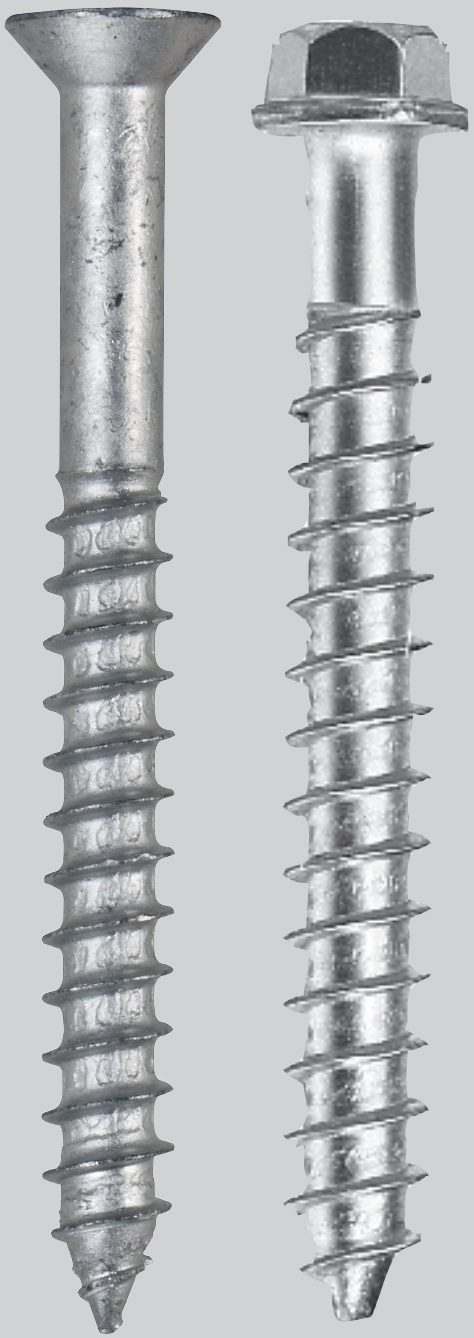
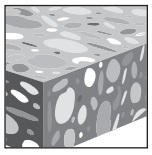
KWIK-CON+ CONCRETE AND MASONRY SCREW



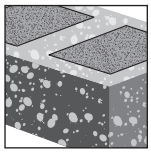
KWIK-CON+ CONCRETE AND MASONRY SCREW PRODUCT DESCRIPTION

KWIK-CON+ concrete and masonry screw anchors

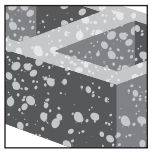
Anchor System		Features and Benefits
	KWIK-CON+ fastener	• Zinc coating with proprietary finish that exceeds 1000 hours of protection from red rust per ASTM B117 • Salt spray testing per ASTM G85 • Coating is more durable than zinc plating alone • Base material specific carbide tipped bits optimize performance in concrete or masonry • Torx Hex washer head for fast secure installations into base material • Torx or Phillips flat head for countersunk applications • Load data available for installations in concrete, grout-filled and hollow concrete masonry units (CMU) and brick
	KWIK-CON+ drive tool and installation accessories	



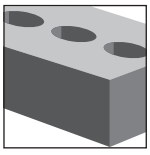
Uncracked concrete



Grout-filled concrete masonry



Ungrout concrete masonry



Brick

Approvals/Listings	
Metro-Dade County	NOA 19-1113.04

Table 1 — Material Properties

Property	Nominal anchor diameter (inches)	
	3/16	1/4
Minimum Hardness	HRC45	
Minimum Tensile Strength (ksi)	150	
Minimum Yield Strength (ksi)	120	
Coating	Zinc with organic top coat	

