The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 22.

Please refer to the publication in its entirety for complete details on this product including data development, base materials, general suitability, installation, corrosion, and product specifications.

Direct Fastening Technical Guide, Edition 22

To consult directly with a team member regarding our direct fastening products, contact Hilti's team of technical support specialists between the hours of 7:00am - 5:00pm CST.

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S-MD 12-24 x 1-5/8 M HWH5

Approvals/Listings

ICC-ES (International Code Council)
ESR-3693 with LABC/LARC Supplement

FM (Factory Mutual)
For attaching Class 1 Steel Roof Decks with wind uplift ratings up to 1-330

UL (Underwriters Laboratories)
Fasteners for attaching steel roof deck (uplift and fire classification)

3.5.5 S-RT5 METAL DECK FASTENER (S-MD 12-24 x 1-5/8 M HWH5)

3.5.5.1 PRODUCT DESCRIPTION

The Hilti Racing Tip fastening system consists of the Hilti SDT 9 stand-up screw fastening system and the S-MD 12-24 x 1-5/8 M HWH5 Racing Tip fasteners, which are available in a collated version.

The SDT 9 Decking system can be powered with either the ST 1800 Adjustable Torque Screwdriver or the ST 1800-A22 Cordless Adjustable Torque Screwdriver. Loaded with up to 50 frame fasteners or sidelap connectors this system can perform frame attachment and sidelap connections. Contact Hilti for specific tool recommendations.

Hilti S-MD 12-24 x 1-5/8 M HWH5 Racing Tip steel deck fasteners comply with ANSI/SDI RD1.0, C1.0 and NC1.0 standards.

3.5.5.2 MATERIAL SPECIFICATIONS

Fastener designation	Fastener material	Fastener plating
S-MD 12-24 x 1-5/8 M HWH5	Carbon steel	5 µm zinc[1]

1 ASTM B633, SC 1, Type III. Reference Section 2.3.3.1 for more information.

3.5.5.3 TECHNICAL DATA

Allowable pullout loads for attachments to steel base material lb (kN)[1,3,4]

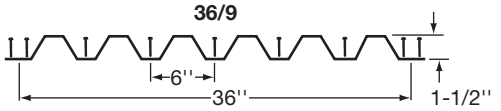
Fastener	Base material thickness in. (Gauge)				
	0.0598 (16)	**0.0747** (14)	**0.1046** (12)	**1/8**[2]	**1/4**[2]
S-MD 12-24 x 1-5/8 M HWH5	**215** (0.96)	**265** (1.18)	**370** (1.65)	**505** (2.25)	**505** (2.25)

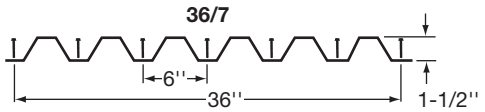
1 Unless otherwise noted, allowable load values based upon calculations done in accordance with AISI S100 with F_u = 58 ksi.
2 Allowable load values based upon testing performed in ASTM A36 (F_u ≥ 58 ksi) plate steel.
3 Allowable tension pullout load values must be compared with allowable tension pullover load values. Use lesser value.
4 Allowable load values based on safety factor of 3.0 per AISI S100.

Allowable tension pullover and shear bearing loads for attaching steel deck [1,2,3,4]

Fastener	Steel deck gauge (in.)									
	16 (0.0598)		**18** (0.0474)		**20** (0.0358)		**22** (0.0295)		**24** (0.0239)	
	Tension lb (kN)	**Shear**[5] **lb** (kN)	**Tension lb** (kN)	**Shear**[5] **lb** (kN)	**Tension lb** (kN)	**Shear lb** (kN)	**Tension lb** (kN)	**Shear lb** (kN)	**Tension lb** (kN)	**Shear lb** (kN)
S-MD 12-24 x 1-5/8 M HWH5	**560** (2.49)	**620** (2.76)	**445** (1.98)	**620** (2.76)	**335** (1.49)	**555** (2.47)	**275** (1.22)	**400** (1.78)	**225** (1.00)	**260** (1.16)

1 Allowable load values are based upon a safety factor of 3.0 per AISI S100.
2 Allowable load values based upon ASTM A1008, or minimum ASTM A653 SQ33 steel deck.
3 Allowable tension pullover load values based upon calculations done in accordance with AISI S100 with F_u = 45 ksi.
4 Allowable tension pullover load values must be compared with allowable tension pullout load values. Use lesser value.
5 Allowable load value limited by screw fastener shear strength.





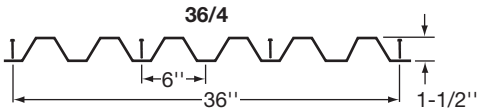
Allowable Stress Design (ASD) — Allowable diaphragm shears, S_{ASD}, (plf) and stiffness factors, G', (kips/in.) for standard 1-1/2" deep flutes, 6" center-to-center steel deck ($F_y \geq 33$ ksi; $F_u \geq 45$ ksi) installed with Hilti S-MD 12-24 x 1-5/8 M HWH5 fasteners with 36/9 or 36/7 end and interior support fastener patterns[1,2,3,4,5,6,7]

