



The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 21.

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.

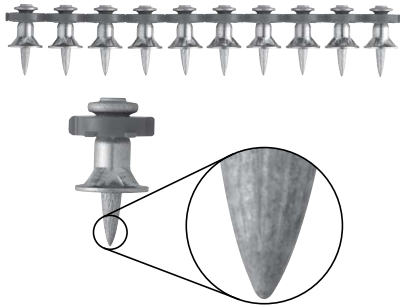
[Direct Fastening Technical Guide, Edition 21](#)

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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- 3.5.2.1 Product description
- 3.5.2.2 Material specifications
- 3.5.2.3 Technical data
- 3.5.2.4 Ordering information



X-HSN 24

Approvals/Listings

ICC-ES (International Code Council)
 ESR-2776 with LABC/LARC Supplement,
 ESR-2197 with LABC/LARC Supplement
IAPMO (Uniform Evaluation Service)
 Co-listings ER-2018, ER-0161, ER-0329
FM (Factory Mutual)

For attaching Class 1 Steel Roof Decks with wind uplift ratings up to 1-330.

Refer to FM RoofNav for specific assembly listings.

UL (Underwriters Laboratories)

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



3.5.2. X-HSN 24 FOR FASTENING DECK TO BAR JOIST

3.5.2.1 PRODUCT DESCRIPTION

The Hilti bar joist deck fastening system consists of powder-actuated tools that are primarily used with the X-HSN 24 fasteners, which are available in a collated version.

For many bar joist decking projects, the tool of choice is the DX 9-HSN tool. This self-contained stand up decking tool is powered by 0.27 caliber short cartridges, which are loaded into the tool in strips of 40. The cartridges drive the X-HSN 24 fasteners into almost any type of steel deck profile and base steel thicknesses of 1/8" to 3/8". These fasteners are available in collated strips of 10. Four of these strips are loaded

into the DX 9-HSN tool, along with the cartridge strip, and enable the operator to fasten at a rate of up to 1,000 quality fastenings per hour. Additionally, this tool offers punch through resistance in cases where the base material is inadvertently missed.

Other tools include the hand held DX 5-SM, a semi-automatic magazine tool for use on smaller jobs or in tandem with the DX 9-HSN.

Hilti X-HSN 24 steel deck fasteners comply with ANSI/SDI RD1.0, C1.0 and NC1.0 standards.

3.5.2.2 MATERIAL SPECIFICATIONS

Fastener designation	Fastener material	Fastener plating	Nominal fastener hardness
X-HSN 24	Carbon steel	5 µm zinc ¹	55.5 HRC

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

3.5.2.3 TECHNICAL DATA

Allowable pullout loads for attachments to steel base material lb (kN)^{1,2,3}

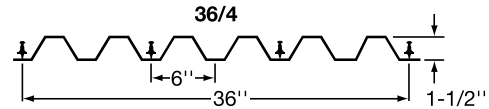
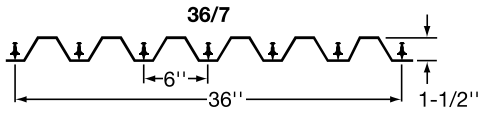
Fastener	Base material thickness (in.)			
	1/8	3/16	1/4	3/8
X-HSN 24	435 (1.95)	635 (2.82)	750 (3.34)	750 (3.34)

¹ These values represent testing performed in ASTM A36 plate steel.
² The values must be compared with allowable tensile pullover values.
³ Allowable values based on safety factor of 5.0.

Allowable pullover and shear bearing loads for attaching steel deck^{1,2,3}

Fastener	Steel deck gauge (in.)											
	16 (0.0598)		18 (0.0474)		20 (0.0358)		22 (0.0295)		24 (0.0239)		26 (0.0179)	
	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
X-HSN 24 ¹	865 (3.85)	975 (4.29)	725 (3.22)	785 (3.45)	560 (2.49)	600 (2.64)	500 (2.22)	500 (2.20)	450 (2.00)	410 (1.80)	415 (1.85)	310 (1.36)

¹ For base steel thickness 1/8" (3 mm) to 3/8" (10 mm).
² Allowable values are based on a safety factor of 3.0.
³ Loads based on ASTM A1008, or minimum ASTM A653 SQ33 steel deck.



