HIT-RE 100 Adhesive Anchoring System

1.0 Product description
2.0 Technical data
3.0 Ordering information

Listings/Approvals

ICC-ES (International Code Council)
ESR-3829
NSF/ANSI Std 61
certification for use of HIT-RE 100 in potable water
City of Los Angeles
Research Report No. 26027

Independent Code Evaluation

IBC®/IRC® 2015 (ICC-ES AC308/ACI 355.4)
IBC®/IRC® 2012 (ICC-ES AC308/ACI 355.4)
IBC®/IRC® 2009 (ICC-ES AC308)
IBC®/IRC® 2006 (ICC-ES AC308)

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.

1.0 Product description

The Hilti HIT-RE 100 adhesive anchoring system is used to resist static, wind and seismic tension and shear loads in normal-weight concrete having a compressive strength, f'_c, of 17.2 MPa to 58.6 MPa. It is suitable to be used in cracked and uncracked concrete as defined per ICC-ES and ACI.

Hilti HIT-RE 100 adhesive is an injectable two-component epoxy adhesive. The two components are separated by means of a dual-cylinder foil pack attached to a manifold. The two components combine and react when dispensed through a static mixing nozzle attached to the manifold.

Elements that are suitable for use with this system are as follows: threaded steel rods and steel reinforcing bars.

Product Features

- Seismic qualified with ICC-ES Acceptance Criteria AC308 and ACI 355.4
- Use in water-filled holes and underwater up to 50 m
- Mixing tube provides proper mixing, eliminates measuring errors and minimizes waste
- Meets requirements of ASTM C881-14, Type I, II, IV, and V Grade 3, Class A, B, C
- Meets requirements of AASHTO specification M235, Type I, II, IV, and V Grade 3, Class A, B, C

2.0 Technical data

The following document is a supplement to the Hilti North American Product Technical Guide, Volume 2: Anchor Fastening Technical Guide, Edition 16. Specific sections in this supplement will refer to the aforementioned document.

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.

To consult directly with a team member regarding our anchor fastening products, contact Hilti's team of technical support specialists on the following mail address ae.technicalsupport@hilti.com.

2.1 Material specifications

For material specifications for anchor rods and inserts, please refer to section 3.2.8.

2.2 ACI 318-14 Chapter 17 design

The load values contained in this section are Hilti Simplified Design Tables. The load tables in this section were developed using the Strength Design parameters and variables of ESR-3187 and the equations within ACI 318-14 Chapter 17. For a detailed explanation of the Hilti Simplified Design Tables, refer to section 3.1.6. Data tables from ESR-3187 are not contained in this section, but can be found at www.icc-es.org or at www.hilti.ae.

HIT-RE 100 Adhesive Anchoring System

2.3 Hilti HIT-RE 100 adhesive with deformed reinforcing bars (rebar)

Cracked or uncracked concrete	Permissible concete conditions	Permissible drilling methods
Uncracked Concrete Cracked Concrete	Dry concrete Water-saturated concrete Water-filled holes Submerged (underwater)	Hammer Drilling with Carbide Tipped Drill Bit

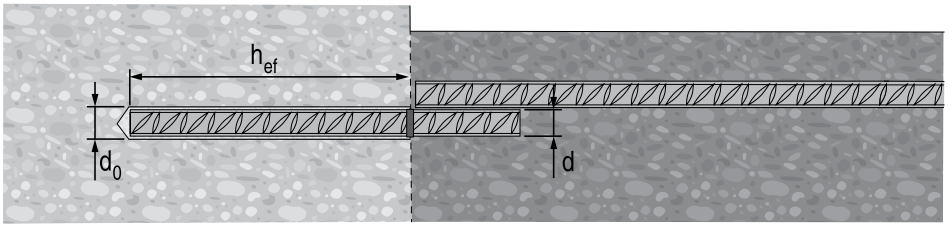


Table 1 — Specifications for rebar installed with HIT-RE 100 adhesive

Setting information		Symbol	Units	Rebar size								
				8	10	12	14	16	20	25	28	32
Nominal bit diameter		d_o	mm	12	14	16	18	20	25	32	35	40
Effective embedment	minimum	$h_{ef,min}$	mm	60	60	70	75	80	90	100	112	128
	maximum	$h_{ef,max}$	mm	160	200	240	280	320	400	500	560	640
Minimum concrete member thickness		h_{min}	mm	h_{ef} + 30		h_{ef} + $2d_o$						
Minimum edge distance[1]		c_{min}	mm	40	50	60	70	80	100	125	140	160
Minimum anchor spacing		s_{min}	mm	40	50	60	70	80	100	125	140	160