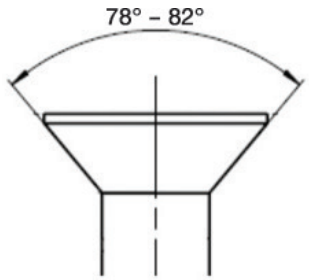


Figure 1 — Flathead KWIK CON+ Head Angle

Table 2 — Physical Dimensions

Characteristic	Nominal anchor diameter (inches)					
	3/16			1/4		
Head Style	Tapered Flat Head	Tapered Flat Head	5/16-in. Hex Washer	Tapered Flat Head	Tapered Flat Head	5/16-in. Hex Washer
Internal recess	#3 Phillips	T-25 TORX	T-25 TORX	#3 Phillips	T-27 TORX	T-25 TORX
Maximum Head Diameter (inches)	0.507	0.385	0.433	0.507	0.507	0.433
Major Thread Diameter (inches)	0.217			0.283		
Minor Diameter (inches)	0.145			0.190		
Shank Diameter (inches)	0.170			0.224		

INSTALLATION

Table 3 — KWIK CON+ Installation Specifications

Setting information	Symbol	Nominal anchor diameter (inches)			
		3/16		1/4	
Embedment (inches)	h_{nom}	1	1-3/4	1	1-3/4
Nominal drill bit diameter (inches)[1]	d_{bit}	3/16		1/4	
Minimum fixture hole diameter (inches)	d_h	1/4		5/16	
Minimum hole depth (inches)	h_o	1-1/4	2	1-1/4	2
Minimum member thickness (inches)	h_{min}	2-1/2	3-1/4	2-1/2	3-1/4
Minimum anchor spacing (inches)	s_{min}	2-1/4		2-1/2	
Critical anchor spacing (inches)	s_{cr}	3	4	3	4
Minimum edge distance (inches)	c_{min}	1-1/8		1-1/2	
Critical edge distance (inches)	c_{cr}	2-1/2	3-1/2	2-1/2	3-1/2

1 Requires matched tolerance drill bit from Hilti, TKC drill bits for concrete, TKB drill bits for other materials.

Table 4 — Load adjustment factors for Hilti KWIK CON+ screw anchors in concrete

Load adjustment factors for anchor spacing f_A						Load adjustment factors for edge distance f_R								
Tension/Shear loads						Tension					Shear			
Embedment (inches)		1	1-3/4	1	1-3/4	Embedment (inches)	1	1-3/4	1	1-3/4	1	1-3/4	1	1-3/4
Spacing (s)		Anchor diameter				Edge Distance	Anchor Diameter				Anchor Diameter			
in.	(mm)	3/16		1/4		in.	(mm)	3/16		1/4		3/16		1/4	
2-1/4	(57)	0.80	0.80			1-1/8	(29)	0.80	0.80			0.30	0.30		
2-1/2	(64)	0.87	0.83	0.80	0.80	1-1/4	(32)	0.82	0.81			0.36	0.34		
2-3/4	(70)	0.93	0.86	0.90	0.86	1-1/2	(38)	0.85	0.83	0.80	0.80	0.49	0.41	0.30	0.30
3	(76)	1.00	0.89	1.00	0.89	1-3/4	(44)	0.89	0.85	0.85	0.83	0.62	0.48	0.48	0.39
3-1/4	(83)		0.91		0.91	2	(51)	0.93	0.87	0.90	0.85	0.75	0.56	0.65	0.48
3-1/2	(89)		0.94		0.94	2-1/4	(57)	0.96	0.89	0.95	0.88	0.87	0.63	0.83	0.56
3-3/4	(95)		0.97		0.97	2-1/2	(64)	1.00	0.92	1.00	0.90	1.00	0.71	1.00	0.65
4	(102)		1.00		1.00	3	(76)		0.96		0.95		0.85		0.83
						3-1/2	(89)		1.00		1.00		1.00		1.00

1 Reduction factors are multiplicative and linear interpolation between s_{cr} and s_{min}, c_{cr} and c_{min} is permitted.

