



HILTI ANCHORS FOR ATTACHMENTS TO HOLLOW CORE CONCRETE PANELS



INTRODUCTION



Hollow core concrete panels are used in many types of structures including office buildings, hotels, multi family residential units and others. The ease of jobsite construction makes hollow core concrete panels a convenient base material between floors of multi story structures. Other building elements, including partitons, supports, mechanical and electrical equipment, plumbing and other piping must be attached to or hung from these panels. Hilti provides a variety of anchoring systems for reliable connection to hollow core concrete panels. Hilti systems include several screw anchors (KH-EZ, KH-EZ P, KH-EZ I, and KH-EZ E), internally threaded flush anchors (HDI-P TZ, HDI-P) and adhesive anchors (HIT HY-270).

This document is a supplement to the Hilti North American Product Technical Guide, Volume 2, Anchor Fastening Technical Guide, Edition 19 (PTG Ed. 19). Please refer to the publication in its entirety, which is available at www.hilti.com or www.hilti.ca, for complete details including data development, product specifications, general suitability, installation, corrosion and spacing and edge distance guidelines.

KWIK HUS-EZ AND KWIK HUS-EZ P SCREW ANCHOR

PRODUCT DESCRIPTION

KWIK HUS EZ carbon steel anchors

Anchor System	Features and Benefits
 <p data-bbox="760 1045 1003 1100">Carbon Steel 1/4"-3/8" KWIK HUS-EZ</p>	<ul data-bbox="1027 911 1495 1213" style="list-style-type: none"> • OSHA 1926.1153 Table 1 compliant installation options including the Hilti SafeSet™ hollow drill bit technology • Easy installation using impact tool or torque wrench • Product and length identification marks facilitate quality control after installation • Through fixture installation improves productivity and accurate installation
 <p data-bbox="760 1381 1003 1436">Carbon Steel 1/4" KWIK HUS EZ P</p>	<ul data-bbox="1027 1226 1520 1528" style="list-style-type: none"> • Thread design enables quality setting and exceptional load values in wide variety of base material strengths • 1/4" diameter available in hex head and pan head styles • Anchor is fully removable • Anchor diameter is same as drill bit diameter. No special diameter bit required

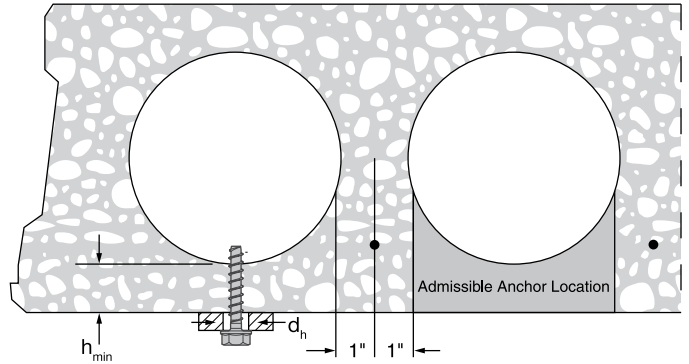
INSTALLATION PARAMETERS

Table 1 – KWIK HUS-EZ and KWIK HUS-EZ P specifications

Setting information	Symbol	Units	Nominal anchor diameter		
			1/4	3/8	Hex head
Head style			Hex head	Pan head	Hex head
Nominal bit diameter	d_{bit}	in.	1/4	3/8	
Minimum base material thickness	h_{min}	in.	1-1/8		
Minimum Fixture hole diameter	d_h	in.	3/8	1/2	
Minimum anchor spacing	s_{min}	in.	4-1/8		
Minimum edge distance	c_{min}	in.	3-3/4		
Installation torque ¹	T_{inst}	ft-lb (Nm)	18 (24)	19 (26)	
Maximum impact wrench torque rating ²	$T_{impact, max}$	ft-lb (Nm)	114 (155)		
Wrench or Torx bit size		in.	7/16	T30	9/16

- ¹ T_{inst} is the maximum installation torque that may be applied with a torque wrench.
- ² Because of variability in measurement procedures, the published torque of an impact tool may not correlate properly with the above setting torques. Over torquing can damage the anchor and/or reduce its holding capacity.

