



Dimensional Lumber Spline
Figure 1: SIP Spline Types

Table 1: Basic Properties^{1, 2}

| Property | Weak-Axis Bending | Strong-Axis Bending |
|---|-------------------|---------------------|
| Allowable Tensile Stress, F_t (psi) | 245 | 495 |
| Allowable Compressive Stress, F_c (psi) | 340 | 580 |
| Elastic Modulus (Bending), E_b (psi) 7 | 738900 | 658800 |
| Shear Modulus, G (psi) | 270 | 405 |
| Allowable Core Shear Stress, F_v (psi) | 4.5 | 5.0 |
| Core Compressive Modulus, E_c (psi) | 360 | 360 |
| Reference Depth, h_o (in.) | 4.625 | 4.625 |
| Shear Depth Factor Exponent, m | 0.84 | 0.84 |

¹ All properties are based on a minimum panel width of 24-inches.

² Refer to NTA IM14 TIP 01 SIP Design Guide for details on engineered design using basic panel properties.

Table 2: Section Properties

| Panel Thickness, h (in.) | Core Thickness, c (in.) | Dead Weight, w_d (psf) | Facing Area, A_f (in. ² /ft) | Shear Area, A_v (in. ² /ft) | Moment of Inertia, I (in. ⁴ /ft) | Section Modulus, S (in. ³ /ft) | Radius of Gyration, r (in.) | Centroid-to-Facing Dist., y_c (in.) |
|----------------------------|---------------------------|--------------------------|---|--|---|---|-------------------------------|---------------------------------------|
| 4.625 | 3.75 | 3.2 | 10.50 | 50.3 | 46.0 | 19.9 | 2.09 | 2.31 |
| 6.50 | 5.625 | 3.3 | 10.50 | 72.8 | 96.5 | 29.7 | 3.03 | 3.25 |
| 8.25 | 7.375 | 3.5 | 10.50 | 93.8 | 160.2 | 38.8 | 3.91 | 4.13 |
| 10.25 | 9.375 | 3.6 | 10.50 | 117.8 | 252.7 | 49.3 | -- | -- |
| 12.25 | 11.375 | 3.8 | 10.50 | 141.8 | 366.3 | 59.8 | -- | -- |

Table 3: Allowable Uniform Transverse Loads^{1,4}

| Panel Length (ft) | 4-5/8-inch Thick SIP | | | 6-1/2-inch Thick SIP | | |
|--------------------------|-------------------------------|-------|-------|-------------------------------|-------|-------|
| | Deflection Limit ² | | | Deflection Limit ² | | |
| | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 |
| 8 WAB³ | 50.8 | 40.9 | 27.3 | 73.8 | 64.7 | 43.1 |
| 8 | 68.8 | 51.6 | 34.4 | 80.6 | 80.6 | 56.6 |
| 10 | 45.1 | 33.8 | 22.5 | 62.0 | 57.9 | 38.6 |
| 12 | 30.8 | 23.1 | 15.4 | 50.4 | 40.9 | 27.3 |
| 14 | 21.7 | 16.3 | -- | 39.6 | 29.7 | 19.8 |
| 16 | -- | -- | -- | 29.4 | 22.1 | 14.7 |
| 18 | -- | -- | -- | 22.4 | 16.8 | -- |

See Table 4 for notes.

Table 4: Allowable Uniform Transverse Loads (continued)^{1,4}

| Panel Length (ft) | 8-1/4-inch Thick SIP | | | 10-1/4-inch Thick SIP | | | 12-1/4-inch Thick SIP | | |
|--------------------------|-------------------------------|-------|-------|-------------------------------|-------|-------|-------------------------------|-------|-------|
| | Deflection Limit ² | | | Deflection Limit ² | | | Deflection Limit ² | | |
| | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 | L/180 | L/240 | L/360 |
| 8 WAB³ | 81.4 | 81.4 | 58.3 | 89.9 | 89.9 | 75.9 | 98.6 | 98.6 | 93.6 |
| 8 | 88.5 | 88.5 | 78.4 | 97.3 | 97.3 | 97.3 | 106.4 | 106.4 | 106.4 |
| 10 | 67.4 | 67.4 | 54.8 | 73.1 | 73.1 | 73.1 | 78.8 | 78.8 | 78.8 |
| 12 | 54.4 | 54.4 | 39.6 | 58.6 | 58.6 | 54.6 | 62.5 | 62.5 | 62.5 |
| 14 | 45.6 | 43.9 | 29.3 | 48.8 | 48.8 | 41.1 | 51.9 | 51.9 | 51.9 |
| 16 | 39.3 | 33.2 | 22.1 | 41.9 | 41.9 | 31.5 | 44.3 | 44.3 | 41.7 |
| 18 | 34.1 | 25.6 | 17.1 | 36.7 | 36.7 | 24.6 | 38.7 | 38.7 | 32.9 |
| 20 | 26.7 | 20.0 | 13.4 | 32.6 | 29.2 | 19.5 | 34.3 | 34.3 | 26.3 |

¹ Table values assume a simply supported panel with 1.5-inches of continuous bearing on facing at supports ($C_v = 1.0$) with splines at bearing locations. Values do not include the dead weight of the panel. $C_v=0.4$ Shall be used where no bearing is provided.

² Deflection limit shall be selected by building designer based on the serviceability requirements of the structure and the requirements of adopted building code. Deflection values based on loads of short duration only and do not consider effects of creep.

