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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3.2.5 HIT-RE 500 Epoxy Adhesive Anchoring System

Listings/Approvals

NSF/ANSI Std 61
certification for use in potable water

Europan Technical Approval
ETA-04/0027
ETA-08/0105

Independent Code Evaluation

LEED® Credit 4.1-Low Emitting Materials

The Leadership in Energy and Environmental Design (LEED®) Green Building Rating system™ is the nationally accepted benchmark for the design, construction and operation of high performance green buildings.

3.2.5.1 Product Description

The Hilti HIT-RE 500 System is a high strength, two part epoxy adhesive. The system consists of a side-by-side adhesive refill pack, a mixing nozzle, a HIT dispenser with refill pack holder, and either a threaded rod, rebar, HIS internally threaded insert or smooth epoxy coated bar. HIT-RE 500 is specifically designed for fastening into solid base materials such as concrete, grout, stone or solid masonry. HIT-RE 500 is also suitable for use under exceptional conditions such as:

- Underwater Fastenings
- Oversized Holes
- Diamond Cored Holes

To meet specific handling requirements for those conditions, refer to instructions for use and/or contact Hilti for assistance.

Product Features

- Superior bond performance
- Use in diamond cored or pneumatic drilled holes.
- Underwater applications down to 165 ft (50 m)
- Meets DOT requirements for most states. Contact Hilti Technical Services for more information.
- Meets requirements of ASTM C881-90, Type IV, Grade 2 and 3, Class A, B, C except gel times
- Meets requirements of AASHTO specification M235, Type IV, Grade 3, Class A, B, C except gel times
- Mixing tube provides proper mixing, eliminates measuring errors and minimizes waste
- Contains no styrene and virtually odorless
- May be installed in concrete with temperatures ranging from 23°F to 104°F (-5°C to 40°C) with no degrading of bond strength.
- May be installed in concrete with temperatures ranging from 23°F to 104°F (-5°C to 40°C) with no degrading of bond strength.
- Good bond strength in elevated service temperatures
- Excellent resistance to weathering
- Suitable for oversized holes

HIT-RE 500 Epoxy Adhesive Anchoring System 3.2.5

Guide Specifications

Master format section:

Previous	2004 Format	
03250	**03 16 00**	Concrete Anchors

Related Sections:

03200	**03 20 00**	Concrete Reinforcing
05050	**05 50 00**	Metal Fabrications
05120	**05 10 00**	Structural Metal Framing

Injectable adhesive shall be used for installation of all reinforcing steel dowels or threaded anchor rods and inserts into existing concrete. Adhesive shall be furnished in side-by-side refill packs which keep component A and component B separate. Side-by-side packs shall be designed to compress during use to minimize waste volume. Side-by-side packs shall also be designed to accept static mixing nozzle which thoroughly blends component A and component B and allows injection directly into drilled hole. Only injection tools and static mixing nozzles as supplied by manufacturer shall be used. Manufacturer's instructions shall be followed. Injection adhesive shall be formulated to include resin and hardener to provide optimal curing speed as well as high strength and stiffness. Typical curing time at 68°F (20°C) shall be approximately 12 hours.

Injection adhesive shall be HIT-RE 500 as furnished by Hilti.

Anchor rods shall be end stamped to show the grade of steel and overall rod length. Anchor rods shall be manufactured to meet the following requirements:

1. ISO 898 Class 5.8
2. ASTM A193, Grade B7 high strength carbon steel anchor;
3. AISI 304 or AISI 316 stainless steel, meeting the requirements of ASTM F593 condition CW.

Special order length HAS Rods may vary from standard product.

Nuts and washers Shall be furnished to meet the requirements of the above anchor rod specifications.

3.2.5 HIT-RE 500 Epoxy Adhesive Anchoring System

3.2.5.2 Material Specifications

Table 1 - Material properties of fully cured HIT-RE 500 adhesive

Bond Strength ASTM C882-91[1] 2 day cure 7 day cure	 12.4 MPa 12.4 MPa	 1,800 psi 1,800 psi
Compressive Strength ASTM D695-96[1]	82.7 MPa	12,000 psi
Compressive Modulus ASTM D695-96[1]	1,493 MPa	0.22×10^6 psi
Tensile Strength 7 day ASTM D638-97	43.5 MPa	6,310 psi
Elongation at break ASTM D638-97	2.0%	
Heat Deflection Temperature ASTM D648-95	63°C	146°F
Absorption ASTM D570-95	0.06%	
Linear Coefficient of Shrinkage on Cure ASTM D2566-86	0.004	
Electrical resistance DIN IEC 93 (12.93)	6.6×10^{13} Ω/m	1.7×10^{12} Ω/in.

1 Minimum values obtained as the result of tests at 23°F, 40°F and 60°F.

HAS-E carbon steel specifications

Carbon steel rods conform to ISO 898 class 5.8 with a minimum tensile strength of 72.5 ksi (500 MPa) and a minimum yield strength of 58 ksi (400 MPa).

HAS-E nuts conform to SAE J995 Grade 5

HAS-E washers conform to ASTM F884, HV, and ANSI B18.22.1 Type A Plain.

HAS-E rod, nut and washer has an electroplated zinc coating conforming to ASTM B633, SC 1

HAS Super high strength specifications

Carbon steel rods manufactured from ASTM A193, Grade B7, with a minimum tensile strength of 125 ksi (862 MPa) and a minimum yield strength of 105 ksi (724 MPa).

HAS Super nuts conform to SAE J995 Grade 5

HAS Super washers conform to ASTM F884, HV, and ANSI B18.22.1 Type A Plain.

HAS Super rods, nuts and washers, except the 7/8-in. diameter, have an electroplated zinc coating conforming to ASTM B633, SC 1

7/8-in. HAS Super rods, nuts and washers are hot-dip galvanized in accordance with ASTM A153

HAS-R 304 stainless steel specifications

3/8-, 1/2- and 5/8-in. rods manufactured from AISI Type 304 stainless steel conforming to ASTM F593 Condition CW with a minimum tensile strength of 100 ksi (689 MPa) and a minimum yield strength of 65 ksi (448 MPa).

3/4-, 1- and 1 1/4-in. rods are manufactured from AISI Type 304 stainless steel conforming to ASTM F593 Condition CW with a minimum tensile strength of 85 ksi (586 MPa) and a minimum yield strength of 45 ksi (310 MPa).

AISI Type 304 stainless steel nuts conform to ASTM F594

AISI Type 304 stainless steel washers conform to ASTM A240 and ANSI B18.22.1 Type A Plain.

HAS-R 316 stainless steel specifications

3/8-, 1/2- and 5/8-in. rods manufactured from AISI Type 316 stainless steel with a minimum tensile strength of 100 ksi (689 MPa) and a minimum yield strength of 65 ksi (448 MPa).

3/4-, 1- and 1 1/4-in. rods are manufactured from AISI Type 316 stainless steel conforming to ASTM F593 Condition CW or cold worked.

AISI Type 316 stainless steel nuts conform to ASTM F594

AISI Type 316 stainless steel washers conform to ASTM A240 and ANSI B18.22.1 Type A Plain.

HIS-N and HIS-NR internally threaded insert specifications

3/8-in. HIS-N is manufactured from 11MnPb30+C carbon steel conforming to DIN 10277-3 with a minimum tensile strength of 71.1 ksi (490 MPa) and a minimum yield strength of 59.5 ksi (410 MPa).