Figure 1 – Installation of Hilti KWIK HUS-EZ (KH-EZ) and KWIK HUS-EZ P (KH-EZ P) in hollow core concrete panels



DESIGN INFORMATION

Table 2 – Hilti KWIK HUS-EZ (KH-EZ) and KWIK HUS-EZ P (KH-EZ P) loads in hollow core concrete panels^{1,2}

Anchor Diameter (inches)	Min. effective embedment h_{ef} (inches)	Allowable loads, lb (kN) ³		Ultimate load lb (kN)	
		Tension	Shear	Tension	Shear
1/4	1-1/8	400 (1.8)	610 (2.7)	1600 (7.1)	2440 (10.9)
	1-3/8	525 (2.3)	770 (3.4)	2100 (9.3)	3080 (13.7)
3/8	1-1/8	435 (1.9)	890 (4.0)	1740 (7.7)	3560 (15.8)
	1-3/8	590 (2.6)	1405 (6.3)	2360 (10.5)	5620 (25.0)

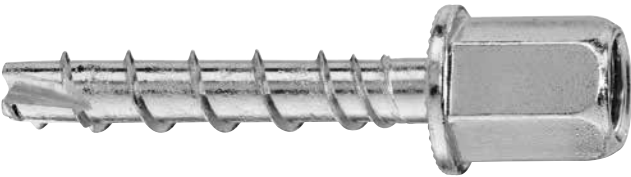

- ¹ The admissible anchor location must be established to prevent damage to the prestressed cable during the drilling process. Verify the location and height of the cable with the hollow core plank supplier to confirm admissible anchor location.
- ² Minimum compressive strength of prestressed concrete is 7,000 psi. Published results represent the average results conducted in local base materials. Due to variations in materials and dimensional configurations, on-site testing is required to determine the actual performance.
- ³ Allowable loads calculated with a factor of safety of 4.

ORDERING INFORMATION

Description	Hole Diameter	Total Length without Anchor Head	Qty (pcs) / Box
KH-EZ 1/4"x1-7/8"	1/4"	1-7/8"	100
KH-EZ 1/4"x2-5/8"	1/4"	2-5/8"	100
KH-EZ 1/4"x3"	1/4"	3"	100
KH-EZ 1/4"x3-1/2"	1/4"	3-1/2"	100
KH-EZ 1/4"x4"	1/4"	4"	100
KH-EZ P 1/4"x1-7/8"	1/4"	1-7/8"	100
KH-EZ P 1/4"x2-5/8"	1/4"	2-5/8"	100
KH-EZ 3/8"x1-7/8"	3/8"	1-7/8"	50
KH-EZ 3/8"x2-1/8"	3/8"	2-1/8"	50
KH-EZ 3/8"x3"	3/8"	3"	50
KH-EZ 3/8"x3-1/2"	3/8"	3-1/2"	50
KH-EZ 3/8"x4"	3/8"	4"	50
KH-EZ 3/8"x5"	3/8"	5"	30

KWIK HUS-EZ I AND KWIK HUS-EZ E SCREW ANCHOR PRODUCT DESCRIPTION

KWIK HUS EZ I and KWIK HUS-EZ E carbon steel anchors

Anchor System		Features and Benefits
 <p>Carbon Steel 1/4", 3/8" KWIK HUS-EZ I</p>		<ul style="list-style-type: none"> • OSHA 1926.1153 Table 1 compliant installation options including the Hilti SafeSet™ hollow drill bit technology • Easy installation using impact tool or torque wrench • Product and length identification marks facilitate quality control after installation • Thread design enables quality setting and exceptional load values in wide variety of base material strengths • 1/4" diameter available in internally and externally threaded head styles • Anchor is fully removable • Anchor diameter is same as drill bit diameter. No special diameter bit required
 <p>Carbon Steel 1/4" KWIK HUS EZ E</p>		

