Series	EI ^(c) (x10 ⁶ lbf-in. ²)	M ^(d) (lbf-ft)	V ^(e) (lbf)	End Reaction ^(f) (lbf)				Intermediate Reaction (lbf)				C ^(g) (x10 ⁶ ft-lb/in.)
						1-3/4 in. Brg. Length		4 in. Brg. Length		3-1/2 in. Brg. Length		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	
9-1/2	GPI 20	PRI-20	159	3,000	1,135	1,050	---	1,135	---	2,340	2,495	3,000	3,145	0.412
	GPI 40	PRI-40	193	3,090	1,200	1,120	---	1,200	---	2,600	2,650	3,025	3,150	0.412
	GPI 65	---	254	4,900	1,210	1,120	---	1,210	---	2,610	2,700	3,070	3,175	0.412
11-7/8	GPI 20	PRI-20	274	3,870	1,435	1,100	---	1,435	---	2,340	2,640	3,000	3,170	0.515
	GPI 40	PRI-40	330	3,990	1,460	1,225	---	1,460	---	2,600	2,750	3,025	3,175	0.515
	GPI 65	---	434	6,325	1,495	1,230	---	1,495	---	2,610	2,800	3,070	3,200	0.515
	GPI 90	PRI-90	661	10,255	1,925	1,400	1,900	1,900	1,925	3,355	3,850	3,850	---	0.515
14	GPI 20	---	409	4,640	1,710	1,150	1,225	1,690	1,710	2,340	2,800	3,000	3,195	0.607
	GPI 40	PRI-40	482	4,790	1,715	1,250	---	1,715	---	2,600	2,850	3,025	3,200	0.607
	GPI 65	---	640	7,605	1,740	1,335	---	1,740	---	2,610	2,900	3,070	3,225	0.607
	GPI 90	PRI-90	965	12,235	2,125	1,400	1,900	1,900	2,125	3,355	3,855	3,970	4,250	0.607
16	GPI 40	PRI-40	657	5,550	1,990	1,235	1,350	1,550	1,990	2,600	2,950	3,025	3,225	0.693
	GPI 65	---	877	8,755	2,000	1,345	1,575	1,650	2,000	2,610	3,000	3,070	3,250	0.693
	GPI 90	PRI-90	1,306	14,020	2,330	1,400	1,900	1,900	2,330	3,355	3,855	3,970	4,470	0.693

For SI: 1 inch = 25.4 mm, 1 foot = 304.8 mm, 1 lbf = 4.448 N.

- (a) The tabulated values are design values for normal duration of load. All values, except for EI and C, shall be permitted to be adjusted for other load durations as permitted by the code.
- (b) The maximum vertical load transfer of GPI Series I-Joists is 2,000 plf.
- (c) Bending stiffness (EI) of the I-joist.
- (d) Moment capacity (M) of the I-joist, which shall not be increased by any repetitive member use factor.
- (e) Shear capacity (V) of the I-joist.
- (f) Interpolation of the end reaction between 1-3/4- and 4-inch bearing is permitted.
- (g) Coefficient of shear deflection (C). For calculating uniform load and center-point load deflections of the I-joist in a simple-span application, use Eqs. 1 and 2.

$$\text{Uniform Load: } \delta = \frac{22.5 \omega \ell^4}{EI} + \frac{\omega \ell^2}{C} \quad [1]$$

$$\text{Center-Point Load: } \delta = \frac{36P\ell^3}{EI} + \frac{2P\ell}{C} \quad [2]$$

Where:

- δ = calculated deflection (in.),
- ω = uniform load (lbf/ft),
- ℓ = design span (ft),
- P = concentrated load (lbf),
- EI = bending stiffness of the I-joist (lbf-in.²), and
- C = coefficient of shear deflection (lbf-ft/in.).

APA – The Engineered Wood Association is an accredited certification body under ISO 65 by Standards Council of Canada (SCC) and an accredited inspection agency by the International Code Council (ICC) International Accreditation Service (IAS) under ISO/IEC 17020. APA is also an accredited testing organization recognized by IAS and SCC under ISO/IEC 17025. APA is a recognized testing laboratory by Miami-Dade County, and a Product Testing Laboratory, Product Quality Assurance Entity, and Product Validation Entity by the Florida Department of Community Affairs (DCA).

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