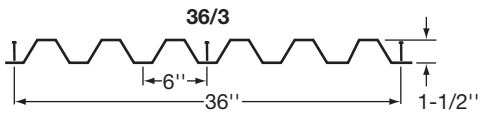
Gauge	Number of Hilti SLC per span	Factor	Span (ft- in.)													
			4'-0"		5'-0"		6'-0"		7'-0"		8'-0"		9'-0"		10'-0"	
			Fasteners per sheet to support													
			9	7	9	7	9	7	9	7	9	7	9	7	9	7
22	2	S_{ASD}	639	477	532	393	450	332	382	283	331	246	293	218	264	196
		G'	60.7	57	64.1	59.1	65.4	59.2	65.2	58.1	64.2	56.4	62.6	54.4	60.8	52.3
	3	S_{ASD}	709	554	596	462	511	394	442	343	383	298	340	265	306	238
		G'	62.4	59.6	66.6	62.6	68.5	63.5	68.9	63	68.3	61.7	67	60	65.4	58
	4	S_{ASD}	773	623	656	525	566	451	497	394	436	350	387	312	348	281
		G'	63.9	61.5	68.7	65.4	71.1	66.9	72	67	71.8	66.2	70.8	64.7	69.4	63
	5	S_{ASD}	831	685	712	584	619	505	545	444	485	395	434	355	390	322
		G'	65	63.1	70.4	67.6	73.3	69.8	74.6	70.4	74.8	70	74.2	68.8	73	67.3
	6	S_{ASD}	882	739	763	637	668	556	590	491	528	438	477	395	433	359
		G'	66	64.4	71.8	69.5	75.2	72.2	76.9	73.3	77.4	73.2	77.1	72.4	76.2	71.1
	7	S_{ASD}	929	787	811	686	714	603	634	535	569	480	515	434	469	395
		G'	66.9	65.5	73.1	71.1	76.9	74.3	79	75.7	79.8	76.1	79.7	75.6	79	74.5
20	2	S_{ASD}	904	680	754	561	643	476	548	408	475	355	418	313	376	282
		G'	83.1	76.9	85.1	77.2	84.6	75.3	82.7	72.5	79.9	69.2	76.9	65.8	73.7	62.5
	3	S_{ASD}	1008	793	849	663	729	566	637	493	553	433	488	383	439	345
		G'	86.1	81.2	89.1	82.7	89.4	81.7	88	79.4	85.7	76.5	82.9	73.3	79.9	70
	4	S_{ASD}	1101	894	937	756	810	651	711	569	632	505	558	453	502	408
		G'	88.6	84.6	92.5	87.1	93.5	86.9	92.6	85.2	90.7	82.7	88.2	79.8	85.4	76.7
	5	S_{ASD}	1184	982	1018	841	886	730	782	642	697	572	628	515	565	468
		G'	90.6	87.3	95.3	90.8	96.9	91.4	96.7	90.2	95.2	88.1	93	85.5	90.4	82.6
	6	S_{ASD}	1257	1059	1092	917	958	803	849	711	760	635	687	574	626	522
		G'	92.4	89.6	97.7	93.8	100	95.1	100.2	94.6	99.1	92.9	97.2	90.5	94.8	87.8
	7	S_{ASD}	1323	1127	1160	987	1024	870	912	775	820	696	743	630	678	575
		G'	93.9	91.5	99.8	96.5	102.6	98.4	103.3	98.3	102.6	97	101	95	98.9	92.5
18	2	S_{ASD}	1062	816	889	676	760	575	660	500	573	436	506	386	451	345
		G'	124.5	112.6	122.1	108.2	117.3	102.1	111.5	95.8	105.6	89.6	99.9	83.9	94.4	78.7
	3	S_{ASD}	1194	960	1012	807	873	693	765	605	679	536	600	480	536	430
		G'	130.4	120.8	129.3	117.7	125.4	112.4	120.2	106.5	114.5	100.4	108.8	94.6	103.4	89.3
	4	S_{ASD}	1310	1083	1124	925	978	802	862	705	768	627	692	564	621	512
		G'	135.4	127.4	135.5	125.6	132.4	121.2	127.7	115.7	122.4	109.9	116.9	104.2	111.5	98.7
	5	S_{ASD}	1410	1189	1225	1030	1075	901	953	798	853	714	771	644	702	587
		G'	139.6	132.8	140.8	132.3	138.5	128.8	134.4	123.8	129.4	118.3	124.2	112.7	118.9	107.2
	6	S_{ASD}	1497	1278	1316	1122	1164	992	1038	884	933	795	846	720	773	658
		G'	143.2	137.4	145.5	138.1	143.9	135.4	140.4	130.9	135.8	125.8	130.8	120.4	125.6	115
	7	S_{ASD}	1572	1353	1396	1203	1245	1073	1117	963	1009	871	918	792	841	726
		G'	146.3	141.4	149.5	143.1	148.7	141.1	145.7	137.3	141.5	132.5	136.8	127.3	131.8	122.1

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses, t_t , with the range 1/8" ≤ t_t ≤ 1/4".

2 Tabulated ASD diaphragm shear loads are calculated with a safety factor (Ω) of 2.00 for wind loads. To calculate ASD values for load combinations involving earthquake, multiply values in table by 2.00 and divide by a safety factor (Ω) of 2.30. Panel buckling has been checked.