1 Edge distance of 44mm is permitted provided the rebar remains un-torqued.

Table 2 - Hilti HIT-RE 100 adhesive design strength with concrete / bond failure for metric rebar in uncracked concrete[1,2,3,4,5,6,7,8]

Nominal rebar diameter mm	Effective embedment mm	Tension — ϕN_n				Shear — ϕV_n			
		f'_c = 25 MPa kN	f'_c = 30 MPa kN	f'_c = 40 MPa kN	f'_c = 50 MPa kN	f'_c = 25 MPa kN	f'_c = 30 MPa kN	f'_c = 40 MPa kN	f'_c = 50 MPa kN
8	60	9.0	9.1	9.4	9.6	9.6	9.8	10.1	10.3
	72	10.7	10.9	11.3	11.5	23.1	23.6	24.3	24.8
	96	14.3	14.6	15.0	15.4	30.9	31.4	32.3	33.1
	160	23.9	24.3	25.0	25.6	51.4	52.4	53.9	55.1
10	60	11.2	11.4	11.7	12.0	12.1	12.3	12.6	12.9
	90	16.8	17.1	17.6	18.0	36.2	36.8	37.9	38.8
	120	22.4	22.8	23.5	24.0	48.2	49.1	50.5	51.7
	200	37.3	38.0	39.1	40.0	80.4	81.8	84.2	86.1
12	70	15.7	16.0	16.4	16.8	33.8	34.4	35.4	36.2
	108	24.2	24.6	25.3	25.9	52.1	53.0	54.6	55.8
	144	32.2	32.8	33.8	34.5	69.4	70.7	72.8	74.4
	240	53.7	54.7	56.3	57.6	115.7	117.8	121.3	124.0
14	75	18.9	19.3	19.8	20.3	40.7	41.5	42.7	43.7
	126	31.8	32.4	33.3	34.1	68.5	69.7	71.8	73.4
	168	42.4	43.2	44.4	45.4	91.3	93.0	95.7	97.8
	280	70.6	71.9	74.0	75.7	152.1	154.9	159.5	163.1
16	80	22.5	22.9	23.6	24.1	48.5	49.4	50.8	52.0
	144	40.5	41.3	42.5	43.4	87.3	88.9	91.5	93.6
	192	54.1	55.0	56.7	57.9	116.4	118.6	122.0	124.8
	320	90.1	91.7	94.4	96.6	194.0	197.6	203.4	208.0
20	90	27.7	30.4	31.6	32.3	59.8	65.5	68.1	69.6
	180	60.3	61.4	63.2	64.6	129.9	132.2	136.1	139.2
	240	80.4	81.9	84.3	86.2	173.1	176.3	181.5	185.6
	400	134.0	136.4	140.4	143.6	288.6	293.9	302.4	309.3
25	100	32.5	35.6	41.1	43.2	70.0	76.7	88.5	93.0
	225	90.6	92.3	95.0	97.1	195.2	198.8	204.6	209.2
	300	120.8	123.1	126.6	129.5	260.3	265.0	272.8	278.9
	500	201.4	205.1	211.1	215.8	433.8	441.7	454.6	464.9
28	112	38.5	42.2	48.7	52.7	83.0	90.9	105.0	113.6
	252	110.7	112.7	116.0	118.6	238.4	242.8	249.9	255.5
	336	147.6	150.3	154.7	158.2	317.9	323.7	333.2	340.7
	560	246.0	250.5	257.8	263.6	529.8	539.5	555.3	567.8
32	128	47.1	51.6	59.5	66.6	101.4	111.0	128.2	143.4
	288	140.7	143.3	147.4	150.8	303.0	308.5	317.5	324.7
	384	187.6	191.0	196.6	201.0	404.0	411.4	423.4	432.9
	640	312.6	318.3	327.6	335.0	673.3	685.6	705.7	721.6

