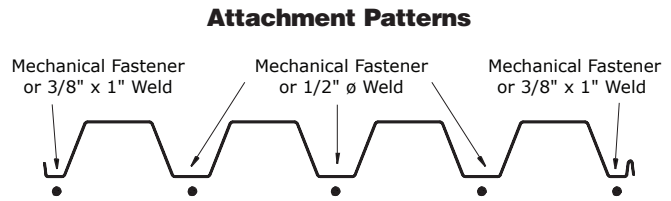
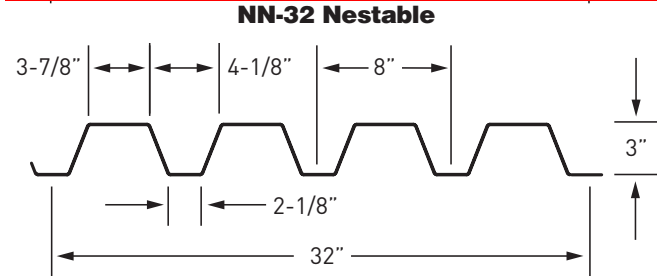
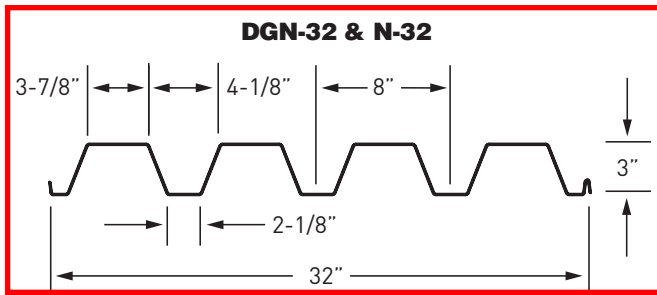


# 3.1 DGN-32, N-32 & NN-32



Note: Weld sizes are effective not visible. Refer to AISI S100 or AWS D1.3 for additional welding requirements.

### Panel Properties

Gauge	Weight	Base Metal Thickness	Yield Strength	Tensile Strength	Gross Section Properties				
					Area	Moment of Inertia	Distance to N.A. from Bottom	Section Modulus (Min.)	Radius of Gyration
	w psf	t in	F <sub>y</sub> ksi	F <sub>u</sub> ksi	A <sub>g</sub> in <sup>2</sup> /ft	I <sub>g</sub> in <sup>4</sup> /ft	y <sub>b</sub> in	S <sub>g</sub> in <sup>3</sup> /ft	r in
22	1.96	0.0299	50	65	0.569	0.814	1.68	0.483	1.195
21	2.16	0.0330	50	65	0.628	0.893	1.68	0.531	1.192
20	2.35	0.0359	50	65	0.681	0.968	1.68	0.576	1.193
19	2.73	0.0420	50	65	0.795	1.125	1.69	0.668	1.190
18	3.10	0.0478	50	65	0.902	1.275	1.69	0.755	1.189
16	3.86	0.0598	50	65	1.123	1.575	1.69	0.931	1.185

Gauge	Effective Section Properties at F <sub>y</sub> for Bending Strength					Effective Section Properties at Service Load Load for Deflection				
	Area	Section Modulus (Min.)	Distance to N.A. from Bottom	Section Modulus (Min.)	Distance to N.A. from Bottom	Moment of Inertia	Moment of Inertia	Uniform Load Only		
								I <sub>d</sub> = (2I <sub>e+</sub> +I <sub>g</sub> )/3		
A <sub>e+</sub> in <sup>2</sup> /ft	S <sub>e+</sub> in <sup>3</sup> /ft	y <sub>b</sub> in	S <sub>e-</sub> in <sup>3</sup> /ft	y <sub>b</sub> in	I <sub>e+</sub> in <sup>4</sup> /ft	I <sub>e-</sub> in <sup>4</sup> /ft	I <sub>+</sub> in <sup>4</sup> /ft	I <sub>-</sub> in <sup>4</sup> /ft		
22	0.272	0.349	1.37	0.402	1.78	0.668	0.754	0.716	0.774	
21	0.322	0.398	1.40	0.453	1.77	0.773	0.870	0.813	0.878	
20	0.372	0.446	1.41	0.505	1.76	0.848	0.930	0.888	0.943	
19	0.487	0.553	1.45	0.611	1.74	1.035	1.125	1.065	1.125	
18	0.604	0.661	1.48	0.715	1.72	1.219	1.275	1.238	1.275	
16	0.871	0.879	1.54	0.927	1.70	1.556	1.575	1.563	1.575	

