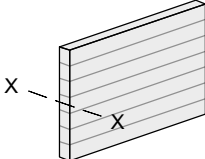
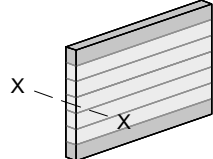


## Glulam Joists – Design Properties

### Design Properties

Application	Joists	
Axonometry		
Appearance classification	Industrial	Industrial
Stress grade	13F-1.7E <sup>(a)</sup>	24F-1.9E <sup>(b)</sup>
Available widths	1-1/2 in.	1-1/2 in.
Available depths	7-1/4 in. to 14 in.	16 in.
Bending about X-X axis		
Bending moment, $F_{bx}$ <sup>(c)</sup>	1,350 psi <sup>(d)</sup>	2,400 psi
Shear parallel to grain, $F_{vx}$	250 psi	250 psi
Compression perpendicular to grain, $F_{cp\perp}$	450 psi	600 psi
Shear-free modulus of elasticity, $E_x$	1,700,000 psi	1,900,000 psi
Apparent modulus of elasticity, $E_{x,app}$ <sup>(e)</sup>	1,600,000 psi	1,800,000 psi
Specific gravity, G	0.41 -	0.41 -
Density (for member weight), $\rho$	35 pcf	35 pcf

- Nordic Lam 13F-1.7E joists are symmetrical throughout the depth and the width of the member (homogeneous layups).
- Nordic Lam 24F-1.9E joists are symmetrical throughout the depth of the member (balanced layups).
- The volume factor,  $C_v$ , shall be calculated as per Clause 5.3.6 of the NDS, where the width,  $b$ , is taken as the full member width.
- This value is based on members 1-1/2 inch in width by 12 inches in depth. For members with other depths,  $F_{bx}$  shall be multiplied by an adjustment factor of  $(12/d)^{(1/9)}$  in lieu of the typical volume factor used for glulam,  $C_v$ .
- The apparent modulus of elasticity values include a 5% shear deflection. For beam stability calculations,  $E_{min}$  shall be determined by multiplying the tabulated apparent modulus of elasticity by 0.528.

#### Notes:

- The tabulated design values are for dry service conditions and normal duration of loading.
- Design of glulam members shall be in accordance with the NDS.
- Nordic Lam products are listed in APA Product Report PR-L294.

## Allowable Floor Spans

### Design Criteria

Loads:	Live load = 40 psf and dead load = 10 psf
Deflection limit:	L/240 under total load
Sheathing:	Nailed-glued sheathing meeting the requirements for APA Rated Sheathing or APA Rated Sturd-I-Floor
Service conditions:	Dry

### Allowable Floor Spans

Live load deflection limit of L/480

Width (in.)	Depth (in.)	Simple span On center spacing				Multiple spans On center spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
1-1/2	7-1/4	14'-0"	12'-11"	12'-2"	10'-11"	15'-2"	13'-3"	12'-1"	10'-10"
	9-1/4	17'-7"	16'-3"	15'-4"	13'-9"	19'-1"	16'-7"	15'-3"	13'-8"
	9-1/2	18'-0"	16'-8"	15'-8"	14'-1"	19'-6"	17'-0"	15'-7"	14'-0"
	11-1/4	21'-2"	19'-6"	18'-4"	16'-6"	22'-10"	19'-11"	18'-3"	16'-5"
	11-7/8	22'-3"	20'-6"	19'-3"	17'-4"	24'-0"	20'-11"	19'-2"	17'-3"
	14	26'-0"	24'-0"	22'-5"	19'-2"	27'-10"	24'-4"	22'-4"	19'-8"
	16	30'-8"	28'-2"	26'-8"	25'-1"	33'-6"	30'-9"	29'-2"	26'-2"

