Hilti HIT-HY 200Rv3 Injectable Mortar

(Post Installed Rebar) Submission Folder

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Hilti (HK) | askHilti 工程師技術支援平台 ask.hilti.com.hk | 香港客戶熱線 +852 8228 8118 澳門客戶熱線(免費) 00800 8228 8118 | 香港門市：大角咀洋松街1號形品星寓地下2號舖 澳門門市：澳門布魯塞爾街70號建興龍廣場地下W座地舖 | 電郵：hksales@hilti.com 傳真：+852 2954 1751

Injectable mortar HIT-HY 200-R V3





BASE MATERIALS

- Concrete (cracked)
- Concrete (uncracked)



APPLICATIONS

- Anchoring secondary steel structures (e.g. racking, guard rails, sound barriers)
- Anchoring structural steel connections (e.g. steel columns, beams)
- Seismic strengthening / retrofitting and bracing of reinforced concrete buildings
- Substitution of misplaced / missing rebars
- Anchoring safety barriers, balustrades, fire staircases
- Structural splices / straight connections with post-installed rebars

ADVANTAGES

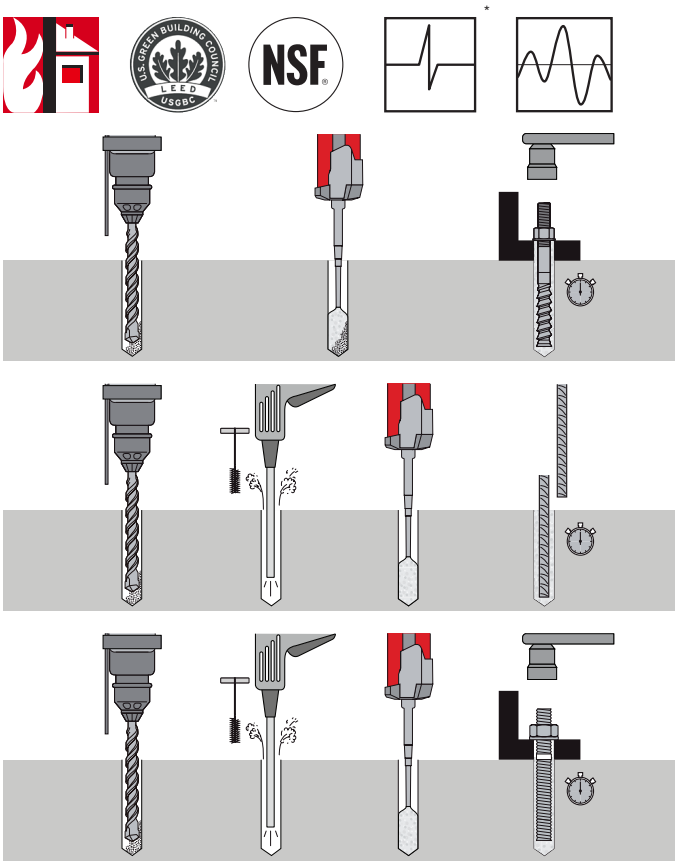
- No hole cleaning required with the revolutionary new Hilti HIT-Z anchor rod
- Automatic hole cleaning with TE-CD and TE-YD drill bits in combination with Hilti vacuum cleaners
- Fulfills the requirements of the most demanding ICC-ES and ETA C2 approvals for seismic applications
- Post-installed rebars perform like cast-in connections

Technical data	
Material composition	Hybrid urethane methacrylate adhesive
Base material condition	Dry, wet
Tested/approved for diamond drilling	Yes (for HIT-Z), No (for HIT-V & Rebar)
Seismic	Yes
Compatible cartridge holder	CR (Red)
Additional product information	Always wear eye protection and gloves while handling

Curing time

Temperature in the base material T [°C]	Maximum working time twork [min]	Minimum curing time tcure [h]
5	60	4
6 to 10	40	2.5
11 to 20	15	1.5
21 to 30	9	1
31 to 40	6	1

[1] The curing time data are vaild for dry base material only. In wet base material the curing times must be doubled.

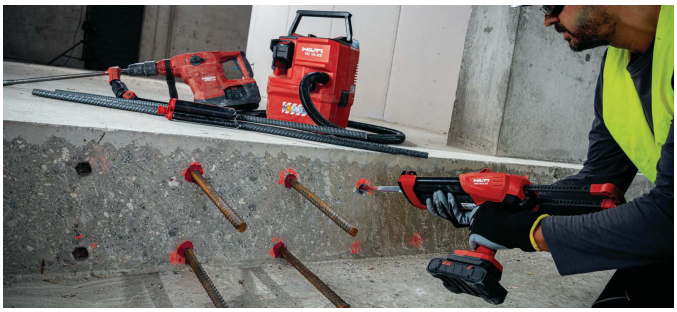


These are abbreviated instructions which may vary according to the application.

Ordering designation	Package contents	Sales pack quantity	Item number
HIT-HY 200-R V3 500/2/EE	1x Foil pack, 2x Mixer, 1x Mixer extension	1 pc	**2262131**

Please visit Hilti website for the latest item numbers and related products

Dispenser HDE 500-22





APPLICATIONS

- Injecting Hilti HIT epoxy or adhesive mortar for fastening anchor rods and rebar in concrete and masonry
- Dispensing Hilti firestop foams (only when packaged in compatible soft foil packs)

ADVANTAGES

- Faster anchoring
- Significantly reduce mortar wastage
- Improve fastener safety and reliability
- Repeat and resume functions
- On the Nuron battery platform

Technical data	
Power source type	Compact B22-55 or B22-85 battery pack
Dispenser type	Battery
Performance (at 20˚C)	55 sec (RE100 500 ml)
B22-55 Battery capacity	100 cartridges (500 ml)
Dimension (L x W x H)	440mm x 120mm x 230 mm
Modes available	Off / continuous / smart discard / measured volume dispensing with ml
Dispensing volume per trigger	1 ml

Order Now

Ordering designation	Content per can/cartridge	Sales pack quantity	Item number
HDE 500-22 + CB (Ultimate) 110V	1x Cordl. dispenser HDE 500-22, 1x Cartridge holder HIT-CB, 1x Battery pack B 22-55, 1x Battery charger C 4-22 110V	1 pc	**3880132**
HDE 500-22 + CR (Ultimate) 110V	1x Cordl. dispenser HDE 500-22, 1x Cartridge holder HIT-CR, 1x Battery pack B 22-55, 1x Battery charger C 4-22 110V	1 pc	**3880183**
HDE 500-22 + CB (Ultimate) 230V	1x Cordl. dispenser HDE 500-22, 1x Cartridge holder HIT-CB, 1x Battery pack B 22-55, 1x Battery charger C 4-22 230V	1 pc	**3880184**
HDE 500-22 + CR (Ultimate) 230V	1x Cordl. dispenser HDE 500-22, 1x Cartridge holder HIT-CR, 1x Battery pack B 22-55, 1x Battery charger C 4-22 230V	1 pc	**3880186**
Battery pack B 22-85 Li-ion	-	1 pc	**2251351**
Battery charger C 4-22 110V	-	1 pc	**2372874**
Battery charger C 4-22 230V	-	1 pc	**2372873**