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 ($F_y \geq 50$ ksi; $F_u \geq 65$ ksi) installed with Hilti X-HSN 24 fasteners with 36/7 or 36/4 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															
		7		4		7		4		7		4		7		4		
22	2	S_{ASD}	667	490	547	414	455	356	387	310	336	268	298	238	268	214		
		G'	57.3	11.9	59.6	14.2	59.8	16.1	58.8	17.8	57.2	19.1	55.2	20.1	53.0	20.9		
	3	S_{ASD}	761	557	629	478	534	417	456	367	396	328	352	292	317	263		
		G'	59.8	12.1	63.0	14.5	63.9	16.6	63.5	18.4	62.3	19.9	60.6	21.2	58.7	22.2		
	4	S_{ASD}	849	612	707	534	603	470	525	418	457	375	406	340	365	310		
		G'	61.8	12.2	65.7	14.7	67.3	16.9	67.5	18.8	66.7	20.5	65.3	21.9	63.6	23.1		
	5	S_{ASD}	930	657	781	582	670	518	585	465	518	419	460	381	414	349		
		G'	63.3	12.3	67.9	14.8	70.1	17.1	70.8	19.2	70.4	21.0	69.3	22.5	67.8	23.9		
	6	S_{ASD}	1004	694	850	623	733	561	642	507	570	460	512	420	462	386		
		G'	64.6	12.3	69.7	14.9	72.5	17.3	73.6	19.4	73.6	21.3	72.8	23.0	71.6	24.5		
	7	S_{ASD}	1071	724	915	658	794	598	698	545	622	498	559	457	508	421		
		G'	65.6	12.4	71.3	15.0	74.5	17.5	76.0	19.7	76.4	21.6	75.9	23.4	74.9	24.9		
	20	2	S_{ASD}	898	660	738	560	621	484	529	424	459	371	405	327	365	294	
			G'	77.5	18.5	78.0	21.6	76.3	24.1	73.5	26.0	70.3	27.5	66.9	28.4	63.6	29.1	
3		S_{ASD}	1034	752	857	651	729	569	630	503	548	450	484	406	436	365		
		G'	81.7	18.8	83.3	22.2	82.5	25.0	80.3	27.3	77.4	29.0	74.2	30.4	71.0	31.3		
4		S_{ASD}	1157	826	968	727	828	644	722	575	637	517	563	469	507	429		
		G'	85.0	19.1	87.6	22.6	87.6	25.7	86.0	28.2	83.5	30.2	80.6	31.8	77.5	33.1		
5		S_{ASD}	1270	885	1073	791	923	709	808	639	717	579	642	528	578	485		
		G'	87.6	19.2	91.2	22.9	91.9	26.1	90.9	28.9	88.8	31.1	86.2	33.0	83.3	34.4		
6		S_{ASD}	1372	932	1170	845	1013	766	890	696	792	636	713	583	647	537		
		G'	89.8	19.4	94.2	23.2	95.6	26.5	95.1	29.4	93.5	31.9	91.2	33.9	88.5	35.5		
7		S_{ASD}	1463	970	1260	890	1098	815	969	747	865	686	780	633	709	585		
		G'	91.7	19.5	96.8	23.4	98.8	26.8	98.8	29.8	97.6	32.4	95.6	34.6	93.1	36.5		
18		2	S_{ASD}	1119	822	920	699	779	605	665	531	579	471	511	416	457	372	
			G'	114.1	33.8	109.8	38.2	103.9	41.2	97.6	43.1	91.5	44.0	85.8	44.3	80.5	44.1	
	3	S_{ASD}	1292	937	1073	813	913	713	793	632	694	566	614	511	550	464		
		G'	121.9	34.8	119.1	39.8	114.0	43.5	108.0	46.0	102.0	47.6	96.3	48.5	90.8	48.7		
	4	S_{ASD}	1450	1028	1216	909	1042	808	909	723	804	652	717	592	642	542		
		G'	128.3	35.5	126.8	41.0	122.5	45.2	117.1	48.3	111.3	50.4	105.6	51.7	100.1	52.4		
	5	S_{ASD}	1592	1100	1349	989	1164	890	1019	804	905	730	813	667	735	613		
		G'	133.6	36.0	133.3	41.9	129.9	46.5	125.0	50.1	119.5	52.6	114.0	54.4	108.6	55.5		
	6	S_{ASD}	1719	1156	1472	1054	1278	960	1125	875	1002	801	903	736	820	679		
		G'	138.1	36.5	138.9	42.6	136.3	47.6	132.0	51.5	126.9	54.4	121.5	56.6	116.2	58.0		
	7	S_{ASD}	1833	1201	1585	1108	1386	1019	1226	938	1096	864	989	798	900	740		
		G'	141.9	36.8	143.8	43.2	142.0	48.4	138.2	52.7	133.5	55.9	128.4	58.4	123.2	60.2		
	16	2	S_{ASD}	1242	912	1022	777	866	673	744	591	648	526	573	469	513	419	
			G'	149.9	53.7	139.8	58.5	129.2	61.0	119.3	61.8	110.4	61.5	102.5	60.4	95.4	58.9	
3		S_{ASD}	1438	1040	1196	905	1019	795	885	706	780	632	690	572	619	521		
		G'	162.2	56.0	153.3	62.0	143.3	65.6	133.4	67.4	124.3	67.9	116.0	67.5	108.5	66.5		
4		S_{ASD}	1616	1141	1358	1012	1164	901	1016	808	900	729	807	663	724	607		
		G'	172.4	57.7	164.9	64.6	155.5	69.2	145.9	71.8	136.7	73.1	128.2	73.3	120.5	72.7		
5		S_{ASD}	1775	1219	1507	1099	1302	992	1142	898	1015	817	912	747	827	687		
		G'	181.0	58.9	174.8	66.6	166.2	72.0	156.9	75.4	147.9	77.3	139.3	78.1	131.4	78.0		
6		S_{ASD}	1916	1280	1645	1171	1431	1069	1261	977	1125	896	1013	824	921	762		
		G'	188.4	59.9	183.5	68.2	175.7	74.2	166.9	78.3	158.0	80.8	149.5	82.2	141.5	82.6		
7		S_{ASD}	2042	1328	1771	1229	1552	1134	1375	1046	1230	966	1111	894	1012	830		
		G'	194.8	60.7	191.1	69.5	184.1	76.1	175.8	80.7	167.2	83.8	158.8	85.7	150.8	86.5		

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses $3/16" \leq t_f \leq 3/8"$. For attachment to base steel with range $1/8" \leq t_f < 3/16"$, diaphragm shear values should be calculated in accordance with Section 3.5.1.7, or by using Hilti Profis DF software.

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 S_{ASD} 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.