1/2-, 5/8- and 3/4-in. HIS-N is manufactured from 11MnPb30+C carbon steel conforming to DIN 10277-3 with a minimum tensile strength of 66.7 ksi (460 MPa) and a minimum yield strength of 54.4 ksi (375 MPa).

HIS-NR is manufactured from X5CrNiMo 17122 K700 stainless steel conforming to DIN EN 10088-3 with a minimum tensile strength of 101.5 ksi (700 MPa) and a minimum yield strength of 50.8 ksi (350 MPa).

3.2.5.3 Technical Data

Table 2 - HAS rod installation specifications installed with HIT-RE 500 adhesive anchor system

Setting information	Symbol	Units	Nominal anchor diameter						
			3/8	1/2	5/8	3/4	7/8	1	1-1/4
Drill bit diameter[1]	d_o	in.	7/16	9/16	11/16	13/16	15/16	1-1/16	1-1/2
Standard effective embedment	$h_{ef,std}$	in. (mm)	3-1/2 (90)	4-1/4 (110)	5 (125)	6-5/8 (170)	7-1/2 (190)	8-1/4 (210)	12 (305)
Installation torque embedment ≥ $h_{ef,std}$	T_{inst}	ft-lb (Nm)	18 (24)	30 (41)	75 (102)	150 (203)	175 (237)	235 (319)	400 (540)
Installation torque embedment < $h_{ef,std}$	T_{inst}	ft-lb (Nm)	15 (20)	20 (27)	50 (68)	105 (142)	125 (169)	165 (224)	280 (375)
Minimum concrete member thickness	h_{min}	in. (mm)	h_{ef}+2 h_{ef}+51					h_{ef}+2-1/4 h_{ef}+57	h_{ef}+3 h_{ef}+76

1 Hole may be drilled with rotary hammer drill or Hilti DD EC-1 Diamond Coring System.

Table 3 - HIS-N and HIS-RN installation specifications with HIT-RE 500 adhesive anchor system

Setting information	Symbol	Units	Thread size			
			3/8-16 UNC	1/2-13 UNC	5/8-11 UNC	3/4-10 UNC
Outside diameter of insert	d	in.	0.65	0.81	1.00	1.09
Nominal bit diameter[1]	d_o	in.	11/16	7/8	1-1/8	1-1/4
Standard effective embedment	$h_{ef,std}$	in. (mm)	4-3/8 (110)	5 (125)	6-5/8 (170)	8-1/4 (210)
Bolt engagement minimum maximum	h_s	in. in.	3/8 15/16	1/2 1-3/16	5/8 1-1/2	3/4 1-7/8
Installation torque	T_{inst}	ft-lb (Nm)	18 (24)	30 (41)	75 (102)	150 (203)
minimum concrete member thickness	h_{min}	in. (mm)	5.9 (150)	6.7 (170)	9.1 (230)	10.6 (270)

1 Hole may be drilled with rotary hammer drill or Hilti DD EC-1 Diamond Coring System.

Table 4 - Rebar installation specifications with HIT-RE 500 adhesive anchor system

Setting information	Symbol	Units	Rebar size								
			No. 3	No. 4	No. 5	No. 6	No. 7	No. 8	No. 9	No. 10	No. 11
Drill bit diameter[1,2]	d_o	in.	1/2	5/8	3/4	7/8	1	1-1/8	1-3/8	1-1/2	1-3/4

1 Rebar diameters may vary. Use the smallest diameter drill bit which will accomodate the rebar.
2 Hole may be drilled with rotary hammer drill or Hilti DD EC-1 Diamond Coring System.

Figure 1— HAS rod specifications

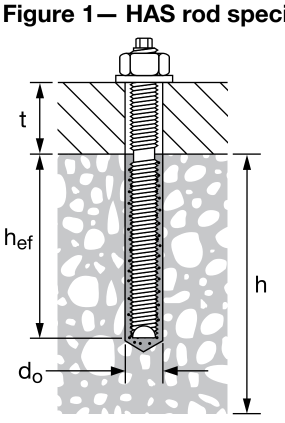
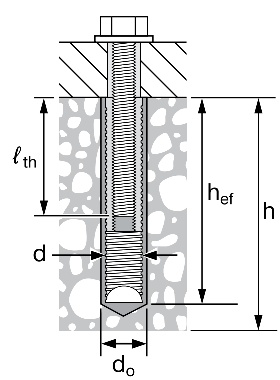


Figure 2— HIS-N and HIS-RN specifications



Combined shear and tension loading

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

3.2.5

3.2.5 HIT-RE 500 Epoxy Adhesive Anchoring System

Table 5 - HIT-RE 500 allowable and ultimate bond/concrete capacity for HAS rods in normal weight concrete[1,2,3,4]