### Reactions at Supports (plf) Based on Web Crippling

Gage	Condition	Bearing Length of Webs							
		ASD, R/Ω				LRFD, φR			
		1"	1.5"	2"	3"	1"	1.5"	2"	3"
22	End	500	566	622	716	764	866	952	1095
	Interior	876	973	1056	1194	1303	1448	1570	1776
20	End	709	799	876	1004	1084	1223	1340	1536
	Interior	1240	1371	1482	1669	1844	2040	2205	2482
18	End	1221	1367	1490	1697	1868	2092	2280	2597
	Interior	2133	2343	2519	2816	3173	3485	3748	4189
16	End	1864	2076	2254	2554	2852	3176	3449	3907
	Interior	3260	3560	3814	4239	4849	5296	5673	6305

Constants      h = 3.06"      r = 0.125"      θ = 70.7°

## Inward Allowable ( $f_b/\Omega$ ) and Factored ( $\Phi f_b$ ) Distributed Load (lbs/ft<sup>2</sup>)

Gauge	Span	Limit Condition	Panel Span (Support Spacing)								
			4' - 0"	6' - 0"	8' - 0"	10' - 0"	12' - 0"	14' - 0"	16' - 0"	18' - 0"	20' - 0"
22	Single Span	$f_b/\Omega$	435	193	109	70	48	36	27	21	17
		$\Phi f_b$	654	291	163	105	73	53	41	32	26
		L/360	489	145	61	31	18	11	8	5	4
		L/240	734	217	92	47	27	17	11	8	6
		L/180	978	290	122	63	36	23	15	11	8
	L/120	1467	435	183	94	54	34	23	16	12	
	Double Span	$f_b/\Omega$	502	223	125	80	56	41	31	25	20
		$\Phi f_b$	754	335	189	121	84	62	47	37	30
		L/360	1178	349	147	75	44	27	18	13	9
		L/240	1767	524	221	113	65	41	28	19	14
		L/180	2356	698	295	151	87	55	37	26	19
	L/120	3535	1047	442	226	131	82	55	39	28	
	Triple Span	$f_b/\Omega$	627	279	157	100	70	51	39	31	25
		$\Phi f_b$	943	419	236	151	105	77	59	47	38
		L/360	923	273	115	59	34	22	14	10	7
L/240		1384	410	173	89	51	32	22	15	11	
L/180		1846	547	231	118	68	43	29	20	15	
L/120	2769	820	346	177	103	65	43	30	22		
20	Single Span	$f_b/\Omega$	557	247	139	89	62	45	35	27	22
		$\Phi f_b$	837	372	209	134	93	68	52	41	33
		L/360	606	180	76	39	22	14	9	7	5
		L/240	909	269	114	58	34	21	14	10	7
		L/180	1212	359	152	78	45	28	19	13	10
	L/120	1818	539	227	116	67	42	28	20	15	
	Double Span	$f_b/\Omega$	630	280	158	101	70	51	39	31	25
		$\Phi f_b$	947	421	237	152	105	77	59	47	38
		L/360	1460	433	182	93	54	34	23	16	12
		L/240	2190	649	274	140	81	51	34	24	18
		L/180	2920	865	365	187	108	68	46	32	23
	L/120	4380	1298	547	280	162	102	68	48	35	
	Triple Span	$f_b/\Omega$	788	350	197	126	88	64	49	39	32
		$\Phi f_b$	1184	526	296	189	132	97	74	58	47
		L/360	1144	339	143	73	42	27	18	13	9
L/240		1715	508	214	110	64	40	27	19	14	
L/180		2287	678	286	146	85	53	36	25	18	
L/120	3431	1017	429	220	127	80	54	38	27		
18	Single Span	$f_b/\Omega$	825	367	206	132	92	67	52	41	33
		$\Phi f_b$	1240	551	310	198	138	101	77	61	50
		L/360	845	250	106	54	31	20	13	9	7
		L/240	1268	376	158	81	47	30	20	14	10
		L/180	1690	501	211	108	63	39	26	19	14
	L/120	2535	751	317	162	94	59	40	28	20	
	Double Span	$f_b/\Omega$	892	396	223	143	99	73	56	44	36
		$\Phi f_b$	1341	596	335	215	149	109	84	66	54
		L/360	2036	603	254	130	75	47	32	22	16
		L/240	3053	905	382	195	113	71	48	34	24
		L/180	4071	1206	509	261	151	95	64	45	33
	L/120	6107	1809	763	391	226	142	95	67	49	
	Triple Span	$f_b/\Omega$	1115	496	279	178	124	91	70	55	45
		$\Phi f_b$	1676	745	419	268	186	137	105	83	67
		L/360	1595	472	199	102	59	37	25	17	13
L/240		2392	709	299	153	89	56	37	26	19	
L/180		3189	945	399	204	118	74	50	35	26	
L/120	4784	1417	598	306	177	112	75	52	38		
16	Single Span	$f_b/\Omega$	1097	487	274	175	122	90	69	54	44
		$\Phi f_b$	1648	733	412	264	183	135	103	81	66
		L/360	1067	316	133	68	40	25	17	12	9
		L/240	1600	474	200	102	59	37	25	18	13
		L/180	2134	632	267	137	79	50	33	23	17
	L/120	3201	948	400	205	119	75	50	35	26	
	Double Span	$f_b/\Omega$	1156	514	289	185	128	94	72	57	46
		$\Phi f_b$	1737	772	434	278	193	142	109	86	69
		L/360	2570	762	321	164	95	60	40	28	21
		L/240	3855	1142	482	247	143	90	60	42	31
		L/180	5140	1523	643	329	190	120	80	56	41
	L/120	7711	2285	964	493	286	180	120	85	62	
	Triple Span	$f_b/\Omega$	1445	642	361	231	161	118	90	71	58
		$\Phi f_b$	2172	965	543	347	241	177	136	107	87
		L/360	2013	597	252	129	75	47	31	22	16
L/240		3020	895	378	193	112	70	47	33	24	
L/180		4027	1193	503	258	149	94	63	44	32	
L/120	6040	1790	755	387	224	141	94	66	48		