³ Tabulated values are based on the strong-axis of the facing material oriented parallel to the span direction. WAB indicates weak-axis bending of the facing material (i.e. the facing material weak-axis is parallel to the span direction).

⁴ Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.

Table 5: Allowable Axial Loads (plf)^{1,2,3,4}

| Lateral Brace Spacing (ft) | Panel Thickness | | |
|----------------------------|-----------------|--------------|--------------|
| | 4-5/8-inches | 6-1/2-inches | 8-1/4-inches |
| 8 WAB ⁵ | 2320 | 2470 | 2530 |
| 8 | 3630 | 4070 | 4240 |
| 10 | 3260 | 3890 | 4130 |
| 12 | 2810 | 3660 | 4000 |
| 14 | -- | 3390 | 3830 |
| 16 | -- | 3090 | 3640 |
| 18 | -- | 2790 | 3430 |
| 20 | -- | -- | 3190 |

1. Permanent loads, such as dead load, shall not exceed 0.50 times the tabulated load.
2. All values are for normal duration and may not be increased for other durations.
3. Axial loads shall be applied concentrically to the top of the panel through repetitive members spaced not more than 24-inches on center. Such members shall be fastened to a rim board or similar member to distribute along the top of the SIP.
4. The ends of both facings must bear on the supporting foundation or structure to achieve the tabulated axial loads.
5. Tabulated values are based on the strong-axis of the facing material oriented parallel to the span direction. WAB indicates weak-axis bending of the facing material (i.e. the facing material weak-axis is parallel to the span direction).

Table 6: Allowable In-Plane Shear Strength (Pounds per Foot) for SIP Shear Walls (Wind and Seismic Loads in Seismic Design Categories A, B and C)^{1,2}

| Spline Type ³ | Nominal SIP Thickness (in.) | Minimum Facing Connections ^{2,4} | | | Shear Strength (plf) |
|--------------------------|-----------------------------|---|-----------------------------|-----------------------------|----------------------|
| | | Chord ² P | late ² | Spline ³ | |
| Block or Surface Spline | 4.625 | 0.131"x 2-1/2" nails, 6" oc | 0.131"x 2-1/2" nails, 6" oc | 0.131"x 2-1/2" nails, 6" oc | 380 |
| | 6.625 | 0.131"x 2-1/2" nails, 6" oc | 0.131"x 2-1/2" nails, 6" oc | 0.131"x 2-1/2" nails, 6" oc | 380 |
| | 8.375 | 0.131"x 2-1/2" nails, 6" oc | 0.131"x 2-1/2" nails, 6" oc | 0.131"x 2-1/2" nails, 6" oc | 400 |

- ¹ Maximum shear wall dimension ratio shall not exceed 2:1 (height : width) for resisting wind or seismic loads.
- ² Chords, holdowns, and connection to other structural elements must be designed by a registered design professional in accordance with accepted engineering practice.
- ³ Spline type at interior panel-to-panel joints only, solid chord members are required at each end of each shearwall segment.
- ⁴ Required connections must be made on each side of the panel. Dimensional or engineered lumber shall have an equivalent specific gravity of 0.42 or greater.

Table 7: Approved Material Sources¹

| Facing | Core | Adhesive |
|--|---|--|
| Ainsworth Group of Companies Suite 3194 Bentall 4 1055 Dunsmuir Street Vancouver BC, Canada V7X 1L3: Barwick, ON (Mill 498) | ACH Corporation Plant U-37 - Fond du Lac, WI Foam-Control EPS Type I-SIP (minimum 0.95 pcf density) | Ashland Specialty Chemical Company 5200 Blazer Parkway Dublin, OH 43017: ISOSET [®] EPI WD3-A322 with ISOSETCX47 ISOSET [®] EPI WD3-A320 with ISOSETCX47 |
| Tolko Industries, Ltd. 3203 30 th Avenue Vernon BC, Canada V1T 6M1: Meadow Lake, SK (Mill 492) | Falcon Foam, A Division of Atlas Roofing Corporation 8240 Byron Center Road SW Byron Center, MI 49315: AtlaSpan Type I EPS (minimum 0.95 pcf density) | Rohm and Haas Company 2531 Technology Drive Elgin, IL 60124: MOR-AD TM M-640 MOR-AD TM M-642 MOR-AD TM M-6575 |
| MAXtek TM OSB Louisiana-Pacific Corporation Sagola, MI (Mill #407) Sales and Marketing by: Affiliated Resources, Inc. 7122 SE Milwaukie Avenue Portland, OR 97202 | Iowa EPS Products, Inc. 5554 N.E. 16 th Street Des Moines, IA 50313 Superfoam Type 11 Virgin (minimum 0.95 pcf density) | |
| | OPCO, Inc. P.O. Box 101 Latrobe, PA 15650 SIP Grade Styropor EPS (minimum 0.95 pcf density) SIP Grade Neopor [®] EPS (minimum 1.15pcf density) | |
| | Plymouth Foam 1800 Sunset Drive Plymouth, WI 53073 SIP Grade EPS with OnGuard TM (minimum 0.95 pcf density) | |
| | Polar Industries, Inc. 32 Gramar Avenue Prospect, CT 06712 Polar Core EPS Boards (minimum 0.95 pcf density) | |
| | Powerfoam Insulation 550 Murray Street/Highway 287 Midlothian, TX 76065 SIP EPS Boards (minimum 0.95 pcf density) | |

¹ Panels may be composed of any combination of approved materials. Contact NTA, Inc. for details on identification and labeling of source material.

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