

GENERAL

Anvil International manufacturers sway brace and seismic products designed to rigidly brace piping systems subjected to seismic loads. Anvil's breadth of products have been manufactured and tested in accordance with ANSI/UL 203A, FM-1950, ANSI/FM-1950, ANSI/MSS SP-58, & MSS SP-127 and are listed for use in NFPA 13 applications.

GENERAL

- It is the responsibility of the design engineer and the Authority Having Jurisdiction (AHJ) to ensure all products and design loads chosen are applicable for the specified application.
- The following information may be used as reference to properly design and engineer sway brace and seismic assemblies.
- All product specific information may be found on the applicable product literature or submittal. If there are any discrepancies found between information listed on the Anvil literature, submittal, Anvil's design software (Seisbrace), UL website, FM website, or this document, please contact Anvil International.
- The lowest capacity for an anchor or seismic bracing product within a brace assembly shall be the controlling load capacity for the assembly.

UNITS

- Dimensions listed within this document are listed in inches unless otherwise noted.
- Load capacities listed within this document are listed in pounds force unless otherwise noted.
- If a dimension is listed with a "D", the dimension was not listed within NFPA or it is not a dimension critical to the anchor or fastener.
- If a load capacity is listed with a "D", the load capacity does not exist for the specified application.

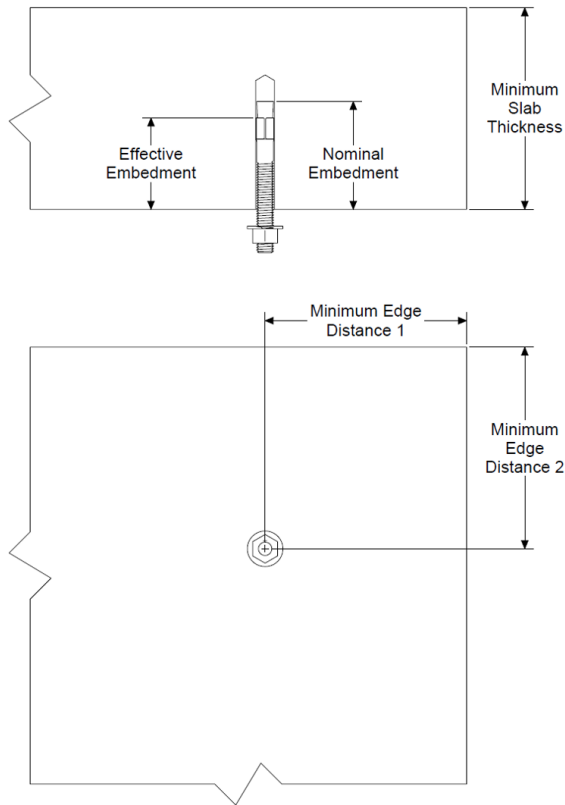
WOOD FASTENERS

- Through bolts, lag screws, and lag bolts should be installed with the design load perpendicular to the grain of the wood.
- Lag screws and lag bolts should be installed with predrilled holes using industry standard practices.
- Wood Fasteners installed in the side of a wood beam in accordance with NFPA 13 must be installed in the upper half of the beam and must be at least 3 inches from the bottom of the beam.
- Some states and counties do not allow the use of lag screws and lag bolts in seismic designs. It shall be the responsibility of the design engineer and the authority having jurisdiction to ensure that all fasteners meet the requirements of federal, state and local building codes.

CONCRETE FASTENERS

- Load capacities and prying factors listed for concrete fasteners which do not come from NFPA 13 were calculated by a Registered Professional Engineer. Calculations may be provided upon request.
- Load capacities listed for fasteners installed in cracked concrete have been reduced based on the prying factors listed for Anvil's swivel attachments.
- Nominal Embedment, Effective Embedment, Minimum Slab Thickness, Minimum Edge Distance 1, and Minimum Edge Distance 2 are shown below.
- Load capacities for the DeWALT WOOD-KNOCKER®II+ may be used for the WOOD-KNOCKER®II+ MULTI assuming 1/2" hardware is used.
- Load capacities for the DeWALT BANG-IT®+ may be used for the BANG-IT®+ MULTI assuming 1/2" hardware is used.

Fasteners in Concrete (Shown with a Wedge Anchor)



Fasteners in Concrete Filled Metal Deck (Shown with a Wedge Anchor)

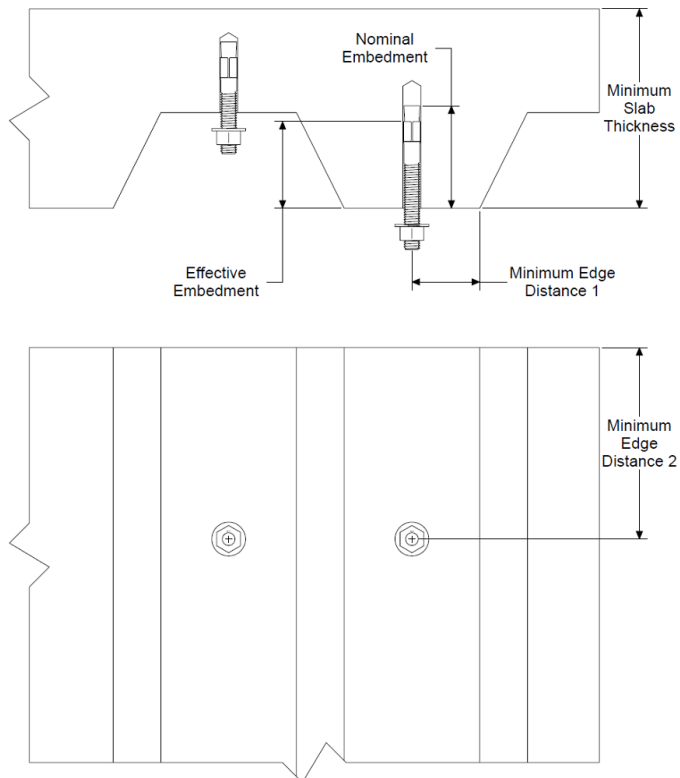


Fig. AF700

Prying Factors

Maximum Distance (feet) Between Intermediate Guides for Pressure (psig)									
Brace Orientation	A	B	C	D	E	F	G	H	I
Brace Angle	30° – 44°	45° – 59°	60° – 90°	30° – 44°	45° – 59°	60° – 90°	30° – 44°	45° – 59°	60° – 90°
AF700	2.55	1.09	0.91	1.41	1.45	2.00	1.83	1.29	1.06
AF700 with Metal Deck	2.55	1.09	1.14	—	—	—	—	—	—

- 1) Brace Orientation per NFPA 13-2019 Figure 18.5.12.1.
- 2) Brace Angles are determined from Vertical.
- 3) Prying Factor calculated in accordance with NFPA 13-2019 Section A.18.5.12.2