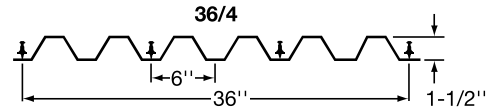
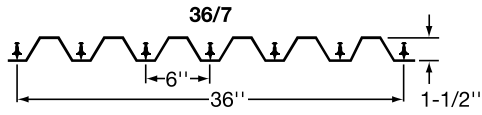
Load Resistance Factor Design (LRFD) - Factored resistance diaphragm shears, S_{LRFD} (plf) and stiffness factors, G' (kips/in.) for standard 1-1/2" deep flutes, 6" center-to-center steel deck ($F_y \geq 50$ ksi; $F_u \geq 65$ ksi) installed with Hilti X-HSN 24 fasteners with 36/11 or 36/9 end and interior 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														
			11	9	11	9	11	9	11	9	11	9	11	9			
22	2	S_{LRFD}	1704	1402	1162	986	854	757	681	1473	1220	1018	862	746	661	595	
		G'	62.8	61.0	67.2	64.7	69.2	66.0	69.7	66.0	69.2	65.0	68.0	63.5	66.5	61.7	
	3	S_{LRFD}	1852	1532	1291	1097	951	843	759	1610	1343	1147	973	843	747	672	
		G'	64.2	62.7	69.1	67.0	71.7	69.1	72.7	69.5	72.6	69.0	71.7	67.8	70.4	66.2	
	4	S_{LRFD}	1993	1657	1412	1208	1048	929	836	1739	1461	1253	1084	939	833	750	
		G'	65.3	64.1	70.8	69.0	73.9	71.6	75.3	72.5	75.5	72.4	74.9	71.5	73.8	70.1	
	5	S_{LRFD}	2126	1778	1520	1318	1145	1016	914	1857	1572	1355	1187	1036	919	827	
		G'	66.2	65.2	72.2	70.7	75.7	73.7	77.5	75.1	78.1	75.3	77.8	74.7	76.9	73.6	
	6	S_{LRFD}	2252	1894	1625	1419	1242	1102	992	1967	1678	1453	1276	1133	1006	905	
		G'	67.0	66.2	73.4	72.1	77.3	75.6	79.4	77.3	80.3	77.9	80.3	77.6	79.7	76.7	
	7	S_{LRFD}	2371	2006	1727	1512	1339	1188	1069	2069	1777	1546	1363	1216	1092	983	
		G'	67.7	67.0	74.4	73.3	78.7	77.2	81.2	79.3	82.4	80.2	82.6	80.2	82.2	79.5	
	20	2	S_{LRFD}	2265	1865	1561	1326	1150	1013	911	1961	1627	1374	1166	1009	888	799
			G'	86.8	83.8	90.1	86.0	90.6	85.7	89.4	83.8	87.2	81.2	84.5	78.2	81.5	75.1
3		S_{LRFD}	2478	2053	1746	1489	1292	1139	1025	2158	1805	1544	1328	1151	1014	912	
		G'	89.2	86.7	93.3	89.9	94.5	90.3	93.8	89.0	92.0	86.8	89.6	84.1	86.9	81.1	
4		S_{LRFD}	2679	2234	1907	1651	1434	1266	1138	2339	1973	1696	1483	1293	1140	1026	
		G'	91.1	89.0	96.0	93.1	97.8	94.2	97.7	93.5	96.3	91.7	94.2	89.3	91.7	86.5	
5		S_{LRFD}	2869	2407	2063	1800	1576	1392	1252	2506	2131	1842	1617	1435	1267	1139	
		G'	92.8	91.0	98.3	95.8	100.7	97.6	101.1	97.4	100.1	96.0	98.3	93.9	96.0	91.4	
6		S_{LRFD}	3046	2573	2214	1937	1718	1518	1365	2658	2279	1981	1745	1555	1393	1253	
		G'	94.2	92.7	100.4	98.2	103.3	100.5	104.1	100.9	103.5	99.9	102.0	98.0	99.9	95.7	
7		S_{LRFD}	3212	2730	2359	2070	1840	1644	1479	2797	2418	2113	1869	1670	1507	1367	
		G'	95.5	94.1	102.1	100.2	105.6	103.1	106.8	103.9	106.6	103.3	105.4	101.8	103.5	99.7	
18		2	S_{LRFD}	2797	2306	1948	1657	1439	1269	1133	2424	2014	1715	1461	1267	1117	996
			G'	132.1	126.0	131.4	124.0	127.7	119.4	122.7	113.7	117.1	107.9	111.5	102.1	106.0	96.7
	3	S_{LRFD}	3072	2549	2169	1869	1624	1434	1281	2677	2243	1921	1673	1452	1281	1144	
		G'	136.8	131.7	137.3	130.9	134.4	127.2	129.9	122.1	124.7	116.5	119.3	110.9	113.9	105.4	
	4	S_{LRFD}	3330	2782	2377	2070	1809	1598	1429	2909	2459	2117	1853	1637	1446	1292	
		G'	140.8	136.5	142.4	136.9	140.3	134.0	136.4	129.4	131.5	124.2	126.3	118.7	121.1	113.3	
	5	S_{LRFD}	3572	3004	2578	2251	1994	1762	1577	3120	2661	2304	2025	1802	1610	1440	
		G'	144.3	140.5	146.8	142.0	145.5	139.9	142.1	135.9	137.7	131.0	132.7	125.8	127.6	120.5	
	6	S_{LRFD}	3797	3216	2772	2428	2155	1927	1725	3312	2849	2482	2190	1954	1761	1588	
		G'	147.3	144.0	150.7	146.5	150.2	145.1	147.3	141.7	143.3	137.2	138.6	132.3	133.7	127.2	
	7	S_{LRFD}	4007	3416	2958	2599	2312	2080	1873	3485	3024	2650	2348	2101	1898	1729	
		G'	149.9	147.0	154.2	150.4	154.3	149.8	152.0	147.0	148.3	142.9	144.0	138.2	139.2	133.2	
	16	2	S_{LRFD}	3089	2548	2161	1845	1604	1416	1266	2679	2227	1897	1630	1416	1249	1115
			G'	178.4	168.6	171.8	160.5	162.9	150.9	153.5	141.2	144.4	132.0	135.9	123.6	128.0	115.9
3		S_{LRFD}	3401	2825	2405	2087	1815	1604	1435	2965	2487	2131	1859	1627	1437	1284	
		G'	186.2	177.8	180.9	171.1	172.8	162.2	163.8	152.7	154.9	143.6	146.3	135.1	138.4	127.2	
4		S_{LRFD}	3693	3089	2641	2301	2026	1792	1604	3226	2732	2354	2062	1830	1625	1454	
		G'	192.8	185.6	188.8	180.2	181.5	172.1	173.1	163.1	164.3	154.1	155.9	145.6	147.9	137.6	
5		S_{LRFD}	3966	3340	2870	2507	2222	1979	1773	3463	2959	2566	2257	2009	1808	1623	
		G'	198.7	192.4	195.8	188.3	189.4	180.9	181.4	172.4	173.0	163.7	164.7	155.2	156.7	147.2	
6		S_{LRFD}	4219	3579	3089	2708	2405	2161	1942	3677	3171	2766	2443	2182	1968	1790	
		G'	203.8	198.3	202.1	195.4	196.4	188.8	189.0	180.8	180.9	172.4	172.8	164.1	164.9	156.1	
7		S_{LRFD}	4453	3805	3299	2901	2583	2325	2111	3870	3366	2955	2621	2348	2123	1934	
		G'	208.3	203.5	207.7	201.7	202.8	196.0	195.9	188.5	188.2	180.4	180.3	172.2	172.5	164.3	

