

Nordic Joist™  
Nordic Engineered Wood

PR-L274  
Revised May 2, 2011

Products: NI-20, 40, 40x, 60, 70, 80, 80x, and 90x Prefabricated Wood I-Joists  
Nordic Engineered Wood,  
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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 D 5055-05 recognized by the 2009 IBC and IRC, and ASTM D 5055-04 recognized by the 2006 IBC and IRC
  - APA Reports T2004P-3, T2004P-21, T2004P-74, T2004P-76, T2005P-30, T2005P-31, T2006P-12, T2006P-13, T2007P-14A, T2007P-76, T2007P-79A, T2007P-81, T2007P-91, T2008P-17, T2010P-20 and other qualification data
2. Product description:  
Nordic Joist™ is made with lumber flanges and OSB webs in accordance with the in-plant manufacturing standard approved by APA.
3. Design properties:  
Table 1 lists the design properties for Nordic Joist. The allowable spans shall be in accordance with the recommendations provided by the manufacturer ([www.nordicewp.com/literature/residential-united-states/](http://www.nordicewp.com/literature/residential-united-states/)).
4. Product installation:  
Nordic Joist shall be installed in accordance with the recommendations provided by the manufacturer (see link above). Permissible web holes, web stiffeners 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 W305 ([www.apawood.org/publications](http://www.apawood.org/publications)).
6. Limitations:
  - a) Nordic Joist shall be designed in accordance with the code using the design properties specified in this report.
  - b) Nordic Joist is limited to dry service conditions where the average equilibrium moisture content of sawn lumber is less than 16 percent.
  - c) Nordic Joist is produced at the Nordic Engineered Wood, Chibougamau, Québec facilities under a quality assurance program audited by APA.
  - d) This report is subject to re-examination in one year.

7. Identification:

The Nordic Joist described in this report is identified by a label bearing the manufacturer's name (Nordic Engineered Wood) and/or trademark, the APA assigned plant number (1052), the I-joist depth and series, the APA logo, the report number PR-L274, and a means of identifying the date of manufacture.

Table 1. Design Properties (Allowable Stress Design) for Nordic Joist™ (a,b)

Joist Depth (in.)	Joist Series	E <sub>I</sub> <sup>(c)</sup> (10 <sup>6</sup> lbf-in. <sup>2</sup> )	M <sup>(d)</sup> (lbf-ft)	V <sup>(e)</sup> (lbf)	IR <sup>(f)</sup> (lbf)				ER <sup>(g)</sup> (lbf)				K <sup>(h)</sup> (10 <sup>6</sup> lbf)
					3-1/2 (in.)		5-1/2 (in.)		1-3/4 (in.)		3-1/2 (in.)		
					w/o WS	w/ WS	w/o WS	w/ WS	w/o WS	w/ WS	w/o WS	w/ WS	
7-7/8	NI-40x	138	2,310	880	1,890	NA	NA	NA	880	NA	NA	NA	4.10
	NI-60	147	3,030	880	1,890	NA	NA	NA	880	NA	NA	NA	4.10
	NI-80	204	4,285	880	1,890	NA	NA	NA	880	NA	NA	NA	4.10
9-1/4	NI-20	138	2,510	1,080	1,700	NA	NA	NA	900	NA	NA	NA	4.81
	NI-40x	198	2,810	1,170	2,240	NA	NA	NA	1,120	NA	NA	NA	4.81
	NI-60	217	3,680	1,170	2,240	NA	NA	NA	1,120	NA	NA	NA	4.81
9-1/2	NI-80	304	5,215	1,170	2,240	NA	NA	NA	1,120	NA	NA	NA	4.81
	NI-20	145	2,590	1,120	1,700	NA	NA	NA	900	NA	NA	NA	4.94
	NI-40	193	2,735	1,120	2,160	NA	NA	NA	1,080	NA	NA	NA	4.94
	NI-40x	218	2,900	1,200	2,240	2,620	NA	NA	1,120	NA	NA	NA	4.94
	NI-60	231	3,810	1,200	2,240	2,620	NA	NA	1,120	NA	NA	NA	4.94
11-1/4	NI-70	304	5,120	1,200	2,240	2,620	NA	NA	1,120	NA	NA	NA	4.94
	NI-80	324	5,385	1,200	2,380	2,790	NA	NA	1,190	NA	NA	NA	4.94
	NI-20	222	3,155	1,340	1,800	NA	NA	NA	900	NA	NA	NA	5.85
	NI-40x	313	3,535	1,410	2,750	NA	NA	NA	1,250	NA	NA	NA	5.85
	NI-60	347	4,630	1,410	2,750	NA	NA	NA	1,250	NA	NA	NA	5.85
11-7/8	NI-80	484	6,560	1,410	2,750	NA	NA	NA	1,330	NA	NA	NA	5.85
	NI-20	253	3,355	1,420	1,800	NA	NA	NA	900	NA	NA	NA	6.18
	NI-40	330	3,545	1,420	2,500	NA	NA	NA	1,200	NA	NA	NA	6.18
	NI-40x	371	3,760	1,480	2,750	2,930	NA	NA	1,250	NA	NA	NA	6.18
	NI-60	396	4,935	1,480	2,750	2,930	NA	NA	1,250	NA	NA	NA	6.18
	NI-70	515	6,635	1,480	2,750	2,930	NA	NA	1,250	NA	NA	NA	6.18
	NI-80	547	6,980	1,480	2,900	3,120	NA	NA	1,330	NA	NA	NA	6.18
14	NI-90x	615	9,465	2,055	4,170	NA	NA	NA	1,765	NA	NA	NA	6.18
	NI-40	482	4,270	1,710	2,500	NA	NA	NA	1,200	NA	NA	NA	7.28
	NI-40x	540	4,530	1,730	2,750	3,240	NA	NA	1,250	NA	NA	NA	7.28
	NI-60	584	5,945	1,730	2,750	3,240	NA	NA	1,250	NA	NA	NA	7.28
	NI-70	749	7,990	1,730	2,750	3,240	NA	NA	1,250	NA	NA	NA	7.28
	NI-80	802	8,405	1,730	3,310	3,840	NA	NA	1,330	NA	NA	NA	7.28
16	NI-90x	910	11,415	2,210	4,170	NA	NA	NA	1,765	NA	NA	NA	7.28
	NI-40	657	4,950	1,970	2,500	NA	NA	NA	1,200	NA	NA	NA	8.32
	NI-40x	734	5,250	1,970	2,750	3,240	NA	NA	1,250	NA	NA	NA	8.32
	NI-60	799	6,895	1,970	2,750	3,240	NA	NA	1,250	NA	NA	NA	8.32
	NI-70	1,015	9,265	1,970	2,750	3,240	NA	NA	1,250	NA	NA	NA	8.32
	NI-80	1,092	9,745	1,970	3,310	3,840	NA	NA	1,330	NA	NA	NA	8.32
18	NI-90x	1,245	13,100	2,325	4,170	NA	NA	NA	1,765	NA	NA	NA	8.32
	NI-60	1,019	7,800	2,000	2,800	3,500	3,150	4,100	1,300	1,700	1,520	1,860	9.36
20	NI-80x	1,399	10,990	2,360	3,100	3,700	3,250	4,250	1,300	1,900	1,520	2,150	9.36
22	NI-80x	1,771	12,315	2,450	3,100	3,700	3,250	4,250	1,300	2,010	1,520	2,250	10.40
24	NI-80x	2,191	13,645	2,530	3,100	3,700	3,250	4,250	1,300	2,130	1,520	2,350	11.44
24	NI-80x	2,660	14,975	2,600	3,100	3,700	3,250	4,250	1,300	2,250	1,520	2,440	12.48