1 See Section 3.1.8 for explanation on development of load values.
2 See Section 3.1.8.6 to convert design strength value to ASD value.
3 Linear interpolation between embedment depths and concrete compressive strengths is not permitted.
4 Tabular values represent a single anchor without reductions for edge distance, anchor spacing, or concrete thickness. Shaded cells indicate that bond strength is the controlling failure mode. Compare to the steel values in Table 4. The lesser of the values is to be used for design.
5 Values are for the following temperature range: maximum short term temperature = 55°C, maximum long term temperature = 43°C. Short term elevated concrete temperatures are those that occur over brief intervals, e.g., as a result of diurnal cycling. Long term concrete temperatures are roughly constant over significant periods of time.
6 Tabular values are for dry concrete conditions. For water saturated concrete, water-filled drilled holes, or submurged (underwater) applications multiply design strength by 0.61.
7 Tabular values are for short term loads only. For sustained loads including overhead use, see Section 3.1.8.8.
8 Tabular values are for normal-weight concrete only. For lightweight concrete multiply design strength by λ_a as follows: For sand-lightweight, λ_a = 0.51. For all-lightweight, λ_a = 0.45.
9 Tabular values are for holes drilled in concrete with carbide tipped hammer drill bit. Diamond core drilling is not permitted.
10 Tabular values are for static loads only. Seismic design is not permitted for uncracked concrete.

HIT-RE 100 Adhesive Anchoring System

Table 3 — Hilti HIT-RE 100 adhesive design strength with concrete / bond failure for metric rebar in cracked concrete [1,2,3,4,5,6,7,8,9,10]

Nominal rebar diameter mm	Effective embedment mm	Tension — ϕN_n				Shear — ϕV_n			
		f'_c = 25 MPa kN	f'_c = 30 MPa kN	f'_c = 40 MPa kN	f'_c = 50 MPa kN	f'_c = 25 MPa kN	f'_c = 30 MPa kN	f'_c = 40 MPa kN	f'_c = 50 MPa kN
10	60	4.2	4.3	4.4	4.5	4.5	4.6	4.7	4.8
	90	6.3	6.4	6.6	6.7	13.6	13.8	14.2	14.5
	120	8.4	8.5	8.8	9.0	18.1	18.4	19.0	19.4
	200	14.0	14.2	14.7	15.0	30.1	30.7	31.6	32.3
12	70	5.9	6.0	6.2	6.3	12.7	12.9	13.3	13.6
	108	9.1	9.2	9.5	9.7	19.5	19.9	20.5	20.9
	144	12.1	12.3	12.7	13.0	26.0	26.5	27.3	27.9
	240	20.1	20.5	21.1	21.6	43.4	44.2	45.5	46.5
14	75	7.3	7.5	7.7	7.9	15.8	16.1	16.6	17.0
	126	12.3	12.6	12.9	13.2	26.6	27.1	27.9	28.5
	168	16.5	16.8	17.2	17.6	35.4	36.1	37.1	38.0
	280	27.4	27.9	28.7	29.4	59.1	60.2	61.9	63.3
16	80	9.0	9.1	9.4	9.6	19.3	19.6	20.2	20.7
	144	16.1	16.4	16.9	17.3	34.7	35.4	36.4	37.2
	192	21.5	21.9	22.5	23.0	46.3	47.1	48.5	49.6
	320	35.8	36.5	37.5	38.4	77.1	78.6	80.9	82.7
20	90	12.6	12.8	13.2	13.5	27.1	27.6	28.4	29.1
	180	25.2	25.6	26.4	27.0	54.2	55.2	56.9	58.1
	240	33.6	34.2	35.2	36.0	72.3	73.7	75.8	77.5
	400	56.0	57.0	58.7	60.0	120.5	122.8	126.3	129.2
25	100	17.0	17.3	17.8	18.2	36.5	37.2	38.3	39.1
	225	38.2	38.9	40.0	40.9	82.2	83.7	86.1	88.1
	300	50.9	51.8	53.3	54.5	109.6	111.6	114.9	117.4
	500	84.8	86.4	88.9	90.9	182.6	186.0	191.4	195.7
28	112	19.9	20.3	20.9	21.4	43.0	43.7	45.0	46.0
	252	44.9	45.7	47.0	48.1	96.6	98.4	101.3	103.6
	336	59.8	60.9	62.7	64.1	128.9	131.2	135.1	138.1
	560	99.7	101.6	104.5	106.9	214.8	218.7	225.1	230.2
32	128	24.3	24.8	25.5	26.1	52.4	53.3	54.9	56.1
	288	54.7	55.7	57.3	58.6	117.8	120.0	123.5	126.3
	384	72.9	74.3	76.4	78.2	157.1	160.0	164.7	168.4
	640	121.6	123.8	127.4	130.3	261.8	266.6	274.4	280.6