Fig. AF700

Horizontal Design Loads 3000psi LW Cracked Concrete on Metal Deck

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF700 in: 3000psi Lightweight Cracked Concrete on 4½" Flute Width Metal Deck															
Size	Anchor	Nominal Effective Embed.	Min Slab Embed.	Min Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
							A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	2 3/8	—	—	—	—	97	257	228	—	—	—	—	—	
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6 1/4	1 1/4	—	86	231	205	—	—	—	—	—	
1/2	Metal Deck Insert (NFPA 13-2019)	—	1 3/4	6 1/4	1 1/4	—	91	199	181	—	—	—	—	—	
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6 1/4	1 1/4	24	180	321	312	—	—	—	—	—	
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6 1/4	1 1/4	24	213	443	428	—	—	—	—	—	
1/2	Bang-It®+	2	1 3/4	6 1/4	1 1/4	24	132	247	240	—	—	—	—	—	
1/2	DDI+™	2	1 3/4	6 1/4	1 1/4	24	217	399	388	—	—	—	—	—	
5/8	Wedge Anchor (NFPA 13-2016)	3 1/8	—	—	—	—	133	326	292	—	—	—	—	—	
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6 1/4	1 1/4	—	113	292	260	—	—	—	—	—	
5/8	Metal Deck Insert (NFPA 13-2019)	—	1 3/4	6 1/4	1 1/4	—	91	199	181	—	—	—	—	—	
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6 1/4	1 1/4	24	162	334	323	—	—	—	—	—	
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6 1/4	1 1/4	24	238	412	401	—	—	—	—	—	
5/8	Bang-It®+	2	1 3/4	6 1/4	1 1/4	24	135	261	253	—	—	—	—	—	
5/8	DDI+™	2 3/8	2	6 1/4	1 1/4	24	279	582	562	—	—	—	—	—	
3/4	Wedge Anchor (NFPA 13-2016)	—	—	—	—	—	—	—	—	—	—	—	—	—	
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	6 1/4	1 1/4	—	165	380	343	—	—	—	—	—	
3/4	Metal Deck Insert (NFPA 13-2019)	—	1 3/4	6 1/4	1 1/4	—	97	257	229	—	—	—	—	—	
3/4	Power-Stud®+ SD1	4	3 1/8	6 1/4	1 1/4	24	231	457	442	—	—	—	—	—	
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	6 1/4	1 1/4	24	251	433	422	—	—	—	—	—	
3/4	Bang-It®+	2	1 3/4	6 1/4	1 1/4	24	135	261	253	—	—	—	—	—	

Fig. AF700

**Horizontal Design Loads
3000psi LW Cracked Concrete**

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF700 in: 3000psi Lightweight Cracked Concrete															
Size	Anchor	Nominal Effective Embed.		Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		Embed.	Embed.				A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	2 3/8	—	—	—	—	94	196	205	119	149	166	104	150	181
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	119	314	335	195	218	209	172	250	299
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	163	376	398	231	272	286	204	294	354
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	149	236	253	152	236	247	126	179	219
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	223	424	474	293	388	287	237	335	410
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	224	429	480	298	390	287	240	339	415
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	149	236	253	152	236	247	126	179	219
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	306	543	597	366	531	427	299	422	517
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	322	595	661	408	559	427	331	467	573
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	187	336	370	—	—	—	—	—	—
5/8	Wedge Anchor (NFPA 13-2016)	3 1/4	—	—	—	—	151	308	322	187	237	265	201	236	285
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6	6	—	163	394	418	244	281	286	215	311	373
5/8	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	163	376	398	231	272	286	204	294	354
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	238	422	464	284	413	333	232	328	402
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	253	472	526	325	440	333	263	372	455
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	261	538	608	380	459	333	304	430	527
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	231	380	410	249	380	360	205	290	355
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	311	558	616	378	539	427	308	436	533
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	335	667	750	467	589	427	375	530	650
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	187	336	370	—	—	—	—	—	—
3/4	Wedge Anchor (NFPA 13-2016)	4 1/8	—	—	—	—	217	469	492	286	351	380	252	362	436
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	7	8	—	214	552	588	343	386	376	303	438	525
3/4	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	163	376	398	231	272	286	204	294	354
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	307	493	531	321	493	498	266	375	460
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	382	717	800	495	664	498	400	566	693
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	390	776	873	543	686	498	436	617	756
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	301	503	546	332	503	457	273	386	473
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	404	757	843	521	703	530	421	596	730

SEISMIC TECHNICAL INFORMATION

Fig. AF700

Horizontal Design Loads 3000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF700 in: 3000psi Cracked Concrete															
Size	Anchor	Nominal Effective Embed.	Min Slab Embed.	Min Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
							A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	3 5/8	—	—	—	—	282	567	592	344	438	493	302	434	523
1/2	Undercut Anchor (NFPA 13-2016)	7	—	—	—	—	505	911	942	547	738	882	479	685	829
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	162	423	451	263	295	285	233	337	403
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	192	443	468	272	321	336	240	347	416
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	181	295	319	193	295	287	159	225	276
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	224	429	480	298	390	287	240	339	415
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	224	429	480	298	390	287	240	339	415
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	198	314	337	203	314	329	169	238	292
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	365	656	723	444	633	501	362	512	627
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	365	656	723	444	633	501	362	512	627
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	248	443	488	—	—	—	—	—	—
5/8	Wedge Anchor (NFPA 13-2016)	3 7/8	—	—	—	—	327	668	699	406	512	571	438	512	618
5/8	Undercut Anchor (NFPA 13-2016)	9 1/2	—	—	—	—	754	1535	1604	933	1179	1318	1005	1177	1419
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6	6	—	252	623	662	386	441	442	341	492	590
5/8	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	192	443	468	272	321	336	240	347	416
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	317	563	619	379	550	444	309	438	536
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	338	630	701	433	587	444	350	496	607
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	346	659	737	457	602	444	368	521	638
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	308	506	547	332	506	480	274	387	474
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	414	745	821	504	719	570	411	581	711
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	434	809	901	556	754	570	450	637	780
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	249	448	494	—	—	—	—	—	—
3/4	Wedge Anchor (NFPA 13-2016)	4 1/8	—	—	—	—	363	780	819	477	584	634	420	604	727
3/4	Undercut Anchor (NFPA 13-2016)	12	—	—	—	—	1143	2404	2520	1468	1819	1996	1291	1854	2233
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	7	8	—	378	940	999	583	665	662	515	744	892
3/4	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	192	443	468	272	321	336	240	347	416
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	421	686	741	448	686	664	370	524	641
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	509	957	1066	659	886	664	533	754	923
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	513	971	1084	671	893	664	542	766	939
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	401	671	728	442	671	609	364	515	630
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	533	989	1098	678	927	706	549	777	951
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	12	24	533	989	1098	678	927	706	549	777	951
3/4	WOOD-KNOCKER®II+	2	1 3/4	7	6	24	249	448	494	—	—	—	—	—	—

