



**ENGINEERED
WOODS**

Load-Span Tables for AdvanTech® VIP+ Panels

Load-span tables provided in this document are applicable to AdvanTech® VIP+® panels manufactured by Huber Engineered Woods LLC. Design capacities recognized in ICC Evaluation Service Legacy Report ER-1785 were used in developing the 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 VIP+ panels for specific applications.

Property Standardization and Product Certification

The Voluntary Inspection Program (VIP), developed by the PFS Research Foundation (www.pfsrf.org), requires monitoring of product properties by an independent third-party organization. Physical and mechanical properties of AdvanTech panels certified as VIP are standardized to common levels across various manufacturing facilities. Property standardization is a prerequisite for development of design capacities. AdvanTech VIP+ panels are also certified as conforming to U.S. Department of Commerce Voluntary Product Standard PS2. The plus symbol "+" appended to the VIP designation indicates that design capacities are superior to those of commodity PS2 panels. Independent third-party services for both VIP+ and PS2 certification are provided by TECO Corporation (IAS AA-654, www.tecotested.com).

Installation Requirements

Installation recommendations for AdvanTech VIP+ panels are posted on the Huber Engineered Woods website (www.huberwood.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 ICBO ES 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 Table¹ for AdvanTech VIP+, loads in psf.

Span Rating	Thickness (in)		Load Governed By	Strength Axis Perpendicular to Supports (Inches, Center-to-Center of Supports)									Strength Axis Parallel to Supports (Inches, Center-to-Center of Supports)			
				12	16	19.2	24	30	32	36	40	48	12	16	24	
AT 1.10 Struct 1 32/16	1/2	Deflection	L/360	582	219	120	58	28	23	20	15	10		252	56	19
			L/240	873	328	180	87	43	35	31	22	14		378	83	28
			L/180	1,164	438	240	116	57	46	41	29	19		505	111	38
			Bending	554	312	216	139	89	78	49	40	28		333	84	30
			Shear	533	366	316	249	196	184	156	140	121		533	366	175
AT 1.10 Struct 1 40/20	5/8	Deflection	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
AT 1.10 20 oc	19/32	Deflection	L/360	1,031	388	212	103	50	41	36	26	17		458	172	58
			L/240	1,547	582	318	154	76	62	54	39	25		687	258	87
			L/180	2,062	776	424	206	101	82	72	52	34		916	345	116
			Bending	796	448	311	199	127	112	71	57	40		479	270	96
			Shear	638	462	379	298	235	220	186	167	145		638	462	286
AT 1.10 24 oc	23/32, 3/4	Deflection	L/360	1,635	615	336	163	80	65	57	41	27		718	270	91
			L/240	2,452	922	505	244	120	98	86	62	40		1,077	405	137
			L/180	3,269	1,230	673	326	160	130	114	82	54		1,436	540	182
			Bending	1,083	609	423	271	173	152	96	78	54		654	368	131
			Shear	743	538	441	347	274	256	217	194	168		743	538	333
AT 1.05 24 oc	23/32, 3/4	Deflection	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
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	

¹ Normal duration of load, dry end-use conditions, minimum panel width 24-inches, panels applied over multiple spans as indicated. See design assumption information.

TABLE 2. Uniform Load Table¹ for AdvanTech VIP+, loads in psf.

Span Rating	Thickness (in)		Load Governed By	Strength Axis Perpendicular to Supports (Inches, Center-to-Center of Supports)									Strength Axis Parallel to Supports (Inches, Center-to-Center of Supports)			
				12	16	19.2	24	30	32	36	40	48	12	16	24	
AT 1.10 Struct 1 32/16	1/2	Deflection	L/720	291	109	60	29	14	12	10	7			126	28	9
			L/600	349	131	72	35	17	14	12	9			151	33	11
			L/480	436	164	90	44	21	17	15	11			189	42	14
			Bending	554	312	216	139	89	78	49	40	28		333	84	30
			Shear	533	366	316	249	196	184	156	140	121		533	366	175
AT 1.10 Struct 1 40/20	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
			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
AT 1.10 20 oc	19/32, 5/8	Deflection	L/720	516	194	106	51	25	21	18	13	8		229	86	29
			L/600	619	233	127	62	30	25	22	16	10		275	103	35
			L/480	773	291	159	77	38	31	27	19	13		343	129	44
			Bending	796	448	311	199	127	112	71	57	40		479	270	96
			Shear	638	462	379	298	235	220	186	167	145		638	462	286
AT 1.10 24 oc	23/32, 3/4	Deflection	L/720	817	307	168	81	40	33	29	21	13		359	135	46
			L/600	981	369	202	98	48	39	34	25	16		431	162	55
			L/480	1,226	461	252	122	60	49	43	31	20		538	203	68
			Bending	1,083	609	423	271	173	152	96	78	54		654	368	131
			Shear	743	538	441	347	274	256	217	194	168		743	538	333
AT 1.05 24 oc	23/32, 3/4	Deflection	L/720	835	314	172	83	41	33	29	21	13		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
			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
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	

¹ Normal duration of load, dry end-use conditions, minimum panel width 24-inches, panels applied over multiple spans as indicated. See design assumption information.

Deflection Serviceability

The deflection criteria used to develop the uniform loads in Table 1 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.

The uniform loads provided in Table 2 are based on more restrictive deflection criteria for use in applications with more demanding deflection performance requirements. In addition, 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 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 Tables 1 and 2 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 in Table 1 for each product-span combination as limited by bending strength (moment) capacity, planar shear capacity, and conventional deflection criteria (span/360, span/240, and span/180). Table 2 provides allowable uniformly-distributed loads with more restrictive deflection criteria than those considered for Table 1. Allowable uniformly-distributed loads provided in Tables 1 and 2 are applicable to design of the panel component only. Relatively high allowable loads are provided with a shaded background as a reminder that design capacities of the support members may control.

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 VIP+ panels is less than 16%. AdvanTech VIP+ 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 load¹. 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.

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.

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

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 2000 International Residential Code for One- and Two-Family Dwellings (Table R503.2.1). 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 32/16	32	28	--	16
Str. 1 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.

Ref. 2000 ICC International Residential Code for One- and Two-Family Dwellings.

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 VIP+ 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	Allowable Live Load	Allowable Total Load
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
					87	116

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.