INSTALLATION PARAMETERS

Table 3 – KWIK HUS-EZ I and KWIK HUS-EZ E specifications

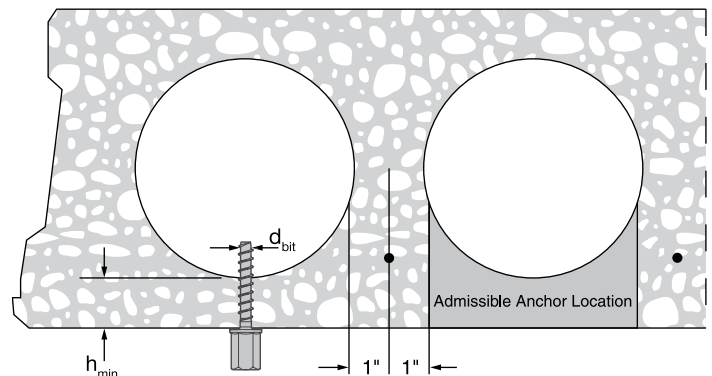
Setting information	Symbol	Units	Nominal anchor diameter			
			1/4		3/8	
Head style			KH-EZ E	KH-EZ I		
Nominal bit diameter	d_{bit}	in.	1/4		3/8	
Threaded rod diameter	d_{rod}	in.	N/A	1/4	3/8	1/2
Minimum base material thickness	h_{min}	in.	1-1/8			
Minimum anchor spacing	s_{min}		4-1/8			
Minimum edge distance	c_{min}		3-3/4			
Installation torque ¹	T_{inst}	ft-lb (N-m)	18 (24)		40 (54)	
Maximum impact wrench torque rating ²	$T_{impact, max}$	ft-lb (Nm)	114 (155)			
Wrench size		in.	1/2	3/8	1/2	11/16

¹ T_{inst} is the maximum installation torque that may be applied with a torque wrench.

² Because of variability in measurement procedures, the published torque of an impact tool may not correlate properly with the above setting torques.

Over torquing can damage the anchor and/or reduce its holding capacity.

Figure 2 – Installation of Hilti KWIK HUS-EZ I (KH-EZ I) and KWIK HUS-EZ E (KH-EZ E) in hollow core concrete panels



DESIGN INFORMATION

Table 4 – Hilti KWIK HUS-EZ I and KWIK HUS-EZ E loads in hollow core concrete panels^{1,2}

Anchor Diameter (inches)	Hanger rod size	Min. effective embedment h_{ef} (inches)	Allowable loads, lb (kN)				Ultimate load lb (kN)			
			Tension ³		Shear ³		Tension		Shear	
1/4	14-20 UNC	1-1/8	400	(1.8)	215	(1.0)	1600	(7.1)	860	(3.8)
		1-3/8	525	(2.3)	585	(2.6)	2100	(9.3)	2340	(10.4)
	3/8-16 UNC	1-1/8	400	(1.8)	295	(1.3)	1600	(7.1)	1180	(5.2)
		1-3/8	525	(2.3)	665	(3.0)	2100	(9.3)	2660	(11.8)
3/8	1/2-13 UNC	1-1/8	435	(1.9)	370	(1.6)	1740	(7.7)	1480	(6.6)
		1-3/8	590	(2.6)	985	(4.4)	2360	(10.5)	3940	(17.5)

1 The admissible anchor location must be established to prevent damage to the prestressed cable during the drilling process. Verify the location and height of the cable with the hollow core plank supplier to confirm admissible anchor location.