1 See Section 3.1.8 for explanation on development of load values.
2 See Section 3.1.8.6 to convert design strength value to ASD value.
3 Linear interpolation between embedment depths and concrete compressive strengths is not permitted.
4 Tabular values represent a single anchor without reductions for edge distance, anchor spacing, or concrete thickness. Shaded cells indicate that bond strength is the controlling failure mode. Compare to the steel values in Table 4. The lesser of the values is to be used for design.
5 Values are for the following temperature range: maximum short term temperature = 55°C, maximum long term temperature = 43°C. Short term elevated concrete temperatures are those that occur over brief intervals, e.g., as a result of diurnal cycling. Long term concrete temperatures are roughly constant over significant periods of time.
6 Tabular values are for dry concrete conditions. For water saturated concrete, water-filled drilled holes, or submurged (underwater) applications multiply design strength by 0.60.
7 Tabular values are for short term loads only. For sustained loads including overhead use, see Section 3.1.8.8.
8 Tabular values are for normal-weight concrete only. For lightweight concrete multiply design strength by λ_a as follows: For sand-lightweight, λ_a = 0.51. For all-lightweight, λ_a = 0.45.
9 Tabular values are for holes drilled in concrete with carbide tipped hammer drill bit. Diamond core drilling is not permitted.
10 Tabular values are for static loads only. For seismic loads, multiply cracked concrete tabular values in tension and shear by α_{seis} = 0.675. See section 3.1.8.7 for additional information on seismic applications.

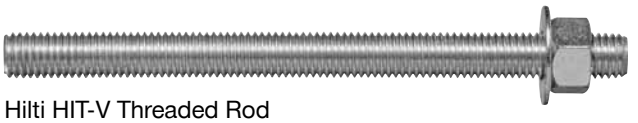
Table 4 - Steel design strength for rebar[1]

Nominal rebar diameter mm	BS 4449 Grade B 500B		
	Tensile[3] ϕN_{sa} kN	Shear[4] ϕV_{sa} kN	Seismic shear[5] $\phi V_{sa,eq}$ kN
8	17.9	9.9	–
10	28.0	15.6	10.9
12	40.3	22.5	15.8
14	54.9	30.6	21.4
16	71.8	39.9	27.9
20	112.5	61.8	43.3
25	175.5	97.2	68.0
28	220.0	121.8	85.3
32	287.6	159.3	111.5

1 See Section 3.1.8.6 to convert design strength value to ASD value.
2 BS 4449 Grade 500B rebar is considered brittle steel elements.
3 Tensile = $\phi A_{se,N} f_{uta}$ as noted in ACI 318-14 Chapter 17
4 Shear = ϕ 0.60 $A_{se,N} f_{uta}$ as noted in ACI 318-14 Chapter 17
5 Seismic Shear = $\alpha_{V,seis} \phi V_{sa}$: Reduction for seismic shear only. See section 3.1.8.7 for additional information on seismic applications.