Please visit Hilti website for the latest item numbers and related products

Mixers for Hilti injectable (RE&HY)



Technical data	
Dispenser, setting tool, accessory, tester type	Mixing nozzles and injection accessories

Order Now

Ordering designation	Sales pack quantity	Item number
Mixers HIT-RE-M (for RE&HY)	1 pc	**337111**

Please visit Hilti website for the latest item numbers and related products

Safety glasses



Technical data	
Lens	PC material
Thickness	2.1 mm
Coating	Optidur NCH coating
Filter	2C-1.2
Impact energy	45 m/s

Order Now

Ordering designation	Sales pack quantity	Item number
Safety glasses PP EY-CA NCH clear	1 pc	**2065449**

Please visit Hilti website for the latest item numbers and related products

Accessories for blowing out



APPLICATIONS

- For fast and efficient removal of dust and debris from drilled holes of varying diameters and depths to allow correct installation of anchors and rebar

Technical data	
Dispenser, setting tool, accessory, tester type	Cleaning accessories

Order Now

Ordering designation	Sales pack quantity	Item number
Blow-out pump	1 pc	**60579**
Extension tube HIT-VL 16/0.7	10 pc	**336646**[1)]

Please visit Hilti website for the latest item numbers and related products

Accessories for blowing out (Air nozzle)



APPLICATIONS

- Clearing dust and debris from drilled holes under various conditions including where adhesive anchors are set at great depth

Technical data	
Dispenser, setting tool, accessory, tester type	Cleaning accessories

ADVANTAGES

- Fast, effective cleaning of drilled holes

Order Now

Ordering designation	Drill hole diameter	Sales pack quantity	Item number
Air nozzle HIT-DL 20	20 mm	1 pc	**371719**[1]
Air nozzle HIT-DL 25	25 mm	1 pc	**371720**[1]
Air nozzle HIT-DL 32	32 mm	1 pc	**371721**[1]

[1] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

Please visit Hilti website for the latest item numbers and related products

Accessories for brushing



HIT-RBH Round steel brush HIT-RB

APPLICATIONS

- For the proper brushing of drilled holes of varying diameters and embedment depths

Technical data	
Dispenser, setting tool, accessory, tester type	Cleaning accessories

Order Now

Ordering designation	Package contents	Sales pack quantity	Item number
Brush extension HIT-RBH	30 cm extension with handle for manual cleaning fitting to all RB diameter.	1 pc	**229138**
Brush extension HIT-RBV	30 cm extention used between RBH (handle) and all RB diameter.	1 pc	**238727**[1]
Brush extension HIT-RBS-10/0.35	35 cm extension for machine cleaning fitting to all RB diameter.	1 pc	**371722**[1]
Holder TE-C	Connection end for C and SDS end. Works with RBS.	1 pc	**263437**[1]
Holder TE-Y	Connection end for Y end. Works with RBS.	1 pc	**263439**[1]
Round steel brush HIT-RB 12	Brush diameter - 12 mm. Use with HIT-RBH/RBV	1 pc	**336548**
Round steel brush HIT-RB 16	Brush diameter - 16 mm. Use with HIT-RBH/RBV	1 pc	**336550**[1]
Round steel brush HIT-RB 20	Brush diameter - 20 mm. Use with HIT-RBH/RBV	1 pc	**336550**
Round steel brush HIT-RB 25	Brush diameter - 25 mm. Use with HIT-RBH/RBV	1 pc	**336553**[1]
Round steel brush HIT-RB 32	Brush diameter - 32 mm. Use with HIT-RBH/RBV	1 pc	**336554**
Round steel brush HIT-RB 40	Brush diameter - 40 mm. Use with HIT-RBH/RBV	1 pc	**382260**[1]
Round steel brush HIT-RB 52	Brush diameter - 52 mm. Use with HIT-RBH/RBV	1 pc	**382265**

[1] This is a non-stock item. For detailed lead time information please contact your Hilti representative. **382265**[1]

Please visit Hilti website for the latest item numbers and related products

Accessories for injection in deep / overhead holes application



APPLICATIONS

- For injection of Hilti HIT adhesive mortars in a variety of situations including deep holes, overhead holes and in underwater applications

ADVANTAGES

- Injection pistons and flexible extension hoses help ensure consistent injection of the adhesive into the hole without formation of air voids

Technical data	
Dispenser, setting tool, accessory, tester type	Cleaning accessories

Order Now

Ordering designation	Drill hole diameter	Sales pack quantity	Item number
Hose HIT-VL 11/1.0 (Plastic tube)	-	10 pc	**2042533**[1]
Coupler VL-K (connect HIT-VL)	-	10 pc	**335021**[1]
Piston plug HIT-SZ 20	20 mm	10 pc	**2039312**
Piston plug HIT-SZ 25	25 mm	10 pc	**2039315**
Piston plug HIT-SZ 30	30 mm	10 pc	**2039317**
Piston plug HIT-SZ 40	40 mm	10 pc	**2039325**[1]
Piston plug HIT-SZ 47	47 mm	10 pc	**2039332**[1]

[1] This is a non-stock item. For detailed lead time information please contact your Hilti representative.

Please visit Hilti website for the latest item numbers and related products

Accessories for overhead applications



Technical data	
Dispenser, setting tool, accessory, tester type	Mixing nozzles and injection accessories

Order Now

Ordering designation	Sales pack quantity	Item number
Drip guard HIT-OHC1 (for fastener Ø10-20 mm)	10 pc	**387551**
Drip guard HIT-OHC2 (for fastener Ø22-32 mm)	10 pc	**387552**
Wedge HIT-OHW	100 pc	**387550**

Please visit Hilti website for the latest item numbers and related products

IMPROVE WORKMANSHIP BY SAFESET SYSTEM

Hilti SafeSet Technology

Now you can design post-installed rebar connections with more confidence. Inadequately cleaning holes during installation can reduce the performance of conventional chemical anchor systems significantly. Hilti SafeSet technology eliminates this factor almost entirely - in both cracked or uncracked concrete.

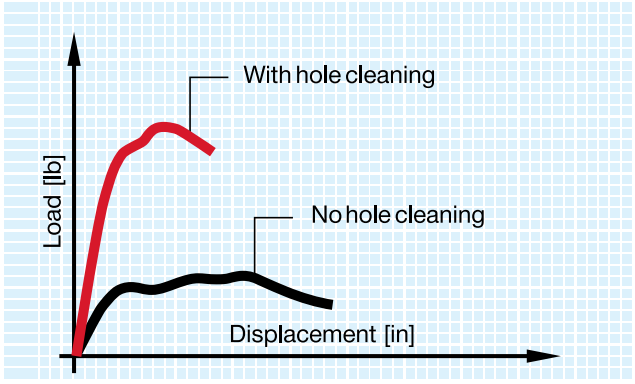
Cleaning while drilling.