Fig. AF700

Horizontal Design Loads 4000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF700 in: 4000psi Cracked Concrete															
Size	Anchor	Nominal Effective Embed.		Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		Embed.	Embed.				A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	3 5/8	—	—	—	—	289	607	636	370	460	506	325	467	563
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	188	466	495	289	330	330	255	368	442
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	218	493	520	303	361	382	266	384	462
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	209	341	368	223	341	331	184	260	319
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	252	471	525	324	439	331	262	371	454
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	252	471	525	324	439	331	262	371	454
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	229	363	389	235	363	380	195	275	337
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	407	712	781	478	705	578	391	552	676
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	407	712	781	478	705	578	391	552	676
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	276	481	526	—	—	—	—	—	—
5/8	Wedge Anchor (NFPA 13-2016)	3 7/8	—	—	—	—	367	729	760	442	566	642	470	557	672
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6	6	—	291	716	761	444	508	511	392	566	678
5/8	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	222	511	541	315	371	389	278	400	481
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	366	650	715	438	635	512	357	505	619
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	389	724	805	497	676	512	402	569	697
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	389	724	805	497	676	512	402	569	697
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	356	584	632	383	584	554	316	447	547
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	478	860	948	582	830	658	474	671	821
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	486	886	980	603	845	658	490	693	848
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	288	517	570	—	—	—	—	—	—
3/4	Wedge Anchor (NFPA 13-2016)	4 1/8	—	—	—	—	419	903	948	552	676	733	486	699	841
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	7	8	—	414	997	1057	617	711	725	544	786	942
3/4	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	222	511	541	315	371	389	278	400	481
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	486	792	855	518	792	766	428	605	741
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	576	1065	1182	729	1002	766	591	836	1024
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	576	1065	1182	729	1002	766	591	836	1024
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	463	774	840	510	774	703	420	594	728
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	597	1080	1193	733	1037	816	597	844	1033
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	12	24	597	1080	1193	733	1037	816	597	844	1033
3/4	WOOD-KNOCKER®II+	2	1 3/4	7	6	24	288	517	570	—	—	—	—	—	—

SEISMIC TECHNICAL INFORMATION

Fig. AF700

Horizontal Design Loads 5000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF700 in: 5000psi Cracked Concrete															
Size	Anchor	Nominal Embed.	Effective Embed.	Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
							A	B	C	D	E	F	G	H	I
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	234	381	412	249	381	370	206	291	356
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	276	506	560	345	479	370	280	396	485
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	276	506	560	345	479	370	280	396	485
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	256	406	435	262	406	425	218	308	377
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	441	757	826	503	757	646	413	584	715
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	441	757	826	503	757	646	413	584	715
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	299	510	556	—	—	—	—	—	—
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	410	727	799	489	710	573	399	565	692
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	425	776	859	529	738	573	430	608	744
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	425	776	859	529	738	573	430	608	744
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	398	653	706	428	653	620	353	500	612
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	530	946	1042	639	920	736	521	737	902
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	530	946	1042	639	920	736	521	737	902
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	321	578	637	—	—	—	—	—	—
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	543	886	956	579	886	857	478	676	828
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	630	1141	1261	775	1093	857	630	891	1092
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	630	1141	1261	775	1093	857	630	891	1092
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	518	866	940	571	866	786	470	664	814
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	651	1153	1268	776	1129	912	634	896	1098
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	12	24	651	1153	1268	776	1129	912	634	896	1098
3/4	WOOD-KNOCKER®II+	2	1 3/4	7	6	24	321	578	637	—	—	—	—	—	—

Fig. AF700

Horizontal Design Loads 6000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF700 in: 6000psi Cracked Concrete															
Size	Anchor	Nominal Effective Embed.		Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		Embed.	Embed.				A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	3 5/8	—	—	—	—	355	744	780	453	564	621	399	573	690
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	228	529	559	326	382	400	287	414	498
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	256	551	578	336	413	449	296	426	512
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	256	418	451	273	418	405	225	319	390
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	296	534	590	362	514	405	295	417	511
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	296	534	590	362	514	405	295	417	511
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	281	444	477	287	444	465	238	337	413
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	471	794	863	524	794	708	431	610	747
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	471	794	863	524	794	708	431	610	747
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	319	534	580	—	—	—	—	—	—
5/8	Wedge Anchor (NFPA 13-2016)	3 7/8	—	—	—	—	450	893	932	542	694	786	576	682	823
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6	6	—	353	812	859	500	589	617	441	636	764
5/8	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	272	627	662	386	454	476	340	491	589
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	449	796	875	536	778	627	438	619	758
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	456	820	904	555	792	627	452	639	783
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	456	820	904	555	792	627	452	639	783
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	436	716	774	469	716	679	387	547	670
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	568	997	1093	669	985	806	547	773	947
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	568	997	1093	669	985	806	547	773	947
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	352	633	698	—	—	—	—	—	—
3/4	Wedge Anchor (NFPA 13-2016)	4 1/8	—	—	—	—	514	1106	1162	676	828	898	595	856	1030
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	7	8	—	496	1127	1190	693	822	868	611	881	1058
3/4	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	272	627	662	386	454	476	340	491	589
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	595	970	1047	634	970	939	524	741	907
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	675	1204	1325	813	1172	939	663	937	1148
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	675	1204	1325	813	1172	939	663	937	1148
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	567	948	1029	625	948	861	515	728	891
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	697	1214	1329	812	1208	999	664	940	1151
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	12	24	697	1214	1329	812	1208	999	664	940	1151
3/4	WOOD-KNOCKER®II+	2	1 3/4	7	6	24	352	633	698	—	—	—	—	—	—

Fig. AF700

Horizontal Design Loads Steel Structural Member

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF700 in: Steel Structural Member										
Size	Anchor	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		A	B	C	D	E	F	G	H	I
1/2	Steel Bolt (NFPA 13-2016 & 2019)	1600	2050	2550	1450	2050	2850	1300	1830	2260
5/8	Steel Bolt (NFPA 13-2016 & 2019)	2500	3300	3950	2250	3300	4400	2045	2880	3557

