



Attached are page(s) from the 2014 Hilti North American Product Tech Guide. For complete details on this product, including data development, product specifications, general suitability, installation, corrosion, and spacing and edge distance guidelines, please refer to the Technical Guide, or contact Hilti.

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3.3.14 HLC Sleeve Anchor

3.3.14.1 Product description

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3.3.14.3 Technical data

3.3.14.4 Installation instructions

3.3.14.5 Ordering information



Bolt Head (HLC-H)

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



3.3.14.1 Product description

HLC sleeve anchors are mechanical expansion anchors consisting of an externally thread stud or bolt, expansion cone and expanding sleeve. It is designed for anchorage to concrete, hollow masonry, solid masonry and brick.

Product features

- 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.

Guide specifications

Expansion anchors Carbon steel sleeve anchors are zinc plated in accordance with ASTM B633, SC 1, Type III. Stainless steel sleeve anchors manufactured from AISI Type 304 stainless steel. Expansion Anchors shall be HLC sleeve anchors supplied by Hilti.

3.3.14.2 Material specifications

Carbon steel expansion 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.

3.3.14.3 Technical data

Table 1- HLC 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. (mm)	1 (25)	1 (25)	1-1/4 (32)	1 1/2 (38)	2 (51)	2 (51)
Minimum hole depth	h _o	in. (mm)	1-3/8 (35)	1-3/8 (35)	1-3/4 (45)	2-1/8 (54)	2-5/8 (67)	2-5/8 (67)
Installation torque	T _{inst} ¹	ft-lb (Nm)		12 (16)	18 (24)	35 (47)		
	T _{inst} ²	ft-lb (Nm)	2 (3)	5 (7)	10 (14)	15 (20)	60 (81)	90 (122)

¹ HLC-H Bolt Head model

² HLC-HX, HLC-FPH, HLC-AC, HLC-RS and HLC-RC models.

Combined shear and tension loading

$$\left(\frac{N_d}{N_{rec}} \right)^{5/3} + \left(\frac{V_d}{V_{rec}} \right)^{5/3} \leq 1.0$$

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Table 2 - Carbon steel sleeve anchor allowable loads in concrete¹

Nominal anchor diameter	Bolt diameter in.	Nominal embedment in. (mm)	$f'_c = 2000$ psi		$f'_c = 4000$ psi		$f'_c = 6000$ psi	
			Tension lb (kN)	Shear ² lb (kN)	Tension lb (kN)	Shear ² lb (kN)	Tension lb (kN)	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 loads¹

Nominal anchor diameter	Nominal embedment in. (mm)	$f'_c = 2000$ psi		$f'_c = 4000$ psi		Hollow C-90 concrete block ²	
		Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	Shear lb (kN)	Tension lb (kN)	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 2000 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}

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.

Table 6 - Carbon steel sleeve anchor allowable loads in clay brick^{1,2}

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.

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3.3.14 HLC Sleeve Anchor

3.3.14.4 Installation instructions

Installation Instructions For Use (IFU) are included with each product package. They can also be viewed or downloaded online at www.us.hilti.com (US) and www.hilti.ca (Canada). 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.

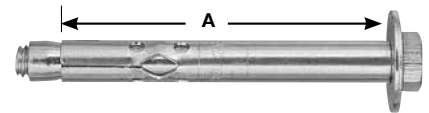
3.3.14.5 Ordering information¹

Round head slotted (RS)



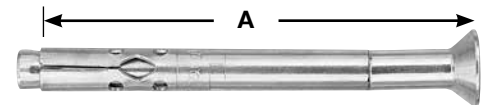
Description	Nominal bit diameter	Bolt thread	Minimum embedment	Fastens materials up to	Qty / box
HLC-RS 1/4 x 1-1/4	1/4	3/16-24	1	1/4	100
HLC-RS 1/4 x 2	1/4	3/16-24	1	1	100
HLC-RS 1/4 x 4	1/4	3/16-24	1	3	100

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

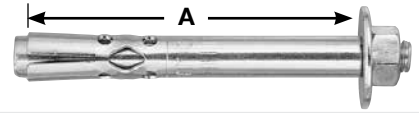
Outside diameter of sleeve, see tables for threaded bolt diameter

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

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

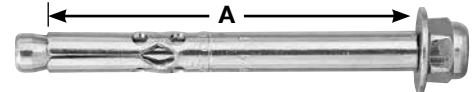
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Hex nut (HX)



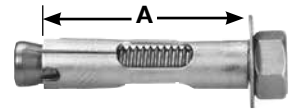
Description	Nominal bit diameter	Bolt thread	Minimum embedment	Fastens materials up to	Qty / box
HLC-HX 5/16 x 1-5/8	5/16	1/4-20	1	1/2	100
HLC-HX 5/16 x 2-5/8	5/16	1/4-20	1	1 - 1/2	100
HLC-HX 3/8 x 1-7/8	3/8	5/16-18	1-1/4	5/8	50
HLC-HX 3/8 x 3	3/8	5/16-18	1-1/4	1-3/4	50
HLC-HX 1/2 x 2-1/4	1/2	3/8-16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

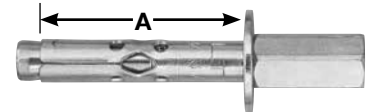
304SS sleeve anchors



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

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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

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