HIT-RE 100 Adhesive Anchoring System

2.4 Hilti HIT-RE 100 adhesive with Hilti HIT-V threaded rod



Hilti HIT-V Threaded Rod

Cracked or uncracked concrete	Permissible concete conditions	Permissible drilling methods
Uncracked Concrete Cracked Concrete	Dry concrete Water-saturated concrete Water-filled holes Submerged (underwater)	Hammer Drilling with Carbide Tipped Drill Bit

Table 5 — Hilti HIT-V threaded rod installation specifications

Setting information		Symbol	Units	Nominal anchor diameter, d							
				8	10	12	16	20	24	27	30
Nominal bit diameter		d_o	mm	10	12	14	18	22	28	30	35
Effective embedment	minimum	$h_{ef,min}$	mm	60	60	70	80	90	96	108	120
	maximum	$h_{ef,max}$	mm	160	200	240	320	400	480	540	600
Diameter of fixture hole	through-set		mm	11	14	16	20[1]	24[1]	30[1]	32[1]	37[1]
	preset		mm	9	12	14	18	22	26	30	33
Installation torque		T_{inst}	Nm	10	20	40	80	150	200	270	300
Minimum concrete member thickness		h_{min}	mm	h_{ef}+30		h_{ef}+2d_o					
Minimum edge distance[2]		c_{min}	mm	40	50	60	80	100	120	135	150
Minimum anchor spacing		s_{min}	mm	40	50	60	80	100	120	135	150

1 Install using (2) washers. See Figure 5.

2 Edge distance of 44mm is permitted provided the installation torque is reduced to 0.30 T_{inst} for 5d < s < 406 mm and to 0.5 T_{inst} for s > 406 mm

Figure 4 — HIT-V threaded rods

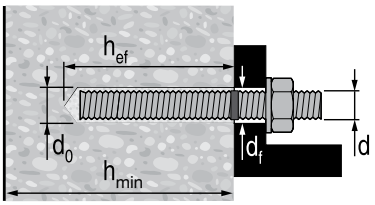


Figure 5 — Installation with (2) washers

Table 6 — Hilti HIT-RE 100 adhesive design strength with concrete / bond failure for metric threaded rod in uncracked concrete [1,2,3,4,5,6,7,8,9,10]

Nominal anchor diameter mm	Effective embedment mm	Tension — ϕN_n				Shear — ϕV_n			
		f'_c = 25 MPa kN	f'_c = 30 MPa kN	f'_c = 40 MPa kN	f'_c = 50 MPa kN	f'_c = 25 MPa kN	f'_c = 30 MPa kN	f'_c = 40 MPa kN	f'_c = 50 MPa kN
8	60	9.0	9.1	9.4	9.6	9.6	9.8	10.1	10.3
	72	10.7	10.9	11.3	11.5	23.1	23.6	24.3	24.8
	96	14.3	14.6	15.0	15.4	30.9	31.4	32.3	33.1
	160	23.9	24.3	25.0	25.6	51.4	52.4	53.9	55.1
10	60	11.2	11.4	11.7	12.0	12.1	12.3	12.6	12.9
	90	16.8	17.1	17.6	18.0	36.2	36.8	37.9	38.8
	120	22.4	22.8	23.5	24.0	48.2	49.1	50.5	51.7
	200	37.3	38.0	39.1	40.0	80.4	81.8	84.2	86.1
12	70	15.5	15.8	16.2	16.6	33.4	34.0	35.0	In I
	108	23.9	24.3	25.1	25.6	51.5	52.4	54.0	55.2
	144	31.9	32.5	33.4	34.2	68.6	69.9	71.9	73.6
	240	53.1	54.1	55.7	56.9	114.4	116.5	119.9	122.6
16	80	22.5	22.9	23.6	24.1	48.5	49.4	50.8	52.0
	144	40.5	41.3	42.5	43.4	87.3	88.9	91.5	93.6
	192	54.1	55.0	56.7	57.9	116.4	118.6	122.0	124.8
	320	90.1	91.7	94.4	96.6	194.0	197.6	203.4	208.0
20	90	27.7	30.4	32.0	32.7	59.8	65.5	68.9	70.5
	180	61.1	62.2	64.0	65.4	131.5	133.9	137.8	140.9
	240	81.4	82.9	85.3	87.2	175.3	178.6	183.8	187.9
	400	135.7	138.2	142.2	145.4	292.2	297.6	306.3	313.2
24	96	30.6	33.5	38.7	40.8	65.8	72.1	83.3	87.9
	216	85.7	87.3	89.8	91.9	184.6	188.0	193.5	197.9
	288	114.3	116.4	119.8	122.5	246.2	250.7	258.0	263.8
	480	190.5	194.0	199.6	204.2	410.3	417.8	430.0	439.7
27	108	36.5	40.0	46.1	49.7	78.6	86.1	99.4	107.0
	243	104.3	106.2	109.3	111.8	224.7	228.8	235.5	240.8
	324	139.1	141.6	145.8	149.1	299.6	305.1	314.0	321.1
	540	231.8	236.1	243.0	248.4	499.3	508.5	523.3	535.1
30	120	42.7	46.8	54.0	58.9	92.0	100.8	116.4	126.8
	270	123.6	125.9	129.6	132.5	266.3	271.2	279.1	285.4
	360	164.8	167.9	172.8	176.7	355.0	361.6	372.1	380.5
	600	274.7	279.8	288.0	294.5	591.7	602.6	620.2	634.2