3 Please refer to footnotes 3 through 7 on page 171.





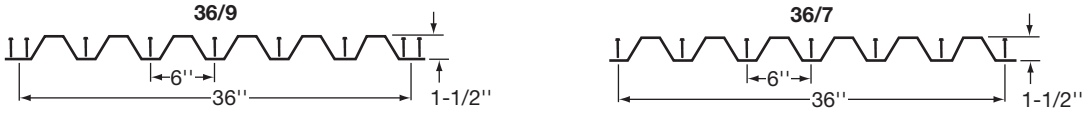
Allowable Stress Design (ASD) - Allowable diaphragm shears, S_{ASD}, (plf) and stiffness factors, G', (kips/in.) for standard 1-1/2" deep flutes, 6" center-to-center steel deck ($F_y \geq 33$ ksi; $F_u \geq 45$ ksi) installed with Hilti S-MD 12-24 x 1-5/8 M HWH5 fasteners with 36/4 or 36/3 end and interior support fastener patterns[1,2,3,4,5,6,7]

Gauge	Number of Hilti SLC per span	Factor	Span (ft- in.)													
			4'-0"		5'-0"		6'-0"		7'-0"		8'-0"		9'-0"		10'-0"	
			Fasteners per sheet to support													
			4	3	4	3	4	3	4	3	4	3	4	3	4	3
22	2	S_{ASD}	350	285	299	253	259	225	228	202	201	182	179	166	161	152
		G'	11.9	6.1	14.2	7.4	16.1	8.7	17.7	9.7	19.0	10.7	20.0	11.5	20.8	12.3
	3	S_{ASD}	399	315	349	286	307	260	273	237	245	216	222	198	202	183
		G'	12.1	6.2	14.5	7.6	16.6	8.8	18.3	10.0	19.9	11.0	21.1	12.0	22.1	12.8
	4	S_{ASD}	437	335	390	311	348	287	313	265	283	245	258	227	236	211
		G'	12.2	6.2	14.7	7.6	16.9	8.9	18.8	10.1	20.5	11.3	21.9	12.3	23.1	13.2
	5	S_{ASD}	466	349	423	328	383	307	348	287	317	268	291	251	268	235
		G'	12.3	6.2	14.8	7.7	17.1	9.0	19.2	10.3	20.9	11.4	22.5	12.5	23.8	13.5
	6	S_{ASD}	489	359	449	341	412	323	378	305	347	288	320	271	296	255
		G'	12.3	6.3	14.9	7.7	17.3	9.1	19.4	10.4	21.3	11.6	23.0	12.7	24.4	13.7
	7	S_{ASD}	507	366	471	351	436	336	404	319	374	303	347	288	323	273
		G'	12.4	6.3	15.0	7.7	17.4	9.1	19.6	10.4	21.6	11.7	23.4	12.8	24.9	13.9
20	2	S_{ASD}	498	404	427	360	371	321	327	289	291	261	258	238	232	218
		G'	18.4	9.7	21.5	11.6	24.0	13.3	25.9	14.8	27.3	16.0	28.2	17.1	28.8	17.9
	3	S_{ASD}	569	445	499	407	441	371	393	339	353	310	320	285	292	264
		G'	18.8	9.8	22.2	11.9	24.9	13.7	27.2	15.3	28.9	16.8	30.2	18.0	31.1	19.0
	4	S_{ASD}	622	473	557	440	499	408	450	378	408	351	372	326	342	303
		G'	19.0	9.9	22.6	12.0	25.6	13.9	28.1	15.7	30.1	17.2	31.7	18.6	32.9	19.8
	5	S_{ASD}	662	491	603	464	548	437	500	410	457	384	420	360	387	338
		G'	19.2	9.9	22.9	12.1	26.1	14.1	28.8	15.9	31.1	17.6	32.9	19.1	34.3	20.4
	6	S_{ASD}	692	505	639	482	589	458	542	434	500	410	462	388	429	366
		G'	19.4	10.0	23.2	12.2	26.5	14.2	29.4	16.1	31.8	17.9	33.8	19.4	35.5	20.8
	7	S_{ASD}	716	514	669	495	622	474	578	453	537	432	500	411	467	391
		G'	19.5	10.0	23.4	12.3	26.8	14.3	29.8	16.3	32.4	18.1	34.6	19.7	36.4	21.2
18	2	S_{ASD}	593	474	513	427	449	385	398	348	356	316	321	289	290	266
		G'	33.6	18.4	38.0	21.6	40.9	24.2	42.7	26.1	43.6	27.6	43.8	28.6	43.5	29.3
	3	S_{ASD}	675	519	600	480	535	443	481	408	434	377	395	349	362	324
		G'	34.7	18.8	39.7	22.3	43.3	25.2	45.8	27.6	47.3	29.5	48.1	30.9	48.3	31.9
	4	S_{ASD}	734	547	667	516	605	484	550	453	503	424	461	397	425	372
		G'	35.4	19.1	40.9	22.8	45.1	25.9	48.1	28.6	50.1	30.8	51.4	32.6	52.1	33.9
	5	S_{ASD}	776	565	717	540	661	514	608	487	561	460	519	435	482	411
		G'	36.0	19.3	41.8	23.1	46.4	26.5	49.9	29.3	52.4	31.8	54.1	33.8	55.2	35.5
	6	S_{ASD}	807	578	756	557	705	535	656	512	611	489	569	466	532	443
		G'	36.4	19.4	42.5	23.3	47.5	26.9	51.3	29.9	54.3	32.6	56.4	34.8	57.8	36.7
	7	S_{ASD}	829	586	785	570	740	551	695	531	653	511	613	490	576	470
		G'	36.8	19.5	43.1	23.5	48.4	27.2	52.5	30.4	55.8	33.2	58.2	35.6	60.0	37.7

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses, t_t , with the range 1/8" ≤ t_t ≤ 1/4".

2 Tabulated ASD diaphragm shear loads are calculated with a safety factor (Ω) of 2.00 for wind loads. To calculate ASD values for load combinations involving earthquake, multiply values in table by 2.00 and divide by a safety factor (Ω) of 2.30. Panel buckling has been checked.

