The following pages are an excerpt from the North American Product Technical Guide, Volume 1: Direct Fastening Technical Guide, Edition 24.

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 24

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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3.6.4 KWIK-FLEX SELF-DRILLING SCREWS

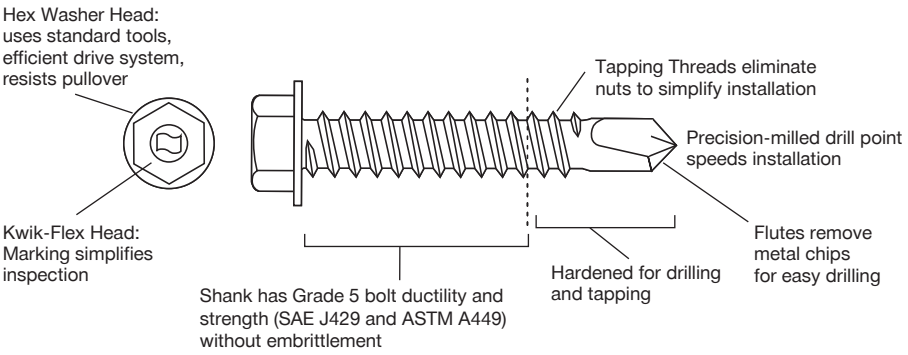
3.6.4.1 PRODUCT DESCRIPTION

Hilti Kwik-Flex fasteners combine the in-place economy of self-drilling screws with the strength and performance of bolted connections. The precision-milled point and lead threads of a Kwik-Flex fastener are selectively hardened for dependable self-drilling and tapping. The balance of the fastener retains the ductility. This results in superior resistance to embrittlement that can be caused by stress, dissimilar metals and moisture.

Product features

- Virtually immune to embrittlement failure
- Self-drilling for convenience, labor savings
- Kwik-Cote finish provides greater corrosion resistance than cadmium or zinc plating (reference Section 2.3.3.1)
- Complies with the Buy America Act
- Suitable for:

  Aluminum to steel
  Fire retardant plywood
  Corrosive environments
  (Reference Section 3.6.1.6)



Listings/Approvals

ICC-ES (International Code Council)
ESR-3332 with LABC/LARC Supplement

3.6.4.2 MATERIALSPECIFICATIONS

Mechanical properties			
Yield Strength, F_y **ksi** (MPa)		Yield Strength, F_u **ksi** (MPa)	
92	(634)	**120**	(828)

Note: These fasteners address delayed failure due to hydrogen assisted stress corrosion cracking. They are not any more resistant to other corrosion effects than standard Hilti Kwik-Cote screws.

3.6.4.3 TECHNICAL DATA

Ultimate tensile strengths - pullout (tension), lb (kN)[1,2,3,4,5,8]

Screw designation	Nominal diameter in.	Thickness of member not in contact with the screw head										
		Steel[6], ga (in.) or in.								Aluminum[7], in.		
		18 (0.048)	16 (0.060)	14 (0.075)	12 (0.105)	1/8	3/16	1/4	5/16	1/8	1/4	3/8
#10-16	0.190	410 (1.82)	580 (2.58)	710 (3.16)	920 (4.09)	890 (3.96)	–	–	–	920 (4.09)	–	–
#12-14	0.216	395 (1.76)	615 (2.74)	790 (3.51)	985 (4.38)	1530 (6.81)	1995 (8.87)	–	–	630 (2.80)	2745 (12.21)	–
1/4-14	0.250	395 (1.76)	620 (2.76)	765 (3.40)	1025 (4.56)	1685 (7.50)	2695 (11.99)	–	–	720 (3.20)	2905 (12.92)	
1/4-20	0.250	–	610 (2.71)	780 (3.47)	1270 (5.65)	1570 (6.98)	2740 (12.19)	3130 (13.92)	3620 (16.10)	690 (3.07)	2100 (9.34)	4365 (19.42)
5/16-18	0.313	–	–	–	1560 (6.94)	2120 (9.43)	–	–	–	–	–	–
5/16-24	0.313	–	–	–	1375 (6.12)	1910 (8.50)	2170 (9.65)	3565 (15.86)	4270 (18.99)	–	–	–