Hollow drill bits + HIT-HY 200-R V3 / HIT-RE 100/ HIT-RE 500-V3

Hilti TE-CD and TE-YD hollow drill bits, in conjunction with HIT-HY 200-R V3, HIT-RE 100 or HIT-RE 500-V3,make subsequent hole cleaning completely unnecessary. Dust is removed by the Hilti vacuum system while drilling is in progress for faster drilling and a virtually dustless wo rking environment.

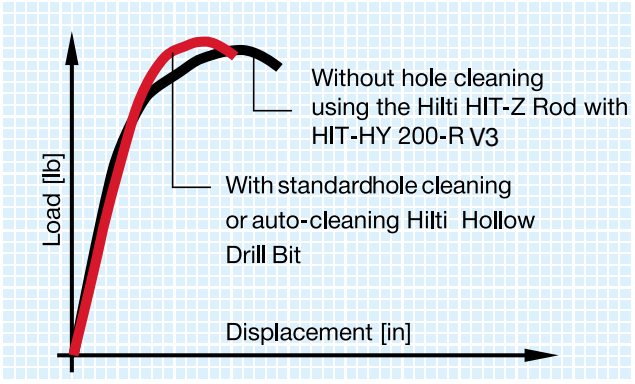


Potential effects of no hole cleaning



The loading performance of a threaded rod or rebar with conventional injection adhesive may be very low if the hole is inadequately cleaned after drilling. The Hilti SafeSet system eliminates a cleaning step while still providing excellent load values.

Hilti adhesive with SafeSet Technology



The new SafeSet system featuring HIT-HY 200-R V3 allows a fastening point to take high loads, as if the hole were cleaned using standard hole cleaning methods.



HIT-HY 200-R V3

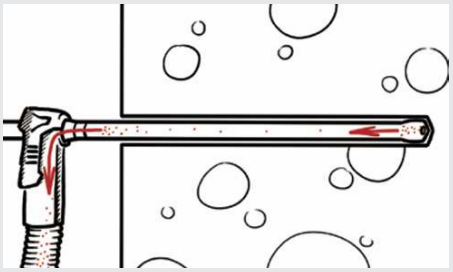


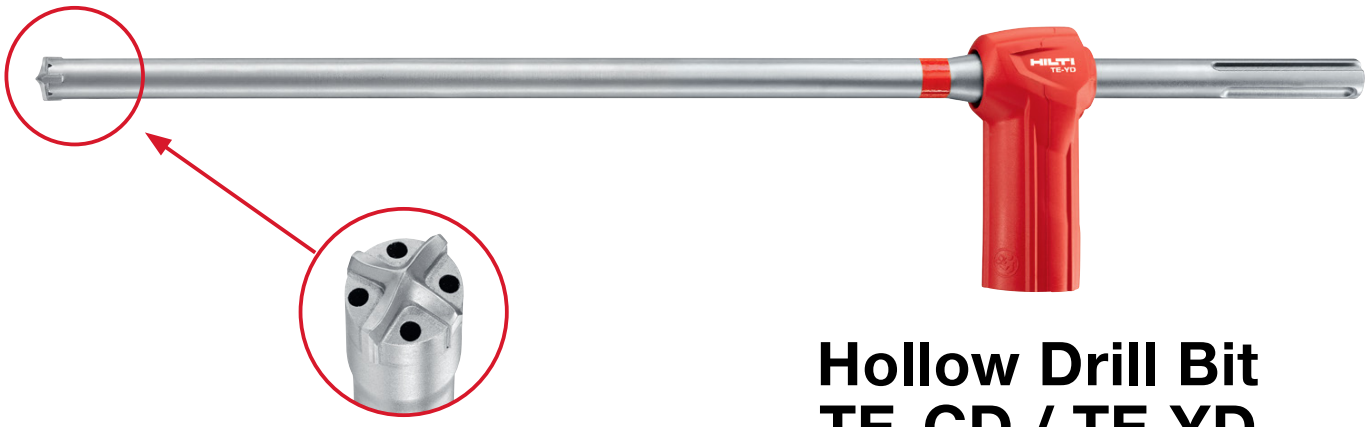
HIT-RE 500 V3

Technical data

Rebar diameter range	Y8 up to Y40
Threaded rod diameters	M10 to M30
Embedment depth	Up to 1000 mm
Concrete compressive strengths	C20/25 to C50/60
Installation temperature range	-10 °C to 40 °C







Hollow Drill Bit TE-CD / TE-YD

HIT-HY 200-R V3 Injection Adhesive with Rebar

Features:	base material: concrete
	Injection system with high loading capacity
	Two-component hybrid mortar
	Suitable for dry and water saturated concrete
	Fast curing system
	SAFEset system with hollow drill bit TE-CD & TE-YD
	Non corrosive to rebar elements
Material:	Hybrid adhesive
Cartridge:	Foil pack: 500ml
	Foil pack: 330ml (special request)
Dispenser:	HDE 500-22 and Cartridge holder, HIT-CR 500



HIT HY 200-R V3 foil pack, mixer



Cartridge holder, HIT-CR 500

Installation Details

	Y10	Y12	Y16	Y20	Y25	Y32	Y40
Rebar diameter (mm) [Ød]	10	12	16	20	25	32	40
Hole diameter (mm) [d0]	12	16	20	25	32	40	55
Min. Embedment Depth (mm) [h1]	Min. embedment depth should be according to EN1992-1-1 (clause 8.6)						
Installation system (Hammer Drilling)							
Hollow Drill bit	TE-CD12	TE-CD16	TE-YD20	TE-YD25	TE-YD30	n/a	n/a
Drill bit	TE-CX12	TE-CX16	TE-CX20	TE-CX25	TE-YX30	TE-YX40	n/a
Drilling system	TE2 / TE7 / TE30 / TE40				TE 50 / TE60 / TE70		

Remarks:

1. Actual embedment depth should be subjected to design stress.
2. All the spacing and edge distance requirement should be reference to European Technical Approval (ETA – 19/0600);
3. **If there is a fire resistance concern, the loading should be referred to the local fire assessment FAHY200RV3 C-2022-S-V3**

Basic Testing & loading data

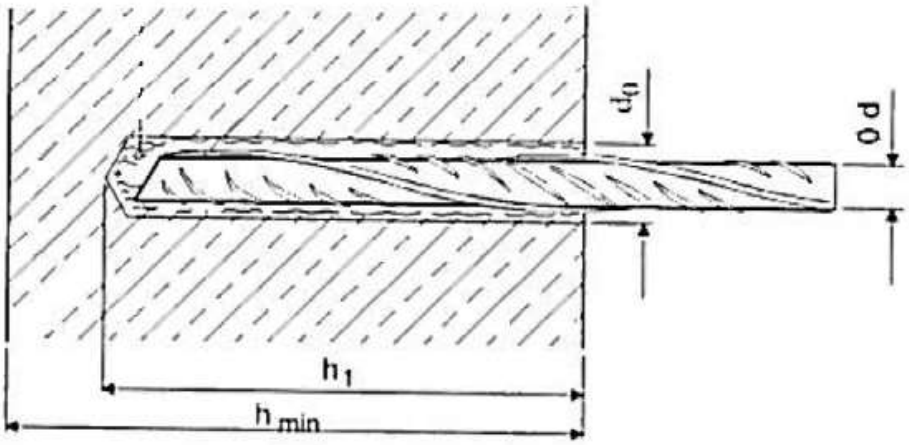
	Y10	Y12	Y16	Y20	Y25	Y32	Y40
Ultimate mean pull-out load as per BS5080 Part 1 (kN) Test Report ***See Remark 1**	***40.7***	***61.5***	***106.4***	***164.4***	***254.8***	***414.0***	***644.0***
Yield load of rebar (kN)	39.3	56.6	100.6	157.1	245.5	402.1	628.3
Max. Testing Load (0.87 x Yield Load)	**34.1**	**49.2**	**87.5**	**136.7**	**213.5**	**349.8**	**546.6**