3 Please refer to footnotes 3 through 7 on page 171.



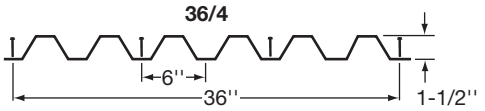
Load Resistance Factor Design (LRFD) - Factored resistance diaphragm shears, S_{LRFD}, (plf) and stiffness factors, G', (kips/in.) for standard 1-1/2" deep flutes, 6" center-to-center steel deck ($F_y \geq 50$ ksi; $F_u \geq 65$ ksi) installed with Hilti S-MD 12-24 x 1-5/8 M HWH5 fasteners with 36/9 or 36/7 end and interior support fastener patterns[1,2,3,4,5,6,7]

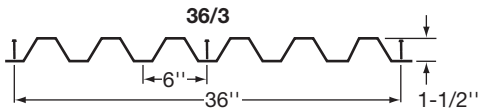
Gauge	Number of Hilti SLC per span	Factor	Span (ft- in.)													
			4'-0"		5'-0"		6'-0"		7'-0"		8'-0"		9'-0"		10'-0"	
			Fasteners per sheet to support													
			9	7	9	7	9	7	9	7	9	7	9	7	9	7
22	2	S_{LRFD}	1022	763	851	629	720	531	611	453	530	394	469	349	422	314
		G'	60.7	57	64.1	59.1	65.4	59.2	65.2	58.1	64.2	56.4	62.6	54.4	60.8	52.3
	3	S_{LRFD}	1134	886	954	739	818	630	707	549	613	477	544	424	490	381
		G'	62.4	59.6	66.6	62.6	68.5	63.5	68.9	63	68.3	61.7	67	60	65.4	58
	4	S_{LRFD}	1237	997	1050	840	906	722	795	630	698	560	619	499	557	450
		G'	63.9	61.5	68.7	65.4	71.1	66.9	72	67	71.8	66.2	70.8	64.7	69.4	63
	5	S_{LRFD}	1330	1096	1139	934	990	808	872	710	776	632	694	568	624	515
		G'	65	63.1	70.4	67.6	73.3	69.8	74.6	70.4	74.8	70	74.2	68.8	73	67.3
	6	S_{LRFD}	1411	1182	1221	1019	1069	890	944	786	845	701	763	632	693	574
		G'	66	64.4	71.8	69.5	75.2	72.2	76.9	73.3	77.4	73.2	77.1	72.4	76.2	71.1
	7	S_{LRFD}	1486	1259	1298	1098	1142	965	1014	856	910	768	824	694	750	632
		G'	66.9	65.5	73.1	71.1	76.9	74.3	79	75.7	79.8	76.1	79.7	75.6	79	74.5
20	2	S_{LRFD}	1446	1088	1206	898	1029	762	877	653	760	568	669	501	602	451
		G'	83.1	76.9	85.1	77.2	84.6	75.3	82.7	72.5	79.9	69.2	76.9	65.8	73.7	62.5
	3	S_{LRFD}	1613	1269	1358	1061	1166	906	1019	789	885	693	781	613	702	552
		G'	86.1	81.2	89.1	82.7	89.4	81.7	88	79.4	85.7	76.5	82.9	73.3	79.9	70
	4	S_{LRFD}	1762	1430	1499	1210	1296	1042	1138	910	1011	808	893	725	803	653
		G'	88.6	84.6	92.5	87.1	93.5	86.9	92.6	85.2	90.7	82.7	88.2	79.8	85.4	76.7
	5	S_{LRFD}	1894	1571	1629	1346	1418	1168	1251	1027	1115	915	1005	824	904	749
		G'	90.6	87.3	95.3	90.8	96.9	91.4	96.7	90.2	95.2	88.1	93	85.5	90.4	82.6
	6	S_{LRFD}	2011	1694	1747	1467	1533	1285	1358	1138	1216	1016	1099	918	1002	835
		G'	92.4	89.6	97.7	93.8	100	95.1	100.2	94.6	99.1	92.9	97.2	90.5	94.8	87.8
	7	S_{LRFD}	2117	1803	1856	1579	1638	1392	1459	1240	1312	1114	1189	1008	1085	920
		G'	93.9	91.5	99.8	96.5	102.6	98.4	103.3	98.3	102.6	97	101	95	98.9	92.5
18	2	S_{LRFD}	1699	1306	1422	1082	1216	920	1056	800	917	698	810	618	722	552
		G'	124.5	112.6	122.1	108.2	117.3	102.1	111.5	95.8	105.6	89.6	99.9	83.9	94.4	78.7
	3	S_{LRFD}	1910	1536	1619	1291	1397	1109	1224	968	1086	858	960	768	858	688
		G'	130.4	120.8	129.3	117.7	125.4	112.4	120.2	106.5	114.5	100.4	108.8	94.6	103.4	89.3
	4	S_{LRFD}	2096	1733	1798	1480	1565	1283	1379	1128	1229	1003	1107	902	994	819
		G'	135.4	127.4	135.5	125.6	132.4	121.2	127.7	115.7	122.4	109.9	116.9	104.2	111.5	98.7
	5	S_{LRFD}	2256	1902	1960	1648	1720	1442	1525	1277	1365	1142	1234	1030	1123	939
		G'	139.6	132.8	140.8	132.3	138.5	128.8	134.4	123.8	129.4	118.3	124.2	112.7	118.9	107.2
	6	S_{LRFD}	2395	2045	2106	1795	1862	1587	1661	1414	1493	1272	1354	1152	1237	1053
		G'	143.2	137.4	145.5	138.1	143.9	135.4	140.4	130.9	135.8	125.8	130.8	120.4	125.6	115
	7	S_{LRFD}	2515	2165	2234	1925	1992	1717	1787	1541	1614	1394	1469	1267	1346	1162
		G'	146.3	141.4	149.5	143.1	148.7	141.1	145.7	137.3	141.5	132.5	136.8	127.3	131.8	122.1

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses, t_t, with the range 1/8" ≤ t_t ≤ 1/4".