1 See Section 3.1.8 for explanation on development of load values.
2 See Section 3.1.8.6 to convert design strength value to ASD value.
3 Linear interpolation between embedment depths and concrete compressive strengths is not permitted.
4 Tabular values represent a single anchor without reductions for edge distance, anchor spacing, or concrete thickness. Shaded cells indicate that bond strength is the controlling failure mode. Compare to the steel values in Table 8. The lesser of the values is to be used for the design.
5 Values are for the following temperature range: maximum short term temperature = 55°C, maximum long term temperature = 43°C. Short term elevated concrete temperatures are those that occur over brief intervals, e.g., as a result of diurnal cycling. Long term concrete temperatures are roughly constant over significant periods of time.
6 Tabular values are for dry concrete conditions. For water saturated concrete, water-filled drilled holes, or submurged (underwater) applications multiply design strength by 0.61.
7 Tabular values are for short term loads only. For sustained loads including overhead use, see Section 3.1.8.8.
8 Tabular values are for normal-weight concrete only. For lightweight concrete multiply design strength by λ_a as follows: For sand-lightweight, λ_a = 0.51. For all-lightweight, λ_a = 0.45.
9 Tabular values are for holes drilled in concrete with carbide tipped hammer drill bit. Diamond core drilling is not permitted.
10 Tabular values are for static loads only. Seismic design is not permitted for uncracked concrete.

HIT-RE 100 Adhesive Anchoring System

Table 7 — Hilti HIT- RE 100 adhesive design strength with concrete / bond failure for metric threaded rod in cracked concrete [1,2,3,4,5,6,7,8,9,10]

Nominal anchor diameter mm	Effective embedment mm	Tension — ϕN_n				Shear — ϕV_n			
		f'_c = 25 MPa kN	f'_c = 30 MPa kN	f'_c = 40 MPa kN	f'_c = 50 MPa kN	f'_c = 25 MPa kN	f'_c = 30 MPa kN	f'_c = 40 MPa kN	f'_c = 50 MPa kN
10	60	5.9	6.0	6.1	6.3	6.3	6.4	6.6	6.8
	90	8.8	8.9	9.2	9.4	18.9	19.3	19.8	20.3
	120	11.7	11.9	12.3	12.5	25.2	25.7	26.4	27.0
	200	19.5	19.9	20.4	20.9	42.0	42.8	44.0	45.0
12	70	7.3	7.4	7.7	7.8	15.7	16.0	16.5	16.9
	108	11.3	11.5	11.8	12.1	24.3	24.7	25.4	26.0
	144	15.0	15.3	15.7	16.1	32.3	32.9	33.9	34.7
	240	25.0	25.5	26.2	26.8	53.9	54.9	56.5	57.8
16	80	11.1	11.3	11.7	11.9	24.0	24.4	25.1	25.7
	144	20.0	20.4	21.0	21.5	43.1	43.9	45.2	46.2
	192	26.7	27.2	28.0	28.6	57.5	58.6	60.3	61.6
	320	44.5	45.3	46.6	47.7	95.8	97.6	100.5	102.7
20	90	14.9	15.2	15.6	15.9	32.1	32.6	33.6	34.4
	180	29.8	30.3	31.2	31.9	64.1	65.3	67.2	68.7
	240	39.7	40.4	41.6	42.5	85.5	87.0	89.6	91.6
	400	66.1	67.4	69.3	70.9	142.5	145.1	149.3	152.7
24	96	17.6	17.9	18.4	18.8	37.9	38.6	39.7	40.6
	216	39.6	40.3	41.5	42.4	85.2	86.8	89.3	91.3
	288	52.7	53.7	55.3	56.5	113.6	115.7	119.1	121.8
	480	87.9	89.5	92.1	94.2	189.4	192.8	198.5	202.9
27	108	20.4	20.8	21.4	21.9	43.9	44.7	46.1	47.1
	243	45.9	46.7	48.1	49.2	98.9	100.7	103.6	106.0
	324	61.2	62.3	64.1	65.6	131.8	134.2	138.2	141.3
	540	102.0	103.9	106.9	109.3	219.7	223.7	230.3	235.4
30	120	21.4	21.8	22.4	22.9	46.0	46.9	48.2	49.3
	270	48.1	49.0	50.4	51.5	103.6	105.5	108.5	111.0
	360	64.1	65.3	67.2	68.7	138.1	140.6	144.7	148.0
	600	106.8	108.8	112.0	114.5	230.1	234.4	241.2	246.6