Remarks:

1. It is based on BS5080 test for non-cracked concrete with strength 30N/mm2;
2. Yield strength of rebar fyk is 500N/mm2;
3. **Design embedment depth and loading should be subjected to design stress or designer's decision.;**
4. **Onsite pullout test can be carried out to verify the workmanship of the installation but should not be served as verification of the ultimate loading. The testing load shall be subjected to the designer's decision and onsite condition. It should not exceed the 0.87 x yield load of rebar to avoid permanent damage to the rebar.**

Setting Details

Temperature in the base material T	Maximum working time t_{work}	Minimum curing time t_{cure}
-10 °C to -5 °C	3 hours	20 hours
> -5 °C to 0 °C	2 hours	8 hours
> 0 °C to 5 °C	1 hour	4 hours
> 5 °C to 10 °C	40 min	2,5 hours
> 10 °C to 20 °C	15 min	1,5 hours
> 20 °C to 30 °C	9 min	1 hours
> 30 °C to 40 °C	6 min	1 hours



Mechanical Properties

Property	Standard	Value
Density Cured Mortar	EN ISO 1183-1	1.83g/cm3
Compressive Strength modulus	EN ISO 604 / HN569	1900 N/mm2
Compressive Strength	EN ISO 604 / HN569	7days - 110 N/mm2

STANGERS

1.0 Introduction

(a) Manufacturer : Hilti (Hong Kong) Ltd.

(b) Anchor Type : HY200R V3 + Y10 Grade 500B

(c) Mass concrete block size : 1920mm x 1920mm x 640mm

(d) Concrete grade : C25/20

(e) Drill hole diameter : 14mm

(f) Drill hole depth : 100mm

(g) Embedment depth : 100mm

(h) Reference standard : BS 5080 Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3

(i) Minimum Distance between the reaction frame and center of the fixing : 200mm

(j) Minimum Distance between the free edge and center of the fixing : 300mm

2.0 Test results

Anchor type	Hilti HY200R V3 + Y10 Grade 500B				
Sample ID	1	2	3	4	5
Failure load (kN)	40.3	40.6	41.2	40.6	40.8
Failure mode	F4	F4	F4	F4	F4
Average failure load (kN)	40.7				
Standard deviation (kN)	0.3				

Failure mode

P = No sign of failure in anchor and/or substrate member
F1 = Breaking of anchor
F2 = Failure of substrate concrete member in a shear cone
F3 = Pull out of anchor
F4 = Sign of separation, plastic deformation or deleterious effect of anchor
F5 = Failure in substrate concrete member with crack radiates outward from anchor
F6 = Other failure mode(s) : -

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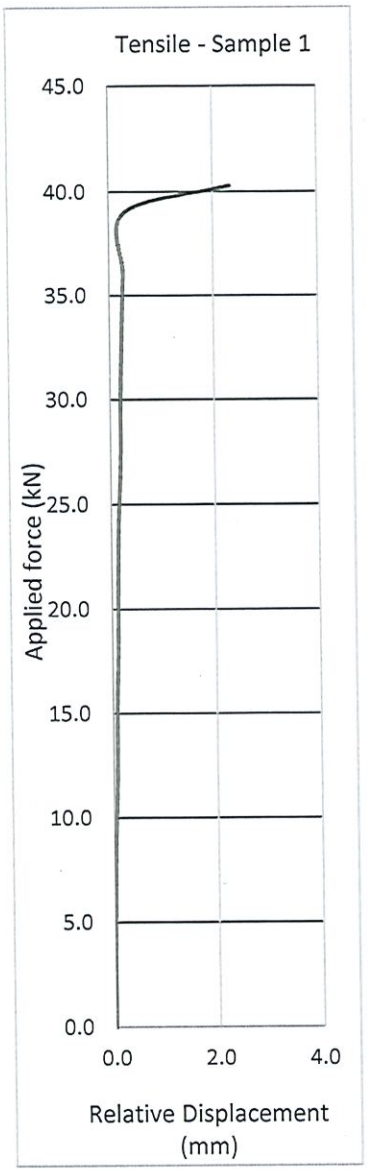
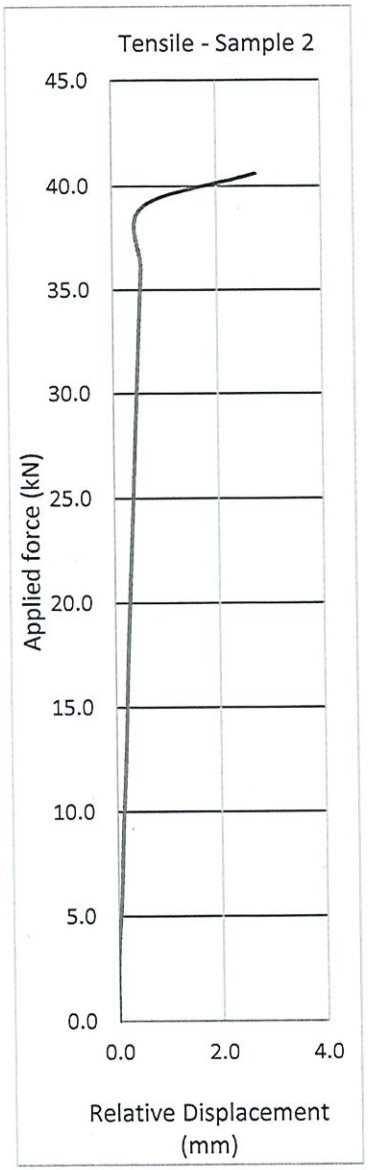
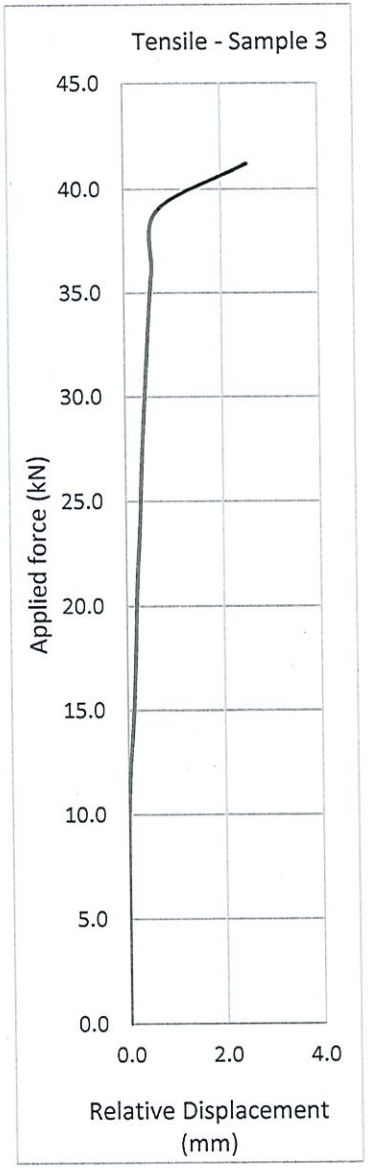
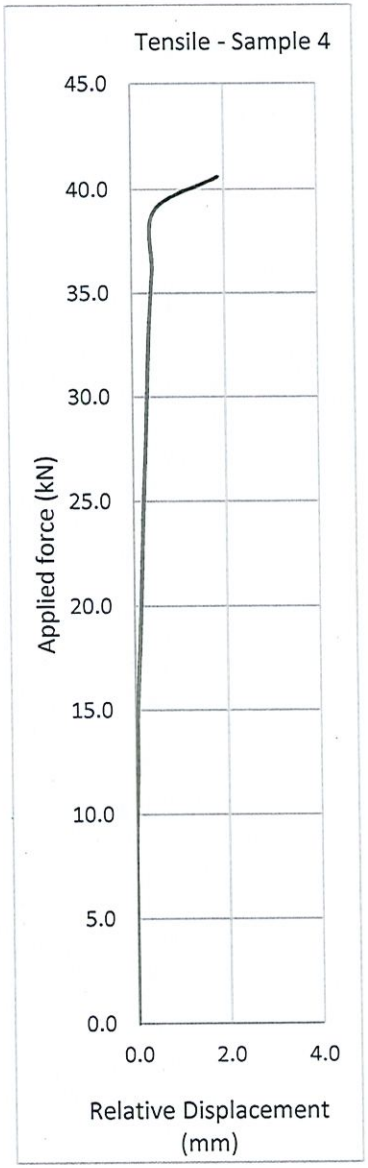
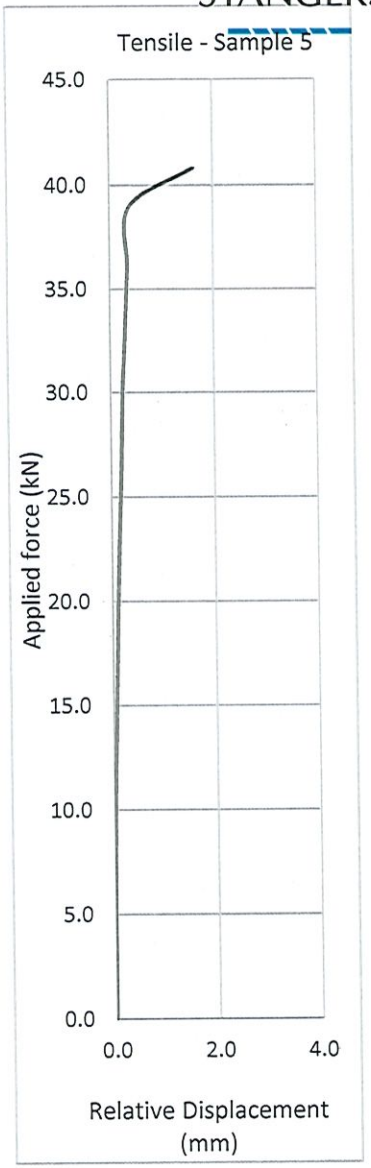
Hilti HY200R V3 + Y10 Grade 500B