Nominal anchor diameter in.	Effective embedment in. (mm)	HIT-RE 500 Allowable bond/concrete capacity				HIT-RE 500 Ultimate bond/concrete capacity			
		Tensile		Shear		Tensile		Shear	
		f'_c = 2000 psi (13.8 MPa) lb (kN)	f'_c = 4000 psi (27.6 MPa) lb (kN)	f'_c = 2000 psi (13.8 MPa) lb (kN)	f'_c = 4000 psi (27.6 MPa) lb (kN)	f'_c = 2000 psi (13.8 MPa) lb (kN)	f'_c = 4000 psi (27.6 MPa) lb (kN)	f'_c = 2000 psi (13.8 MPa) lb (kN)	f'_c = 4000 psi (27.6 MPa) lb (kN)
3/8	1-3/4 (44)	645 (2.9)	1,095 (4.9)	1,510 (6.7)	2,135 (9.5)	2,580 (11.5)	4,370 (19.4)	4,530 (20.2)	6,405 (28.4)
	3-3/8 (86)	2,190 (9.7)	2,585 (11.5)	3,155 (14.0)	4,460 (19.8)	8,760 (39.0)	10,345 (46.0)	9,460 (42.1)	13,380 (59.5)
	4-1/2 (114)	2,420 (10.8)	2,585 (11.5)	4,855 (21.6)	6,860 (30.5)	9,685 (43.1)	10,335 (46.0)	14,560 (64.8)	20,580 (91.5)
1/2	2-1/4 (57)	1,130 (5.0)	1,965 (8.7)	2,510 (11.2)	3,550 (15.8)	4,530 (20.2)	7,860 (35.0)	7,525 (33.5)	10,640 (47.3)
	4-1/2 (114)	4,045 (18.0)	5,275 (23.5)	5,610 (25.0)	7,935 (35.3)	16,185 (72.0)	21,095 (93.8)	16,820 (74.8)	23,800 (105.9)
	6 (152)	4,775 (21.2)	5,380 (23.9)	8,635 (38.4)	12,210 (54.3)	19,095 (84.9)	21,520 (95.7)	25,900 (115.2)	36,620 (162.9)
5/8	2-7/8 (73)	1,690 (7.5)	3,045 (13.5)	5,245 (23.3)	7,420 (33.0)	6,770 (30.1)	12,175 (54.2)	15,735 (70.0)	22,250 (99.0)
	5-5/8 (143)	6,560 (29.2)	7,355 (32.7)	8,760 (39.0)	12,395 (55.1)	26,240 (116.7)	29,420 (130.9)	26,280 (116.9)	37,180 (165.4)
	7-1/2 (190)	7,320 (32.6)	7,515 (33.4)	13,615 (60.6)	19,080 (84.9)	29,290 (130.3)	30,060 (133.7)	40,480 (180.1)	57,240 (254.6)
3/4	3-3/8 (86)	2,310 (10.3)	4,515 (20.1)	7,335 (32.6)	10,370 (46.1)	9,250 (41.1)	18,065 (80.4)	22,000 (97.9)	31,108 (138.4)
	6-3/4 (172)	8,670 (38.6)	10,755 (47.8)	12,615 (56.1)	17,840 (79.4)	34,685 (154.3)	43,020 (191.4)	37,840 (168.3)	53,520 (238.1)
	9 (229)	10,385 (46.2)	12,995 (57.8)	19,430 (86.4)	27,470 (122.2)	41,535 (184.8)	51,985 (231.2)	58,280 (259.2)	82,400 (366.5)
7/8	4 (101)	3,005 (13.4)	5,665 (25.2)	7,795 (34.7)	11,020 (49.0)	12,030 (53.5)	22,670 (100.8)	23,375 (104.0)	33,050 (147.0)
	7-7/8 (200)	12,495 (55.6)	15,875 (70.6)	17,175 (76.4)	24,290 (108.0)	49,975 (222.3)	63,495 (282.4)	51,520 (229.2)	72,860 (324.1)
	10-1/2 (267)	14,705 (65.4)	16,185 (72.0)	26,440 (117.6)	37,390 (166.3)	58,820 (261.6)	64,730 (287.9)	79,320 (352.8)	112,160 (498.9)
1	4-1/2 (114)	3,945 (17.5)	8,440 (37.5)	10,035 (44.6)	14,190 (63.1)	15,790 (70.2)	33,765 (150.2)	30,104 (133.9)	42,565 (189.3)
	9 (229)	13,845 (61.6)	17,365 (77.2)	22,435 (99.8)	31,720 (141.1)	55,380 (246.3)	69,465 (309.0)	67,300 (299.4)	95,160 (423.3)
	12 (305)	17,935 (79.8)	17,935 (79.8)	34,535 (153.6)	48,830 (217.2)	71,740 (319.1)	71,740 (319.1)	103,600 (460.8)	146,480 (651.6)
1-1/4	5-5/8 (143)	5,760 (25.6)	12,815 (57.0)	14,760 (65.7)	20,870 (92.8)	23,045 (102.5)	51,270 (228.1)	44,280 (197.0)	62,610 (278.5)
	11-1/4 (286)	24,610 (109.5)	31,620 (140.7)	35,050 (155.9)	49,570 (220.5)	9,8430 (437.8)	126,480 (562.6)	105,140 (467.7)	148,710 (661.5)
	15 (381)	34,130 (151.8)	35,270 (156.9)	53,960 (240.0)	76,300 (339.4)	136,525 (607.3)	141,090 (627.6)	161,880 (720.1)	228,900 (1018.2)

1 Influence factors for spacing and/or edge distance are applied to allowable concrete/bond values above, and then compared to the steel value. The lesser of the values is to be used for the design.

2 Average ultimate concrete shear capacity based on Strength Design Method for standard and deep embedment and based on testing for shallow embedment.

3 All values based on holes drilled with carbide bit and installed per manufacturer's instructions. Ultimate tensile concrete/bond loads represent the average values obtained in testing.

4 For underwater applications with a maximum depth of 165 ft (50 m), reduce the tabulated concrete/bond values 30% to account for reduced mechanical properties of saturated concrete.

Table 6 - Allowable steel strength for carbon steel and stainless steel HAS rods[1]

Nominal anchor diameter in.	HAS-E ISO 898 Class 5.8		HAS Super ASTM A193 B7		HAS SS AISI 304/316 SS	
	Tensile	Shear	Tensile	Shear	Tensile	Shear
	lb (kN)	lb (kN)	lb (kN)	lb (kN)	lb (kN)	lb (kN)
3/8	2,640 (11.7)	1,360 (6.0)	4,555 (20.3)	2,345 (10.4)	3,645 (16.2)	1,875 (8.3)
1/2	4,700 (20.9)	2,420 (10.8)	8,100 (36.0)	4,170 (18.5)	6,480 (28.8)	3,335 (14.8)
5/8	7,340 (32.7)	3,780 (16.8)	12,655 (56.3)	6,520 (29.0)	10,125 (45.0)	5,215 (23.2)
3/4	10,570 (47.0)	5,445 (24.2)	18,225 (81.1)	9,390 (41.8)	12,390 (55.1)	6,385 (28.4)
7/8	14,385 (64.0)	7,410 (33.0)	24,805 (110.3)	12,780 (56.9)	16,865 (75.0)	8,690 (38.6)
1	18,790 (83.6)	9,680 (43.0)	32,400 (144.1)	16,690 (74.2)	22,030 (98.0)	11,350 (50.5)
1-1/4	29,360 (130.6)	15,125 (67.3)	50,620 (225.2)	26,080 (116.0)	34,425 (153.1)	17,735 (78.9)

1 Steel strength as defined in AISC Manual of Steel Construction (ASD):

Tensile = 0.33 x F_u x Nominal Area
Shear = 0.17 x F_u x Nominal Area

Table 7 - Ultimate steel strength for carbon steel and stainless steel HAS rods[1]

Nominal anchor diameter in.	HAS-E ISO 898 Class 5.8			HAS Super ASTM A193 B7			HAS SS AISI 304/316 SS		
	Yield lb (kN)	Tensile lb (kN)	Shear lb (kN)	Yield lb (kN)	Tensile lb (kN)	Shear lb (kN)	Yield lb (kN)	Tensile lb (kN)	Shear lb (kN)
3/8	4,495 (20.0)	6,005 (26.7)	3,605 (16.0)	8,135 (36.2)	10,350 (43.4)	6,210 (27.6)	5,035 (22.4)	8,280 (36.8)	4,970 (22.1)
1/2	8230 (36.6)	10,675 (47.5)	6,405 (28.5)	14,900 (66.3)	18,405 (79.0)	11,040 (49.1)	9,225 (41.0)	14,720 (65.5)	8,835 (39.3)
5/8	13110 (58.3)	16,680 (74.2)	10,010 (44.5)	23,730 (105.6)	28,760 (125.7)	17,260 (76.8)	14,690 (65.3)	23,010 (102.4)	13,805 (61.4)
3/4	19,400 (86.3)	24,020 (106.9)	14,415 (64.1)	35,120 (156.2)	41,420 (185.7)	24,850 (110.5)	15,050 (66.9)	28,165 (125.3)	16,800 (75.2)
7/8	26,780 (119.1)	32,695 (145.4)	19,620 (87.3)	48,480 (215.7)	56,370 (256.9)	33,825 (150.5)	20,775 (92.4)	38,335 (170.5)	23,000 (102.3)
1	35,130 (156.3)	42,705 (190.0)	25,625 (114.0)	63,600 (282.9)	73,630 (337.0)	44,180 (196.5)	27,255 (121.2)	50,070 (222.7)	30,040 (133.6)
1-1/4	56,210 (250.0)	66,730 (296.8)	40,035 (178.1)	101,755 (452.6)	115,050 (511.8)	69,030 (307.1)	43,610 (194.0)	78,235 (348.0)	46,940 (208.8)