Fig. AF700

Horizontal Design Loads Saw Lumber or Glue-Laminated Timbers

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF700 in: Saw Lumber or Glue-Laminated Timbers (Load Perpendicular to Grain) With a Specific Gravity of 0.35											
Size	Anchor	Nominal Embed.	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
			A	B	C	D	E	F	G	H	I
1/2	Through Bolt (NFPA 13-2016 & 2019)	1 1/2	115	165	200	135	230	395	130	215	310
1/2	Through Bolt (NFPA 13-2016 & 2019)	2 1/2	140	200	240	160	280	480	165	275	410
1/2	Through Bolt (NFPA 13-2016 & 2019)	3 1/2	175	250	305	200	350	600	200	330	485
5/8	Through Bolt (NFPA 13-2016 & 2019)	1 1/2	135	190	235	155	270	460	155	255	380
5/8	Through Bolt (NFPA 13-2016 & 2019)	2 1/2	160	225	280	185	320	550	190	320	495
5/8	Through Bolt (NFPA 13-2016 & 2019)	3 1/2	200	285	345	230	400	685	235	405	635
5/8	Through Bolt (NFPA 13-2016 & 2019)	5 1/2	280	395	485	325	560	960	315	515	735
3/4	Through Bolt (NFPA 13-2016 & 2019)	1 1/2	155	220	270	180	310	530	170	300	450
3/4	Through Bolt (NFPA 13-2016 & 2019)	2 1/2	180	255	310	205	360	615	215	365	575
3/4	Through Bolt (NFPA 13-2016 & 2019)	3 1/2	220	310	380	255	440	755	260	455	730
3/4	Through Bolt (NFPA 13-2016 & 2019)	5 1/2	310	440	535	360	620	1065	360	610	925

For Seismic Design loads for alternate Specific Gravity ranges, multiply the Seismic Design Load above by the applicable factor below.

Factors per Specific Gravity Ranges	
Specific Gravity	Multiplier Factor
0.36 – 0.49	1.17
0.50 – 0.65	1.25
0.66 – 0.73	1.50

Fig. AF700

Horizontal Design Loads Wood

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF700 in: Wood (Load Perpendicular to Grain - Holes Predrilled) With a Specific Gravity of 0.35											
Size	Anchor	Nominal Embed.	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
			A	B	C	D	E	F	G	H	I
1/2	Lag Screw (NFPA 13-2016 & 2019)	4 1/2	300	355	380	315	400	550	145	230	325
1/2	Lag Screw (NFPA 13-2016 & 2019)	5 1/2	320	370	380	320	420	610	145	230	325
1/2	Lag Screw (NFPA 13-2016 & 2019)	6 1/2	340	375	380	325	435	650	145	230	325
5/8	Lag Screw (NFPA 13-2016 & 2019)	5 1/2	435	525	555	425	550	775	195	320	460
5/8	Lag Screw (NFPA 13-2016 & 2019)	6 1/2	465	540	555	430	570	840	195	320	460

For Seismic Design loads for alternate Specific Gravity ranges, multiply the Seismic Design Load above by the applicable factor below.

Factors per Specific Gravity Ranges	
Specific Gravity	Multiplier Factor
0.36 – 0.49	1.17
0.50 – 0.65	1.25
0.66 – 0.73	1.50

Fig. AF771

Prying Factors

Horizontal Prying Factors (Pr)									
Brace Orientation	A	B	C	D	E	F	G	H	I
Brace Angle	30° – 44°	45° – 59°	60° – 90°	30° – 44°	45° – 59°	60° – 90°	30° – 44°	45° – 59°	60° – 90°
AF771	4.17	2.00	0.96	1.97	2.38	2.96	1.93	1.36	1.11
AF771 with Metal Deck	4.17	2.00	0.96	—	—	—	—	—	—

- 1) Brace Orientation per NFPA 13-2019 Figure 18.5.12.1.
- 2) Brace Angles are determined from Vertical.
- 3) Prying Factor calculated in accordance with NFPA 13-2019 Section A.18.5.12.2

Fig. AF771

Horizontal Design Loads 3000psi LW Cracked Concrete on Metal Deck

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF771 in: 3000psi Lightweight Cracked Concrete on 4½" Flute Width Metal Deck															
Size	Anchor	Nominal Effective Embed.	Min Slab Embed.	Min Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
							A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	2 3/8	—	—	—	—	67	136	274	—	—	—	—	—	
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6 1/4	1 1/4	—	60	121	247	—	—	—	—	—	
1/2	Metal Deck Insert (NFPA 13-2019)	—	1 3/4	6 1/4	1 1/4	—	67	118	209	—	—	—	—	—	
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6 1/4	1 1/4	24	120	215	343	—	—	—	—	—	
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6 1/4	1 1/4	24	130	272	482	—	—	—	—	—	
1/2	Bang-It®+	2	1 3/4	6 1/4	1 1/4	24	83	160	266	—	—	—	—	—	
1/2	DDI+™	2	1 3/4	6 1/4	1 1/4	24	140	262	429	—	—	—	—	—	
5/8	Wedge Anchor (NFPA 13-2016)	3 1/8	—	—	—	—	93	179	346	—	—	—	—	—	
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6 1/4	1 1/4	—	79	157	311	—	—	—	—	—	
5/8	Metal Deck Insert (NFPA 13-2019)	—	1 3/4	6 1/4	1 1/4	—	67	118	209	—	—	—	—	—	
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6 1/4	1 1/4	24	99	207	364	—	—	—	—	—	
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6 1/4	1 1/4	24	163	283	438	—	—	—	—	—	
5/8	Bang-It®+	2	1 3/4	6 1/4	1 1/4	24	83	166	283	—	—	—	—	—	
5/8	DDI+™	2 3/8	2	6 1/4	1 1/4	24	171	356	634	—	—	—	—	—	
3/4	Wedge Anchor (NFPA 13-2016)	—	—	—	—	—	—	—	—	—	—	—	—	—	
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	6 1/4	1 1/4	—	116	216	402	—	—	—	—	—	
3/4	Metal Deck Insert (NFPA 13-2019)	—	1 3/4	6 1/4	1 1/4	—	67	136	275	—	—	—	—	—	
3/4	Power-Stud®+ SD1	4	3 1/8	6 1/4	1 1/4	24	142	287	496	—	—	—	—	—	
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	6 1/4	1 1/4	24	171	298	461	—	—	—	—	—	
3/4	Bang-It®+	2	1 3/4	6 1/4	1 1/4	24	83	166	283	—	—	—	—	—	

