The following excerpt are pages from the North American Product Technical Guide, Volume 2: Anchor Fastening, Edition 21.

Please refer to the publication in its entirety for complete details on this product including data development, product specifications, general suitability, installation, corrosion and spacing and edge distance guidelines.
US&CA: https://submittals.us.hilti.com/PTGVol2/

To consult directly with a team member regarding our anchor fastening products, contact Hilti's team of technical support specialists between the hours of 7:00am – 6:00pm CST.
US: 877-749-6337 or HNATechnicalServices@hilti.com
CA: 1-800-363-4458, ext. 6 or CATechnicalServices@hilti.com

Hilti, Inc.
7250 Dallas Parkway, Suite 1000
Plano, TX 75024

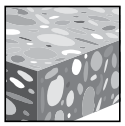
1-800-879-8000
www.hilti.com

3.3.19 HLC SLEEVE ANCHOR

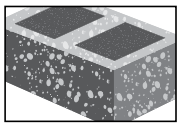
PRODUCT DESCRIPTION

HLC Sleeve anchors

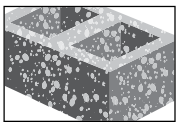
Anchor System		Features and Benefits
	Bolt head — HLC-H	• Anchor suitable for through-hole installation • Anchor and masonry bit are the same diameter • Good selection of anchor diameters, lengths and head configurations offer versatility • Load data for concrete, hollow masonry, solid masonry and brick • Extrusions on sleeve prevent the anchor from spinning in hole during installation or dropping out of overhead hole prior to applying installation torque.
	Hex Nut — HLC-HX	
	Flat Phillips Head — HLC-FPH	
	Tie-Wire Head — HLC-T	
	Acorn Nut — HLC-AC	
	Round Head Slotted — HLC-RS	
	Rod Coupling — HLC-RC	



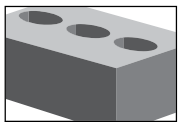
Uncracked concrete



Grout-filled concrete masonry



Ungrouted concrete masonry



Hollow brick

MATERIAL SPECIFICATIONS

Carbon steel epansion sleeves and spacer sleeves are manufactured from cold rolled steel.
Carbon steel anchors are zinc plated in accordance with ASTM B633, SC 1, TYPE III.
Stainless steel anchor components are manufactured from AISI Type 304 stainless steel.

Table 1 — Hilti HLS Sleeve anchor specification table

Setting information	Symbol		Nominal anchor diameter					
			1/4	5/16	3/8	1/2	5/8	3/4
Thread size	UNC	in.	3/16-24	1/4-20	5/16-18	3/8-16	1/2-13	5/8-11
Nominal bit diameter	d_{bit}	in.	1/4	5/16	3/8	1/2	5/8	3/4
Minimum nominal embedment	h_{nom}	in.	1	1	1-1/4	1-1/2	2	2
		(mm)	(25)	(25)	(32)	(38)	(51)	(51)
Minimum hole depth	h_o	in.	1-3/8	1-3/8	1-3/4	2-1/8	2-5/8	2-5/8
		(mm)	(35)	(35)	(45)	(54)	(67)	(67)
Installation torque	T_{inst} [1]	ft-lb	-	12	18	35	-	-
		(Nm)	-	(16)	(24)	(47)	-	-
	T_{inst} [2]	ft-lb	2	5	10	15	60	90
		(Nm)	(3)	(7)	(14)	(20)	(81)	(122)

1 HLC-H Bolt Head model.
2 HLC-HX, HLC-FPH, HLC-AC, HLC-RS and HLC-RC models.

Table 2 — Carbon steel sleeve anchor allowable loads in concrete[1]