2 Tabulated LRFD diaphragm shear loads are calculated with a phi factor (Φ) of 0.70 for wind loads. To calculate LRFD values for load combinations involving earthquake, divide values in table by 0.70 and multiply by a phi factor (Φ) of 0.65. Panel buckling has been checked.

3 Please refer to footnotes 3 through 7 on page 171.





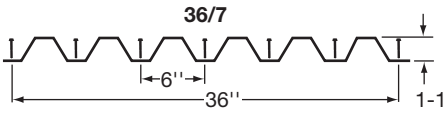
Load Resistance Factor Design (LRFD) - Factored resistance diaphragm shears, S_{LRFD}, (plf) and stiffness factors, G', (kips/in.) for standard 1-1/2" deep flutes, 6" center-to-center steel deck ($F_y \geq 33$ ksi; $F_u \geq 45$ ksi) installed with Hilti S-MD 12-24 x 1-5/8 M HWH5 fasteners with 36/4 or 36/3 end and interior support fastener patterns[1,2,3,4,5,6,7]

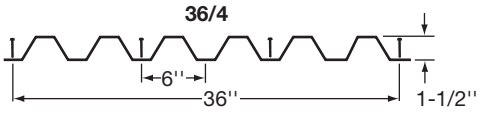
Gauge	Number of Hilti SLC per span	Factor	Span (ft- in.)													
			4'-0"		5'-0"		6'-0"		7'-0"		8'-0"		9'-0"		10'-0"	
			Fasteners per sheet to support													
			4	3	4	3	4	3	4	3	4	3	4	3	4	3
22	2	S_{LRFD}	560	456	478	405	414	360	365	323	322	291	286	266	258	243
		G'	11.9	6.1	14.2	7.4	16.1	8.7	17.7	9.7	19.0	10.7	20.0	11.5	20.8	12.3
	3	S_{LRFD}	638	504	558	458	491	416	437	379	392	346	355	317	323	293
		G'	12.1	6.2	14.5	7.6	16.6	8.8	18.3	10.0	19.9	11.0	21.1	12.0	22.1	12.8
	4	S_{LRFD}	699	536	624	498	557	459	501	424	453	392	413	363	378	338
		G'	12.2	6.2	14.7	7.6	16.9	8.9	18.8	10.1	20.5	11.3	21.9	12.3	23.1	13.2
	5	S_{LRFD}	746	558	677	525	613	491	557	459	507	429	466	402	429	376
		G'	12.3	6.2	14.8	7.7	17.1	9.0	19.2	10.3	20.9	11.4	22.5	12.5	23.8	13.5
	6	S_{LRFD}	782	574	718	546	659	517	605	488	555	461	512	434	474	408
		G'	12.3	6.3	14.9	7.7	17.3	9.1	19.4	10.4	21.3	11.6	23.0	12.7	24.4	13.7
	7	S_{LRFD}	811	586	754	562	698	538	646	510	598	485	555	461	517	437
		G'	12.4	6.3	15.0	7.7	17.4	9.1	19.6	10.4	21.6	11.7	23.4	12.8	24.9	13.9
20	2	S_{LRFD}	797	646	683	576	594	514	523	462	466	418	413	381	371	349
		G'	18.4	9.7	21.5	11.6	24.0	13.3	25.9	14.8	27.3	16.0	28.2	17.1	28.8	17.9
	3	S_{LRFD}	910	712	798	651	706	594	629	542	565	496	512	456	467	422
		G'	18.8	9.8	22.2	11.9	24.9	13.7	27.2	15.3	28.9	16.8	30.2	18.0	31.1	19.0
	4	S_{LRFD}	995	757	891	704	798	653	720	605	653	562	595	522	547	485
		G'	19.0	9.9	22.6	12.0	25.6	13.9	28.1	15.7	30.1	17.2	31.7	18.6	32.9	19.8
	5	S_{LRFD}	1059	786	965	742	877	699	800	656	731	614	672	576	619	541
		G'	19.2	9.9	22.9	12.1	26.1	14.1	28.8	15.9	31.1	17.6	32.9	19.1	34.3	20.4
	6	S_{LRFD}	1107	808	1022	771	942	733	867	694	800	656	739	621	686	586
		G'	19.4	10.0	23.2	12.2	26.5	14.2	29.4	16.1	31.8	17.9	33.8	19.4	35.5	20.8
	7	S_{LRFD}	1146	822	1070	792	995	758	925	725	859	691	800	658	747	626
		G'	19.5	10.0	23.4	12.3	26.8	14.3	29.8	16.3	32.4	18.1	34.6	19.7	36.4	21.2
18	2	S_{LRFD}	949	758	821	683	718	616	637	557	570	506	514	462	464	426
		G'	33.6	18.4	38.0	21.6	40.9	24.2	42.7	26.1	43.6	27.6	43.8	28.6	43.5	29.3
	3	S_{LRFD}	1080	830	960	768	856	709	770	653	694	603	632	558	579	518
		G'	34.7	18.8	39.7	22.3	43.3	25.2	45.8	27.6	47.3	29.5	48.1	30.9	48.3	31.9
	4	S_{LRFD}	1174	875	1067	826	968	774	880	725	805	678	738	635	680	595
		G'	35.4	19.1	40.9	22.8	45.1	25.9	48.1	28.6	50.1	30.8	51.4	32.6	52.1	33.9
	5	S_{LRFD}	1242	904	1147	864	1058	822	973	779	898	736	830	696	771	658
		G'	36.0	19.3	41.8	23.1	46.4	26.5	49.9	29.3	52.4	31.8	54.1	33.8	55.2	35.5
	6	S_{LRFD}	1291	925	1210	891	1128	856	1050	819	978	782	910	746	851	709
		G'	36.4	19.4	42.5	23.3	47.5	26.9	51.3	29.9	54.3	32.6	56.4	34.8	57.8	36.7
	7	S_{LRFD}	1326	938	1256	912	1184	882	1112	850	1045	818	981	784	922	752
		G'	36.8	19.5	43.1	23.5	48.4	27.2	52.5	30.4	55.8	33.2	58.2	35.6	60.0	37.7