1 Steel strength as defined in AISC Manual of Steel Construction 2nd Ed. (LRFD):

Yield = F_y x tensile stress area
Tensile = 0.75 x F_u x nominal area
Shear = 0.45 x F_u x nominal area

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Table 8 - HIT-RE 500 allowable bond or concrete capacity and steel strength for HIS-N and HIS-RN inserts[1]

Thread size in.	Effective embedment in. (mm)	HIT-RE 500 allowable bond/concrete capacity[2]		Steel bolt strength[2]			
				ASTM A325 carbon steel		ASTM F593 stainless steel	
		Tensile (13.8 MPa) lb (kN)	Shear (13.8 MPa) lb (kN)	Tensile lb (kN)	Shear lb (kN)	Tensile lb (kN)	Shear lb (kN)
3/8-16 UNC	4-3/8 (110)	2,870 (12.8)	1,565 (7.0)	4,370 (19.4)	2,250 (10.0)	3,645 (16.2)	1,875 (8.3)
1/2-13 UNC	5 (127)	4,530 (20.1)	2,890 (12.9)	7,775 (34.6)	4,005 (17.8)	6,480 (28.8)	3,335 (14.8)
5/8-11 UNC	6-5/8 (168)	8,255 (36.7)	4,635 (20.6)	12,150 (54.0)	6,260 (27.8)	10,125 (45.0)	5,215 (23.2)
3/4-10 UNC	8-1/4 (210)	9,030 (40.1)	6,695 (29.8)	17,945 (77.8)	9,010 (40.1)	12,395 (55.1)	6,385 (28.4)

Table 9 - HIT-RE 500 ultimate bond or concrete capacity and steel strength for HIS-N and HIS-RN inserts[1]

Thread size in.	Effective embedment in. (mm)	HIT-RE 500 ultimate bond/concrete capacity		Ultimate bolt strength[2]			
				ASTM A325 carbon steel		ASTM F593 stainless steel	
		Tensile (13.8 MPa) lb (kN)	Shear (13.8 MPa) lb (kN)	Tensile lb (kN)	Shear lb (kN)	Tensile lb (kN)	Shear lb (kN)
3/8-16 UNC	4-3/8 (110)	11,480 (51.0)	6,260 (27.8)	9,935 (44.2)	5,960 (26.5)	8,280 (36.8)	4,970 (22.1)
1/2-13 UNC	5 (127)	18,115 (80.5)	11,565 (51.4)	17,665 (78.6)	10,600 (47.2)	14,720 (65.5)	8,835 (39.3)
5/8-11 UNC	6-5/8 (168)	33,025 (146.9)	18,550 (82.5)	27,610 (122.8)	16,565 (73.7)	23,010 (102.4)	13,805 (61.4)
3/4-10 UNC	8-1/4 (210)	36,125 (160.6)	26,775 (119.1)	39,760 (176.9)	23,855 (106.1)	28,165 (125.3)	16,900 (75.1)

1 Use lower value of either allowable bond/concrete capacity or steel strength. Minimum concrete compressive strength f'_c is 2,000 psi.

2 Steel values in accordance with AISC

ASTM A325 bolts	F_y = 92 ksi , F_u = 120 ksi	
ASTM F593 (AISI 304/316)	F_y = 65 ksi, F_u = 100 ksi	for 3/8- through 5/8 in.
	F_y = 45 ksi, F_u = 85 ksi	for 3/4-in.

Allowable load values	**Ultimate load values**
Tension = 0.33 x F_u x A_{nom}	Tension = 0.75 x F_u x A_{nom}
Shear = 0.17 x F_u x A_{nom}	Shear = 0.45 x F_u x A_{nom}

Table 10 - HIT-RE 500 ultimate bond capacity and steel strength for rebar in concrete

		Concrete compressive strength						Grade 60 rebar	
		f'_c = 2000 psi (13.8 MPa)			f'_c = 4000 psi (27.6 MPa)				
Rebar size	Effective embedment in. (mm)	Ultimate bond strength lb (kN)	Embed. to develop yield strength[1] in. (mm)	Embed. to develop tensile strength[1] in. (mm)	Ultimate bond strength lb (kN)	Embed. to develop yield strength[1] in. (mm)	Embed. to develop tensile strength[1] in. (mm)	Yield strength lb (kN)	Tensile strength lb (kN)
#3	3-3/8 (86)	10,105 (45.0)	2-1/4 (57)	3-3/8 (86)	10,810 (48.1)	2-1/8 (54)	3-1/4 (84)	6,600 (29.4)	9,900 (44.0)
	4-1/2 (114)	10,920 (48.6)			10,810 (48.1)				
#4	4-1/2 (114)	15,980 (71.1)	3-3/8 (86)	5-5/8 (143)	18,540 (82.5)	3 (76)	4-3/8 (111)	12,000 (53.4)	18,000 (80.1)
	6 (152)	18,830 (83.8)			18,655 (83.0)				
#5	5-5/8 (143)	20,630 (91.8)	5-1/8 (130)	8-7/8 (225)	27,790 (123.6)	3-7/8 (98)	5-3/4 (146)	18,600 (82.7)	27,900 (124.1)
	7-1/2 (191)	24,870 (110.6)			27,790 (128.6)				
#6	6-3/4 (171)	33,695 (149.9)	5-3/8 (136)	9-3/8 (238)	44,675 (198.7)	4 (102)	6 (152)	26,400 (117.4)	39,600 (176.2)
	9 (229)	38,960 (173.3)			44,870 (200.0)				
#7	7-7/8 (200)	40,525 (180.3)	7 (178)	12-3/8 (314)	59,340 (264.0)	4-7/8 (124)	7-1/4 (184)	36,000 (160.1)	54,000 (240.2)
	10-1/2 (267)	48,460 (215.6)			61,720 (274.6)				
#8	9 (229)	63,940 (284.4)	8-1/4 (210)	12-7/8 (327)	72,820 (323.9)	5-7/8 (149)	8-7/8 (225)	47,400 (210.9)	71,100 (316.3)
	12 (305)	69,610 (309.7)			72,950 (324.5)				
#9	10-1/8 (257)	72,245 (321.4)	8-1/2 (216)	13 (330)	81,235 (361.4)	7-1/2 (191)	12 (305)	60,000 (266.9)	90,000 (400.4)
	13-1/2 (343)	94,205 (419.1)			84,015 (373.7)				
#10	11-1/4 (286)	92,000 (409.3)	9-3/8 (238)	17-7/8 (454)	96,725 (430.3)	8-7/8 (225)	14 (356)	76,200 (339.0)	114,300 (508.5)
	15 (381)	95,850 (426.4)			97,070 (431.8)				
#11	12-3/8 (314)	118,615 (527.6)	9-7/8 (251)	18-3/4 (476)	123,120 (547.7)	9-1/2 (241)	16-1/2 (419)	93,600 (416.4)	140,400 (624.6)
	16-1/2 (419)	123,570 (549.7)			123,790 (550.7)				

1 Based on comparison of average ultimate adhesive bond test values versus minimum yield and ultimate tensile strength of rebar. For more information, contact Hilti.