Fig. AF771

Horizontal Design Loads 3000psi LW Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF771 in: 3000psi Lightweight Cracked Concrete															
Size	Anchor	Nominal Effective Embed.		Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		Embed.	Embed.				A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	2 3/8	—	—	—	—	71	121	205	104	121	97	93	132	161
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	83	167	335	163	167	109	147	208	254
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	115	213	398	198	213	152	178	251	307
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	106	173	248	157	173	166	124	175	214
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	137	271	458	273	240	193	229	324	396
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	137	273	464	275	240	193	232	328	401
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	106	173	248	157	173	166	124	175	214
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	205	366	580	367	358	288	290	410	503
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	205	389	640	391	358	288	320	453	555
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	123	224	359	—	—	—	—	—	—
5/8	Wedge Anchor (NFPA 13-2016)	3 1/4	—	—	—	—	114	192	322	165	192	157	185	208	254
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6	6	—	113	218	418	207	218	150	186	263	320
5/8	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	115	213	398	198	213	152	178	251	307
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	160	285	451	285	278	224	226	319	391
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	160	307	509	308	279	224	254	360	441
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	160	333	586	336	279	224	293	414	508
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	161	271	401	257	271	243	200	283	347
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	205	373	598	374	358	288	290	410	503
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	205	418	724	421	358	288	362	512	627
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	123	224	359	—	—	—	—	—	—
3/4	Wedge Anchor (NFPA 13-2016)	4 1/8	—	—	—	—	162	280	492	249	280	214	223	315	385
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	7	8	—	150	297	588	288	297	197	259	367	447
3/4	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	115	213	398	198	213	152	178	251	307
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	217	358	519	331	358	336	260	367	450
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	239	463	774	466	417	336	387	547	670
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	239	487	842	490	417	336	421	595	729
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	208	354	533	344	354	308	266	377	461
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	254	490	816	492	444	357	408	577	706

SEISMIC TECHNICAL INFORMATION

Fig. AF771

Horizontal Design Loads 3000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF771 in: 3000psi Cracked Concrete															
Size	Anchor	Nominal Effective Embed.	Min Slab Embed.	Min Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lb) per NFPA 13 Brace Orientation								
							A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	3 5/8	—	—	—	—	214	357	592	305	357	296	271	384	469
1/2	Undercut Anchor (NFPA 13-2016)	7	—	—	—	—	395	620	942	497	620	557	440	622	760
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	113	226	451	220	226	149	199	281	342
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	135	251	468	233	251	179	209	296	361
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	127	212	312	199	212	193	156	220	270
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	137	273	464	275	240	193	232	328	401
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	137	273	464	275	240	193	232	328	401
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	141	230	330	210	230	222	165	233	286
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	240	437	702	439	420	338	351	497	608
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	240	437	702	439	420	338	351	497	608
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	164	297	474	—	—	—	—	—	—
5/8	Wedge Anchor (NFPA 13-2016)	3 7/8	—	—	—	—	247	415	699	359	415	337	404	452	551
5/8	Undercut Anchor (NFPA 13-2016)	9 1/2	—	—	—	—	572	957	1604	825	957	781	927	1039	1268
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6	6	—	176	341	662	326	341	232	293	415	506
5/8	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	135	251	468	233	251	179	209	296	361
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	213	379	601	380	371	299	301	425	521
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	213	409	679	411	372	299	339	480	588
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	213	421	712	423	372	299	356	504	617
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	215	361	535	343	361	324	267	378	463
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	273	497	797	499	478	385	399	564	691
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	273	525	872	528	478	385	436	517	755
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	164	299	479	—	—	—	—	—	—
3/4	Wedge Anchor (NFPA 13-2016)	4 1/8	—	—	—	—	271	467	819	416	467	357	371	526	641
3/4	Undercut Anchor (NFPA 13-2016)	12	—	—	—	—	860	1463	2520	1287	1463	1147	1149	1624	1980
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	7	8	—	264	514	999	493	514	348	443	627	763
3/4	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	135	251	468	233	251	179	209	296	361
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	295	492	724	464	492	448	362	512	627
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	318	618	1032	621	557	448	516	730	894
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	318	623	1048	627	557	448	524	741	908
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	278	472	710	458	472	411	355	502	615
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	339	645	1064	648	592	477	532	752	921
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	12	24	339	645	1064	648	592	477	532	752	921
3/4	WOOD-KNOCKER®II+	2	1 3/4	7	6	24	164	299	479	—	—	—	—	—	—

Fig. AF771

Horizontal Design Loads 4000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF771 in: 4000psi Cracked Concrete															
Size	Anchor	Nominal Effective Embed.		Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		Embed.	Embed.				A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	3 5/8	—	—	—	—	218	370	636	325	370	292	290	410	500
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	131	255	495	244	255	173	219	310	378
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	157	284	520	261	284	207	233	330	403
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	147	245	360	230	245	223	180	254	312
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	159	306	508	307	278	223	254	359	440
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	159	306	508	307	278	223	254	359	440
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	163	266	381	242	266	256	191	269	330
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	276	485	760	485	478	390	380	537	658
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	276	485	760	485	478	390	380	537	658
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	188	328	512	—	—	—	—	—	—
5/8	Wedge Anchor (NFPA 13-2016)	3 7/8	—	—	—	—	280	463	760	393	463	389	435	494	603
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6	6	—	203	393	761	375	393	268	337	477	582
5/8	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	157	290	541	270	290	207	242	342	417
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	246	438	694	439	428	346	347	491	601
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	246	470	779	473	430	346	390	551	675
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	246	470	779	473	430	346	390	551	675
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	248	417	617	396	417	374	309	436	535
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	316	574	921	576	552	444	460	651	797
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	316	585	950	587	552	444	475	672	823
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	190	345	553	—	—	—	—	—	—
3/4	Wedge Anchor (NFPA 13-2016)	4 1/8	—	—	—	—	313	540	948	481	540	413	430	608	741
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	7	8	—	289	553	1057	524	553	381	470	665	810
3/4	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	157	290	541	270	290	207	242	342	417
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	340	568	836	535	568	517	418	591	724
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	368	696	1146	699	643	517	573	810	992
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	368	696	1146	699	643	517	573	810	992
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	321	546	820	529	546	474	410	580	710
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	391	718	1158	720	684	550	579	819	1003
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	12	24	391	718	1158	720	684	550	579	819	1003
3/4	WOOD-KNOCKER®II+	2	1 3/4	7	6	24	190	345	553	—	—	—	—	—	—

SEISMIC TECHNICAL INFORMATION

Fig. AF771

Horizontal Design Loads 5000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF771 in: 5000psi Cracked Concrete															
Size	Anchor	Nominal Embed.	Effective Embed.	Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
							A	B	C	D	E	F	G	H	I
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	164	274	402	258	274	250	201	284	348
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	177	333	543	334	310	250	272	384	470
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	177	333	543	334	310	250	272	384	470
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	182	297	426	271	297	286	213	301	369
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	302	523	805	523	523	436	402	569	697
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	302	523	805	523	523	436	402	569	697
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	205	354	542	—	—	—	—	—	—
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	275	490	776	491	479	386	388	549	672
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	275	512	833	514	480	386	417	589	722
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	275	512	833	514	480	386	417	589	722
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	277	466	690	443	466	418	345	488	598
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	353	635	1012	637	617	496	506	716	877
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	353	635	1012	637	617	496	506	716	877
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	212	386	619	—	—	—	—	—	—
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	380	635	934	599	635	578	467	661	809
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	411	757	1223	759	719	578	612	865	1059
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	411	757	1223	759	719	578	612	865	1059
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	358	610	917	592	610	531	458	648	794
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	437	778	1232	780	762	615	616	871	1067
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	12	24	437	778	1232	780	762	615	616	871	1067
3/4	WOOD-KNOCKER®II+	2	1 3/4	7	6	24	212	386	619	—	—	—	—	—	—