1 See Section 3.1.8 for explanation on development of load values.
2 See Section 3.1.8.6 to convert design strength value to ASD value.
3 Linear interpolation between embedment depths and concrete compressive strengths is not permitted.
4 Tabular values represent a single anchor without reductions for edge distance, anchor spacing, or concrete thickness. Shaded cells indicate that bond strength is the controlling failure mode. Compare to the steel values in Table 8. The lesser of the values is to be used for the design.
5 Values are for the following temperature range: maximum short term temperature = 55°C, maximum long term temperature = 43°C. Short term elevated concrete temperatures are those that occur over brief intervals, e.g., as a result of diurnal cycling. Long term concrete temperatures are roughly constant over significant periods of time.
6 Tabular values are for dry concrete conditions. For water saturated concrete, water-filled drilled holes, or submurged (underwater) applications multiply design strength by 0.61.
7 Tabular values are for short term loads only. For sustained loads including overhead use, see Section 3.1.8.8.
8 Tabular values are for normal-weight concrete only. For lightweight concrete multiply design strength by λ_a as follows: For sand-lightweight, λ_a = 0.51. For all-lightweight, λ_a = 0.45.
9 Tabular values are for holes drilled in concrete with carbide tipped hammer drill bit. Diamond core drilling is not permitted.
10 Tabular values are for static loads only. For seismic loads, multiply cracked concrete tabular values in tension and shear by α_{seis} = 0.675. See section 3.1.8.7 for additional information on seismic applications

Table 8 — Steel design strength for Hilti HIT-V threaded rods [1]

Nominal anchor diameter mm	HIT-V ISO 898-1 Class 5.8[5]			HIT-V ISO 898-1 Class 8.8[5]			HIT-V-R ISO 3506-1 Class A4 stainless[5]			HIT-V-HCR High corrosion resistant steel[5]		
	Tensile[2] ϕN_{sa} kN	Shear[3] ϕV_{sa} kN	Seismic Shear[4] $\phi V_{sa,eq}$ kN	Tensile[2] ϕN_{sa} kN	Shear[3] ϕV_{sa} kN	Seismic Shear[4] $\phi V_{sa,eq}$ kN	Tensile[2] ϕN_{sa} kN	Shear[3] ϕV_{sa} kN	Seismic Shear[4] $\phi V_{sa,eq}$ kN	Tensile[2] ϕN_{sa} kN	Shear[3] ϕV_{sa} kN	Seismic Shear[4] $\phi V_{sa,eq}$ kN
8	11.9	6.6	–	19.0	10.6	–	16.6	9.2	–	19.0	8.8	–
10	18.9	8.7	6.1	30.2	13.8	9.7	26.4	12.2	8.5	30.2	13.9	9.7
12	27.3	15.3	10.7	43.9	24.3	17.0	38.4	21.2	14.9	43.8	24.3	17.0
16	51.0	28.2	19.7	81.6	45.3	31.7	71.4	39.5	27.7	81.6	45.2	31.7
20	79.6	44.1	30.9	127.4	70.5	49.4	111.5	61.7	43.2	127.4	70.6	49.4
25	114.7	63.6	44.5	183.6	101.7	71.2	160.6	89.0	62.3	160.6	89.0	62.3
28	149.2	82.5	57.8	238.6	132.3	92.6	119.0	65.9	46.2	208.8	115.7	81.0
30	182.3	101.1	70.8	291.9	161.7	113.2	145.5	80.6	56.4	255.3	141.4	99.0
32	182.3	101.1	70.8	291.9	161.7	113.2	145.5	80.6	56.4	255.3	141.4	99.0