2 Minimum compressive strength of prestressed concrete is 7,000 psi. Published results represent the average results conducted in local base materials. Due to variations in materials and dimensional configurations, on-site testing is required to determine the actual performance

3 Allowable loads calculated with a factor of safety of 4.


ORDERING INFORMATION

Description	Thread diameter	Thread length	Drill bit diameter	Qty/box
KWIK HUS-EZ 1/4x1-5/8 I 1/4	1/4	3/8	1/4	100
KWIK HUS-EZ 1/4x2-1/2 I 1/4	1/4	3/8	1/4	100
KWIK HUS-EZ 1/4x1-5/8 I 3/8	3/8	7/16	1/4	100
KWIK HUS-EZ 1/4x2-1/2 I 3/8	3/8	7/16	1/4	100
KWIK HUS-EZ 1/4x1-5/8 E 3/8	3/8	1	1/4	100
KWIK HUS-EZ 3/8x2-1/8 I 1/2	1/2	1/2	3/8	100

HDI-P DROP-IN ANCHORS

PRODUCT DESCRIPTION

HDI-P Drop-in Anchors

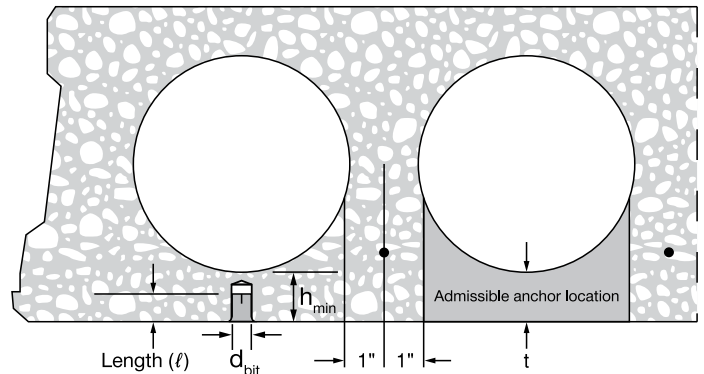
Anchor System	Features and Benefits
<p>HDI-P Drop-in Anchor</p> 	<ul style="list-style-type: none"> Optimized anchor length to allow reliable fastenings in hollow core panels, precast plank and post tensioned slabs Shallow drilling enables fast installation Lip provides flush installation, consistent anchor depth and easy rod alignment HSD-G 3/8 setting tool with hand guard leaves mark on flange when anchor is set properly to enable inspection and verification of proper expansion

INSTALLATION PARAMETERS

Table 5 – HDI-P specifications

Setting information	Symbol	Units	Nominal anchor diameter		
			1/4	3/8	1/2
Nominal bit diameter	d_{bit}	in.	3/8	1/2	5/8
Threaded rod diameter	d_{rod}	in.	1/4	3/8	1/2
Minimum base material thickness	h_{min}	in.	1-3/8		
Anchor length	ℓ	in. (mm)	5/8 (15.9)	3/4 (19.1)	1 (25.4)
Hole depth in base material	h_0	in. (mm)	5/8 (15.9)	3/4 (19.1)	1 (25.4)
Minimum anchor spacing	s_{min}	in.	4-1/8		
Minimum edge distance	c_{min}	in.	3-3/4		

Figure 3 – Installation of Hilti HDI-P in hollow core concrete panels



- The Admissible Anchor Location must be established to prevent damage to the prestressed cable during the drilling process. Verify the location and height of the cable with the hollow core plank supplier to confirm Admissible Anchor Location.
- Minimum compressive strength of hollow core panels is 7,000 psi at the time of installation. The minimum thickness h_{min} is 1-3/8 inches.

DESIGN INFORMATION

Table 6 – Hilti HDI-P loads in hollow core concrete panels^{1,2}

Nominal Anchor Diameter (inches)	Length in. (mm)	Nominal Bit Diameter in.	Allowable loads, lb (kN) ³		Ultimate loads lb (kN)	
			Tension	Shear	Tension	Shear
1/4	5/8 (15.9)	3/8	310 (1.4)	455 (2.0)	1,550 (6.9)	2,275 (10.1)
3/8	3/4 (19.1)	1/2	420 (1.9)	800 (3.6)	2,100 (9.3)	4,000 (17.8)
1/2	1 (25.4)	5/8	620 (2.8)	1100 (4.9)	3,100 (13.8)	5,500 (24.5)

- 1 The admissible anchor location must be established to prevent damage to the prestressed cable during the drilling process. Verify the location and height of the cable with the hollow core plank supplier to confirm admissible anchor location.
- 2 Minimum compressive strength of prestressed concrete is 7,000 psi. Published results represent the average results conducted in local base materials. Due to variations in materials and dimensional configurations, on-site testing is required to determine the actual performance.
- 3 Allowable loads calculated with a factor of safety of 5.