Table 11 - HIT-RE 500 ultimate tensile bond strength for smooth epoxy coated dowel bars in concrete[1]

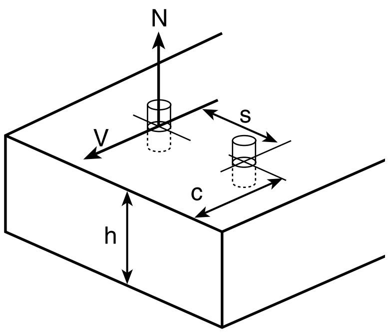
Dowel bar diameter in.	Nominal bit diameter in.	Embedment depth in. (mm)	Ultimate tensile load lb (kN)
1	1-1/8	9 (229)	40,385 (179.7)
1-1/4	1-3/8		
1-1/2	1-5/8		

1 Minimum concrete compressive strength is 2,400 psi.

3.2.5

3.2.5 HIT-RE 500 Epoxy Adhesive Anchoring System

Figure 3 - Anchor spacing and edge distance in concrete

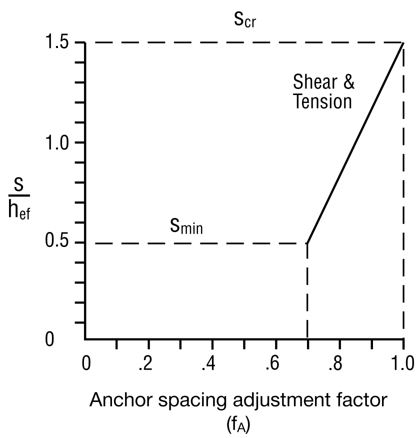


Note: Tables apply for listed embedment depths. Reduction factors for other embedment depths must be calculated using equations below.

Spacing tension/shear s_{min} = 0.5 h_{ef} s_{cr} = 1.5 h_{ef} $f_A = 0.3(s/h_{ef}) + 0.55$ for s_{cr}>s>s_{min}
Edge distance tension c_{min} = 0.5 h_{ef} c_{cr} = 1.5 h_{ef} $f_{RN} = 0.3(c/h_{ef}) + 0.55$ for c_{cr}>c>c_{min}
Edge distance shear ⊥ toward edge c_{min} = 0.5 h_{ef} c_{cr} = 2.0 h_{ef} $f_{RV1} = 0.54(c/h_{ef}) - 0.09$ for c_{cr}>c>c_{min}
Edge distance shear II to or away from edge c_{min} = 0.5 h_{ef} c_{cr} = 2.0 h_{ef} $f_{RV2} = 0.36(c/h_{ef}) + 0.28$ for c_{cr}>c>c_{min}

Anchor spacing adjustment factors

s = Actual spacing
h_{ef} = Actual embedment
s_{min} = 0.5 h_{ef}
s_{cr} = 1.5 h_{ef}



Edge distance adjustment factors

c = Actual edge distance
h_{ef} = Actual embedment
c_{min} = 0.5 h_{ef} Tension and shear
c_{cr} = 1.5 h_{ef} Tension
= 2.0 h_{ef} Shear
⊥ = Perpendicular to edge
II = Parallel to edge

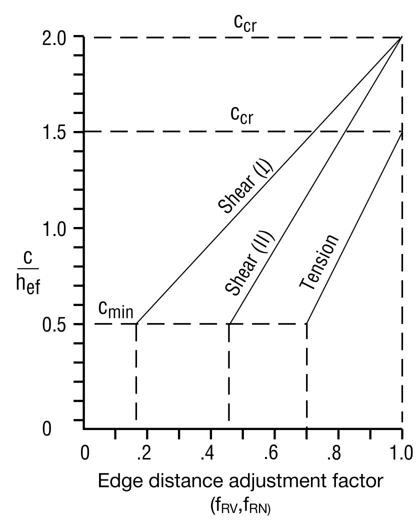


Table 12 - Load adjustment factors for 3/8-in. diameter anchors

Diameter		3/8-in.											
Adjustment factor		Spacing tension/shear f_A			Edge distance tension f_{RN}			Edge distance shear (⊥ toward edge) f_{RV1}			Edge distance shear (II to or away from edge) f_{RV2}		
Embedment depth, in.		1-3/4	3-3/8	4-1/2	1-3/4	3-3/8	4-1/2	1-3/4	3-3/8	4-1/2	1-3/4	3-3/8	4-1/2
Spacing (s)/edge distance (c), in.	7/8	0.70			0.70			0.18			0.46		
	1	0.72			0.72			0.22			0.49		
	1 11/16	0.84	0.70		0.84	0.70		0.43	0.18		0.63	0.46	
	2	0.89	0.73		0.89	0.73		0.53	0.22		0.69	0.49	
	2 1/4	0.94	0.75	0.70	0.94	0.75	0.70	0.60	0.27	0.18	0.74	0.52	0.46
	2 5/8	1.00	0.78	0.73	1.00	0.78	0.73	0.72	0.33	0.23	0.82	0.56	0.49
	3		0.82	0.75		0.82	0.75	0.84	0.39	0.27	0.90	0.60	0.52
	3 1/2		0.86	0.78		0.86	0.78	1.00	0.47	0.33	1.00	0.65	0.56
	4		0.91	0.82		0.91	0.82		0.55	0.39		0.71	0.60
	5 1/16		1.00	0.89		1.00	0.89		0.72	0.52		0.82	0.69
	5 1/2			0.92			0.92		0.79	0.57		0.87	0.72
	6			0.95			0.95		0.87	0.63		0.92	0.76
	6 3/4			1.00			1.00		1.00	0.72		1.00	0.82
	8									0.87			0.92
	9									1.00			1.00

Anchor spacing and edge distance guidelines in concrete

Note: Tables apply for listed embedment depths. Reduction factors for other embedment depths must be calculated using equations below.

Table 13 - Load adjustment factors for 1/2-in. diameter anchors

Diameter	1/2-in.											
Adjustment factor	Spacing tension/shear f_A			Edge distance tension f_{RN}			Edge distance shear (⊥ toward edge) f_{RV1}			Edge distance shear (II to or away from edge) f_{RV2}		
Embedment depth, in.	2-1/4	4-1/2	6	2-1/4	4-1/2	6	2-1/4	4-1/2	6	2-1/4	4-1/2	6
Load adjustment factors for 5/8-in. and 3/4-in. diameter anchors												
1-1/8	0.70			0.70			0.18			0.46		
1-1/2	0.75			0.75			0.27			0.52		
1-3/4	0.78			0.78			0.33			0.56		
2	0.82			0.82			0.39			0.60		
2-1/4	0.85	0.70		0.85	0.70		0.45	0.18		0.64	0.46	
2-1/2	0.88	0.72		0.88	0.72		0.51	0.21		0.68	0.48	
3	0.95	0.75	0.70	0.95	0.75	0.70	0.63	0.27	0.18	0.76	0.52	0.46
3-3/8	1.00	0.78	0.72	1.00	0.78	0.72	0.72	0.32	0.21	0.82	0.55	0.48
4		0.82	0.75		0.82	0.75	0.87	0.39	0.27	0.92	0.60	0.52
4-1/2		0.85	0.78		0.85	0.78	1.00	0.45	0.32	1.00	0.64	0.55
5		0.88	0.80		0.88	0.80		0.51	0.36		0.68	0.58
6		0.95	0.85		0.95	0.85		0.63	0.45		0.76	0.64
6-3/4		1.00	0.89		1.00	0.89		0.72	0.52		0.82	0.69
7			0.90			0.90		0.75	0.54		0.84	0.70
8			0.95			0.95		0.87	0.63		0.92	0.76
9			1.00			1.00		1.00	0.72		1.00	0.82
10									0.81			0.88
11									0.90			0.94
12									1.00			1.00

