



## **AdvanTech® Sheathing and Subfloor Panels**

### **Load Span Tables**

AdvanTech wood structural panels are high performance panels designed around 3 performance pillars: 1) superior moisture resistance, 2) superior strength and stiffness, and 3) highest quality and service. AdvanTech 1/2", 5/8" and 23/32" panels are made in accordance with the evaluation service report, ESR-1785, which have strength and stiffness design values that surpass what is required of commodity OSB and plywood in the product standard, PS 2-04, *Performance Standard for Wood-Based Structural-Use Panels*.

Load-span tables provided in this document are applicable to AdvanTech panels manufactured by Huber Engineered Woods LLC. Design capacities recognized in the International Code Council (ICC) evaluation service report, ESR-1785 and the product standard, PS 2-04 were used in developing these load-span tables. The design assumptions used to develop the load-span tables are reviewed in this document, and adjustment factors are provided for applications in which the design conditions differ from those assumed. The information provided in this document should be considered in its entirety when specifying AdvanTech panels for specific applications.

### **Property Standardization and Product Certification**

AdvanTech sheathing and flooring panels are certified as conforming to PS2 in addition to the higher performance requirements specified in ESR-1785 for 1/2", 5/8" and 23/32" thicknesses, which indicates that design capacities are superior to those of commodity PS2 panels. Independent third-party services for both ESR-1785 and PS 2-04 certification are provided by TECO Corporation (IAS AA-654, [www.tecotested.com](http://www.tecotested.com)).

### **Installation Requirements**

Installation recommendations for AdvanTech panels are posted on [huberwood.com](http://huberwood.com) and [advantechperforms.com](http://advantechperforms.com). For specific applications, such as for roof sheathing in high wind areas, local building code provisions may be more restrictive than the recommendations of Huber Engineered Woods. Installation provisions provided in the model building codes and ER-5637 for products certified to PS2 should also be checked. For applications in which multiple and conflicting installation requirements exist, the most restrictive installation requirements shall apply.