ORDERING INFORMATION

HDI-P anchor

Description	Bit diameter	Qty / box
HDI-P 1/4	3/8	100
HDI-P 3/8	1/2	100
HDI-P 1/2	5/8	50




Setting tools for HDI-P anchors HDI

Description
HST-P 1/4 Hand Setting Tool
HST-P 3/8 Hand Setting Tool
HSD-G 3/8 Hand Setting Tool with hand guard
HST-P 1/2 Hand Setting Tool

HDI-P TZ FLUSH ANCHORS

PRODUCT DESCRIPTION

HDI-P TZ Flush anchors

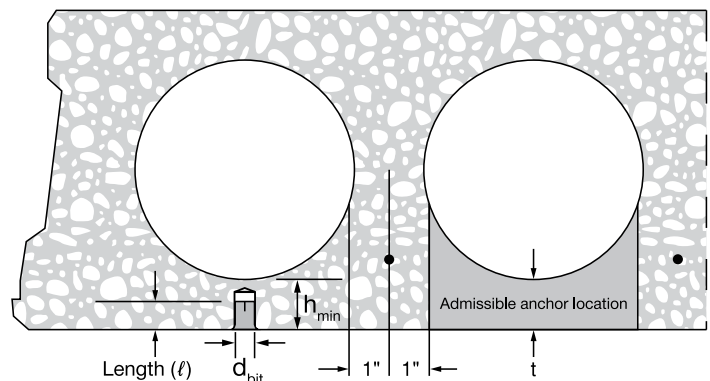
Anchor System		Features and Benefits
	Carbon steel HDI-P TZ	<ul style="list-style-type: none"> • Flush anchor anchor with optimized length for reliable fastenings in post-tensioned concrete slabs • Suitable for uncracked and cracked concrete including seismic areas
	Auto-setting tool HDI-P TZ	<ul style="list-style-type: none"> • Productive installation with HDI-P TZ automatic setting tool with hammer drill • Used with Hilti Dust Removal System (DRS) for compliance with Table 1 of OSHA 1926.1153 regulations for silica dust exposure • Shallow drilling for fast installations
	Hand-setting tool HDI-P TZ	<ul style="list-style-type: none"> • Easy installation with Auto Setting Tool • Lip provides flush installation, consistent anchor depth, and easy rod alignment • Auto Setting Tool includes stop drill bit and setting tool, no tool change necessary

INSTALLATION PARAMETERS

Table 7 – HDI-P TZ Specifications

Setting information	Symbol	Unit	Nominal anchor size / internal thread dia. (in)
			3/8
Nominal bit diameter	d_{bit}	in.	9/16
Threaded rod diameter	d_{rod}	in.	3/8
Minimum base material thickness	h_{min}	in.	1-3/8
Anchor length	ℓ	in. (mm)	3/4 (19.1)
Hole depth in base material	h_0	in. (mm)	3/4 (19)
Minimum anchor spacing	s_{min}	in.	8
Minimum edge distance	c_{min}	in.	8

Figure 4 – Installation HDI-P TZ in hollow core concrete panels



- 1 The Admissible Anchor Location must be established to prevent damage to the prestressed cable during the drilling process. Verify the location and height of the cable with the hollow core plank supplier to confirm Admissible Anchor Location.
- 2 Minimum compressive strength of hollow core panels is 7,000 psi at the time of installation. The minimum thickness h_{min} is 1-3/8 inches.