Spacing tension/shear

$s_{min} = 0.5\ h_{ef}$ $s_{cr} = 1.5\ h_{ef}$

$f_A = 0.3(s/h_{ef}) + 0.55$

for $s_{cr} > s > s_{min}$

Edge distance tension

$c_{min} = 0.5\ h_{ef}$ $c_{cr} = 1.5\ h_{ef}$

$f_{RN} = 0.3(c/h_{ef}) + 0.55$

for $c_{cr} > c > c_{min}$

Edge distance shear ⊥ toward edge

$c_{min} = 0.5\ h_{ef}$ $c_{cr} = 2.0\ h_{ef}$

$f_{RV1} = 0.54(c/h_{ef}) - 0.09$

for $c_{cr} > c > c_{min}$

Edge distance shear II to or away from edge

$c_{min} = 0.5\ h_{ef}$ $c_{cr} = 2.0\ h_{ef}$

$f_{RV2} = 0.36(c/h_{ef}) + 0.28$

for $c_{cr} > c > c_{min}$

Table 14 - Load adjustment factors for 5/8-in. and 3/4-in. diameter anchors

Diameter	5/8-in.												3/4-in.											
Adjustment factor	Spacing tension/shear f_A			Edge distance tension f_{RN}			Edge distance shear (⊥ toward edge) f_{RV1}			Edge distance shear (II to or away from edge) f_{RV2}			Spacing tension/shear f_A			Edge distance tension f_{RN}			Edge distance shear (⊥ toward edge) f_{RV1}			Edge distance shear (II to or away from edge) f_{RV2}		
Embedment depth, in.	2-7/8	5-5/8	7-1/2	2-7/8	5-5/8	7-1/2	2-7/8	5-5/8	7-1/2	2-7/8	5-5/8	7-1/2	3-3/8	6-3/4	9	3-3/8	6-3/4	9	3-3/8	6-3/4	9	3-3/8	6-3/4	9
Spacing (s)/edge distance (c), in.																								
1-7/16	0.70			0.70			0.18			0.46														
1-11/16	0.73			0.73			0.23			0.49			0.70			0.70			0.18			0.46		
2	0.76			0.76			0.29			0.53			0.73			0.73			0.23			0.49		
2-13/16	0.84	0.70		0.84	0.70		0.44	0.18		0.63	0.46		0.80			0.80			0.36			0.58		
3-3/8	0.90	0.73		0.90	0.73		0.54	0.23		0.70	0.50		0.85	0.70		0.85	0.70		0.45	0.18		0.64	0.46	
3-3/4	0.94	0.75	0.70	0.94	0.75	0.70	0.61	0.27	0.18	0.75	0.52	0.46	0.88	0.72		0.88	0.72		0.51	0.21		0.68	0.48	
4-5/16	1.00	0.78	0.72	1.00	0.78	0.72	0.72	0.32	0.22	0.82	0.56	0.49	0.93	0.74		0.93	0.74		0.60	0.26		0.74	0.51	
4-1/2		0.79	0.73		0.79	0.73	0.76	0.34	0.23	0.84	0.57	0.50	0.95	0.75	0.70	0.95	0.75	0.70	0.63	0.27	0.18	0.76	0.52	0.46
5-1/16		0.82	0.75		0.82	0.75	0.86	0.40	0.27	0.91	0.60	0.52	1.00	0.78	0.72	1.00	0.78	0.72	0.72	0.32	0.21	0.82	0.55	0.48
5-5/8		0.85	0.78		0.85	0.78	0.97	0.45	0.32	0.98	0.64	0.55		0.80	0.74		0.80	0.74	0.81	0.36	0.25	0.88	0.58	0.51
5-3/4		0.86	0.78		0.86	0.78	1.00	0.46	0.32	1.00	0.65	0.56		0.81	0.74		0.81	0.74	0.83	0.37	0.26	0.89	0.59	0.51
6-3/4		0.91	0.82		0.91	0.82		0.56	0.40		0.71	0.60		0.85	0.78		0.85	0.78	1.00	0.45	0.32	1.00	0.64	0.55
8-7/16		1.00	0.89		1.00	0.89		0.72	0.52		0.82	0.69		0.93	0.83		0.93	0.83		0.59	0.42		0.73	0.62
10-1/8			0.96			0.96		0.88	0.64		0.93	0.77		1.00	0.89		1.00	0.89		0.72	0.52		0.82	0.69
11-1/4			1.00			1.00		1.00	0.72		1.00	0.82			0.93			0.93		0.81	0.59		0.88	0.73
12									0.77			0.86			0.95			0.95		0.87	0.63		0.92	0.76
13-1/2									0.88			0.93			1.00			1.00		1.00	0.72		1.00	0.82
15									1.00			1.00									0.81			0.88
16																					0.87			0.92
18																					1.00			1.00

3.2.5 HIT-RE 500 Epoxy Adhesive Anchoring System

Anchor spacing and edge distance guidelines in concrete

Note: Tables apply for listed embedment depths. Reduction factors for other embedment depths must be calculated using equations below.

Table 15 - Load adjustment factors for 7/8-in. diameter anchors

Diameter	7/8-in.											
Adjustment factor	Spacing tension/shear f_A			Edge distance tension f_{RN}			Edge distance shear (⊥ toward edge) f_{RV1}			Edge distance shear (II to or away from edge) f_{RV2}		
Embedment depth, in.	4	7-7/8	10-1/2	4	7-7/8	10-1/2	4	7-7/8	10-1/2	4	7-7/8	10-1/2
Spacing (s)/Edge distance (c), in.												
2	0.70			0.70			0.18			0.46		
2-1/2	0.74			0.74			0.25			0.51		
3	0.78			0.78			0.32			0.55		
3-1/2	0.81			0.81			0.38			0.60		
3-15/16	0.85	0.70		0.85	0.70		0.44	0.18		0.63	0.46	
4-1/2	0.89	0.72		0.89	0.72		0.52	0.22		0.69	0.49	
5	0.93	0.74		0.93	0.74		0.59	0.25		0.73	0.51	
5-1/4	0.94	0.75	0.70	0.94	0.75	0.70	0.62	0.27	0.18	0.75	0.52	0.46
6	1.00	0.78	0.72	1.00	0.78	0.72	0.72	0.32	0.22	0.82	0.55	0.49
6-1/2		0.80	0.74		0.80	0.74	0.79	0.36	0.24	0.87	0.58	0.50
7		0.82	0.75		0.82	0.75	0.86	0.39	0.27	0.91	0.60	0.52
8		0.85	0.78		0.85	0.78	1.00	0.46	0.32	1.00	0.65	0.55
10		0.93	0.84		0.93	0.84		0.60	0.42		0.74	0.62
11-13/16		1.00	0.89		1.00	0.89		0.72	0.52		0.82	0.69
12			0.89			0.89		0.73	0.53		0.83	0.69
14			0.95			0.95		0.87	0.63		0.92	0.76
15-3/4			1.00			1.00		1.00	0.72		1.00	0.82
18									0.84			0.90
20									0.94			0.97
21									1.00			1.00