Nominal anchor diameter	Bolt diameter in.	Nominal embedment in. (mm)	f'_c = 2,000 psi Tension lb (kN)	f'_c = 2,000 psi Shear [2] lb (kN)	f'_c = 4,000 psi Tension lb (kN)	f'_c = 4,000 psi Shear [2] lb (kN)	f'_c = 6,000 psi Tension lb (kN)	f'_c = 6,000 psi Shear [2] lb (kN)
1/4	3/16	1 (25)	225 (1.0)	305 (1.4)	250 (1.1)	305 (1.4)	250 (1.1)	305 (1.4)
5/16	1/4	1 (25)	350 (1.5)	560 (2.5)	450 (2.0)	560 (2.5)	500 (2.2)	560 (2.5)
3/8	5/16	1-1/4 (32)	450 (2.0)	870 (3.9)	565 (2.5)	870 (3.9)	700 (3.1)	890 (4.4)
1/2	3/8	1-1/2 (38)	675 (3.0)	1,250 (5.6)	925 (4.1)	1,325 (5.9)	1,100 (4.9)	1,325 (5.9)
5/8	1/2	2 (51)	1,035 (4.6)	1,750 (7.8)	1,500 (6.7)	2,295 (10.2)	1,950 (8.7)	2,295 (10.2)
3/4	5/8	2 (51)	1,125 (5.0)	1,750 (7.8)	1,500 (6.7)	3,000 (13.3)	1,950 (8.7)	3,010 (13.4)

1 Based on a safety factor of 4.0.

2 For 1/4- and 3/8-in. flat phillips and round head anchors, shear values should be reduced by 57% due to the potential of the shear acting through the hollow portion of the head.

Table 3 — Stainless steel sleeve anchor allowable loads[1]

Nominal anchor diameter	Nominal embedment in. (mm)	f'_c = 2,000 psi Tension lb (kN)	f'_c = 2,000 psi Shear lb (kN)	f'_c = 4,000 psi Tension lb (kN)	f'_c = 4,000 psi Shear lb (kN)	Hollow C-90 concrete block[2] Tension lb (kN)	Hollow C-90 concrete block[2] Shear lb (kN)
1/4	1-1/8 (29)	235 (1.0)	450 (2.0)	300 (1.3)	450 (2.0)	200 (0.9)	400 (1.8)
5/16	1-1/4 (32)	310 (1.4)	675 (3.0)	410 (1.8)	675 (3.0)	335 (1.5)	600 (2.7)
3/8	1-1/2 (38)	450 (2.0)	1,000 (4.4)	600 (2.7)	1,000 (4.4)	470 (2.1)	890 (4.0)

1 Based on using a safety factor of 4.
2 ASTM Specification C90, Type II.

Table 4 — Carbon steel sleeve anchor allowable loads in grout-filled block[1,2,3,4,5,6,7]

Nominal anchor diameter	Nominal embedment in. (mm)	Edge distance in. (mm)	Tension lb (kN)	Shear lb (kN)
1/4	1 (25)	4 (101)	290 (1.3)	305 (1.4)
		≥ 12 (305)		
5/16	1 (25)	4 (101)	385 (1.7)	500 (2.2)
		≥ 12 (305)		
3/8	1-1/4 (32)	4 (101)	435 (1.9)	725 (3.2)
		≥ 12 (305)		
1/2	1-1/2 (38)	4 (101)	605 (2.7)	865 (3.8)
		≥ 12 (305)		1,145 (5.1)
5/8	2 (51)	4 (101)	710 (3.2)	1,050 (4.7)
		≥ 12 (305)		1,815 (8.1)
3/4	2 (51)	4 (101)	840 (3.7)	1,050 (4.7)
		≥ 12 (305)		1,970 (8.8)

1 Values are for lightweight, medium-weight or normal-weight concrete masonry units conforming to ASTM C90 with 2,000 psi grout conforming to ASTM C474.
2 Embedment depth is measured from the outside face of the concrete masonry unit.
3 Values are for anchors located in the grouted cell, bed joint, cross web or any combination of the above.
4 For anchors installed in the T joint or head joint reduce tension values by 20%.
5 Values for edge distances between 4 inches and 12 inches may be calculated by linear interpolation.
6 Anchors are limited to one per unit cell.
7 Based on using a safety factor of 4.

Table 5 — Carbon steel sleeve anchor allowable loads in hollow concrete block[1,2,3,4]

Nominal Anchor Diameter	Nominal embedment in. (mm)	Tension lb (kN)	Shear lb (kN)
1/4	1 (25)	350 (1.5)	305 (1.4)
5/16	1 (25)	375 (1.7)	560 (2.5)
3/8	1-1/4 (32)	435 (1.9)	800 (3.5)
1/2	1-1/2 (38)	565 (2.5)	1,125 (5.0)

1 Based on using a safety factor of 4.
2 ASTM Specification C90, Type II.
3 Installation in the mortar joints is outside the scope of the published data.
4 Anchors are limited to one per unit cell with a minimum edge distance of 12 inches.