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses $3/16" \leq t_f \leq 3/8"$. For attachment to base steel with range $1/8" \leq t_f < 3/16"$, diaphragm shear values should be calculated in accordance with Section 3.5.1.7, or by using Hilti Profis DF software.

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 0,70. 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 X-HSN 24 fasteners with 36/7 or 36/4 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															
			7	4	7	4	7	4	7	4	7	4	7	4	7	4		
22	2	S_{LRFD}	1067	784	875	663	728	570	619	496	537	429	477	381	429	342		
		G'	57.3	11.9	59.6	14.2	59.8	16.1	58.8	17.8	57.2	19.1	55.2	20.1	53.0	20.9		
	3	S_{LRFD}	1218	891	1006	765	854	666	730	588	634	524	563	467	507	420		
		G'	59.8	12.1	63.0	14.5	63.9	16.6	63.5	18.4	62.3	19.9	60.6	21.2	58.7	22.2		
	4	S_{LRFD}	1358	978	1131	855	965	753	839	669	731	600	649	543	584	496		
		G'	61.8	12.2	65.7	14.7	67.3	16.9	67.5	18.8	66.7	20.5	65.3	21.9	63.6	23.1		
	5	S_{LRFD}	1487	1051	1249	932	1072	829	935	743	828	671	735	610	662	559		
		G'	63.3	12.3	67.9	14.8	70.1	17.1	70.8	19.2	70.4	21.0	69.3	22.5	67.8	23.9		
	6	S_{LRFD}	1606	1110	1361	997	1173	897	1028	811	913	736	820	673	739	618		
		G'	64.6	12.3	69.7	14.9	72.5	17.3	73.6	19.4	73.6	21.3	72.8	23.0	71.6	24.5		
	7	S_{LRFD}	1714	1158	1465	1053	1270	957	1117	871	995	796	895	731	813	674		
		G'	65.6	12.4	71.3	15.0	74.5	17.5	76.0	19.7	76.4	21.6	75.9	23.4	74.9	24.9		
	20	2	S_{LRFD}	1438	1057	1181	897	994	774	846	679	735	594	648	523	583	471	
			G'	77.5	18.5	78.0	21.6	76.3	24.1	73.5	26.0	70.3	27.5	66.9	28.4	63.6	29.1	
3		S_{LRFD}	1654	1204	1371	1041	1166	910	1008	805	877	720	775	650	697	584		
		G'	81.7	18.8	83.3	22.2	82.5	25.0	80.3	27.3	77.4	29.0	74.2	30.4	71.0	31.3		
4		S_{LRFD}	1852	1322	1549	1163	1325	1030	1155	920	1019	828	901	751	810	686		
		G'	85.0	19.1	87.6	22.6	87.6	25.7	86.0	28.2	83.5	30.2	80.6	31.8	77.5	33.1		
5		S_{LRFD}	2032	1416	1716	1266	1477	1135	1292	1023	1146	927	1027	845	924	775		
		G'	87.6	19.2	91.2	22.9	91.9	26.1	90.9	28.9	88.8	31.1	86.2	33.0	83.3	34.4		
6		S_{LRFD}	2195	1491	1872	1353	1621	1226	1425	1114	1267	1017	1140	932	1035	859		
		G'	89.8	19.4	94.2	23.2	95.6	26.5	95.1	29.4	93.5	31.9	91.2	33.9	88.5	35.5		
7		S_{LRFD}	2341	1552	2016	1425	1757	1304	1551	1195	1384	1098	1248	1012	1135	937		
		G'	91.7	19.5	96.8	23.4	98.8	26.8	98.8	29.8	97.6	32.4	95.6	34.6	93.1	36.5		
18		2	S_{LRFD}	1790	1315	1472	1119	1246	967	1064	849	926	754	818	666	732	595	
			G'	114.1	33.8	109.8	38.2	103.9	41.2	97.6	43.1	91.5	44.0	85.8	44.3	80.5	44.1	
	3	S_{LRFD}	2067	1499	1717	1302	1461	1141	1270	1011	1111	905	982	818	880	743		
		G'	121.9	34.8	119.1	39.8	114.0	43.5	108.0	46.0	102.0	47.6	96.3	48.5	90.8	48.7		
	4	S_{LRFD}	2320	1645	1946	1455	1667	1293	1454	1157	1287	1043	1147	948	1028	867		
		G'	128.3	35.5	126.8	41.0	122.5	45.2	117.1	48.3	111.3	50.4	105.6	51.7	100.1	52.4		
	5	S_{LRFD}	2547	1760	2159	1582	1862	1423	1631	1286	1448	1168	1301	1068	1176	981		
		G'	133.6	36.0	133.3	41.9	129.9	46.5	125.0	50.1	119.5	52.6	114.0	54.4	108.6	55.5		
	6	S_{LRFD}	2751	1850	2355	1687	2045	1535	1800	1400	1604	1281	1444	1177	1312	1087		
		G'	138.1	36.5	138.9	42.6	136.3	47.6	132.0	51.5	126.9	54.4	121.5	56.6	116.2	58.0		
	7	S_{LRFD}	2933	1922	2536	1773	2218	1631	1962	1500	1754	1382	1583	1278	1441	1185		
		G'	141.9	36.8	143.8	43.2	142.0	48.4	138.2	52.7	133.5	55.9	128.4	58.4	123.2	60.2		
	16	2	S_{LRFD}	1987	1459	1635	1244	1385	1077	1191	946	1037	841	917	750	821	670	
			G'	149.9	53.7	139.8	58.5	129.2	61.0	119.3	61.8	110.4	61.5	102.5	60.4	95.4	58.9	
3		S_{LRFD}	2301	1664	1913	1449	1630	1272	1417	1129	1248	1012	1104	915	990	834		
		G'	162.2	56.0	153.3	62.0	143.3	65.6	133.4	67.4	124.3	67.9	116.0	67.5	108.5	66.5		
4		S_{LRFD}	2585	1825	2172	1619	1863	1442	1626	1292	1440	1167	1291	1061	1159	971		
		G'	172.4	57.7	164.9	64.6	155.5	69.2	145.9	71.8	136.7	73.1	128.2	73.3	120.5	72.7		
5		S_{LRFD}	2839	1950	2412	1758	2083	1587	1827	1437	1623	1307	1459	1196	1323	1100		
		G'	181.0	58.9	174.8	66.6	166.2	72.0	156.9	75.4	147.9	77.3	139.3	78.1	131.4	78.0		
6		S_{LRFD}	3066	2048	2632	1873	2290	1710	2018	1563	1800	1433	1621	1319	1474	1219		
		G'	188.4	59.9	183.5	68.2	175.7	74.2	166.9	78.3	158.0	80.8	149.5	82.2	141.5	82.6		
7		S_{LRFD}	3267	2125	2834	1967	2483	1814	2200	1673	1969	1545	1778	1430	1620	1328		
		G'	194.8	60.7	191.1	69.5	184.1	76.1	175.8	80.7	167.2	83.8	158.8	85.7	150.8	86.5		

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses $3/16" \leq t_f \leq 3/8"$. For attachment to base steel with range $1/8" \leq t_f < 3/16"$, diaphragm shear values should be calculated in accordance with Section 3.5.1.7, or by using Hilti Profis DF software.

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 0.70. Panel buckling has been checked.

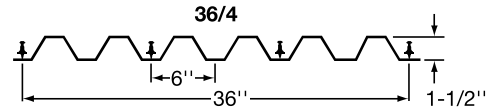
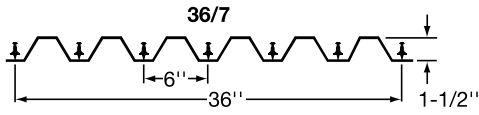
3 Please refer to footnotes 3 through 7 on page 171.