# 3.2 DGN-32

## Allowable Wind Uplift Loads



DGN-32				Support Fastener Pattern: 32 / 5									
Allowable Wind Uplift Load (psf)													
Gauge	Fastener	Support Thickness	Fastener Capacity [lbs]	Span	Span (ft.-in.)								
					4	6	8	10	12	14	16	18	20
22	#12-14 ITW Buildex TEKS	16ga	165	Single Span	77	52	39	31	26	22	19	17	15
	#12-24 ITW Buildex TEKS	≥ 3/16"	280		131	88	66	53	44	38	31	25	20
	Hilti X-ENP-19 L15	≥ 1/4"	660		309	206	126	80	56	41	31	25	20
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	80	56	41	31	25	20
	1/2" Eff. Arc Spot Weld	≥ 1/8"	787		369	223	126	80	56	41	31	25	20
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	56	41	31	25	20
	#12-14 ITW Buildex TEKS	16ga	165		Double Span	77	52	39	31	26	22	19	17
	#12-24 ITW Buildex TEKS	≥ 3/16"	280	131		88	66	53	44	38	31	25	20
	Hilti X-ENP-19 L15	≥ 1/4"	660	309		206	126	80	56	41	31	25	20
	Hilti X-HSN 24	1/8" - 3/8"	435	204		136	102	80	56	41	31	25	20
	1/2" Eff. Arc Spot Weld	≥ 1/8"	787	369		223	126	80	56	41	31	25	20
	Simpson XL Screws	≥ 1/8"	385	180		120	90	72	56	41	31	25	20
	#12-14 ITW Buildex TEKS	16ga	165	Triple Span		77	52	39	31	26	22	19	17
	#12-24 ITW Buildex TEKS	≥ 3/16"	280		131	88	66	53	44	38	33	29	25
	Hilti X-ENP-19 L15	≥ 1/4"	660		309	206	155	101	70	51	39	31	25
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	82	68	51	39	31	25
	1/2" Eff. Arc Spot Weld	≥ 1/8"	787		369	246	157	101	70	51	39	31	25
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	60	51	39	31	25