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses, t_t , with the range 1/8" ≤ t_t ≤ 1/4".

2 Tabulated LRFD diaphragm shear loads are calculated with a phi factor (Φ) of 0.80 for wind loads. To calculate LRFD values for load combinations involving earthquake, divide values in table by 0.80 and multiply by a phi factor (Φ) of 0.683. Panel buckling has been checked.

3 Please refer to footnotes 3 through 7 on page 171.





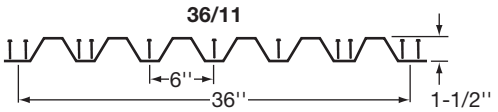
Limit States Design (LSD) – Factored resistance diaphragm shears, S_{LSD}, (N/mm) and stiffness factors, G', (103 N/mm) for standard 38mm deep flutes, 152mm center-to-center deck (F_y≥345 Mpa;F_u≥450 Mpa) installed with Hilti S-MD 12-24 x 1-5/8 M HWH5 fasteners with 914/7 (36/7) or 914/4 (36/4) end and interior support fastener patterns[1,2,3,4,5,6,7]

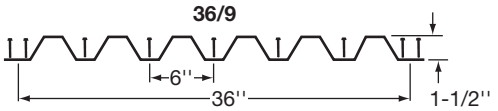
Gauge	Number of Hilti SLC per span	Factor	Span (mm)													
			1200		1500		1800		2100		2400		2700		3000	
			Fasteners per sheet to support													
			7	4	7	4	7	4	7	4	7	4	7	4	7	4
22	2	S_{LSD}	10.6	7.7	8.7	6.6	7.4	5.8	6.3	5.1	5.5	4.5	4.8	4.0	4.4	3.6
		G'	9.9	2.1	10.3	2.5	10.4	2.8	10.2	3.1	9.9	3.3	9.6	3.5	9.2	3.6
	3	S_{LSD}	12.3	8.8	10.2	7.7	8.7	6.8	7.6	6.1	6.6	5.4	5.9	4.9	5.3	4.5
		G'	10.4	2.1	10.9	2.5	11.1	2.9	11.1	3.2	10.9	3.4	10.6	3.7	10.2	3.8
	4	S_{LSD}	13.8	9.6	11.6	8.6	10.0	7.7	8.8	6.9	7.8	6.3	6.9	5.7	6.2	5.2
		G'	10.7	2.1	11.4	2.5	11.7	2.9	11.8	3.3	11.6	3.6	11.4	3.8	11.1	4.0
	5	S_{LSD}	15.2	10.3	12.9	9.3	11.2	8.5	9.8	7.7	8.8	7.0	7.9	6.4	7.2	5.9
		G'	11.0	2.1	11.8	2.6	12.2	3.0	12.3	3.3	12.3	3.6	12.1	3.9	11.9	4.1
	6	S_{LSD}	16.3	10.8	14.1	9.9	12.3	9.1	10.9	8.3	9.7	7.7	8.8	7.1	8.0	6.6
		G'	11.2	2.1	12.1	2.6	12.6	3.0	12.8	3.4	12.8	3.7	12.7	4.0	12.5	4.2
	7	S_{LSD}	17.4	11.1	15.2	10.4	13.4	9.6	11.9	8.9	10.6	8.3	9.6	7.7	8.8	7.1
		G'	11.4	2.1	12.4	2.6	13.0	3.0	13.3	3.4	13.3	3.7	13.3	4.1	13.1	4.3
20	2	S_{LSD}	15.1	11.0	12.5	9.5	10.6	8.2	9.1	7.3	7.9	6.5	7.0	5.8	6.3	5.2
		G'	13.5	3.2	13.5	3.7	13.3	4.2	12.8	4.5	12.2	4.8	11.6	4.9	11.1	5.0
	3	S_{LSD}	17.6	12.6	14.7	11.0	12.6	9.8	10.9	8.7	9.7	7.8	8.5	7.1	7.7	6.5
		G'	14.2	3.3	14.5	3.8	14.4	4.3	14.0	4.7	13.5	5.0	12.9	5.3	12.4	5.4
	4	S_{LSD}	19.8	13.7	16.8	12.3	14.4	11.0	12.6	10.0	11.2	9.0	10.1	8.3	9.1	7.6
		G'	14.8	3.3	15.3	3.9	15.3	4.4	15.0	4.9	14.6	5.2	14.1	5.5	13.5	5.7
	5	S_{LSD}	21.7	14.6	18.6	13.3	16.2	12.1	14.2	11.1	12.7	10.1	11.4	9.3	10.4	8.6
		G'	15.2	3.3	15.9	4.0	16.0	4.5	15.9	5.0	15.5	5.4	15.1	5.7	14.6	6.0
	6	S_{LSD}	23.4	15.2	20.3	14.1	17.8	13.0	15.8	12.0	14.1	11.1	12.7	10.2	11.6	9.5
		G'	15.6	3.3	16.4	4.0	16.7	4.6	16.6	5.1	16.3	5.5	15.9	5.9	15.5	6.2
	7	S_{LSD}	24.9	15.7	21.8	14.7	19.3	13.7	17.2	12.8	15.4	11.9	14.0	11.1	12.8	10.3
		G'	16.0	3.4	16.9	4.0	17.2	4.6	17.3	5.2	17.1	5.6	16.7	6.0	16.3	6.3
18	2	S_{LSD}	18.1	13.1	15.0	11.4	12.8	10.0	11.1	8.8	9.7	7.9	8.6	7.1	7.7	6.5
		G'	19.8	5.8	19.1	6.6	18.0	7.1	16.9	7.5	15.9	7.6	14.9	7.7	14.0	7.6
	3	S_{LSD}	21.3	14.9	17.9	13.3	15.4	11.8	13.4	10.6	11.9	9.6	10.7	8.8	9.6	8.0
		G'	21.2	6.0	20.7	6.9	19.8	7.5	18.8	8.0	17.8	8.3	16.7	8.4	15.8	8.5
	4	S_{LSD}	24.0	16.2	20.5	14.7	17.8	13.4	15.6	12.2	13.9	11.1	12.5	10.2	11.4	9.4
		G'	22.3	6.1	22.1	7.1	21.3	7.8	20.4	8.4	19.4	8.8	18.4	9.0	17.5	9.1
	5	S_{LSD}	26.3	17.1	22.8	15.8	20.0	14.6	17.7	13.4	15.8	12.4	14.3	11.5	13.0	10.7
		G'	23.3	6.2	23.2	7.3	22.7	8.1	21.8	8.7	20.9	9.1	19.9	9.5	19.0	9.6
	6	S_{LSD}	28.2	17.7	24.8	16.6	22.0	15.5	19.6	14.5	17.6	13.5	16.0	12.6	14.6	11.8
		G'	24.0	6.3	24.2	7.4	23.8	8.2	23.1	8.9	22.2	9.5	21.2	9.8	20.3	10.1
	7	S_{LSD}	29.8	18.2	26.6	17.3	23.7	16.3	21.3	15.3	19.3	14.4	17.6	13.5	16.1	13.6
		G'	24.7	6.4	25.1	7.5	24.8	8.4	24.2	9.1	23.3	9.7	22.5	10.1	21.6	10.8