**TABLE 1. Uniform Load Tables for AdvanTech Flooring (Normal Duration), loads in psf**

| Span Rating   | Thickness (in) | Load Governed By | Strength Axis Perpendicular to Supports<br>(Inches, Center-to-Center of Supports) |        |        |        |        |        |        |        |        | Strength Axis Parallel to Supports<br>(Inches, Center-to-Center of Supports) |        |        |     |
|---|----------------|------------------|---|--------|--------|--------|--------|--------|--------|--------|--------|--|--------|--------|-----|
|   |                |                  | 12  | 16     | 19.2   | 24     | 30     | 32     | 36     | 40     | 48     | 12   | 16     | 24     |     |
| 20 oc   | 19/32          | Deflection       | L/720   | 457    | 172    | 94     | 46     | 22     | 18     | 13     | 9      | 5  | 88     | 33     | 9   |
|   |                |                  | L/600   | 548    | 206    | 113    | 55     | 27     | 22     | 15     | 11     | 6  | 106    | 40     | 11  |
|   |                |                  | L/480   | 685    | 258    | 141    | 68     | 33     | 27     | 19     | 14     | 8  | 132    | 50     | 13  |
|   |                |                  | L/360   | 914    | 344    | 188    | 91     | 45     | 36     | 25     | 18     | 10   | 176    | 66     | 18  |
|   |                |                  | L/240   | 1,370  | 516    | 282    | 137    | 67     | 55     | 38     | 27     | 15   | 264    | 99     | 26  |
|   |                | L/180            | 1,827   | 687    | 376    | 182    | 89     | 73     | 50     | 36     | 20     | 352  | 133    | 35     |     |
|   |                | Bending          | 479   | 270    | 187    | 120    | 77     | 67     | 53     | 43     | 30     | 208  | 117    | 52     |     |
|   |                | Shear            | 390   | 283    | 232    | 182    | 144    | 134    | 119    | 106    | 88     | 390  | 283    | 182    |     |
| 24 oc<br>ESR-1785<br>AT 1.05  | 23/32          | Deflection       | L/720   | 835    | 314    | 172    | 83     | 41     | 33     | 23     | 16     | 9  | 337    | 127    | 43  |
|   |                |                  | L/600   | 1,002  | 377    | 206    | 100    | 49     | 40     | 35     | 25     | 16   | 405    | 152    | 51  |
|   |                |                  | L/480   | 1,252  | 471    | 258    | 125    | 61     | 50     | 44     | 31     | 21   | 506    | 190    | 64  |
|   |                |                  | L/360   | 1,670  | 628    | 344    | 166    | 82     | 67     | 58     | 42     | 27   | 674    | 254    | 86  |
|   |                |                  | L/240   | 2,505  | 942    | 516    | 250    | 122    | 100    | 88     | 63     | 41   | 1,011  | 381    | 128 |
|   |                | L/180            | 3,339   | 1,256  | 687    | 333    | 163    | 133    | 117    | 84     | 55     | 1,349  | 507    | 171    |     |
|   |                | Bending          | 1,042   | 586    | 407    | 260    | 167    | 146    | 93     | 75     | 52     | 592  | 333    | 118    |     |
|   |                | Shear            | 695   | 503    | 412    | 324    | 256    | 239    | 203    | 182    | 157    | 695  | 503    | 311    |     |
| 32 oc   | 7/8, 1         | Deflection       | L/720   | 1,414  | 532    | 291    | 141    | 69     | 56     | 49     | 36     | 23   | 511    | 192    | 65  |
|   |                |                  | L/600   | 1,697  | 638    | 349    | 169    | 83     | 68     | 59     | 43     | 28   | 613    | 231    | 78  |
|   |                |                  | L/480   | 2,121  | 798    | 437    | 211    | 104    | 84     | 74     | 53     | 35   | 767    | 288    | 97  |
|   |                |                  | L/360   | 2,828  | 1,064  | 582    | 282    | 138    | 113    | 99     | 71     | 46   | 1,022  | 385    | 130 |
|   |                |                  | L/240   | 4,242  | 1,596  | 873    | 423    | 207    | 169    | 148    | 107    | 70   | 1,534  | 577    | 195 |
|   |                | L/180            | 5,656   | 2,128  | 1,164  | 564    | 276    | 225    | 198    | 142    | 93     | 2,045  | 769    | 260    |     |
|   |                | Bending          | 875   | 492    | 342    | 219    | 140    | 123    | 78     | 63     | 44     | 571  | 321    | 114    |     |
|   |                | Shear            | 571   | 414    | 339    | 267    | 211    | 197    | 167    | 150    | 129    | 571  | 414    | 256    |     |
| 48 oc   | 1-1/8          | Deflection       | L/720   | 2,502  | 941    | 515    | 249    | 122    | 100    | 88     | 63     | 41   | 1,077  | 405    | 137 |
|   |                |                  | L/600   | 3,002  | 1,129  | 618    | 299    | 147    | 120    | 105    | 75     | 49   | 1,292  | 486    | 164 |
|   |                |                  | L/480   | 3,752  | 1,412  | 772    | 374    | 183    | 149    | 131    | 94     | 62   | 1,615  | 608    | 205 |
|   |                |                  | L/360   | 5,003  | 1,882  | 1,030  | 499    | 244    | 199    | 175    | 126    | 82   | 2,154  | 810    | 273 |
|   |                |                  | L/240   | 7,505  | 2,823  | 1,545  | 748    | 367    | 299    | 263    | 189    | 123  | 3,230  | 1,215  | 410 |
|   |                | L/180            | 10,006  | 3,764  | 2,060  | 998    | 489    | 399    | 350    | 252    | 164    | 4,307  | 1,620  | 547    |     |
|   |                | Bending          | 1,583   | 891    | 618    | 396    | 253    | 223    | 141    | 114    | 79     | 1,000  | 563    | 200    |     |
|   |                | Shear            | 733   | 531    | 435    | 342    | 270    | 252    | 214    | 192    | 166    | 733  | 531    | 329    |     |
| Continuous Spans  |                |                  | 3-span  | 3-span | 3-span | 3-span | 3-span | 3-span | 2-span | 2-span | 2-span | 3-span   | 3-span | 2-span |     |
| Normal Duration of load, dry-end use conditions, minimum panel width 24-inches, panels applied over multiple spans as indicated |                |                  |   |        |        |        |        |        |        |        |        |  |        |        |     |