Fig. AF771

Horizontal Design Loads 6000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF771 in: 6000psi Cracked Concrete															
Size	Anchor	Nominal Effective Embed.		Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		Embed.	Embed.				A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	3 5/8	—	—	—	—	267	454	780	398	454	358	355	502	613
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	161	299	559	279	299	212	250	354	431
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	192	330	578	293	330	253	262	371	452
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	180	300	441	282	300	274	220	312	382
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	194	356	573	357	340	274	286	405	496
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	194	356	573	357	340	274	286	405	496
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	199	326	467	296	326	314	233	330	404
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	325	556	841	544	556	478	421	595	729
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	325	556	841	544	556	478	421	595	729
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	221	376	566	—	—	—	—	—	—
5/8	Wedge Anchor (NFPA 13-2016)	3 7/8	—	—	—	—	343	567	932	481	567	476	534	606	739
5/8	Wedge Anchor (NFPA 13-2019)	3 7/8	—	6	6	—	249	462	859	429	462	329	384	544	663
5/8	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	192	356	662	331	356	253	296	419	511
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	6	301	537	850	538	525	423	425	601	737
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	6	24	301	547	878	549	526	423	439	621	760
5/8	Power-Stud®+ SD1	3 3/8	2 3/4	6	12	24	301	547	878	549	526	423	439	621	760
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	4 1/4	4 1/4	304	511	756	485	511	458	378	535	655
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	6	24	385	678	1063	679	667	544	532	752	921
5/8	Power-Stud®+ SD2	3 7/8	3 1/4	6	12	24	385	678	1063	679	667	544	532	752	921
5/8	WOOD-KNOCKER®II+	2	1 3/4	6	6	24	232	423	678	—	—	—	—	—	—
3/4	Wedge Anchor (NFPA 13-2016)	4 1/8	—	—	—	—	384	662	1162	590	662	506	527	745	909
3/4	Wedge Anchor (NFPA 13-2019)	4 1/2	—	7	8	—	354	647	1190	596	647	467	534	756	921
3/4	Wood Form Insert (NFPA 13-2019)	—	1 3/4	4	8	—	192	356	662	331	356	253	296	419	511
3/4	Power-Stud®+ SD1	4	3 1/8	7	5	5	417	696	1024	656	696	633	512	724	886
3/4	Power-Stud®+ SD1	4	3 1/8	7	8	24	450	809	1288	811	787	633	644	910	1115
3/4	Power-Stud®+ SD1	4	3 1/8	7	12	24	450	809	1288	811	787	633	644	910	1115
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	5	5	393	668	1004	648	668	581	502	710	870
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	8	24	474	830	1293	830	821	674	647	914	1120
3/4	Power-Stud®+ SD2	4 1/2	3 3/4	7	12	24	474	830	1293	830	821	674	647	914	1120
3/4	WOOD-KNOCKER®II+	2	1 3/4	7	6	24	232	423	678	—	—	—	—	—	—

Fig. AF771

Horizontal Design Loads Steel Structural Member

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF771 in: Steel Structural Member										
Size	Anchor	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		A	B	C	D	E	F	G	H	I
1/2	Steel Bolt (NFPA 13-2016 & 2019)	1600	2050	2550	1450	2050	2850	1300	1830	2260
5/8	Steel Bolt (NFPA 13-2016 & 2019)	2500	3300	3950	2250	3300	4400	2045	2880	3557

Fig. AF771

Horizontal Design Loads Saw Lumber or Glue-Laminated Timbers

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF771 in: Saw Lumber or Glue-Laminated Timbers (Load Perpendicular to Grain) With a Specific Gravity of 0.35											
Size	Anchor	Nominal Embed.	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
			A	B	C	D	E	F	G	H	I
1/2	Through Bolt (NFPA 13-2016 & 2019)	1 1/2	115	165	200	135	230	395	130	215	310
1/2	Through Bolt (NFPA 13-2016 & 2019)	2 1/2	140	200	240	160	280	480	165	275	410
1/2	Through Bolt (NFPA 13-2016 & 2019)	3 1/2	175	250	305	200	350	600	200	330	485
5/8	Through Bolt (NFPA 13-2016 & 2019)	1 1/2	135	190	235	155	270	460	155	255	380
5/8	Through Bolt (NFPA 13-2016 & 2019)	2 1/2	160	225	280	185	320	550	190	320	495
5/8	Through Bolt (NFPA 13-2016 & 2019)	3 1/2	200	285	345	230	400	685	235	405	635
5/8	Through Bolt (NFPA 13-2016 & 2019)	5 1/2	280	395	485	325	560	960	315	515	735
3/4	Through Bolt (NFPA 13-2016 & 2019)	1 1/2	155	220	270	180	310	530	170	300	450
3/4	Through Bolt (NFPA 13-2016 & 2019)	2 1/2	180	255	310	205	360	615	215	365	575
3/4	Through Bolt (NFPA 13-2016 & 2019)	3 1/2	220	310	380	255	440	755	260	455	730
3/4	Through Bolt (NFPA 13-2016 & 2019)	5 1/2	310	440	535	360	620	1065	360	610	925

For Seismic Design loads for alternate Specific Gravity ranges, multiply the Seismic Design Load above by the applicable factor below.

Factors per Specific Gravity Ranges	
Specific Gravity	Multiplier Factor
0.36 – 0.49	1.17
0.50 – 0.65	1.25
0.66 – 0.73	1.50

Fig. AF771

Horizontal Design Loads Wood

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF771 in: Wood (Load Perpendicular to Grain - Holes Predrilled) With a Specific Gravity of 0.35												
Size	Anchor	Nominal Embed.	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation									
			A	B	C	D	E	F	G	H	I	
1/2	Lag Screw (NFPA 13-2016 & 2019)	4 1/2	300	355	380	315	400	550	145	230	325	
1/2	Lag Screw (NFPA 13-2016 & 2019)	5 1/2	320	370	380	320	420	610	145	230	325	
1/2	Lag Screw (NFPA 13-2016 & 2019)	6 1/2	340	375	380	325	435	650	145	230	325	
5/8	Lag Screw (NFPA 13-2016 & 2019)	5 1/2	435	525	555	425	550	775	195	320	460	
5/8	Lag Screw (NFPA 13-2016 & 2019)	6 1/2	465	540	555	430	570	840	195	320	460	

For Seismic Design loads for alternate Specific Gravity ranges, multiply the Seismic Design Load above by the applicable factor below.