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STANGERS

1.0 Introduction

(a) Manufacturer : Hilti (Hong Kong) Ltd.

(b) Anchor Type : HY200R V3 + Y12 Grade 500B

(c) Mass concrete block size : 1920mm x 1920mm x 640mm

(d) Concrete grade : C25/20

(e) Drill hole diameter : 16mm

(f) Drill hole depth : 120mm

(g) Embedment depth : 120mm

(h) Reference standard : BS 5080 Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3

(i) Minimum Distance between the reaction frame and center of the fixing : 240mm

(j) Minimum Distance between the free edge and center of the fixing : 360mm

2.0 Test results

Anchor type	Hilti HY200R V3 + Y12 Grade 500B				
Sample ID	1	2	3	4	5
Failure load (kN)	61.5	61.0	62.0	60.5	62.5
Failure mode	F4	F4	F4	F4	F4
Average failure load (kN)	61.5				
Standard deviation (kN)	0.8				

Failure mode

P = No sign of failure in anchor and/or substrate member
F1 = Breaking of anchor
F2 = Failure of substrate concrete member in a shear cone
F3 = Pull out of anchor
F4 = Sign of separation, plastic deformation or deleterious effect of anchor
F5 = Failure in substrate concrete member with crack radiates outward from anchor
F6 = Other failure mode(s) : -

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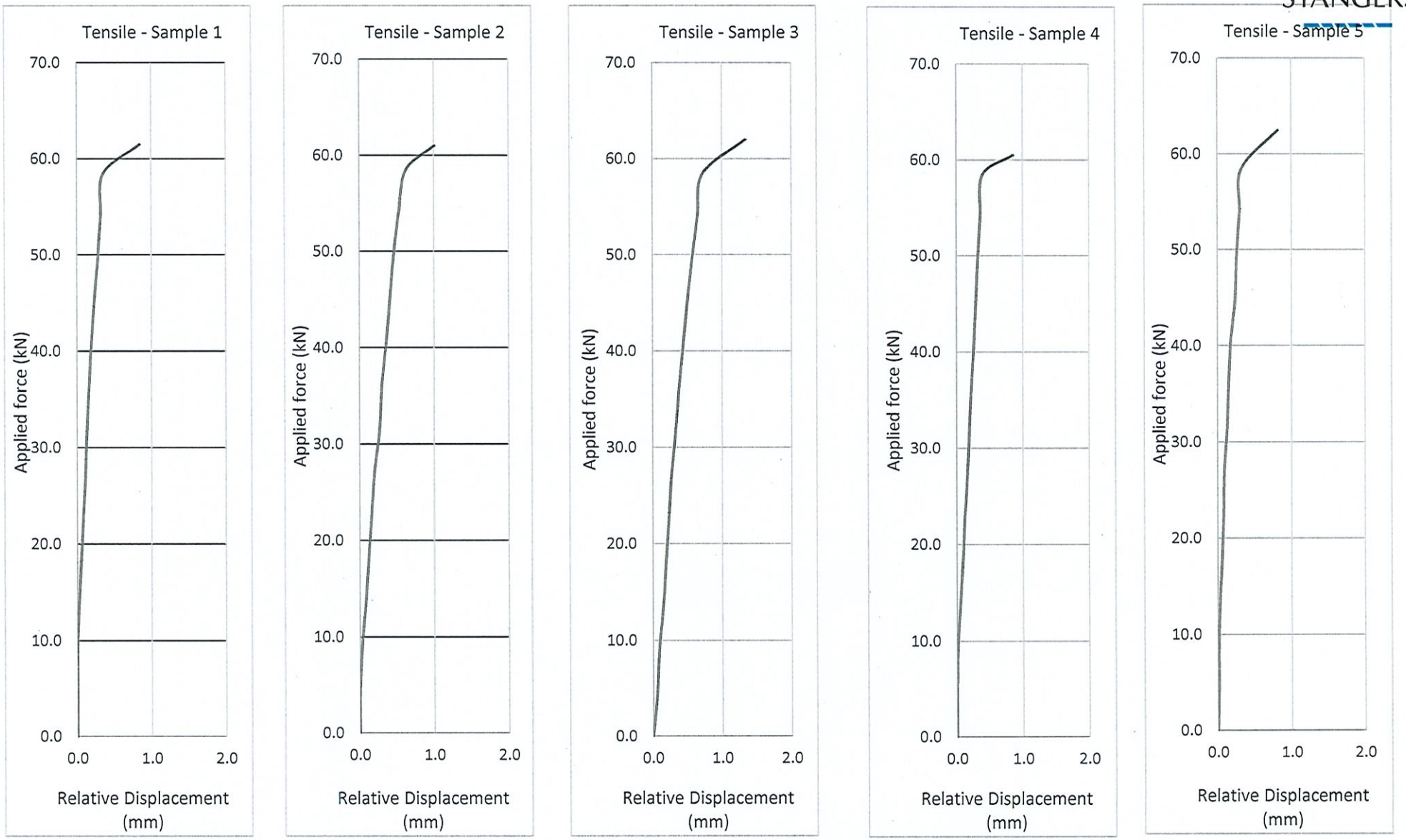