| Span Rating   | Thickness (in) | Load Governed By | Strength Axis Perpendicular to Supports<br>(Inches, Center-to-Center of Supports) |        |        |        |        |        |        |        |        | Strength Axis Parallel to Supports<br>(Inches, Center-to-Center of Supports) |        |        |    |
|---|----------------|------------------|---|--------|--------|--------|--------|--------|--------|--------|--------|--|--------|--------|----|
|   |                |                  | 12  | 16     | 19.2   | 24     | 30     | 32     | 36     | 40     | 48     | 12   | 16     | 24     |    |
| 32/16<br>ESR-1785<br>AT 1.10<br>Struct 1  | 1/2            | Deflection       | L/720   | 291    | 109    | 60     | 29     | 14     | 12     | 10     | 7      |  | 126    | 47     | 16 |
|   |                |                  | L/600   | 349    | 131    | 72     | 35     | 17     | 14     | 12     | 9      |  | 151    | 57     | 19 |
|   |                |                  | L/480   | 436    | 164    | 90     | 44     | 21     | 17     | 15     | 11     |  | 189    | 71     | 24 |
|   |                |                  | L/360   | 582    | 219    | 120    | 58     | 28     | 23     | 20     | 15     | 10   | 252    | 95     | 32 |
|   |                |                  | L/240   | 873    | 328    | 180    | 87     | 43     | 35     | 31     | 22     | 14   | 378    | 142    | 48 |
|   |                | L/180            | 1,164   | 438    | 240    | 116    | 57     | 46     | 41     | 29     | 19     | 505  | 190    | 64     |    |
|   |                | Bending          | 554   | 312    | 216    | 139    | 89     | 78     | 49     | 40     | 28     | 333  | 188    | 67     |    |
|   |                | Shear            | 533   | 386    | 316    | 249    | 196    | 184    | 156    | 140    | 121    | 533  | 386    | 239    |    |
| 40/20<br>ESR-1785<br>AT 1.10<br>Struct 1  | 5/8            | Deflection       | L/720   | 557    | 209    | 115    | 56     | 27     | 22     | 19     | 14     | 9  | 248    | 93     | 31 |
|   |                |                  | L/600   | 668    | 251    | 138    | 67     | 33     | 27     | 23     | 17     | 11   | 298    | 112    | 38 |
|   |                |                  | L/480   | 835    | 314    | 172    | 83     | 41     | 33     | 29     | 21     | 14   | 372    | 140    | 47 |
|   |                |                  | L/360   | 1,114  | 419    | 229    | 111    | 54     | 44     | 39     | 28     | 18   | 496    | 187    | 63 |
|   |                |                  | L/240   | 1,671  | 628    | 344    | 167    | 82     | 67     | 58     | 42     | 27   | 744    | 280    | 94 |
|   |                | L/180            | 2,227   | 838    | 458    | 222    | 109    | 89     | 78     | 56     | 37     | 992  | 373    | 126    |    |
|   |                | Bending          | 863   | 485    | 337    | 216    | 138    | 121    | 77     | 62     | 43     | 521  | 293    | 104    |    |
|   |                | Shear            | 667   | 483    | 395    | 311    | 246    | 230    | 195    | 175    | 151    | 667  | 483    | 299    |    |
| Continuous Spans  |                |                  | 3-span  | 3-span | 3-span | 3-span | 3-span | 3-span | 2-span | 2-span | 2-span | 3-span   | 3-span | 2-span |    |
| Normal Duration of load, dry-end use conditions, minimum panel width 24-inches, panels applied over multiple spans as indicated |                |                  |   |        |        |        |        |        |        |        |        |  |        |        |    |

### **Deflection Serviceability**

The deflection criteria used to develop the uniform loads in Table 1 and Table 2 are typical of the limits commonly used for most conventional design applications. The structural-use panel component of floor, roof, and wall systems is but one factor influencing system serviceability. Support spans and spacings may require more restrictive deflection limitations for the panel component. For example, panels with a 24 oc span rating installed over joists spaced 24-inches on-center may exhibit unacceptable deflection under foot traffic, despite the fact that the panels comply with conventional design criteria and building code requirements. Similarly, conventional deflection criteria may not be adequate for floor applications in which relatively brittle floor coverings are used, such as ceramic or marble tile.

Table 3 provides absolute deflection values associated with deflection criteria and support spacings provided in Tables 1 and 2.