Factors per Specific Gravity Ranges	
Specific Gravity	Multiplier Factor
0.36 – 0.49	1.17
0.50 – 0.65	1.25
0.66 – 0.73	1.50

Fig. AF075, AF076, AF077

Prying Factors

Horizontal Prying Factors (Pr)									
Brace Orientation	A	B	C	D	E	F	G	H	I
Brace Angle	30° – 44°	45° – 59°	60° – 90°	30° – 44°	45° – 59°	60° – 90°	30° – 44°	45° – 59°	60° – 90°
AF075, AF076, AF077	2.52	1.07	1.38	1.62	1.42	2.25	2.75	1.94	1.59
AF075, AF076, AF077 with Metal Deck	2.52	1.16	1.38	–	–	–	–	–	–

1) Brace Orientation per NFPA 13-2019 Figure 18.5.12.1.

2) Brace Angles are determined from Vertical.

3) Prying Factor calculated in accordance with NFPA 13-2019 Section A.18.5.12.2

Fig. AF075, AF076, AF077

Horizontal Design Loads 3000psi LW Cracked Concrete on Metal Deck

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF075, AF076, or AF077 in: 3000psi Lightweight Cracked Concrete on 4½” Flute Width Metal Deck														
Size	Anchor	Nominal Embed.	Effective Embed.	Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation							
							A	B	C	D	E	F	G	H
1/2	Wedge Anchor (NFPA 13-2016)	2 3/8	–	–	–	–	97	178	196	–	–	–	–	–
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	–	6 1/4	1 1/4	–	86	160	175	–	–	–	–	–
1/2	Metal Deck Insert (NFPA 13-2019)	–	1 3/4	6 1/4	1 1/4	–	91	199	160	–	–	–	–	–
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6 1/4	1 1/4	24	125	230	203	–	–	–	–	–
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6 1/4	1 1/4	24	136	295	250	–	–	–	–	–
1/2	Bang-It®+	2	1 3/4	6 1/4	1 1/4	24	86	171	150	–	–	–	–	–
1/2	DDI+™	2	1 3/4	6 1/4	1 1/4	24	146	281	246	–	–	–	–	–

Fig. AF075, AF076, AF077

Horizontal Design Loads 3000psi LW Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF075, AF076, or AF077 in: 3000psi Lightweight Cracked Concrete															
Size	Anchor	Nominal Effective					Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		Embed. Embed.	Min Slab Thickness	Min Edge 1	Min Edge 2	A	B	C	D	E	F	G	H	I	
1/2	Wedge Anchor (NFPA 13-2016)	2 3/8	—	—	—	—	94	196	253	119	149	124	84	118	145
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	119	314	239	195	218	144	128	178	220
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	163	376	296	231	272	199	157	219	271
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	109	190	164	118	190	139	106	149	183
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	144	309	254	197	255	161	180	254	311
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	144	312	256	199	255	161	182	257	314
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	109	190	164	118	190	139	106	149	183
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	214	412	345	260	376	241	235	333	408
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	215	441	365	280	380	241	255	360	441
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	129	253	211	—	—	—	—	—	—

Fig. AF075, AF076, AF077

Horizontal Design Loads 3000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF075, AF076, or AF077 in: 3000psi Cracked Concrete															
Size	Anchor	Nominal Effective					Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		Embed. Embed.	Min Slab Thickness	Min Edge 1	Min Edge 2	A	B	C	D	E	F	G	H	I	
1/2	Wedge Anchor (NFPA 13-2016)	3 5/8	—	—	—	—	282	567	469	344	438	371	247	345	425
1/2	Undercut Anchor (NFPA 13-2016)	7	—	—	—	—	505	911	780	547	738	683	407	570	701
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	162	423	323	263	295	196	173	241	298
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	192	443	348	272	321	235	185	258	319
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	132	235	201	146	230	161	131	186	227
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	144	312	256	199	255	161	182	257	314
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	144	312	256	199	255	161	182	257	314
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	146	253	219	157	253	185	141	199	244
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	251	494	412	312	445	282	283	400	490
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	251	494	412	312	445	282	283	400	490
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	172	334	279	—	—	—	—	—	—

Fig. AF075, AF076, AF077

Horizontal Design Loads 4000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF075, AF076, or AF077 in: 4000psi Cracked Concrete															
Size	Anchor	Nominal Embed.	Effective Embed.	Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
							A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	3 5/8	—	—	—	—	289	607	494	370	460	377	261	365	449
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	188	466	360	289	330	227	192	268	330
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	218	493	390	303	361	271	207	290	357
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	152	271	233	169	265	186	152	214	263
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	166	347	287	221	294	186	201	284	348
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	166	347	287	221	294	186	201	284	348
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	168	293	253	181	293	214	163	230	282
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	286	544	457	343	501	325	310	439	537
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	286	544	457	343	501	325	310	439	537
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	195	368	310	—	—	—	—	—	—

Fig. AF075, AF076, AF077

Horizontal Design Loads 5000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF075, AF076, or AF077 in: 5000psi Cracked Concrete															
Size	Anchor	Nominal Embed.	Effective Embed.	Min Slab Thickness	Min Edge 1	Min Edge 2	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
							A	B	C	D	E	F	G	H	I
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	170	303	260	189	296	208	170	240	294
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	186	377	312	239	329	208	217	307	376
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	186	377	312	239	329	208	217	307	376
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	188	327	283	203	327	239	182	257	315
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	314	585	495	367	549	364	332	469	574
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	314	585	495	367	549	364	332	469	574
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	213	396	335	—	—	—	—	—	—

Fig. AF075, AF076, AF077

Horizontal Design Loads 6000psi Cracked Concrete

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF075, AF076, or AF077 in: 6000psi Cracked Concrete															
Size	Anchor	Nominal Effective					Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		Embed.	Embed.	Thickness	Min Edge 1	Min Edge 2	A	B	C	D	E	F	G	H	I
1/2	Wedge Anchor (NFPA 13-2016)	3 5/8	—	—	—	—	355	744	606	453	564	462	320	447	551
1/2	Wedge Anchor (NFPA 13-2019)	3 3/4	—	6	6	—	228	529	415	326	382	278	221	308	380
1/2	Wood Form Insert (NFPA 13-2019)	—	1 11/16	4	6	—	256	551	445	336	413	332	235	328	405
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	3	3	186	332	285	207	325	228	186	263	322
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	6	24	204	402	335	254	361	228	231	326	399
1/2	Power-Stud®+ SD1	3 3/4	3 1/4	6	12	24	204	402	335	254	361	228	231	326	399
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	3	3	206	358	310	222	358	262	199	282	345
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	6	24	337	619	527	388	589	398	350	494	605
1/2	Power-Stud®+ SD2	3 3/4	3 1/4	6	12	24	337	619	527	388	589	398	350	494	605
1/2	WOOD-KNOCKER®II+	2	1 3/4	6	4 1/4	24	229	419	356	—	—	—	—	—	—