1 The lower of the ultimate pullout, pullover, and tension fastener strength of screw should be used for design.
2 Load values based upon testing completed in accordance with AISI S905.
3 AISI S100 recommends a safety factor of 3.0 be applied for allowable strength design, a Φ factor of 0.5 be applied for LRFD design and a Φ factor of 0.4 be applied for LSD design.
4 ANSI/ASME standard screw diameters were used in the calculations and are listed in the tables.
5 The screw diameters in the table above are available in head styles of pan, hex washer head, pancake, flat, wafer and bugle.
6 The load data in the table is based upon sheet steel with F_u = 45 ksi. For F_u = 55 ksi steel, multiply values by 1.22. For F_u = 65 ksi steel, multiply values by 1.44.
7 Load values based upon testing in 6063-T5 aluminum alloy.
8 Refer to Section 3.6.4.5 to ensure drilling capacities.

Ultimate tensile strengths - pullover (tension), lb (kN)[1,2,4,5,7]

Screw designation	Washer or head diameter in.	Thickness of member in contact with the screw head							
		Steel[6], ga (in.) or in.							
		18 (0.048)[3]	16 (0.060)	14 (0.075)	12 (0.105)	1/8	3/16	1/4	5/16
Hex Washer Head (HWH)									
#10-16	0.384	1245 (5.54)	1445 (6.43)	1445 (6.43)	1445 (6.43)	1445 (6.43)	–	–	–
#12-14 #12-24	0.398	1290 (5.74)	1610[3] (7.16)	2015[3] (8.96)	2200 (9.79)	2200 (9.79)	2200 (9.79)	–	–
1/4-14	0.480	1555 (6.92)	1945[3] (8.65)	2430[3] (10.81)	3380 (15.03)	3380 (15.03)	3380 (15.03)	–	–
1/4-20	0.480	–	1945[3] (8.65)	2430[3] (10.81)	3380 (15.03)	3380 (15.03)	3380 (15.03)	3380 (15.03)	3380 (15.03)
5/16-18	0.600	–	–	–	3505 (15.59)	3505 (15.59)	–	–	–
5/16-24	0.600	–	–	–	3980 (17.70)	3980 (17.70)	3980 (17.70)	3980 (17.70)	3980 (17.70)
Phillips Pan Head (PPH)									
#10	0.357	1160 (5.16)	1445 (6.43)	1805 (8.03)	2530 (11.25)	3010 (13.39)	–	–	–

1 The lower of the ultimate pullout, pullover, and tension fastener strength of screw should be used for design.
2 Unless otherwise noted, load values based upon testing completed in accordance with AISI S905.
3 Load values for 18 gauge and noted 16 and 14 gauge steel are based upon calculations done in accordance with Section J4 of AISI S100. ANSI/ASME standard screw head diameters were used in the calculations and are listed in the table.
4 AISI S100 recommends a safety factor of 3.0 be applied for allowable strength design, a Φ factor of 0.5 be applied for LRFD design and a Φ factor of 0.4 be applied for LSD design.
5 Pancake Framing Head Undercut (PFHUC) and Phillips Wafer Head (PWH) styles are not covered by this table because they are not used for attachment of steel to steel.
6 The load data in the table is based upon sheet steel with F_u = 45 ksi. For F_u = 55 ksi steel, multiply values by 1.22.
7 Refer to Section 3.6.4.5 to ensure drilling capacities.