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 X-HSN 24 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}	23.6	20.4	19.5	16.9	16.2	14.2	13.7	12.0	11.9	10.4	10.5	8.0	9.5	8.3	
		G'	10.9	10.6	11.7	11.3	12.1	11.6	12.2	11.6	12.2	11.4	12.0	10.3	11.7	10.9	
	3	S_{LSD}	25.7	22.3	21.3	18.6	18.0	15.9	15.3	13.6	13.3	11.7	11.7	10.4	10.5	9.3	
		G'	11.2	10.9	12.1	11.7	12.5	12.1	12.7	12.2	12.7	12.1	12.6	11.9	12.4	11.7	
	4	S_{LSD}	27.6	24.1	23.0	20.2	19.6	17.4	16.8	15.1	14.6	13.1	12.9	11.6	11.6	10.4	
		G'	11.4	11.2	12.3	12.0	12.9	12.5	13.2	12.7	13.2	12.7	13.2	12.6	13.0	12.3	
	5	S_{LSD}	29.4	25.7	24.6	21.8	21.1	18.8	18.4	16.5	15.9	14.4	14.1	12.8	12.7	11.5	
		G'	11.5	11.4	12.6	12.3	13.2	12.9	13.6	13.1	13.7	13.2	13.7	13.1	13.5	12.9	
	6	S_{LSD}	31.2	27.2	26.3	23.2	22.5	20.1	19.7	17.7	17.3	15.8	15.3	14.0	13.8	12.6	
		G'	11.7	11.5	12.8	12.6	13.5	13.2	13.9	13.5	14.1	13.7	14.1	13.6	14.0	13.5	
	7	S_{LSD}	32.8	28.6	27.8	24.6	24.0	21.4	21.0	18.9	18.6	16.9	16.5	15.2	14.9	13.7	
		G'	11.8	11.7	13.0	12.8	13.7	13.5	14.2	13.9	14.4	14.0	14.5	14.1	14.4	14.0	
	20	2	S_{LSD}	31.4	27.2	25.9	22.6	21.7	19.1	18.5	16.2	16.0	14.1	14.1	12.4	12.7	11.1
			G'	15.2	14.6	15.8	15.1	15.9	15.0	15.7	14.7	15.3	14.3	14.9	13.8	14.4	13.2
3		S_{LSD}	34.3	29.9	28.5	25.0	24.2	21.4	20.7	18.5	18.0	16.0	15.9	14.1	14.2	12.7	
		G'	15.6	15.1	16.3	15.7	16.5	15.8	16.5	15.6	16.2	15.3	15.8	14.8	15.3	14.3	
4		S_{LSD}	37.1	32.4	31.0	27.3	26.5	23.5	23.0	20.6	20.0	18.0	17.6	15.9	15.8	14.3	
		G'	15.9	15.5	16.8	16.3	17.1	16.5	17.1	16.4	16.9	16.1	16.6	15.7	16.1	15.2	
5		S_{LSD}	39.7	34.7	33.4	29.5	28.6	25.5	25.0	22.4	22.0	19.9	19.4	17.6	17.4	15.8	
		G'	16.2	15.9	17.2	16.7	17.6	17.1	17.7	17.1	17.6	16.9	17.3	16.5	16.9	16.1	
6		S_{LSD}	42.1	36.7	35.6	31.6	30.7	27.5	26.9	24.2	23.8	21.6	21.1	19.4	19.0	17.4	
		G'	16.4	16.2	17.5	17.2	18.1	17.6	18.2	17.7	18.2	17.5	17.9	17.2	17.6	16.8	
7		S_{LSD}	44.4	38.6	37.8	33.4	32.7	29.3	28.7	25.9	25.5	23.2	22.9	20.9	20.6	19.0	
		G'	16.6	16.4	17.8	17.5	18.5	18.0	18.7	18.2	18.7	18.1	18.5	17.9	18.2	17.5	
18		2	S_{LSD}	38.8	33.6	32.0	27.9	27.1	23.8	23.1	20.4	20.0	17.7	17.7	15.6	15.8	13.9
			G'	23.1	22.0	23.0	21.7	22.4	20.9	21.5	20.0	20.6	19.0	19.6	18.0	18.7	17.0
	3	S_{LSD}	42.6	37.1	35.4	31.1	30.1	26.6	26.0	23.2	22.6	20.2	20.0	17.9	17.9	15.9	
		G'	23.9	23.0	24.0	22.9	23.6	22.3	22.8	21.4	21.9	20.5	21.0	19.5	20.0	18.6	
	4	S_{LSD}	46.1	40.2	38.6	34.1	33.0	29.4	28.7	25.7	25.2	22.8	22.3	20.1	19.9	18.0	
		G'	24.6	23.8	24.9	24.0	24.6	23.5	23.9	22.7	23.1	21.8	22.2	20.9	21.3	20.0	
	5	S_{LSD}	49.4	43.1	41.6	36.8	35.8	31.9	31.2	28.1	27.7	25.0	24.5	22.4	22.0	20.1	
		G'	25.2	24.5	25.7	24.9	25.5	24.5	24.9	23.9	24.2	23.0	23.3	22.1	22.5	21.2	
	6	S_{LSD}	52.5	45.8	44.5	39.4	38.4	34.4	33.7	30.4	29.9	27.1	26.8	24.4	24.0	22.1	
		G'	25.7	25.1	26.4	25.6	26.3	25.4	25.8	24.9	25.2	24.1	24.4	23.3	23.5	22.4	
	7	S_{LSD}	55.5	48.1	47.3	41.8	41.0	36.7	36.0	32.5	32.1	29.1	28.9	26.3	26.1	24.0	
		G'	26.2	25.7	27.0	26.3	27.0	26.2	26.7	25.8	26.0	25.1	25.3	24.3	24.5	23.4	
	16	2	S_{LSD}	42.8	37.1	35.4	30.9	30.0	26.3	25.7	22.7	22.3	19.7	19.7	17.4	17.6	15.5
			G'	31.3	29.6	30.2	28.2	28.7	26.6	27.1	24.9	25.5	23.3	24.0	21.8	22.6	20.5
3		S_{LSD}	47.1	41.1	39.2	34.5	33.4	29.6	29.0	25.8	25.3	22.7	22.3	20.0	20.0	17.9	
		G'	32.6	31.2	31.8	30.1	30.4	28.5	28.9	26.9	27.3	25.3	25.8	23.9	24.4	22.5	
4		S_{LSD}	51.1	44.6	42.8	37.8	36.6	32.6	31.9	28.6	28.2	25.4	24.9	22.6	22.3	20.2	
		G'	33.8	32.5	33.1	31.7	31.9	30.3	30.5	28.7	29.0	27.2	27.5	25.7	26.1	24.3	
5		S_{LSD}	54.9	47.9	46.3	41.0	39.8	35.6	34.8	31.3	30.9	27.9	27.6	25.1	24.7	22.6	
		G'	34.8	33.7	34.4	33.1	33.3	31.8	31.9	30.4	30.5	28.9	29.0	27.4	27.7	26.0	
6		S_{LSD}	58.4	50.8	49.6	43.9	42.8	38.3	37.6	33.9	33.4	30.3	30.0	27.3	27.0	24.8	
		G'	35.7	34.7	35.5	34.3	34.5	33.2	33.3	31.8	31.9	30.4	30.5	28.9	29.1	27.6	
7		S_{LSD}	61.6	53.4	52.7	46.5	45.7	40.9	40.2	36.3	35.8	32.6	32.3	29.4	29.3	26.8	
		G'	36.5	35.6	36.4	35.4	35.6	34.4	34.5	33.2	33.1	31.8	31.8	30.4	30.4	29.0	