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STANGERS

1.0 Introduction

(a) Manufacturer : Hilti (Hong Kong) Ltd.

(b) Anchor Type : HY200R V3 + Y16 Grade 500B

(c) Mass concrete block size : 1920mm x 1920mm x 640mm

(d) Concrete grade : C25/20

(e) Drill hole diameter : 20mm

(f) Drill hole depth : 160mm

(g) Embedment depth : 160mm

(h) Reference standard : BS 5080 Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3

(i) Minimum Distance between the reaction frame and center of the fixing : 320mm

(j) Minimum Distance between the free edge and center of the fixing : 480mm

2.0 Test results

Anchor type	Hilti HY200R V3 + Y16 Grade 500B				
Sample ID	1	2	3	4	5
Failure load (kN)	105.0	107.0	107.5	106.5	106.0
Failure mode	F4	F4	F4	F4	F4
Average failure load (kN)	106.4				
Standard deviation (kN)	1.0				

Failure mode

P = No sign of failure in anchor and/or substrate member
F1 = Breaking of anchor
F2 = Failure of substrate concrete member in a shear cone
F3 = Pull out of anchor
F4 = Sign of separation, plastic deformation or deleterious effect of anchor
F5 = Failure in substrate concrete member with crack radiates outward from anchor
F6 = Other failure mode(s) : -

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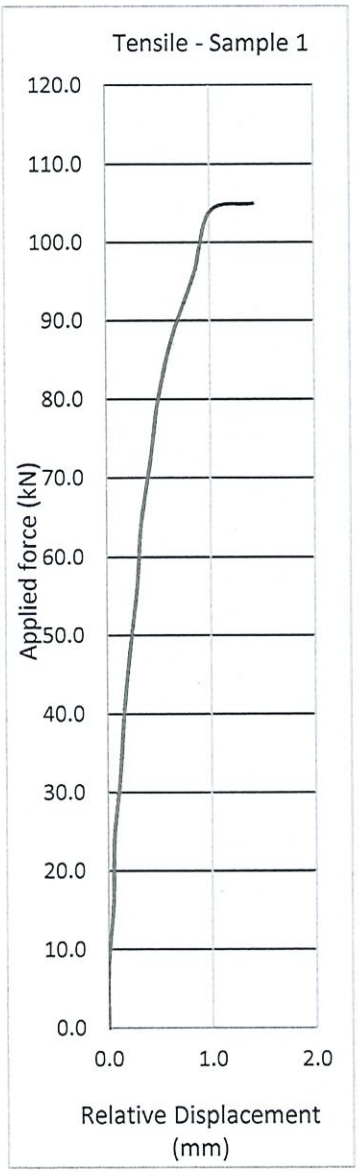
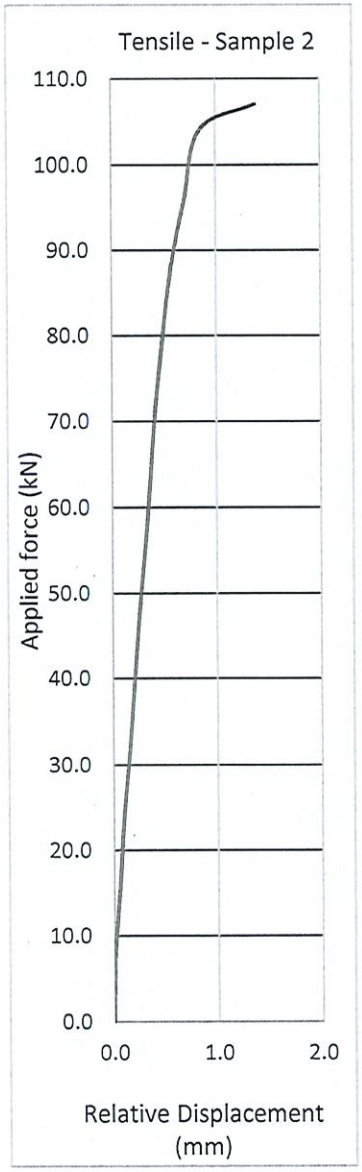
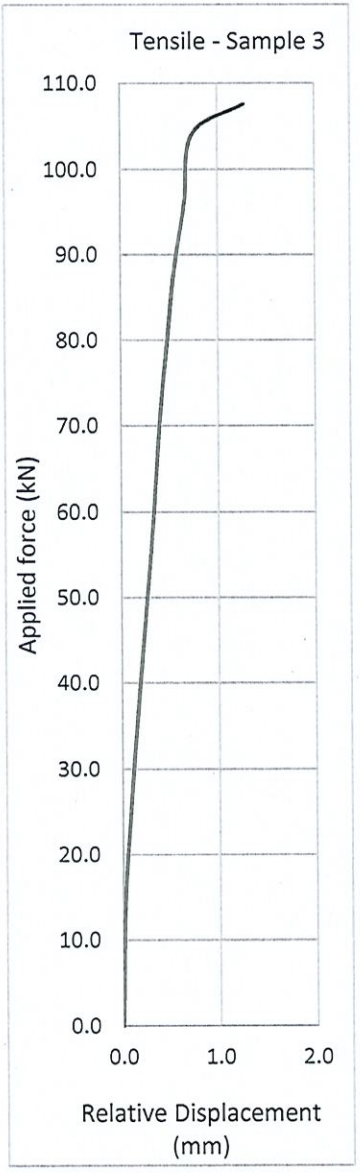
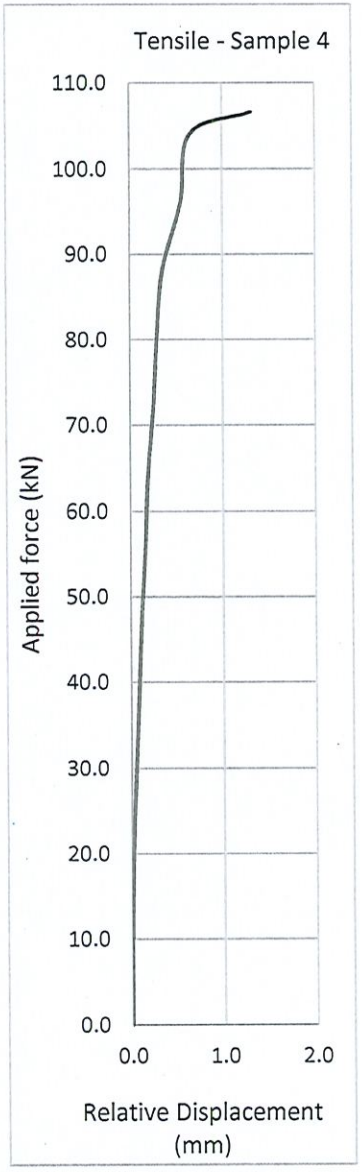
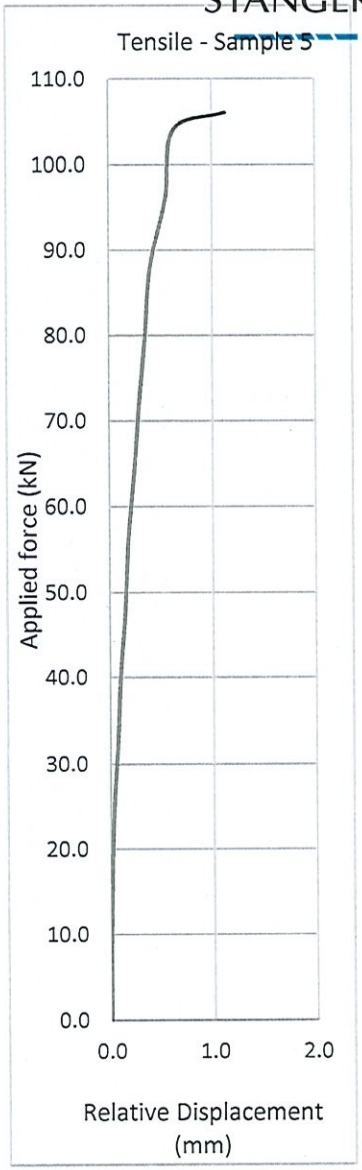
Hilti HY200R V3 + Y16 Grade 500B