Table 6 — Carbon steel sleeve anchor allowable loads in clay brick[1,2,3,4]

Nominal Anchor Diameter	Nominal embedment in. (mm)	Tension lb (kN)	Shear lb (kN)
1/4	1 (25)	350 (1.5)	305 (1.4)
5/16	1 (25)	345 (1.5)	530 (2.3)
3/8	1-1/4 (32)	375 (1.7)	850 (3.8)
1/2	1-1/2 (38)	435 (1.9)	1,230 (5.5)

1 Based on using a safety factor of 4.
2 Due to wide strength variations encountered in masonry, these values should be considered as guide values.
3 Installation in the mortar joints is outside the scope of the published data.
4 Minimum anchor spacing shall be two (2) complete bricks in any direction. Minimum edge distance shall be the lesser of two (2) complete bricks or 16 inches in any direction.

INSTALLATION INSTRUCTIONS

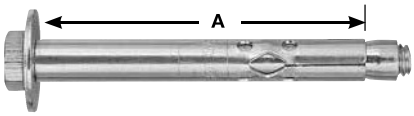
Installation Instructions For Use (IFU) are included with each product package. They can also be viewed or downloaded online at www.hilti.com. Because of the possibility of changes, always verify that downloaded IFU are current when used. Proper installation is critical to achieve full performance. Training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

ORDERING INFORMATION[1]

Round head slotted (RS)

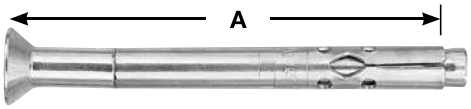
Description	Nominal bit diameter	Bolt thread	Minimum embedment	Fastens materials up to	Qty / box
HLC-RS 1/4 x 1-1/4	1/4	3/16-24	1	1/4	100
HLC-RS 1/4 x 2	1/4	3/16-24	1	1	100
HLC-RS 1/4 x 4	1/4	3/16-24	1	3	100

Bolt head (H)



Description	Nominal bit diameter	Bolt thread	Minimum embedment	Fastens materials up to	Qty / box
HLC-H 5/16 x 1-5/8	5/16	1/4-20	1	5/8	100
HLC-H 5/16 x 2-5/8	5/16	1/4-20	1	1-5/8	100
HLC-H 3/8 x 1-7/8	3/8	5/16-18	1-1/4	5/8	50
HLC-H 3/8 x 3	3/8	5/16-18	1-1/4	1-3/4	50
HLC-H 1/2 x 2-1/4	1/2	3/8-16	1-1/2	3/4	50
HLC-H 1/2 x 3	1/2	3/8-16	1-1/2	1-1/2	25
HLC-H 1/2 x 4	1/2	3/8-16	1-1/2	2-1/2	25

Flat phillips head (FPH)



Description	Nominal bit diameter	Bolt thread	Minimum embedment	Fastens materials up to	Qty / box
HLC-FPH 1/4 x 1-3/8	1/4	3/16-24	1	3/8	100
HLC-FPH 1/4 x 2	1/4	3/16-24	1	1	100
HLC-FPH 1/4 x 3	1/4	3/16-24	1	2	100
HLC-FPH 1/4 x 4	1/4	3/16-24	1	3	100
HLC-FPH 3/8 x 2-7/8	3/8	5/16-18	1-1/4	1-1/2	50
HLC-FPH 3/8 x 4	3/8	5/16-18	1-1/4	2-3/4	50
HLC-FPH 3/8 x 5	3/8	5/16-18	1-1/4	3-3/4	25
HLC-FPH 3/8 x 6	3/8	5/16-18	1-1/4	4-3/4	25

1 All dimensions in inches

Definition of nomenclature

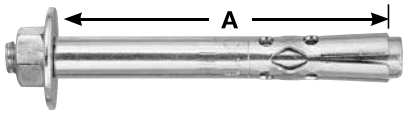
Outside diameter of sleeve, see tables for threaded bolt diameter