DESIGN INFORMATION

Table 8 – Hilti HDI-P TZ loads in hollow core concrete panels^{1,2}

Nominal Anchor Diameter (inches)	Length in. (mm)	Nominal Bit Diameter in.	Allowable loads, lb (kN) ³		Ultimate loads lb (kN)	
			Tension	Shear	Tension	Shear
3/8	3/4 (19.1)	9/16	475 (2.1)	700 (3.1)	1,900 (8.5)	2,800 (12.5)

- 1 The admissible anchor location must be established to prevent damage to the prestressed cable during the drilling process. Verify the location and height of the cable with the hollow core plank supplier to confirm admissible anchor location.
- 2 Minimum compressive strength of prestressed concrete is 7,000 psi. Published results represent the average results conducted in local base materials. Due to variations in materials and dimensional configurations, on-site testing is required to determine the actual performance.
- 3 Allowable loads calculated with a factor of safety of 4.

ORDERING INFORMATION

HDI-P TZ anchor

Description	Bit diameter (inches)	Qty/box
HDI-P TZ 3/8"	9/16	100

Setting tools for HDI-P TZ anchors

Description
Auto setting tool HDI-P TZ 3/8"
Setting tool HST HDI-P TZ 3/8"x20

HIT-HY 270 ANCHORS

PRODUCT DESCRIPTION

HIT-HY 270 Adhesive Anchor System

Anchor System	Features and Benefits
<p>Hilti HIT-HY 270 Cartridge</p> <p>Hilti HAS Threaded rods</p> <p>HIT-SC Screen</p>	<ul style="list-style-type: none"> • Injectable two-component hybrid adhesive mortar • Fast cure adhesive for quick installation time • Mixing nozzle provides proper mix ratio

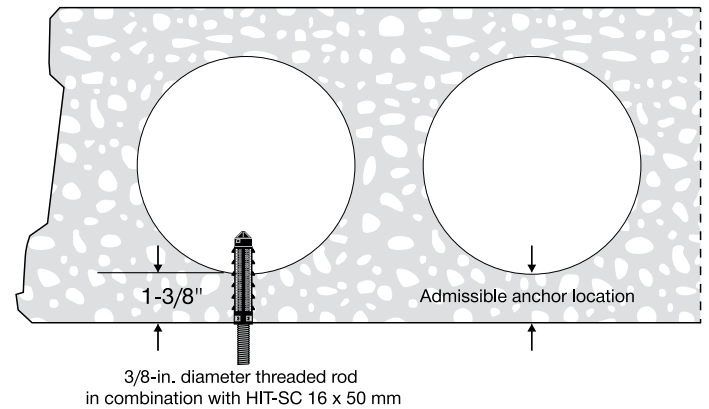
INSTALLATION PARAMETERS

Table 10 — Hilti Installation specifications for HAS threaded rod in hollowcore concrete panels

Setting information	Symbol	Unit	Nominal anchor size (in)
			3/8
Nominal bit diameter	d_o	in.	5/8
Screen size	HIT-SC	mm.	16x50
Depth Drilled	h_o	in.	Through drill
Installation torque	T_{inst}	ft.-lb (Nm)	2.2 (3)
Diameter of fixture hole	d_h	in.	7/16

- 1 The Admissible Anchor Location must be established to prevent damage to the prestressed cable during the drilling process. Verify the location and height of the cable with the hollow core plank supplier to confirm Admissible Anchor Location.
- 2 Minimum compressive strength of hollow core panels is 7,000 psi at the time of installation. The minimum thickness h_{min} is 1-3/8 inches.
- 3 Allowable loads calculated with a 5:1 factor-of-safety.

Figure 5 — Hilti HIT-HY 270 adhesive installed in hollow core concrete^{1,2}



- 1 Representation of the tested conditions for which allowable adhesive bond loads are applicable. Refer to footnotes of tables 10 and 11 for more information on requirements and restrictions on the admissible anchor installation.
- 2 Minimum edge distance is 6-inches.
Minimum spacing is:
- 8-inches along the length of each hollow core section.
- One anchor per hollow core section (left and right on page), 6-inches minimum between adjacent hollow core sections.