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STANGERS

1.0 Introduction

(a) Manufacturer : Hilti (Hong Kong) Ltd.

(b) Anchor Type : HY200R V3 + Y20 Grade 500B

(c) Mass concrete block size : 1920mm x 1920mm x 640mm

(d) Concrete grade : C25/20

(e) Drill hole diameter : 25mm

(f) Drill hole depth : 200mm

(g) Embedment depth : 200mm

(h) Reference standard : BS 5080 Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3

(i) Minimum Distance between the reaction frame and center of the fixing : 400mm

(j) Minimum Distance between the free edge and center of the fixing : 600mm

2.0 Test results

Anchor type	Hilti HY200R V3 + Y20 Grade 500B				
Sample ID	1	2	3	4	5
Failure load (kN)	162.3	164.3	165.2	166.1	164.2
Failure mode	F4	F4	F4	F4	F4
Average failure load (kN)	164.4				
Standard deviation (kN)	1.4				

Failure mode

P = No sign of failure in anchor and/or substrate member
F1 = Breaking of anchor
F2 = Failure of substrate concrete member in a shear cone
F3 = Pull out of anchor
F4 = Sign of separation, plastic deformation or deleterious effect of anchor
F5 = Failure in substrate concrete member with crack radiates outward from anchor
F6 = Other failure mode(s) : -

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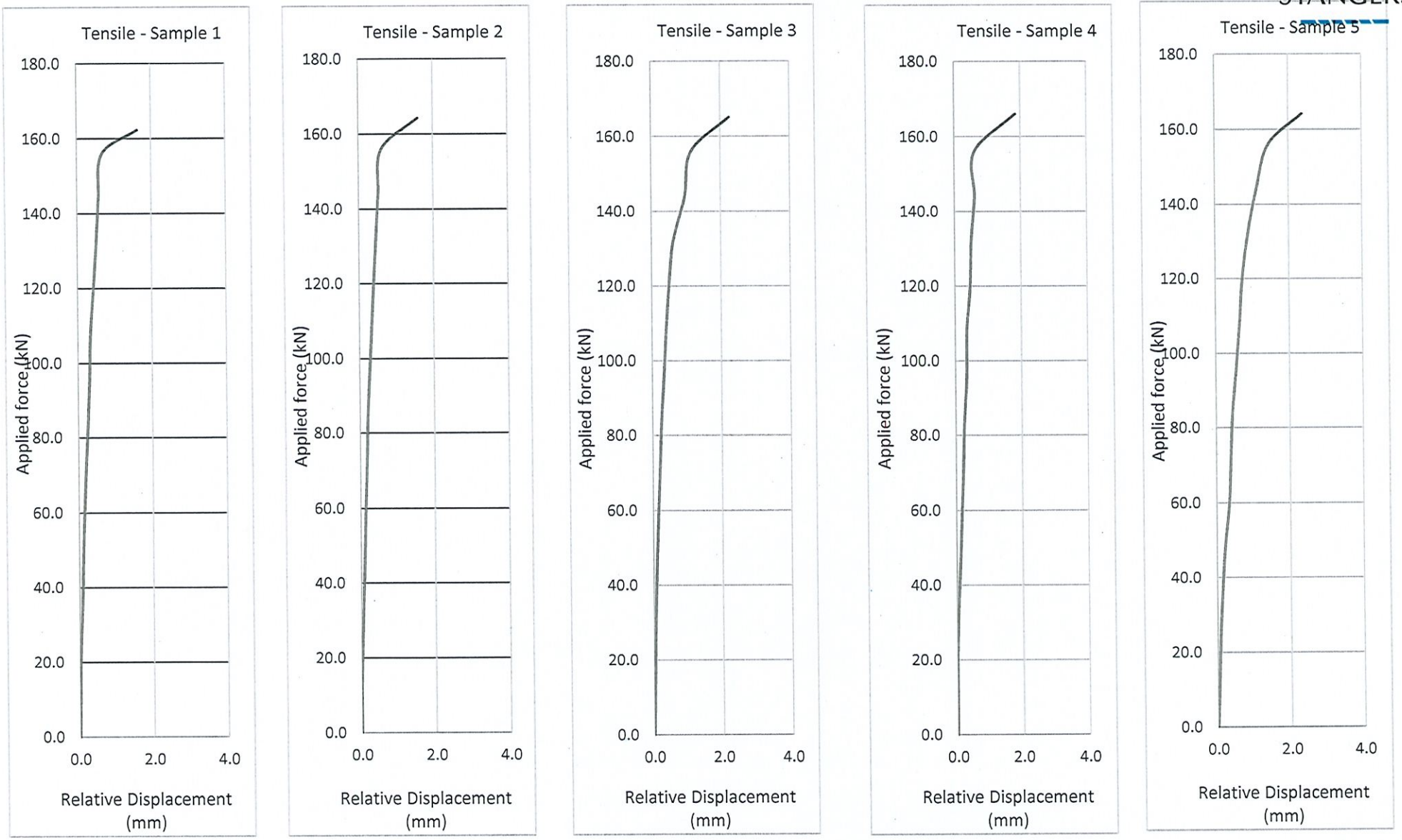
Hilti HY200R V3 + Y20 Grade 500B



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STANGERS

1.0 Introduction

(a) Manufacturer : Hilti (Hong Kong) Ltd.