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses $5\text{ mm} \leq t_f \leq 10\text{ mm}$. For attachment to base steel thickness with range $3\text{ mm} \leq t_f < 5\text{ mm}$, diaphragm shear values should be calculated in accordance with Section 3.5.1.7, or by using Hilti Profis DF software.
 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 X-HSN 24 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		
22	2	S_{LSD}	14.8	10.9	12.1	9.2	10.1	7.9	8.6	6.9	7.5	6.0	6.6	5.3	6.0	4.8		
		G'	10.0	2.1	10.4	2.5	10.5	2.8	10.3	3.1	10.1	3.3	9.7	3.5	9.4	3.6		
	3	S_{LSD}	16.9	12.3	14.0	10.6	11.9	9.2	10.2	8.1	8.8	7.3	7.8	6.5	7.0	5.8		
		G'	10.4	2.1	11.0	2.5	11.2	2.9	11.2	3.2	11.0	3.5	10.7	3.7	10.3	3.9		
	4	S_{LSD}	18.8	13.5	15.7	11.8	13.4	10.4	11.7	9.3	10.2	8.3	9.0	7.5	8.1	6.9		
		G'	10.8	2.1	11.5	2.5	11.8	2.9	11.8	3.3	11.7	3.6	11.5	3.8	11.2	4.0		
	5	S_{LSD}	20.6	14.5	17.3	12.9	14.9	11.5	13.0	10.3	11.5	9.3	10.2	8.5	9.2	7.7		
		G'	11.0	2.1	11.8	2.6	12.3	3.0	12.4	3.3	12.4	3.6	12.2	3.9	11.9	4.1		
	6	S_{LSD}	22.2	15.3	18.8	13.8	16.3	12.4	14.3	11.2	12.7	10.2	11.4	9.3	10.3	8.6		
		G'	11.2	2.1	12.2	2.6	12.7	3.0	12.9	3.4	12.9	3.7	12.8	4.0	12.6	4.2		
	7	S_{LSD}	23.7	15.9	20.3	14.5	17.6	13.2	15.5	12.0	13.8	11.0	12.4	10.1	11.3	9.3		
		G'	11.4	2.1	12.4	2.6	13.0	3.0	13.3	3.4	13.4	3.7	13.3	4.1	13.2	4.3		
	20	2	S_{LSD}	19.9	14.6	16.4	12.4	13.8	10.7	11.8	9.4	10.2	8.3	9.0	7.3	8.1	6.5	
			G'	13.6	3.2	13.7	3.7	13.4	4.2	12.9	4.5	12.4	4.8	11.8	5.0	11.2	5.1	
3		S_{LSD}	22.9	16.6	19.0	14.4	16.2	12.6	14.0	11.2	12.2	10.0	10.8	9.0	9.7	8.1		
		G'	14.3	3.3	14.6	3.8	14.5	4.3	14.1	4.7	13.6	5.1	13.1	5.3	12.5	5.5		
4		S_{LSD}	25.6	18.2	21.5	16.1	18.4	14.3	16.0	12.7	14.2	11.5	12.5	10.4	11.3	9.5		
		G'	14.8	3.3	15.3	3.9	15.4	4.4	15.1	4.9	14.7	5.3	14.2	5.5	13.7	5.8		
5		S_{LSD}	28.1	19.5	23.8	17.5	20.5	15.7	17.9	14.1	15.9	12.8	14.3	11.7	12.8	10.8		
		G'	15.3	3.3	16.0	4.0	16.1	4.5	16.0	5.0	15.6	5.4	15.2	5.7	14.7	6.0		
6		S_{LSD}	30.3	20.5	25.9	18.6	22.5	16.9	19.8	15.4	17.6	14.1	15.8	12.9	14.4	11.9		
		G'	15.7	3.3	16.5	4.0	16.8	4.6	16.7	5.1	16.4	5.5	16.0	5.9	15.6	6.2		