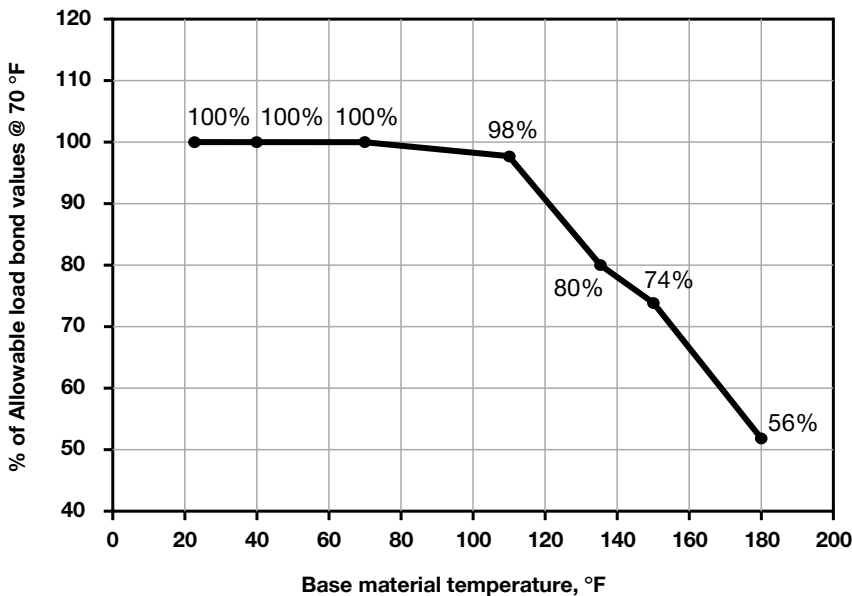
DESIGN INFORMATION

Table 11 – Hilti HIT-HY 270 loads for threaded rods in hollow core concrete panels^{1,4,5,6,7}

Nominal Anchor Diameter (inches)	Effective embedment in. (mm) ²	Nominal Bit Diameter in.	Allowable loads, lb (kN) ³		Ultimate loads lb (kN)	
			Tension	Shear	Tension	Shear
3/8	2 (19.1)	5/8	450 (2.0)	560 (2.5)	2,250 (10.0)	2,800 (12.5)

- All values are for anchor installed in hollow core concrete with minimum compressive strength of 7,000 psi. Due to variations in materials and dimensional configurations, on-site testing is required to determine the actual performance of the anchor. Allowable loads are calculated using a safety factor of 5.
- Tabulated embedment depth is limited by the plastic HIT-SC 16x50 mm screens. See figure 5.
- The required concrete thickness is the thickness for which values are available and installation is recommended. Anchors shall be installed along the centerline of the hollow core or along the line of minimum thickness. Verify these requirements with the hollow core plank supplier before installation. The required thickness is measured from the inner to the outer side of hollow core panel. See figure 5.
- Tabulated allowable loads must be the lesser of the adjusted bond values tabulated and the steel values in table 3 of Section 3.2.5 of Hilti Product Technical Guide Volume 2, Ed. 19.
- Allowable loads shall be adjusted for increased base material temperature in accordance with Figure 6.
- The adhesive gel and cure times shall be identical to the values adopted for masonry.
- For combined loading: $(T_{\text{applied}} / T_{\text{allowable}}) + (V_{\text{applied}} / V_{\text{allowable}}) \leq 1$

Figure 6 – Influence of in-service base material temperature on bond loads for HIT-HY 270



ORDERING INFORMATION

HIT-HY 270 with mesh screen

Product Description
HIT-HY 270 Adhesive
HIT-SC 16 x 50 mm screen
HAS-E 3/8 threaded rod

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 or www.hilti.ca. 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.



Hilti, Inc. (U.S.) 1-800-879-8000
en español 1-800-879-5000
www.hilti.com

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