1 See Section 3.1.8.6 to convert design strength value to ASD value.
2 Tensile = $\phi\ A_{se,N}\ f_{uta}$ as noted in ACI 318-14 Chapter 17
3 Shear = $\phi\ 0.60\ A_{se,V}\ f_{uta}$ as noted in ACI 318-14 Chapter 17.
4 Seismic Shear = $\alpha_{V,seis}\ \phi V_{sa}$: Reduction for seismic shear only. See ACI 318-14 Chapter 17 for additional information on seismic applications
5 HIT-V threaded rods are considered brittle steel elements.

HIT-RE 100 Adhesive Anchoring System

2.5 Installation instructions

Installation Instructions For Use (IFU) are included with each product package. They can also be viewed or downloaded on-line at **www.us.hilti.com (US)**. 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.

2.6 Working time and cure time (approx.)

[°C]	[°F]	t_{work}	$t_{cure, ini}$	$t_{cure, full}$
5	41	2 1/2 h	≥ 18 h	≥ 72 h
10	50	2 h	≥ 12 h	≥ 48 h
15	59	1 1/2 h	≥ 8 h	≥ 24 h
20	68	30 min	≥ 6 h	≥ 12 h
30	86	20 min	≥ 4 h	≥ 8 h
40	104	12 min	≥ 2 h	≥ 4 h

2.7 Materials specifications

Table 9 — Material properties of fully cured HIT-RE 100 adhesive

Bond Strength ASTM C882-12[1] 2 day cure 14 day cure	 20.1 Mpa 21.0 Mpa
Compressive Strength ASTM D695-10[1]	74.3 Mpa
Compressive Modulus ASTM D695-10[1]	3,731 Mpa
Tensile Strength 7 day ASTM D638-10	11.7 Mpa
Elongation at break ASTM D638-10	0.10%
Heat Deflection Temperature ASTM D648-07	56.8°C
Absorption ASTM D570-10	0.06%
Linear Coefficient of Shrinkage on Cure ASTM D2566-86	0.0001

1 Minimum values obtained as the result of tests at 2°C, 10°C, 24°C, and 43°C.

2.8 Resistance of cured Hilti HIT-RE 100 to chemicals

Table 10 — Resistance of HIT-RE 100 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	+	
Alkaline	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	Chemicals Concrete plasticizer	+	
	used on job Diesel oil	+	
	sites Oil	+	
	Petrol	+	
	Oil for form work (forming oil)	+	
Environmental chemicals	Environmental Salt water	+	
	chemicals de-mineralized water	+	
	salt spraying test	+	
	SO2	+	
	Environment/weather	+	

1 Concrete was dissolved by acid

Samples of the HIT-RE 100 resin were immersed in the various chemical compounds for up to one year. At the time 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.

3.0 Ordering information

HIT-RE 100 adhesive

Description	Package content	Qty	Item number
HIT-RE 100/500/1	Includes (1) foil pack with (1) mixer	1	**2123386**

Accessories

Description	Item number
Cordless dispenser HDE 500-A22 with (1) black cassette 500 ml, (1) red cassette 500 ml and (1) case	**2005637**
Cordless dispenser HDE 500-A22	**2005630**
Manual dispenser HDM 500 box	**2005641**