Live load deflection limit of L/360

Width (in.)	Depth (in.)	Simple span On center spacing				Multiple spans On center spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
1-1/2	7-1/4	15'-3"	13'-4"	12'-2"	10'-11"	15'-2"	13'-3"	12'-1"	10'-10"
	9-1/4	19'-2"	16'-8"	15'-4"	13'-9"	19'-1"	16'-7"	15'-3"	13'-8"
	9-1/2	19'-7"	17'-1"	15'-8"	14'-1"	19'-6"	17'-0"	15'-7"	14'-0"
	11-1/4	22'-11"	20'-0"	18'-4"	16'-6"	22'-10"	19'-11"	18'-3"	16'-5"
	11-7/8	24'-1"	21'-0"	19'-3"	17'-4"	24'-0"	20'-11"	19'-2"	17'-3"
	14	27'-11"	24'-5"	22'-5"	19'-2"	27'-10"	24'-4"	22'-4"	19'-8"
	16	33'-9"	31'-0"	29'-5"	25'-5"	36'-11"	33'-11"	32'-2"	26'-2"

### Notes:

1. The tabulated clear spans are applicable to residential floor construction meeting the above design criteria and are based on a sheathing thickness of 19/32 inch (40/20 or 20 oc) for a joist spacing of 19.2 inches or less, or 23/32 inch (48/24 or 24 oc) for a joist spacing of 24 inches.
2. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
3. Joist shall be laterally supported at points of bearing and along all compression edges.
4. Minimum bearing length shall be 1-1/2 inch for end bearings and 3-1/2 inches for intermediate bearings.

## Design Criteria

Loads:	Live load = 40 psf and dead load = 20 psf
Deflection limit:	L/240 under total load
Sheathing:	Nailed-glued sheathing meeting the requirements for APA Rated Sheathing or APA Rated Sturd-I-Floor
Service conditions:	Dry

## Allowable Floor Spans

Live load deflection limit of L/480

Width (in.)	Depth (in.)	Simple span On center spacing				Multiple spans On center spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
1-1/2	7-1/4	14'-0"	12'-2"	11'-2"	10'-0"	13'-11"	12'-1"	11'-1"	9'-11"
	9-1/4	17'-7"	15'-4"	14'-0"	12'-7"	17'-6"	15'-3"	13'-11"	12'-6"
	9-1/2	18'-0"	15'-8"	14'-4"	12'-10"	17'-11"	15'-7"	14'-3"	12'-9"
	11-1/4	21'-0"	18'-4"	16'-10"	15'-1"	20'-11"	18'-3"	16'-9"	15'-0"
	11-7/8	22'-1"	19'-3"	17'-8"	15'-10"	22'-0"	19'-2"	17'-7"	15'-9"
	14	25'-8"	22'-5"	19'-11"	16'-1"	25'-7"	22'-4"	20'-6"	16'-6"
	16	30'-8"	28'-2"	26'-5"	21'-4"	33'-6"	30'-9"	27'-2"	22'-0"

Live load deflection limit of L/360

Width (in.)	Depth (in.)	Simple span On center spacing				Multiple spans On center spacing			
		12"	16"	19.2"	24"	12"	16"	19.2"	24"
1-1/2	7-1/4	14'-0"	12'-2"	11'-2"	10'-0"	13'-11"	12'-1"	11'-1"	9'-11"
	9-1/4	17'-7"	15'-4"	14'-0"	12'-7"	17'-6"	15'-3"	13'-11"	12'-6"
	9-1/2	18'-0"	15'-8"	14'-4"	12'-10"	17'-11"	15'-7"	14'-3"	12'-9"
	11-1/4	21'-0"	18'-4"	16'-10"	15'-1"	20'-11"	18'-3"	16'-9"	15'-0"
	11-7/8	22'-1"	19'-3"	17'-8"	15'-10"	22'-0"	19'-2"	17'-7"	15'-9"
	14	25'-8"	22'-5"	19'-11"	16'-1"	25'-7"	22'-4"	20'-6"	16'-6"
	16	32'-8"	30'-3"	26'-5"	21'-4"	36'-11"	32'-4"	27'-2"	22'-0"