Spacing tension/shear

$s_{min} = 0.5\,h_{ef}$ $\quad s_{cr} = 1.5\,h_{ef}$

$f_A = 0.3(s/h_{ef}) + 0.55$

for $s_{cr} > s > s_{min}$

Edge distance tension

$c_{min} = 0.5\,h_{ef}$ $\quad c_{cr} = 1.5\,h_{ef}$

$f_{RN} = 0.3(c/h_{ef}) + 0.55$

for $c_{cr} > c > c_{min}$

Edge distance shear ⊥ toward edge

$c_{min} = 0.5\,h_{ef}$ $\quad c_{cr} = 2.0\,h_{ef}$

$f_{RV1} = 0.54(c/h_{ef}) - 0.09$

for $c_{cr} > c > c_{min}$

Edge distance shear II to or away from edge

$c_{min} = 0.5\,h_{ef}$ $\quad c_{cr} = 2.0\,h_{ef}$

$f_{RV2} = 0.36(c/h_{ef}) + 0.28$

for $c_{cr} > c > c_{min}$

Table 16 - Load adjustment factors for 1-in. and 1-1/4-in. diameter anchors

Diameter	1-in.											
Adjustment factor	Spacing tension/shear f_A			Edge distance tension f_{RN}			Edge distance shear (⊥ toward edge) f_{RV1}			Edge distance shear (II to or away from edge) f_{RV2}		
Embedment depth, in.	4-1/2	9	12	4-1/2	9	12	4-1/2	9	12	4-1/2	9	12
Spacing (s)/Edge distance (c), in.												
2-1/4	0.70			0.70			0.18			0.46		
2-3/4	0.73			0.73			0.24			0.50		
3	0.75			0.75			0.27			0.52		
4	0.82			0.82			0.39			0.60		
4-1/2	0.85	0.70		0.85	0.70		0.45	0.18		0.64	0.46	
5	0.88	0.72		0.88	0.72		0.51	0.21		0.68	0.48	
5-5/8	0.93	0.74		0.93	0.74		0.59	0.25		0.73	0.51	
6	0.95	0.75	0.70	0.95	0.75	0.70	0.63	0.27	0.18	0.76	0.52	0.46
6-3/4	1.00	0.78	0.72	1.00	0.78	0.72	0.72	0.32	0.21	0.82	0.55	0.48
7-1/2		0.80	0.74		0.80	0.74	0.81	0.36	0.25	0.88	0.58	0.51
8-1/4		0.83	0.76		0.83	0.76	0.90	0.41	0.28	0.94	0.61	0.53
9		0.85	0.78		0.85	0.78	1.00	0.45	0.32	1.00	0.64	0.55
10		0.88	0.80		0.88	0.80		0.51	0.36		0.68	0.58
11		0.92	0.83		0.92	0.83		0.57	0.41		0.72	0.61
12		0.95	0.85		0.95	0.85		0.63	0.45		0.76	0.64
13-1/2		1.00	0.89		1.00	0.89		0.72	0.52		0.82	0.69
14			0.90			0.90		0.75	0.54		0.84	0.70
16-7/8			0.97			0.97		0.92	0.67		0.96	0.79
18			1.00			1.00		1.00	0.72		1.00	0.82
20									0.81			0.88
22-1/2									0.92			0.96
24									1.00			1.00
27												
30												

Diameter	1-1/4-in.											
Adjustment factor	Spacing tension/shear f_A			Edge distance tension f_{RN}			Edge distance shear (⊥ toward edge) f_{RV1}			Edge distance shear (II to or away from edge) f_{RV2}		
Embedment depth, in.	5-5/8	11-1/4	15	5-5/8	11-1/4	15	5-5/8	11-1/4	15	5-5/8	11-1/4	15
Spacing (s)/Edge distance (c), in.												
2-1/4												
2-3/4	0.70			0.70			0.18			0.46		
3	0.71			0.71			0.20			0.47		
4	0.76			0.76			0.29			0.54		
4-1/2	0.79			0.79			0.34			0.57		
5	0.82			0.82			0.39			0.60		
5-5/8	0.85	0.70		0.85	0.70		0.45	0.18		0.64	0.46	
6	0.87	0.71		0.87	0.71		0.49	0.20		0.66	0.47	
6-3/4	0.91	0.73		0.91	0.73		0.56	0.23		0.71	0.50	
7-1/2	0.95	0.75	0.70	0.95	0.75	0.70	0.63	0.27	0.18	0.76	0.52	0.46
8-1/4	0.99	0.77	0.72	0.99	0.77	0.72	0.70	0.31	0.21	0.81	0.54	0.48
9	1.00	0.79	0.73	1.00	0.79	0.73	0.77	0.34	0.23	0.86	0.57	0.50
10		0.82	0.75		0.82	0.75	0.87	0.39	0.27	0.92	0.60	0.52
11		0.84	0.77		0.84	0.77	1.00	0.44	0.31	0.98	0.63	0.54
12		0.87	0.79		0.87	0.79		0.49	0.34	1.00	0.66	0.57
13-1/2		0.91	0.82		0.91	0.82		0.56	0.40		0.71	0.60
14		0.92	0.83		0.92	0.83		0.58	0.41		0.73	0.62
16-7/8		1.00	0.89		1.00	0.89		0.72	0.52		0.82	0.69
18			0.91			0.91		0.77	0.56		0.86	0.71
20			0.95			0.95		0.87	0.63		0.92	0.76
22-1/2			1.00			1.00		1.00	0.72		1.00	0.82
24									0.77			0.86
27									0.88			0.93
30									1.00			1.00

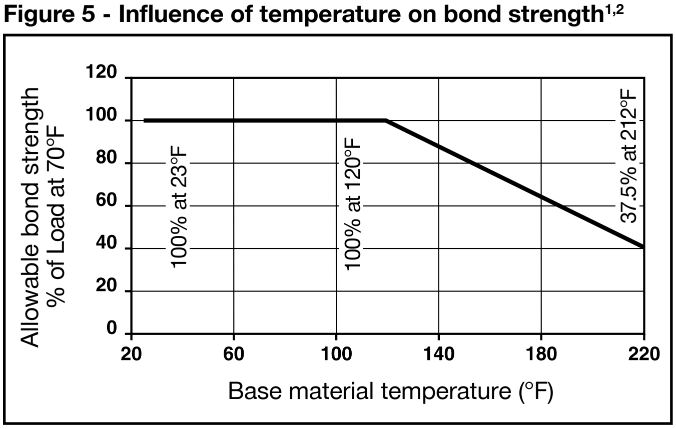
HIT-RE 500 Epoxy Adhesive Anchoring System 3.2.5

Figure 4 - Resistance of HIT-RE 500 to chemicals

Chemical	Chemicals Tested	Resistant	Not Resistant
Alkaline	Concrete drilling mud (10%) pH=12.6	+	
	Concrete drilling mud (10%) pH=13.2	+	
	Concrete potash solution (10%) pH=14.0	+	
Acids	Acetic acid (10%)[1]		–
	Nitric acid (10%)[1]		–
	Hydrochloric acid (10%) 3 month -		–
	Sulfuric acid (10%)		–
Solvents	Benzyl alcohol		–
	Ethanol		–
	Ethyl acetate		–
	Methyl ethyl ketone (MEK)		–
	Trichlorethylene		–
	Xylene (mixture)	+	
Chemicals used on job sites	Concrete plasticizer	+	
	Diesel oil	+	
	Oil	+	
	Petrol	+	
	Oil for form work (forming oil)	+	
Environmental chemicals	Salt water	+	
	de-mineralized water	+	
	salt spraying test	+	
	SO_2	+	
	Environment/weather	+	

1 Concrete was dissolved by acid.

Figure 5 - Influence of temperature on bond strength[1,2]



1 Test procedure involves the concrete being held at the elevated temperature for 24 hours then removing it from the controlled environment and testing to failure.