DGN-32				Support Fastener Pattern: 32 / 5									
Allowable Wind Uplift Load (psf)													
Gauge	Fastener	Support Thickness	Fastener Capacity [lbs]	Span	Span (ft.-in.)								
					4	6	8	10	12	14	16	18	20
20	#12-14 ITW Buildex TEKS	16ga	165	Single Span	77	52	39	31	26	22	19	17	15
	#12-24 ITW Buildex TEKS	≥ 3/16"	336		158	105	79	63	53	45	39	31	25
	Hilti X-ENP-19 L15	≥ 1/4"	705		330	220	158	101	70	52	39	31	25
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	82	68	52	39	31	25
	1/2" Eff. Arc Spot Weld	≥ 1/8"	953		447	281	158	101	70	52	39	31	25
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	60	52	39	31	25
	#12-14 ITW Buildex TEKS	16ga	165		Double Span	77	52	39	31	26	22	19	17
	#12-24 ITW Buildex TEKS	≥ 3/16"	336	158		105	79	63	53	45	39	31	25
	Hilti X-ENP-19 L15	≥ 1/4"	705	330		220	158	101	70	52	39	31	25
	Hilti X-HSN 24	1/8" - 3/8"	435	204		136	102	82	68	52	39	31	25
	1/2" Eff. Arc Spot Weld	≥ 1/8"	953	447		281	158	101	70	52	39	31	25
	Simpson XL Screws	≥ 1/8"	385	180		120	90	72	60	52	39	31	25
	#12-14 ITW Buildex TEKS	16ga	165	Triple Span		77	52	39	31	26	22	19	17
	#12-24 ITW Buildex TEKS	≥ 3/16"	336		158	105	79	63	53	45	39	35	32
	Hilti X-ENP-19 L15	≥ 1/4"	705		330	220	165	126	88	64	49	39	32
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	82	68	58	49	39	32
	1/2" Eff. Arc Spot Weld	≥ 1/8"	953		447	298	197	126	88	64	49	39	32
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	60	52	45	39	32

Notes:

- 1) Deck uplift table evaluates for the allowable bending stress of the panel and the allowable fastener capacity.
- 2) Overall fastener capacities based on a minimum of: Fastener tensile capacity, Fastener pullout from substrate, and Deck pullover from fastener head.
- 3) ITW Buildex TEKS fastener capacities per ICC-ES ESR1976 compliance report utilizing a min. substrate Fu=45ksi.
- 4) Simpson XL fastener capacities per IAPMO-UES ER326 compliance report utilizing a min. substrate Fu=50ksi.
- 5) Hilti X-HSN 24 and X-ENP-19 pin capacities per ICC-ES ESR-2197 compliance report utilizing a min substrate Fu=58ksi.
- 6) Spot weld tensile capacities evaluated per AISI S100, Sec.J2.2.3 with a minimum effective weld diameter of 1/2".
- 7) Shaded values represent conditions where panel capacity governs vs. fastener capacity.