### Notes:

1. The tabulated clear spans are applicable to residential floor construction meeting the above design criteria and are based on a sheathing thickness of 19/32 inch (40/20 or 20 oc) for a joist spacing of 19.2 inches or less, or 23/32 inch (48/24 or 24 oc) for a joist spacing of 24 inches.
2. For multiple-span applications, the end spans shall be 40% or more of the adjacent span.
3. Joist shall be laterally supported at points of bearing and along all compression edges.
4. Minimum bearing length shall be 1-1/2 inch for end bearings and 3-1/2 inches for intermediate bearings.

## Allowable Roof Spans

### Design Criteria

Span:	Simple span
Load:	Dead load = 15 psf
Deflection limit:	L/240 under snow load and L/180 under total load
Service conditions:	Dry

### Allowable Roof Spans

Snow load = 30 psf

Width (in.)	Depth (in.)	Slope of $\leq 4:12$ On center spacing			Slope of $>4:12$ to $8:12$ On center spacing			Slope of $>8:12$ to $12:12$ On center spacing		
		12"	16"	24"	12"	16"	24"	12"	16"	24"
1-1/2	7-1/4	16'-4"	14'-6"	11'-11"	15'-4"	14'-0"	11'-7"	14'-2"	12'-11"	11'-3"
	9-1/4	20'-9"	18'-5"	15'-2"	19'-6"	17'-10"	14'-9"	18'-0"	16'-6"	14'-3"
	9-1/2	21'-3"	18'-11"	15'-7"	20'-0"	18'-3"	15'-2"	18'-6"	16'-11"	14'-8"
	11-1/4	25'-1"	22'-4"	18'-5"	23'-7"	21'-7"	17'-11"	21'-9"	20'-0"	17'-4"
	11-7/8	26'-5"	23'-6"	19'-5"	24'-10"	22'-9"	18'-11"	23'-0"	21'-1"	18'-3"
	14	31'-0"	27'-4"	20'-10"	29'-2"	26'-7"	19'-9"	26'-11"	24'-8"	18'-5"
	16	36'-9"	33'-8"	28'-1"	34'-6"	31'-8"	27'-11"	31'-10"	29'-3"	25'-10"

Snow load = 40 psf

Width (in.)	Depth (in.)	Slope of $\leq 4:12$ On center spacing			Slope of $>4:12$ to $8:12$ On center spacing			Slope of $>8:12$ to $12:12$ On center spacing		
		12"	16"	24"	12"	16"	24"	12"	16"	24"
1-1/2	7-1/4	15'-2"	13'-2"	10'-10"	14'-5"	12'-11"	10'-7"	13'-5"	12'-3"	10'-4"
	9-1/4	19'-3"	16'-9"	13'-9"	18'-4"	16'-5"	13'-6"	17'-1"	15'-7"	13'-1"
	9-1/2	19'-9"	17'-3"	14'-2"	18'-10"	16'-10"	13'-10"	17'-6"	16'-0"	13'-6"
	11-1/4	23'-3"	20'-4"	16'-9"	22'-3"	19'-10"	16'-4"	20'-8"	18'-11"	15'-9"
	11-7/8	24'-6"	21'-5"	17'-4"	23'-6"	20'-11"	16'-7"	21'-9"	19'-11"	15'-8"
	14	28'-6"	24'-11"	17'-3"	27'-7"	24'-2"	16'-6"	25'-6"	22'-9"	15'-6"
	16	34'-7"	31'-9"	23'-3"	32'-7"	29'-11"	24'-0"	30'-3"	27'-9"	24'-5"

### Notes:

1. The tabulated spans are based on the horizontal distance between inside face of supports and are applicable to residential roof construction meeting the above design criteria.
2. Joist shall be laterally supported at points of bearing and along all compression edges.
3. Minimum bearing length shall be 1-1/2 inch for end bearings.