2 Long term creep test in accordance with ICC-ES Acceptance Criteria AC58 is available; please contact Hilti Technical Services.

Samples of the HIT-RE 500 resin were immersed in the various chemical compounds for up to one year. At the end of the test period, the samples were analyzed. Any samples showing no visible damage and having less than a 25% reduction in bending (flexural) strength were classified as Resistant. Samples that were heavily damaged or destroyed were classified as Not Resistant.

Note: In actual use, the majority of the resin is encased in the base material, leaving very little surface area exposed.

Table 17 - Full cure time

Base material temperature		Approximate full curing time
°F	°C	
23	–5	72 h
32	0	50 h
50	10	24 h
68	20	12 h
86	30	8 h
104	40	4 h

Table 18 - Initial cure time to develop 25% of bond strength

Base material temperature		Approximate initial cure time
°F	°C	
23	–5	36 h
32	0	25 h
50	10	12 h
68	20	6 h
86	30	4 h
104	40	2 h

Table 19 - Gel time

Base material temperature		Approximate gel time
°F	°C	
23	–5	4 h
32	0	3 h
50	10	2 h
68	20	30 min
86	30	20 min
104	40	12 min

1 Minimum product temperature must be maintained above 41°F (5°C) prior/during installation.

2 Gel times and full cure times are approximate.

3.2.5 HIT-RE 500 Epoxy Adhesive Anchoring System

3.2.5.4 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.

HIT-RE 500 Volume

Table 20 - Threaded rod installation

Nominal anchor diameter in.	Nominal bit diameter in.	Adhesive volume required per Inch of embedment in^3
1/4	5/16	0.055
3/8	7/16	0.095
1/2	9/16	0.133
5/8	3/4	0.261
3/4	7/8	0.326
7/8	1	0.391
1	1-1/8	0.478
1-1/4	1-3/8	0.626

The useable volume of HIT-RE 500 refill cartridge is 16.5 in^3 (270 ml)

The useable volume of HIT-RE 500 medium refill is 26.9 in^3 (440 ml)

The useable volume of HIT-RE 500 medium refill is 81.8 in^3 (1340 ml)

Example:

5/8-in. diameter rod with an embedment of 10 inches:

10 in. x 0.26 in^3 /in. = 2.6 in^3/fastening

16.5 in^3/cartridge ÷ 2.6 in^3/fastening ≈ 6 fastenings/cartridge

81.8 in^3/cartridge ÷ 2.6 in^3/fastening ≈ 31 fastenings/cartridge

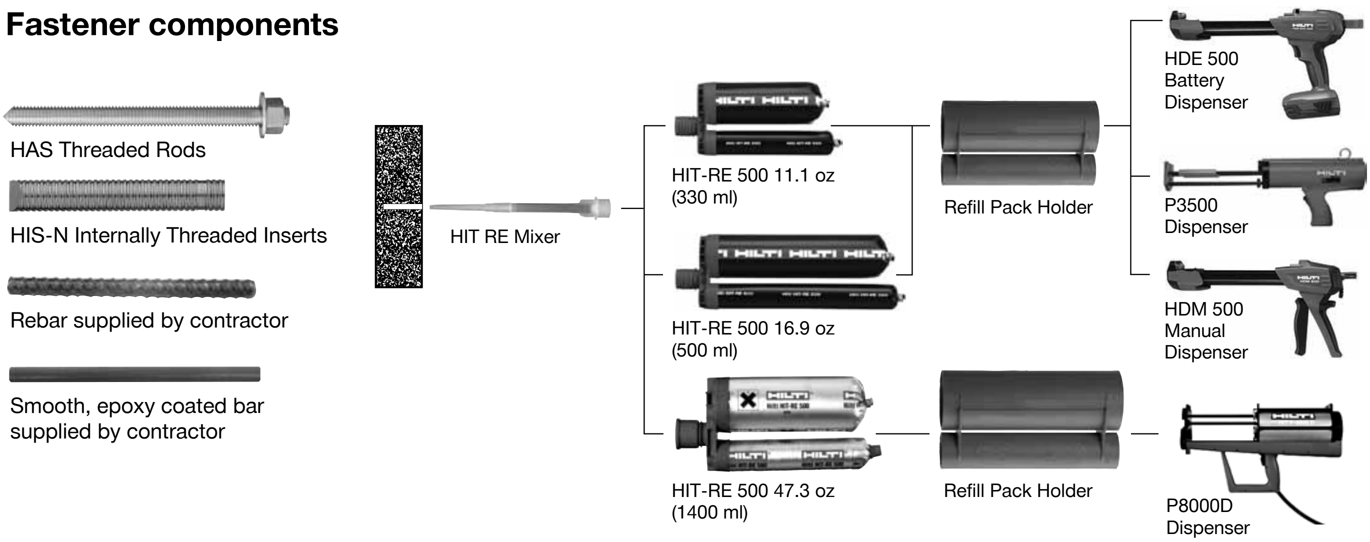
Table 21 - Rebar installation[1]

Rebar Size	Nominal bit[1] diameter in.	Adhesive volume required per Inch of embedment in^3
#3	1/2	0.110
#4	5/8	0.146
#5	3/4	0.176
#6	7/8	0.218
#7	1	0.252
#8	1-1/8	0.299
#9	1-3/8	0.601
#10	1-1/2	0.659
#11	1-3/4	1.037

1 Rebar diameter may vary. Use smallest drill bit which will accommodate rebar.

3.2.5.5 Ordering information[1]

Fastener components



HIT-RE 500 Epoxy Adhesive

Order information

Description	Package contents	Qty of foil packs
HIT-RE 500 (11.1 fl oz/330 ml)	Includes (1) refill pack and (1) mixer with filler tube	1
HIT-RE 500 MC Master Carton (11.1 fl oz/330 ml)	Includes (25) refill packs and (25) mixer with filler tube	25
HIT-RE 500 (16.9 fl oz/500 ml)	Includes (20) refil packs and (20) mixer with filler tube	20
HIT-RE 500 (47.3 fl oz/1400 ml)	Includes (4) jumbo refil packs and (4) mixder	4

1 For complete information about Hilti anchors, adhesive anchoring dispensers, drilled hole preparation and other adhesive anchoring accessories, see HIT-HY 200 Anchoring System, Section 3.2.3.5 Ordering Information.

Notes