HLC-AC 1/4 X 1-3/8

Nut configuration

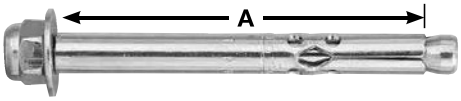
The overall length from bottom of washer to end of sleeve

Hex nut (HX)



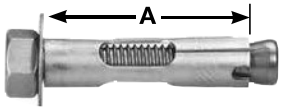
Description	Nominal bit diameter	Bolt thread	Minimum embedment	Fastens materials up to	Qty / box
HLC-HX 5/16 x 1-5/8	5/16	1/4-20	1	1/2	100
HLC-HX 5/16 x 2-5/8	5/16	1/4-20	1	1 -1/2	100
HLC-HX 3/8 x 1-7/8	3/8	5/16-18	1-1/4	5/8	50
HLC-HX 3/8 x 3	3/8	5/16-18	1-1/4	1-3/4	50
HLC-HX 1/2 x 2-1/4	1/2	3/8-16	1-1/2	3/4	25
HLC-HX 1/2 x 3	1/2	3/8-16	1-1/2	1-1/2	25
HLC-HX 1/2 x 4	1/2	3/8-16	1-1/2	2-1/2	25
HLC-HX 1/2 x 6	1/2	3/8-16	1-1/2	4-1/2	15
HLC-HX 5/8 x 2-1/4	5/8	1/2-13	2	1/4	25
HLC-HX 5/8 x 4-1/4	5/8	1/2-13	2	2-1/4	10
HLC-HX 5/8 x 6	5/8	1/2-13	2	4	10
HLC-HX 3/4 x 2-1/2	3/4	5/8-11	2	1/2	10
HLC-HX 3/4 x 4-1/4	3/4	5/8-11	2	1-3/4	10
HLC-HX 3/4 x 6-1/4	3/4	5/8-11	2	3-3/4	10

Acorn head (AC)



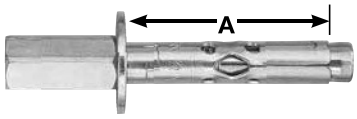
Description	Nominal bit diameter	Bolt thread	Minimum embedment	Fastens materials up to	Qty / box
HLC-AC 1/4 x 1-3/8	1/4	3/16-24	1	3/8	100
HLC-AC 1/4 x 2-1/4	1/4	3/16-24	1	1-1/4	100

304SS sleeve anchors



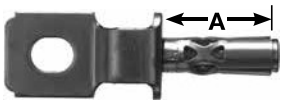
Description	Nominal bit diameter	Bolt thread	Minimum embedment	Fastens materials up to	Qty / box
HLC-HX 304SS 1/4 x 2-1/4	1/4	3/16-24	1-1/8	1-1/8	100
HLC-HX 304SS 5/16 x 1-1/2	5/16	1/4-20	1-1/4	1/4	100
HLC-HX 304SS 5/16 x 2-1/2	5/16	1/4-20	1-1/4	1-1/4	100
HLC-HX 304SS 3/8 x 1-7/8	3/8	5/16-18	1-1/2	3/8	50
HLC-HX 304SS 3/8 x 3	3/8	5/16-18	1-1/2	1-1/2	50

Rod coupling (RC)



Description	Nominal bit diameter	Bolt thread	Minimum embedment	Fastens materials up to	Qty / box
HLC-RC 3/8 x 1-7/8	3/8	5/16-18	1-1/4	5/16 x 3/8	50
HLC-RC 1/2 x 2-1/4	1/2	3/8-16	1-1/2	3/8 x 1/2	25

Tie-wire head (T)



Description	Nominal bit diameter	Bolt thread	Minimum embedment	Qty / box
HLC-T 1/4 x 1-3/8	1/4"	3/16-24	1-3/8	50

1 All dimensions in inches

Definition of nomenclature

Outside diameter of sleeve, see tablesfor threaded bolt diameter

HLC-AC 1/4 X 1-3/8

Nut configuration — The overall length from bottom of washer to end of sleeve