DESIGN INFORMATION IN CONCRETE PER ALLOWALBLE STRESS DESIGN

Table 5 — Tension and shear allowable loads in concrete [1, 2, 3]

Nominal anchor diameter (in.)	Nominal embedment in. (mm)	f'_c = 2,000 psi		f'_c = 4,000 psi		f'_c = 6,000 psi	
		Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
3/16	1 (25)	100 (0.4)	260 (1.2)	125 (0.6)	260 (1.2)	185 (0.8)	280 (1.3)
3/16	1-3/4 (44)	275 (1.2)	260 (1.2)	295 (1.3)	265 (1.2)	325 (1.5)	300 (1.3)
1/4	1 (25)	190 (0.9)	325 (1.4)	240 (1.1)	390 (1.7)	275 (1.2)	540 (2.4)
1/4	1-3/4 (44)	425 (1.9)	560 (2.5)	475 (2.1)	600 (2.8)	525 (2.3)	600 (2.7)

1 Screws installed in holes drilled with Hilti TKC carbide bits.
2 Allowable loads are based on a factor of safety of 4.
3 Apply spacing and edge distance reduction factors in Table 4 as needed.

Table 6 — Tension and shear ultimate loads in concrete[1]

Nominal anchor diameter (in.)	Nominal embedment in. (mm)	f'_c = 2,000 psi		f'_c = 4,000 psi		f'_c = 6,000 psi	
		Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)
3/16	1 (25)	400 (1.8)	1,050 (4.7)	500 (2.2)	1,050 (4.7)	750 (3.3)	1,150 (5.1)
3/16	1-3/4 (44)	1,100 (4.9)	1,050 (4.7)	1,180 (5.3)	1,070 (4.8)	1,300 (5.8)	1,200 (5.3)
1/4	1 (25)	760 (3.4)	1,300 (5.8)	970 (4.3)	1,575 (7.0)	1,100 (4.9)	2,175 (9.7)
1/4	1-3/4 (44)	1,700 (7.6)	2,250 (10.0)	1,900 (8.5)	2,400 (11.3)	2,100 (9.34)	2,400 (10.7)

1 Screws installed in holes drilled with TKC bits.

Table 7 — Tension and shear allowable loads in grout-filled and hollow concrete masonry units (CMU)[1,2,3,4,5]

Nominal anchor diameter (in.)	Nominal embedment in. (mm)	Tension lb (kN)	Shear lb (kN)
3/16	1 (25)	150 (0.7)	225 (1.0)
3/16	1-3/4 (44)	290 (1.3)	300 (1.3)
1/4	1 (25)	165 (0.7)	275 (1.2)
1/4	1-3/4 (44)	310 (1.4)	400 (1.8)

1 All values for anchors installed in grout-filled or hollow concrete masonry (CMU) with a minimum prism strength of 1,500 psi. CMU may be lightweight, medium-weight or normal-weight conforming to ASTM C90.
2 Screws installed in holes drilled with TKB bits.
3 Allowable loads calculated using a factor of safety of 4.
4 Installation in the mortar joints is outside the scope of the published data.
5 C_{min}, S_{min} equals 4 inches

Table 8 — Tension and shear allowable loads in brick[1,2,3,4,5]

Nominal anchor diameter (in.)	Nominal embedment in. (mm)	Tension lb (kN)	Shear lb (kN)
3/16	1 (25)	125 (0.6)	235 (1.0)
3/16	1-3/4 (44)	350 (1.6)	300 (1.3)
1/4	1 (25)	205 (0.9)	415 (1.8)
1/4	1-3/4 (44)	350 (1.6)	500 (2.2)

1 This test was performed on individual specimens of ASTM C62 common brick. Due to the wide variations encountered in the compressive strength of brick, these values should be considered guide values.
2 Allowable loads are based on a factor of safety of 4.
3 Installation in the mortar joints is outside the scope of the published data.
4 KWIK CON+ installed with TKB bits.
5 C_{min}, S_{min} equals 4 inches

Combined shear and tension loading

$$\left(\frac{N_d}{N_{rec}}\right) + \left(\frac{V_d}{V_{rec}}\right) \leq 1.0$$

INSTALLATION INSTRUCTIONS

Installation Instructions For Use (IFU) / Operating Instructions (OI) throughout the document are included with each product package. They can also be viewed or downloaded online at www.hilti.com. Because of the possibility of changes, always verify that downloaded IFU are current when used. Proper installation is critical to achieve full performance. Training is available on request. Contact Hilti Technical Services for applications and conditions not addressed in the (IFU)/Operating Instructions (OI).