Ultimate shear strengths – bearing (shear), lb (kN)[1,2,3,4,5,8]

Screw designation	Nominal diameter in.	Thickness of members, in contact with screw head - not in contact with screw head								
		Steel[6], ga (in.) or in.							Aluminum[7], in.	
		18 (0.048) - 18 (0.048	18 (0.048) - 14 (0.075)	16 (0.060) - 16 (0.060)	14 (0.075) - 14 (0.075)	1/8-3/16	3/16 – 1/4	1/4 - 12 (0.105)	1/8 – 1/8	1/8 – 1/4
#10-16 #2	0.190	865 (3.85)	865 (3.85)	1210 (5.38)	–	–	–	–	1760 (7.83)	–
#10-16 #3	0.190	1105 (4.92)	1185 (5.27)	1360 (6.05)	–	–	–	–	1760 (7.83)	–
#12-14	0.216	1070 (4.76)	1720 (7.65)	1540 (6.85)	1490 (6.63)	–	–	–	1005 (4.47)	1425 (6.34)
1/4-14	0.250	1130 (5.03)	1880 (8.36)	1560 (6.94)	1985 (8.83)	1915 (8.52)	–	–	1215 (5.40)	1770 (7.87)
1/4-20	0.250	1160 (5.16)	1580 (7.03)	1600 (7.12)	2010 (8.94)	1785 (7.94)	1870 (8.32)	1660 (7.38)	1185 (5.27)	1770 (7.87)
5/16-18	0.313	1225 (5.45)	1865 (8.30)	1685 (7.50)	2675 (11.90)	–	–	–	–	–
5/16-24	0.313	–	–	–	–	4040 (17.97)	2955 (13.14)	2660 (11.83)	2220 (9.88)	3440 (15.30)

1 The lower of the ultimate shear bearing and shear fastener strength of screw should be used for design.
2 Load values based upon testing completed in accordance with AISI S905.
3 AISI S100 recommends a safety factor of 3.0 be applied for allowable strength design, a Φ factor of 0.5 be applied for LRFD design and a Φ factor of 0.4 be applied for LSD design.
4 ANSI/ASME standard screw head diameters were used in the calculations and are listed in the tables.
5 Load values in table are for Hex Washer Head (HWH) and Phillips Pan Head (PPH). Pancake Framing Head Undercut (PFHUC) and Phillips Wafer Head (PWH) styles are not covered by this table because they are not used for attachment of steel to steel or aluminum to aluminum.
6 The load data in the table is based upon sheet steel with F_u = 45 ksi. For F_u = 55 ksi steel, multiply values by 1.22. For F_u = 65 ksi steel, multiply values by 1.44.
7 Load values based upon testing in 6063-T5 aluminum alloy.
8 Refer to Section 3.6.4.5 to ensure drilling capacities.

Nominal ultimate fastener strength of screw[3]

Screw designation	Nominal diameter in.	Nominal fastener strength			
		Tension, P_{ts} lb (kN)[1]		Shear, P_{ss} lb (kN)[2]	
#10-16	0.190	2275	(10.12)	1465	(6.52)
#12-14	0.216	3215	(14.30)	1990	(8.85)
#12-24	0.216	4175	(18.57)	2505	(11.14)
1/4-14	0.250	4365	(19.42)	2690	(11.97)
1/4-20	0.250	4365	(19.42)	2615	(11.63)
5/16-18	0.313	8070	(35.90)	4570	(20.33)
5/16-24	0.313	8755	(38.94)	5470	(24.33)

1 The lower of the ultimate pullout, pullover, and tension fastener strength of screw should be used for design. The Pullout and Pullover tables in this section have already been adjusted where screw strength governs.
2 The lower of the ultimate shear fastener strength and shear bearing should be used for design. The Shear Bearing table in this section has already been adjusted where screw strength governs.
3 AISI S100 recommends a safety factor of 3.0 be applied for allowable strength design, a Φ factor of 0.5 be applied for LRFD design and a Φ factor of 0.4 be applied for LSD design.