For SI: 1 inch = 25.4 mm, 1 lbf = 4.448 N, 1 lbf-ft = 1.356 N-m, 1 lbf-in<sup>2</sup> = 0.000287 N-m<sup>2</sup>

- (a) The tabulated values are design values for normal duration of load. All values, except for EI and K, shall be permitted to be adjusted for other load durations as permitted by the code.
- (b) The maximum vertical load capacity for Nordic Joist without bearing stiffeners is 2,000 lbf/ft for joists up to 16-inch deep, 1,850 lbf/ft for 18-inch NI-60 and 1,275 lbf/ft for 18-inch NI-80x to 24-inch NI-80x.
- (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) Intermediate reaction (IR) of the I-joist for a bearing length of 3-1/2 or 5-1/2 inches with or without web stiffeners in accordance with the bearing stiffener recommendations listed in Table 2.
- (g) End reaction (ER) of the I-joist for a bearing length of 1-3/4 and 3-1/2 inches with and without web stiffeners. Higher end reactions are permitted. For a bearing length of 4 inches, the end reaction may be set equal to the tabulated shear value. Interpolation of the end reaction between 1-3/4 and 4-inch bearing length is permitted. For joists up to 16-inch deep with end reaction values greater than 1,550 lbf, web stiffeners are required with the exception of NI-90x, which requires bearing stiffeners when end reaction values exceed 1,885 lbf. For 18-inch NI-60 and 18-inch NI-80x to 24-inch NI-80x with end reactions greater than 1,850 lbf, web stiffeners are required.
- (h) Coefficient of shear deflection (K). For calculating uniform load and center-point load deflections of the I-joist in a simple-span application, use Equations 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:

- $\delta$  = calculated deflection (in.)
- $\omega$  = uniform load (lbf/in.)
- P = concentrated load (lbf)
- $\ell$  = design span (in.)
- EI = bending stiffness of the I-joist (lbf-in.<sup>2</sup>)
- K = coefficient of shear deflection (lbf)

Table 2. Minimum Dimensions for Web Stiffeners <sup>(a)</sup>

Joist Series	Web Stiffeners		Flange width (in.)
	Thickness (in.)	Width (in.)	
NI-20	1	2-5/16	2-1/2
NI-40	1	2-5/16	2-1/2
NI-40x	1	2-5/16	2-1/2
NI-60	1	2-5/16	2-1/2
NI-70	1-1/2	2-5/16	3-1/2
NI-80	1-1/2	2-5/16	3-1/2
NI-80x	1-1/2	2-5/16	3-1/2
NI-90x	1-1/2	2-5/16	3-1/2

<sup>(a)</sup> Web stiffener length is 1/8 to 1/4 inch less than the clear distance between flanges. Stiffeners 1-inch thick are wood structural panels and stiffeners 1-1/2-inch thick are SPF lumber (specific gravity of 0.42) or denser lumber.

*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).

**APA – THE ENGINEERED WOOD ASSOCIATION**

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