7		S_{LSD}	32.3	21.3	27.9	19.6	24.3	18.0	21.5	16.5	19.2	15.2	17.3	14.0	15.8	13.0		
		G'	16.0	3.4	16.9	4.0	17.3	4.6	17.3	5.2	17.1	5.6	16.8	6.0	16.4	6.3		
18		2	S_{LSD}	24.8	18.2	20.4	15.5	17.3	13.4	14.8	11.8	12.9	10.5	11.4	9.3	10.2	8.3	
			G'	20.0	5.9	19.3	6.6	18.3	7.2	17.2	7.5	16.1	7.7	15.1	7.7	14.2	7.7	
	3	S_{LSD}	28.6	20.7	23.8	18.0	20.3	15.8	17.6	14.0	15.5	12.6	13.7	11.3	12.3	10.3		
		G'	21.3	6.0	20.9	6.9	20.0	7.6	19.0	8.0	18.0	8.3	17.0	8.5	16.0	8.5		
	4	S_{LSD}	32.1	22.7	27.0	20.1	23.1	17.9	20.2	16.0	17.9	14.5	16.0	13.1	14.3	12.0		
		G'	22.4	6.1	22.2	7.1	21.5	7.9	20.6	8.4	19.6	8.8	18.6	9.0	17.7	9.2		
	5	S_{LSD}	35.2	24.2	29.9	21.8	25.8	19.7	22.6	17.8	20.1	16.2	18.1	14.8	16.4	13.6		
		G'	23.4	6.2	23.4	7.3	22.8	8.1	22.0	8.7	21.0	9.2	20.1	9.5	19.1	9.7		
	6	S_{LSD}	38.0	25.5	32.6	23.2	28.3	21.2	25.0	19.4	22.3	17.7	20.0	16.3	18.2	15.1		
		G'	24.1	6.3	24.3	7.4	23.9	8.3	23.2	8.9	22.3	9.5	21.4	9.9	20.5	10.1		
	7	S_{LSD}	40.5	26.4	35.1	24.4	30.7	22.5	27.2	20.7	24.3	19.1	22.0	17.7	20.0	16.4		
		G'	24.8	6.4	25.2	7.5	24.9	8.4	24.3	9.1	23.5	9.7	22.6	10.2	21.7	10.5		
	16	2	S_{LSD}	27.6	20.2	22.7	17.2	19.2	14.9	16.6	13.1	14.4	11.7	12.8	10.4	11.4	9.3	
			G'	26.3	9.3	24.6	10.2	22.8	10.7	21.1	10.8	19.5	10.8	18.1	10.6	16.9	10.4	
3		S_{LSD}	31.9	23.0	26.5	20.2	22.6	17.6	19.7	15.6	17.4	14.0	15.4	12.7	13.8	11.6		
		G'	28.5	9.7	27.0	10.8	25.3	11.5	23.6	11.8	22.0	11.9	20.5	11.8	19.2	11.7		
4		S_{LSD}	35.8	25.2	30.1	22.4	25.8	19.9	22.6	17.9	20.0	16.2	17.9	14.7	16.1	13.5		
		G'	30.3	10.0	29.0	11.2	27.4	12.1	25.7	12.5	24.1	12.8	22.7	12.8	21.3	12.8		
5		S_{LSD}	39.3	26.9	33.4	24.3	28.9	21.9	25.3	19.9	22.5	18.1	20.3	16.6	18.4	15.2		
		G'	31.8	10.2	30.7	11.6	29.3	12.5	27.7	13.2	26.1	13.5	24.6	13.7	23.2	13.7		
6		S_{LSD}	42.4	28.2	36.4	25.8	31.7	23.6	28.0	21.6	25.0	19.8	22.5	18.3	20.5	16.9		
		G'	33.0	10.4	32.2	11.9	30.9	12.9	29.4	13.7	27.9	14.1	26.4	14.4	25.0	14.5		
7		S_{LSD}	45.1	29.2	39.2	27.1	34.4	25.0	30.5	23.1	27.3	21.3	24.7	19.8	22.5	18.4		
		G'	34.1	10.5	33.6	12.1	32.4	13.2	31.0	14.1	29.5	14.6	28.0	15.0	26.6	15.1		