3.6.4.4 INSTALLATION INSTRUCTIONS

For general discussion of Hilti screw fastener installation, reference Section 3.6.1.7. For specific Kwik-Flex spacing and edge distance recommendations, reference the following table.

Kwik-flex screw specification table

Fastener size/diameter	Fastened material	Minimum spacing (in.)	Minimum edge distance (in.)
#10	Steel	5/8	9/32
	Aluminum	15/32	3/8
#12	Steel	11/16	3/8
	Aluminum	9/16	7/16
1/4 Inch	Steel	3/4	3/8
	Aluminum	5/8	1/2

3.6.4.5 ORDERING INFORMATION

Description	Maximum drilling capacity	Maximum total thickness (MT)	Recess	Box Qty
Countersinking head				
S-WD 10-24 x 1 1/4" PWH3 KF	0.175"	0.750"	PH2 TEK	5,000
S-WD 12-14 x 1" PFHUC3 KF	0.210"	0.500"	PH2 TEK	4,000
S-WD 12-14 x 1 1/2" PFHUC3 KF[1]	0.210"	1.000"	PH2 TEK	2,500
S-WD 14-20 x 3" PFHUC4 KF[1]	0.312"	2.500"	PH3	500
S-WD 14-20 x 4" PFHUC4 KF[1]	0.312"	3.500"	PH3	500
#10 Diameter				
S-MD 10-16 x 3/4" PPH3 KF[1]	0.175"	0.500"	PH2 TEK	6,000
S-MD 10-16 x 3/4" HWH3 KF	0.175"	0.500"	5/16"	6,000
#12 Diameter HWH				
S-MD 12-14 x 7/8" HWH3 KF	0.210"	0.470"	5/16"	5,000
S-MD 12-14 x 1" HWH3 KF	0.210"	0.500"	5/16"	4,000
S-MD 12-14 x 1 1/2" HWH3 KF	0.210"	1.000"	5/16"	2,500
S-MD 12-14 x 1 1/2" HWH4 KF[1]	0.312"	0.875"	5/16"	2,500
S-MD 12-14 x 2" HWH3 KF	0.210"	1.500"	5/16"	2,000
S-MD 12-14 x 3" HWH3 KF[1]	0.210"	2.500"	5/16"	1,000
S-MD 12-24 x 1 3/4" HWH5 KF[1]	0.500"	0.800"	5/16"	2,500
1/4 Diameter HWH				
S-MD 1/4-14 x 1" HWH3 KF	0.220"	0.450"	3/8"	3,000
S-MD 1/4-14 x 1 1/2" HWH3 KF	0.220"	0.950"	3/8"	2,000
S-MD 1/4-14 x 2" HWH3 KF	0.220"	1.450"	3/8"	1,500
S-MD 1/4-20 x 1 1/8" HWH4 KF[1]	0.312"	0.500"	3/8"	2,500
S-MD 1/4-20 x 1 1/2" HWH4 KF	0.312"	0.830"	3/8"	2,000
S-MD 1/4-20 x 1 3/4" HWH5 KF[1]	0.500"	0.800"	3/8"	1,000
S-MD 1/4-20 x 2" HWH4 KF	0.312"	1.330"	3/8"	1,500
S-MD 1/4-20 x 2 1/2" HWH4 KF	0.312"	1.830"	3/8"	1,000
S-MD 1/4-20 x 3 3/8" HWH4 KF[1]	0.312"	2.700"	3/8"	500
S-MD 1/4-20 x 4" HWH4 KF[1]	0.312"	3.500"	3/8"	500
5/16 Diameter HWH				
S-MD 5/16-18 x 1-1/2" HWH3 KF[1]	0.220"	0.850"	3/8"	1,000
S-MD 5/16-24 x 1-1/2" HWH4 KF[1]	0.312"	0.850"	3/8"	1,000
S-MD 5/16-24 x 2" HWH4 KF[1]	0.312"	1.350"	3/8"	1,000

1 Available only through special order.