DGN-32				Support Fastener Pattern: 32 / 5									
Allowable Wind Uplift Load (psf)													
Gauge	Fastener	Support Thickness	Fastener Capacity [lbs]	Span	Span (ft.-in.)								
					4	6	8	10	12	14	16	18	20
<b>18</b>	#12-14 ITW Buildex TEKS	16ga	165	Single Span	77	52	39	31	26	22	19	17	15
	#12-24 ITW Buildex TEKS	≥ 3/16"	448		210	140	105	84	70	60	53	44	36
	Hilti X-ENP-19 L15	≥ 1/4"	805		377	252	189	143	99	73	56	44	36
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	82	68	58	51	44	36
	1/2" Eff. Arc Spot Weld	≥ 1/8"	1292		606	397	223	143	99	73	56	44	36
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	60	52	45	40	36
	#12-14 ITW Buildex TEKS	16ga	165	Double Span	77	52	39	31	26	22	19	17	15
	#12-24 ITW Buildex TEKS	≥ 3/16"	448		210	140	105	84	70	60	53	44	36
	Hilti X-ENP-19 L15	≥ 1/4"	805		377	252	189	143	99	73	56	44	36
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	82	68	58	51	44	36
	1/2" Eff. Arc Spot Weld	≥ 1/8"	1292		606	397	223	143	99	73	56	44	36
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	60	52	45	40	36
	#12-14 ITW Buildex TEKS	16ga	165	Triple Span	77	52	39	31	26	22	19	17	15
	#12-24 ITW Buildex TEKS	≥ 3/16"	448		210	140	105	84	70	60	53	47	42
	Hilti X-ENP-19 L15	≥ 1/4"	805		377	252	189	151	124	91	70	55	45
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	82	68	58	51	45	41
	1/2" Eff. Arc Spot Weld	≥ 1/8"	1292		606	404	279	179	124	91	70	55	45
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	60	52	45	40	36

DGN-32				Support Fastener Pattern: 32 / 5									
Allowable Wind Uplift Load (psf)													
Gauge	Fastener	Support Thickness	Fastener Capacity [lbs]	Span	Span (ft.-in.)								
					4	6	8	10	12	14	16	18	20
<b>16</b>	#12-14 ITW Buildex TEKS	16ga	165	Single Span	77	52	39	31	26	22	19	17	15
	#12-24 ITW Buildex TEKS	≥ 3/16"	515		241	161	121	97	80	69	60	54	46
	Hilti X-ENP-19 L15	≥ 1/4"	880		413	275	206	165	129	95	72	57	46
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	82	68	58	51	45	41
	1/2" Eff. Arc Spot Weld	≥ 1/8"	1622		761	507	290	185	129	95	72	57	46
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	60	52	45	40	36
	#12-14 ITW Buildex TEKS	16ga	165	Double Span	77	52	39	31	26	22	19	17	15
	#12-24 ITW Buildex TEKS	≥ 3/16"	515		241	161	121	97	80	69	60	54	46
	Hilti X-ENP-19 L15	≥ 1/4"	880		413	275	206	165	129	95	72	57	46
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	82	68	58	51	45	41
	1/2" Eff. Arc Spot Weld	≥ 1/8"	1622		761	507	290	185	129	95	72	57	46
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	60	52	45	40	36
	#12-14 ITW Buildex TEKS	16ga	165	Triple Span	77	52	39	31	26	22	19	17	15
	#12-24 ITW Buildex TEKS	≥ 3/16"	515		241	161	121	97	80	69	60	54	48
	Hilti X-ENP-19 L15	≥ 1/4"	880		413	275	206	165	138	118	91	72	58
	Hilti X-HSN 24	1/8" - 3/8"	435		204	136	102	82	68	58	51	45	41
	1/2" Eff. Arc Spot Weld	≥ 1/8"	1622		761	507	362	232	161	118	91	72	58
	Simpson XL Screws	≥ 1/8"	385		180	120	90	72	60	52	45	40	36

**Notes:**

- 1) Deck uplift table evaluates for the allowable bending stress of the panel and the allowable fastener capacity.
- 2) Overall fastener capacities based on a minimum of: Fastener tensile capacity, Fastener pullout from substrate, and Deck pullover from fastener head.
- 3) ITW Buildex TEKS fastener capacities per ICC-ES ESR1976 compliance report utilizing a min. substrate Fu=45ksi.
- 4) Simpson XL fastener capacities per IAPMO-UES ER326 compliance report utilizing a min. substrate Fu=50ksi.
- 5) Hilti X-HSN 24 and X-ENP-19 pin capacities per ICC-ES ESR-2197 compliance report utilizing a min substrate Fu=58ksi.
- 6) Spot weld tensile capacities evaluated per AISI S100, Sec.J2.2.3 with a minimum effective weld diameter of 1/2".
- 7) Shaded values represent conditions where panel capacity governs vs. fastener capacity.

N PANELS