**TABLE 3. Deflection limits for specific deflection criteria and support spacings (spans)**

| Deflection<br>Criteria | Deflection Limits, inches |       |       |       |       |       |       |       |       |
|------------------------|---------------------------|-------|-------|-------|-------|-------|-------|-------|-------|
|                        | Span, in. c-c             |       |       |       |       |       |       |       |       |
|                        | 12                        | 16    | 19.2  | 24    | 30    | 32    | 36    | 40    | 48    |
| L/720                  | 0.017                     | 0.022 | 0.027 | 0.033 | 0.042 | 0.044 | 0.050 | 0.056 | 0.067 |
| L/600                  | 0.020                     | 0.027 | 0.032 | 0.040 | 0.050 | 0.053 | 0.060 | 0.067 | 0.080 |
| L/480                  | 0.025                     | 0.033 | 0.040 | 0.050 | 0.063 | 0.067 | 0.075 | 0.083 | 0.100 |
| L/360                  | 0.033                     | 0.044 | 0.053 | 0.067 | 0.083 | 0.089 | 0.100 | 0.111 | 0.133 |
| L/240                  | 0.050                     | 0.067 | 0.080 | 0.100 | 0.125 | 0.133 | 0.150 | 0.167 | 0.200 |
| L/180                  | 0.067                     | 0.089 | 0.107 | 0.133 | 0.167 | 0.178 | 0.200 | 0.222 | 0.267 |

### **Primary and Secondary Structural Axes**

The primary axis referenced in the Uniform Load Span Tables is that with higher stiffness and strength capacities relative to the secondary axis. For typical 4 x 8-ft. panels, the primary axis corresponds to the 8-ft. panel dimension and the secondary axis corresponds to the 4-ft. panel dimension. If the primary axis does not correspond to the panel length dimension, the primary axis ("strength" axis) will be stamped on the panel.

### **Design Assumptions and Adjustment Factors**

**Design Criteria:** Allowable uniformly-distributed loads are provided for each product-span combination as limited by bending strength (moment) capacity, planar shear capacity, and deflection criteria. Allowable uniformly-distributed loads provided in Tables 1 and 2 are applicable to design of the panel component only.

**Panel Width:** Allowable uniformly-distributed loads provided in Tables 1 and 2 are applicable to panels with widths of two-feet or greater applied over either two or three continuous spans as specified in the tables. If allowed in a specific application by local building code officials, panels as narrow as one-foot in width may be used, but with reductions in allowable loads. Allowable loads for panels one-foot in width are fifty-percent (50%) of those provided in Tables 1 and 2. Allowable loads for panel widths intermediate between one- and two-feet shall be determined by linear interpolation. For example, allowable loads for panels 18-inches in width are seventy-five percent (75%) of values provided in Tables 1 and 2. Panel widths narrower than one-foot are not recommended.

**Panel Moisture Content:** Allowable uniformly-distributed loads provided in Tables 1 and 2 are applicable for end-use conditions in which the equilibrium moisture content of the AdvanTech panels is less than 16%. AdvanTech panels are not suitable for use in applications in which the in-service panel equilibrium moisture content is greater than or equal to 16%.

**Span Conditions:** The number of continuous spans assumed in developing the allowable loads in Tables 1 and 2 is provided in the bottom row of each table. When span conditions differ from those assumed in Tables 1 and 2, adjustment factors provided in Table 4 shall be applied to the tabulated loads. These adjustment factors are simply ratios of constants in corresponding design equations. As is evident in the Table 4 adjustment factors, single span applications are generally inefficient and should be avoided whenever possible.

**TABLE 4. Span Adjustment Factors**

|            | 3-spans to 2-spans | 3-spans to 1-span | 2-spans to 1-span |
|------------|--------------------|-------------------|-------------------|
| Deflection | 1.27               | 0.53              | 0.42              |
| Moment     | 0.80               | 0.80              | 1.00              |
| Shear      | 0.96               | 1.20              | 1.25              |

**Duration of Load:** Allowable loads, limited in Tables 1 and 2 by bending and planar shear strength capacities, are based on normal duration of load<sup>1</sup>. Since panel strength design capacities are dependent upon duration of loading, corresponding allowable loads shall be adjusted when the design load duration differs from the assumed normal duration of load. Duration of load adjustment factors are provided in Table 5.