ORDERING INFORMATION[1]

KWIK-CON+ fasteners

5/16 - in. Magnetic nut setter or T-25 TORX bit

Description	Diameter	Total length	Thread length	Shank length
KWIK-CON+ 316-114 THH	3/16	1-1/4	1-1/4	0
KWIK-CON+ 316-134 THH	3/16	1-3/4	1-3/4	0
KWIK-CON+ 316-214 THH	3/16	2-1/4	1-3/4	1/2
KWIK-CON+ 316-234 THH	3/16	2-3/4	1-3/4	1
KWIK-CON+ 316-314 THH	3/16	3-1/4	1-3/4	1-1/2

5/16 - in. Magnetic nut setter or T-25 TORX bit

Description	Diameter	Total length	Thread length	Shank length
KWIK-CON+ 14-134 THH	1/4	1-3/4	1-3/4	0
KWIK-CON+ 14-214 THH	1/4	2-1/4	1-3/4	1/2
KWIK-CON+ 14-314 THH	1/4	3-1/4	1-3/4	1-1/2

T-25 TORX bit

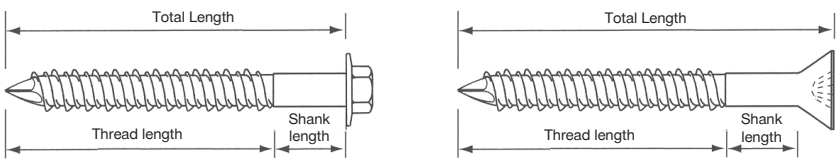
Description	Diameter	Total length	Thread length	Shank length
KWIK-CON+ 316-114 TFH	3/16	1-1/4	1-1/8	0
KWIK-CON+ 316-134 TFH	3/16	1-3/4	1-5/8	0
KWIK-CON+ 316-234 TFH	3/16	2-3/4	1-3/4	7/8
KWIK-CON+ 316-314 TFH	3/16	3-1/4	1-3/4	1-3/8
KWIK-CON+ 316-334 TFH	3/16	3-3/4	1-3/4	1-7/8

KWIK-CON+ fasteners

#3 Phillips bit

Description	Diameter	Total length	Thread length	Shank length
KWIK-CON+ 316-134 PFH	3/16	1-3/4	1-9/16	0
KWIK-CON+ 316-234 PFH	3/16	2-3/4	1-3/4	13/16
KWIK-CON+ 316-314 PFH	3/16	3-1/4	1-3/4	1-5/16

1 All dimensions in inches



KWIK-CON+ hex driver system

Description	Qty / pack
KWIK-CON Hex Driver Deluxe Kit	1
KWIK-CON Hex Driver	1
5/16-in. Hex Driver for all THH	1
5/16-in. Hex Nut Setter/Depth Locator	1
Insert Bit Holder/Depth Locator	1
#3 Phillips Driver for all PFH	1
T-25 TORX Driver for 3/16-in. TFH	1

KWIK-CON+ matched tolerance drill bits

Description
For 1/4-in. KWIK-CON+ Applications in normal-weight concrete
TKC Large Concrete Bit SDS+ Hex
TKC Large Concrete Bit Smooth Shank
For 1/4-in. KWIK-CON+ Applications in lightweight concrete, brick or CMU
TKB Large CMU Bit SDS+ Hex
TKB Large CMU Bit Smooth Shank
For 3/16-in. KWIK-CON+ Applications in normal-weight concrete
TKC Small Concrete Bit SDS+ Hex
TKC Small Concrete Bit Smooth Shank
For 3/16-in. KWIK-CON+ Applications in lightweight concrete, brick or CMU
TKB Small CMU Bit SDS+ Hex
TKB Small Block Bit Smooth Shank

Hilti, Inc. 1-800-879-8000
en español 1-800-879-5000
www.hilti.com

Hilti (Canada) Corporation 1-800-363-4458
www.hilti.ca

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