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses, t_f, with the range 1/8" ≤ t_f ≤ 6 mm.

2 Tabulated LSD diaphragm shear loads are calculated with a phi factor (Φ) of 0.75 for wind loads. To calculate LSD values for load combinations involving earthquake, divide values in table by 0.75 and multiply by a phi factor (Φ) of 0.55. Panel buckling has been checked.

3 Please refer to footnotes 3 through 7 on page 171.





Limit States Design (LSD) – Factored resistance diaphragm shears, S_{LSD}, (N/mm) and stiffness factors, G', (10^3 N/mm) for standard 38mm deep flutes, 152mm center-to-center deck ($F_y \geq 345$ Mpa;$F_u \geq 450$ Mpa) installed with Hilti S-MD 12-24 x 1-5/8 M HWH5 fasteners with 914/11 (36/11) or 914/9 (36/9) end and interior support fastener patterns[1,2,3,4,5,6,7]

Gauge	Number of Hilti SLC per span	Factor	Span (mm)													
			1200		1500		1800		2100		2400		2700		3000	
			Fasteners per sheet to support													
			11	9	11	9	11	9	11	9	11	9	11	9	11	9
22	2	S_{LSD}	16.3	14.2	13.5	11.8	11.4	10.0	9.6	8.5	8.4	7.4	7.4	6.5	6.7	5.9
		G'	10.9	10.6	11.6	11.2	12.0	11.5	12.1	11.5	12.0	11.3	11.8	11.0	11.5	10.7
	3	S_{LSD}	18.0	15.7	15.0	13.2	12.8	11.3	11.0	9.9	9.5	8.5	8.4	7.6	7.6	6.8
		G'	11.1	10.9	12.0	11.6	12.5	12.0	12.6	12.1	12.6	12.0	12.5	11.8	12.2	11.5
	4	S_{LSD}	19.6	17.1	16.4	14.5	14.1	12.6	12.3	11.0	10.7	9.7	9.5	8.6	8.5	7.7
		G'	11.3	11.1	12.3	12.0	12.8	12.4	13.1	12.6	13.1	12.6	13.0	12.4	12.9	12.2
	5	S_{LSD}	21.1	18.4	17.8	15.8	15.3	13.7	13.4	12.1	11.9	10.8	10.5	9.6	9.5	8.7
		G'	11.5	11.3	12.5	12.3	13.2	12.8	13.5	13.1	13.6	13.1	13.5	13.0	13.4	12.8
	6	S_{LSD}	22.4	19.5	19.1	16.9	16.5	14.8	14.5	13.1	12.9	11.7	11.6	10.6	10.4	9.6
		G'	11.6	11.5	12.7	12.5	13.4	13.1	13.8	13.5	14.0	13.6	14.0	13.5	13.9	13.4
	7	S_{LSD}	23.7	20.5	20.3	17.9	17.7	15.8	15.6	14.1	13.9	12.6	12.5	11.4	11.3	10.4
		G'	11.8	11.6	12.9	12.7	13.7	13.4	14.1	13.8	14.3	14.0	14.4	14.0	14.3	13.9
20	2	S_{LSD}	23.1	20.0	19.1	16.7	16.2	14.3	13.8	12.2	12.0	10.6	10.5	9.3	9.5	8.4
		G'	15.0	14.5	15.6	14.9	15.7	14.9	15.5	14.5	15.1	14.1	14.6	13.6	14.1	13.0
	3	S_{LSD}	25.6	22.3	21.3	18.8	18.2	16.2	15.8	14.1	13.7	12.3	12.1	10.9	10.9	9.8
		G'	15.5	15.0	16.2	15.6	16.4	15.7	16.3	15.5	16.0	15.1	15.6	14.6	15.1	14.1
	4	S_{LSD}	27.9	24.4	23.5	20.8	20.1	18.0	17.6	15.8	15.5	14.0	13.7	12.4	12.3	11.2
		G'	15.8	15.5	16.7	16.2	17.0	16.4	17.0	16.3	16.8	16.0	16.4	15.5	16.0	15.1
	5	S_{LSD}	30.0	26.2	25.5	22.5	22.0	19.6	19.2	17.3	17.1	15.5	15.2	14.0	13.7	12.6
		G'	16.1	15.8	17.1	16.7	17.5	17.0	17.6	17.0	17.4	16.7	17.1	16.4	16.7	15.9