**Table 5. Duration of Load Adjustment Factors**

| Load Duration | Adjustment Factor | Typical Design Condition |
|---------------|-------------------|--------------------------|
| Permanent     | 0.9               | Dead Load                |
| Ten Years     | 1.0               | Occupancy Live Load      |
| Two Months    | 1.15              | Snow Load                |
| Seven Days    | 1.25              | Construction Load        |
| Ten Minutes   | 1.6               | Wind or Earthquake       |
| Impact        | 2.0               | Impact Load              |

Factors are applicable to moment and shear, not to deflection

Ref. AF&PA National Design Specification

**Long-Term Deflection:** Uniform loads limited in Tables 1 and 2 by deflection criteria (deflection limits) are based on the assumption of initial elastic deflection. Wood products under constant (permanent) loading may exhibit long-term (creep) deflection. For seasoned (dry) wood products, creep deflection may be as much as 1.5 times that of initial elastic deflection. Creep deflection may be a design consideration if the dead load or sustained live load represents a high percentage of the total design load. Significant permanent loads are not typical of conventional panel applications, so creep deflection is not usually considered in panel design. However, use of the full dead load in determination of the total design load limited by deflection represents consideration of creep effects.

<sup>1</sup> Normal duration of load represents application of full design load for a period of ten years, either continuously or cumulatively.

**Support Width:** In developing the allowable uniformly-distributed loads provided in Tables 1 and 2, the support width was assumed to be 1.5 inches for support spacings (panel spans) less than 48-inches, and 3.5 inches for 48-inch support spacings.

**Panel Edge Support and Maximum Spans:** Building code provisions limit maximum spans of span-rated panels used in conventional applications. Maximum span limitations reflect consideration of PS2 performance criteria for concentrated static and impact loads as well as uniform loads. Panel edge support conditions are also considered in establishing maximum spans for roof applications.

Table 6 summarizes the maximum span and edge support provisions of the 2006 International Residential Code for One- and Two-Family Dwellings (Table R503.2.1.1(1)). Maximum spans for floor applications may be increased in some cases with the use of specific finish flooring - check governing code provisions.

**TABLE 6. Building Code Maximum Span and Edge Support Provisions**

| Span Rating     | Maximum Span, inches c-c |                      |              |          |
|-----------------|--------------------------|----------------------|--------------|----------|
|                 | Roof                     |                      | Floor        |          |
|                 | With Edge Support        | Without Edge Support | Single Floor | Subfloor |
| 20 oc           | 32                       | 32                   | 20           | --       |
| 24 oc           | 48                       | 36                   | 24           | --       |
| Str. 1<br>32/16 | 32                       | 28                   | --           | 16       |
| Str. 1<br>40/20 | 40                       | 32                   | --           | 20       |

Edge support may be provided by tongue-and-groove edges, edge clips (one spaced midway between supports, except two equally spaced when span is 48 inches), lumber blocking, or other approved type of edge support.

Single Floor panels are combined subfloor-underlayment panels.

## **Example - Use of Load-Span Tables**

**Roof Application:** Determine allowable uniform live load and total load for 1/2" Structural 1 Sheathing 32/16 AdvanTech for application in a roof system subject to snow loads. The primary axis is applied perpendicular to roof trusses spaced 24-inches on center. The snow load duration adjustment factor of 1.15 is provided in Table 5. Assume a nominal dead load of 10 psf. As summarized in Table 7, the specified panels can support a live load of 87 psf and a total load of 116 psf.

**TABLE 7. Roof application example, supports 24" o.c.**

Structural 1 Sheathing 32/16, Roof Application, Snow Load Duration

| Load Limited by | Table 1, 24" o.c. | Duration of Load | Adjusted Loads | Nominal Dead Load | <b>Allowable Live Load</b> | <b>Allowable Total Load</b> |
|-----------------|-------------------|------------------|----------------|-------------------|----------------------------|-----------------------------|
| L/240           | 87                | 1.0              | 87             | n.a.              | 87                         | n.a.                        |
| L/180           | 116               | 1.0              | 116            | 10                | 106                        | 116                         |
| Moment          | 138               | 1.15             | 159            | 10                | 149                        | 159                         |
| Shear           | 249               | 1.15             | 286            | 10                | 276                        | 286                         |
|                 |                   |                  |                |                   | <b>87</b>                  | <b>116</b>                  |

Allowable Live Load of 87 psf is limited by L/240 deflection criterion.

Allowable Total Load of 116 psf is limited by L/180 deflection criterion.