Fig. AF075, AF076, AF077

Horizontal Design Loads Steel Structural Member

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF075, AF076, or AF077 in: Steel Structural Member										
Size	Anchor	Horizontal Seismic Design Load (lbf) per NFPA 13 Brace Orientation								
		A	B	C	D	E	F	G	H	I
1/2	Steel Bolt (NFPA 13-2016 & 2019)	1600	2050	2550	1450	2050	2850	1300	1830	2260

Fig. AF075, AF076, AF077 Horizontal Design Loads Saw Lumber or Glue-Laminated Timbers

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF075, AF076, or AF077 in: Saw Lumber or Glue-Laminated Timbers (Load Perpendicular to Grain) With a Specific Gravity of 0.35											
Size	Anchor	Nominal Embed.	Horizontal Seismic Design Load (Ibf) per NFPA 13 Brace Orientation								
			A	B	C	D	E	F	G	H	I
1/2	Through Bolt (NFPA 13-2016 & 2019)	1 1/2	115	165	200	135	230	395	130	215	310
1/2	Through Bolt (NFPA 13-2016 & 2019)	2 1/2	140	200	240	160	280	480	165	275	410
1/2	Through Bolt (NFPA 13-2016 & 2019)	3 1/2	175	250	305	200	350	600	200	330	485

For Seismic Design loads for alternate Specific Gravity ranges, multiply the Seismic Design Load above by the applicable factor below.

Factors per Specific Gravity Ranges	
Specific Gravity	Multiplier Factor
0.36 – 0.49	1.17
0.50 – 0.65	1.25
0.66 – 0.73	1.50

Fig. AF075, AF076, AF077 Horizontal Design Loads Wood

Maximum Horizontal Seismic Design Load (ASD) for an Anchor with the AF075, AF076, or AF077 in: Wood (Load Perpendicular to Grain) With a Specific Gravity of 0.35											
Size	Anchor	Nominal Embed.	Horizontal Seismic Design Load (Ibf) per NFPA 13 Brace Orientation								
			A	B	C	D	E	F	G	H	I
1/2	Lag Screw (NFPA 13-2016 & 2019)	4 1/2	300	355	380	315	400	550	145	230	325
1/2	Lag Screw (NFPA 13-2016 & 2019)	5 1/2	320	370	380	320	420	610	145	230	325
1/2	Lag Screw (NFPA 13-2016 & 2019)	6 1/2	340	375	380	325	435	650	145	230	325

For Seismic Design loads for alternate Specific Gravity ranges, multiply the Seismic Design Load above by the applicable factor below.

Factors per Specific Gravity Ranges	
Specific Gravity	Multiplier Factor
0.36 – 0.49	1.17
0.50 – 0.65	1.25
0.66 – 0.73	1.50

SEISMIC HORIZONTAL DESIGN FORCE

ASCE 7

NFPA 13 allows for Seismic Horizontal Design Forces (F_{pw}) to be calculated per ASCE 7 with a 0.7 multiplier used to convert from LRFD to ASD. The following equations and tables may be used as reference to determine project specific Seismic Horizontal Design Forces.

<p>F_{pw} = Seismic Horizontal Design Force in ASD. Note: A factor of 0.7 was used to convert from LRFD to ASD.</p> <p>C_p = Seismic Coefficient per NFPA 13.</p> <p>S_s = Short Period MCE_r Spectral Response Acceleration.</p> <p>F_a = Site Coefficient. See Tables Below.</p> <p>S_{DS} = Short Period Spectral Acceleration.</p> <p>a_p = Component Amplification Factor. Taken as 2.5 for Fire Sprinkler Applications.</p> <p>R_p = Component Response Modification Factor. Taken as 4.5 for Fire Sprinkler Applications.</p> <p>I_p = Component Importance Factor. Taken as 1.5 for Fire Sprinkler Applications.</p> <p>W_p = Component Operating Weight. Taken as the weight of the Sprinkler System in the ZOI plus 15%.</p> <p>Z = Height in the structure where the component attaches. The height is relative to the base of the structure and shall not be taken as less than 0 and shall not be larger than "H".</p> <p>H = Average roof height of the structure relative to the base.</p>	<p>EQUATIONS</p> $F_{pw} = C_p W_p$ <p>Where: $C_p = 0.7 * \frac{0.4 a_p S_{DS} I_p}{R_p} \left(1 + 2 \frac{Z}{H} \right)$</p> <p>Where: $S_{DS} = \frac{2}{3} F_a S_s$</p> $C_{p \max} = 0.7 * 1.6 S_{DS} I_p$ $C_{p \min} = 0.7 * 0.3 S_{DS} I_p$
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Site Classification per ASCE/SEI 7-10 & 7-16	
Site Class	Ground Structure
A	Hard Rock
B	Rock
C	Very Dense Soil and Soft Rock
D	Stiff Soil
E	Soft Clay Soil

Site Coefficient, F_a per ASCE/SEI 7-10					
Site Class	$S_s \leq 0.25$	$S_s = 0.5$	$S_s = 0.75$	$S_s = 1.0$	$S_s \geq 1.25$
A	0.8	0.8	0.8	0.8	0.8
B	1.0	1.0	1.0	1.0	1.0
C	1.2	1.2	1.1	1.0	1.0
D	1.6	1.4	1.2	1.1	1.0
E	2.5	1.7	1.2	0.9	0.9

Use straight-line interpolation for intermediate values of SS.

Site Coefficient, F_a per ASCE/SEI 7-16						
Site Class	$S_s \leq 0.25$	$S_s = 0.50$	$S_s = 0.75$	$S_s = 1.00$	$S_s = 1.25$	$S_s \geq 1.50$
A	0.8	0.8	0.8	0.8	0.8	0.8
B	0.9	0.9	0.9	0.9	0.9	0.9
C	1.3	1.3	1.2	1.2	1.2	1.2
D	1.6	1.4	1.2	1.1	1.0	1.0
E	2.4	1.7	1.3	1.2*	1.2*	1.2*

Use straight-line interpolation for intermediate values of SS.
* ASCE 7-16 - Section 11.4.8 Exception 1 – Use Site Class C Minimum