	6	S_{LSD}	32.0	27.8	27.3	24.2	23.7	21.2	20.9	18.8	18.6	16.9	16.7	15.2	15.1	13.9
		G'	16.4	16.1	17.4	17.1	18.0	17.5	18.1	17.6	18.0	17.4	17.8	17.1	17.4	16.7
	7	S_{LSD}	33.8	29.2	29.1	25.6	25.4	22.7	22.4	20.2	20.0	18.2	18.0	16.5	16.4	15.1
		G'	16.6	16.4	17.8	17.4	18.4	18.0	18.6	18.1	18.6	18.0	18.4	17.8	18.1	17.4
18	2	S_{LSD}	27.0	23.5	22.4	19.7	19.1	16.9	16.5	14.7	14.3	12.8	12.6	11.3	11.3	10.1
		G'	22.9	21.8	22.7	21.5	22.1	20.7	21.2	19.7	20.3	18.7	19.3	17.7	18.3	16.7
	3	S_{LSD}	30.3	26.4	25.4	22.4	21.7	19.4	18.9	17.0	16.7	15.1	14.7	13.4	13.2	12.0
		G'	23.7	22.8	23.8	22.7	23.3	22.1	22.5	21.2	21.6	20.2	20.7	19.2	19.7	18.3
	4	S_{LSD}	33.2	29.0	28.1	24.9	24.2	21.7	21.2	19.1	18.8	17.1	16.8	15.4	15.1	13.9
		G'	24.4	23.7	24.7	23.8	24.4	23.3	23.7	22.5	22.8	21.6	21.9	20.6	21.0	19.7
	5	S_{LSD}	35.9	31.2	30.7	27.1	26.6	23.8	23.4	21.1	20.8	18.9	18.8	17.1	17.0	15.6
		G'	25.1	24.4	25.5	24.7	25.3	24.3	24.7	23.7	23.9	22.8	23.1	21.9	22.2	21.0
	6	S_{LSD}	38.2	33.0	33.0	29.1	28.8	25.8	25.5	23.0	22.8	20.7	20.5	18.8	18.7	17.2
		G'	25.6	25.0	26.2	25.5	26.1	25.3	25.6	24.7	24.9	23.9	24.1	23.1	23.3	22.2
	7	S_{LSD}	40.4	34.7	35.2	30.9	30.9	27.5	27.5	24.7	24.6	22.4	22.3	20.4	20.3	18.7
		G'	26.1	25.6	26.8	26.2	26.9	26.1	26.5	25.6	25.8	24.9	25.1	24.1	24.3	23.3

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses, t_f, with the range 1/8" ≤ t_f ≤ 6 mm.

2 Tabulated LSD diaphragm shear loads are calculated with a phi factor (Φ) of 0.75 for wind loads. To calculate LSD values for load combinations involving earthquake, divide values in table by 0.75 and multiply by a phi factor (Φ) of 0.55. Panel buckling has been checked.

3 Please refer to footnotes 3 through 7 on page 171.

3.5.5.4 ORDERING INFORMATION

Racing Tip Screw Fastening System

SDT 9 Stand Up Decking System* description	Package contents
ST 1800 Metal Construction Screwdriver	Includes tool with depth gauge, 13 ft supply cord and operating instructions in a cardboard box
SDT 9 Stand Up Decking Tool	Includes stand up tool, 2 grips, magazine, 5/16“ nutsetter, supply cord strain relief clasp and operating instructions

* Additional tool and fastener packages available. Contact Hilti for more information.

Accessories description	Notes	Qty
SDT 9 Magazine	For use with the SDT 9 Stand Up Decking Tool	1
SDT Integrated Driver and Setter - 5/16”	For use with the SDT 9 or SDT 30 Stand Up Decking Tools	1

For attachment of metal deck to bar joist description	Max. drill capacity	Qty
S-MD 12-24 x 1 5/8“ M HWH5	0.500”	250