1 Tabulated diaphragm shear values are for attachment of steel deck to base steel thicknesses $5 \text{ mm} \leq t_f \leq 10 \text{ mm}$. For attachment to base steel thickness with range $3 \text{ mm} \leq t_f < 5 \text{ mm}$, diaphragm shear values should be calculated in accordance with Section 3.5.1.7, or by using Hilti Profis DF software.

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.

3.5.2.4 ORDERING INFORMATION

DX 9-HSN Decking System

Tools description	Notes	Qty
DX 9-HSN Stand-Up Decking Tool	Use-on-Demand service provides daily rental	1 pcs



Accessories description	Notes	Qty
HSN Piston and Brake Spares Pack	Replacement piston and brake for DX 9-HSN	1 pcs



Fasteners (Combos with 40-strip Cartridges) description	Base Steel Thickness	Qty
X-HSN 24 bulk fastener/cartridge combo	$1/8'' (3 \text{ mm}) \leq t_i \leq 3/8'' (10 \text{ mm})$	2,000 pcs
X-HSN 24 pallet fastener/cartridge combo	$1/8'' (3 \text{ mm}) \leq t_i \leq 3/8'' (10 \text{ mm})$	32,000 pcs



DX 5-SM Decking System

Tools description	Notes	Qty
DX 5-SM Hand Held Decking Tool		1 pcs



Accessories description	Notes	Qty
Magazine X-SM	Replacement magazine for DX 460-SM	1 pcs
Piston X-AP PSM	Replacement piston for DX 460-SM	1 pcs
Buffer (reinforced) X-5-B	Replacement buffer for DX-460-SM	1 pcs



Fasteners (Combos with 10-strip cartridges for DX 5-SM) description	Base steel thickness	Qty
X-HSN 24 bulk fastener/cartridge combo	$3/16'' (5 \text{ mm}) \leq t_i \leq 3/8'' (10 \text{ mm})$	1,000 pcs
X-HSN 24 pallet fastener/cartridge combo	$3/16'' (5 \text{ mm}) \leq t_i \leq 3/8'' (10 \text{ mm})$	32,000 pcs