(b) Anchor Type : HY200R V3 + Y25 Grade 500B

(c) Mass concrete block size : 1500mm x 1500mm x 500mm

(d) Concrete grade : C25/20

(e) Drill hole diameter : 32mm

(f) Drill hole depth : 250mm

(g) Embedment depth : 250mm

(h) Reference standard : BS 5080 Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3

(i) Minimum Distance between the reaction frame and center of the fixing : 500mm

(j) Minimum Distance between the free edge and center of the fixing : 750mm

2.0 Test results

Anchor type	Hilti HY200R V3 + Y25 Grade 500B				
Sample ID	1	2	3	4	5
Failure load (kN)	258.0	256.0	254.0	255.0	251.0
Failure mode	F4	F4	F4	F4	F4
Average failure load (kN)	254.8				
Standard deviation (kN)	2.6				

Failure mode

P = No sign of failure in anchor and/or substrate member
F1 = Breaking of anchor
F2 = Failure of substrate concrete member in a shear cone
F3 = Pull out of anchor
F4 = Sign of separation, plastic deformation or deleterious effect of anchor
F5 = Failure in substrate concrete member with crack radiates outward from anchor
F6 = Other failure mode(s) : -

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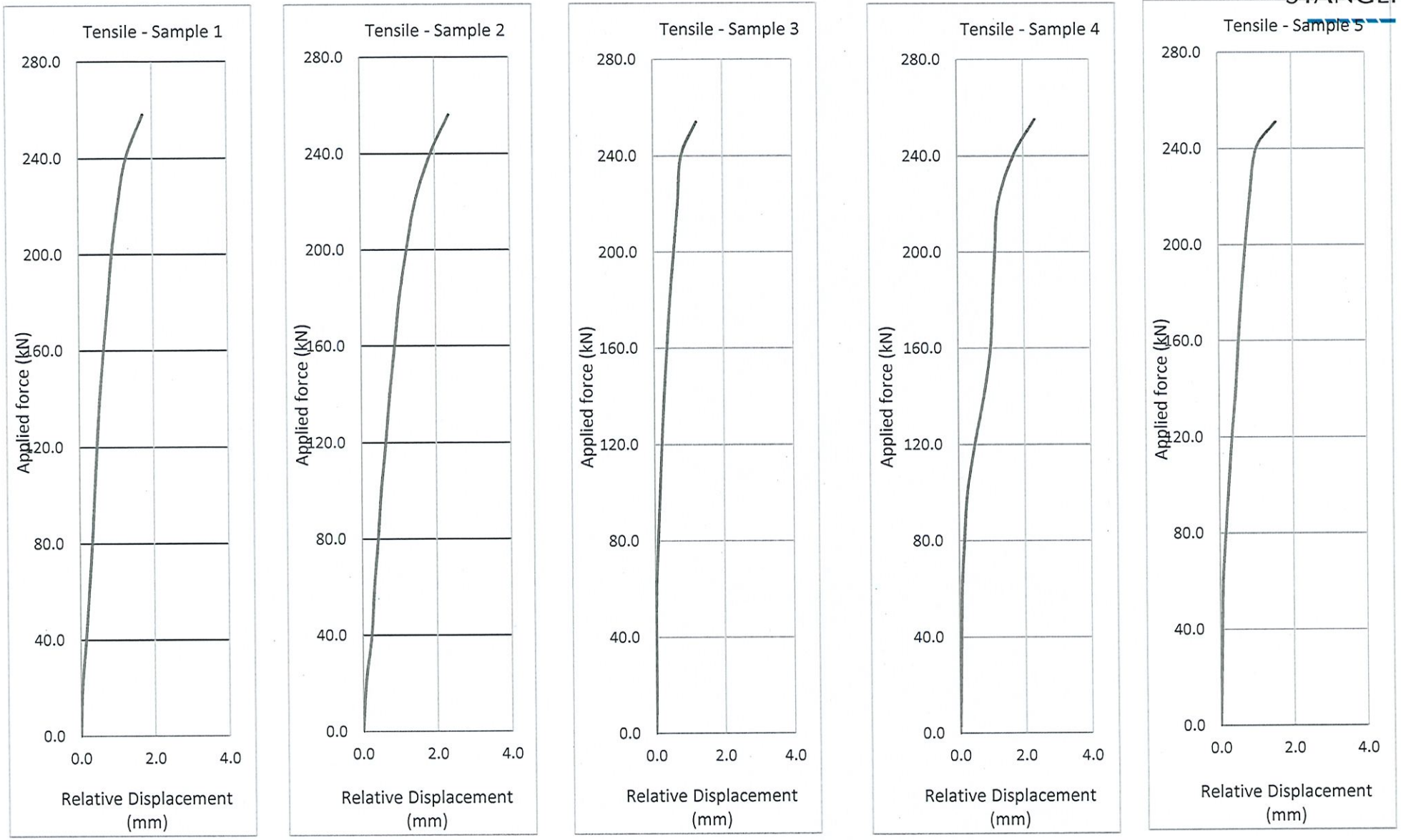
Hilti HY200R V3 + Y25 Grade 500B



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STANGERS

1.0 Introduction

(a) Manufacturer : Hilti (Hong Kong) Ltd.

(b) Anchor Type : HY200R V3 + Y32 Grade 500B

(c) Mass concrete block size : 1920mm x 1920mm x 640mm

(d) Concrete grade : C25/20

(e) Drill hole diameter : 40mm

(f) Drill hole depth : 320mm

(g) Embedment depth : 320mm

(h) Reference standard : BS 5080 Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3

(i) Minimum Distance between the reaction frame and center of the fixing : 640mm

(j) Minimum Distance between the free edge and center of the fixing : 960mm

2.0 Test results

Anchor type	Hilti HY200R V3 + Y32 Grade 500B				
Sample ID	1	2	3	4	5
Failure load (kN)	410.0	414.0	412.0	416.0	418.0
Failure mode	F4	F4	F4	F4	F4
Average failure load (kN)	414.0				
Standard deviation (kN)	3.2				

Failure mode

P = No sign of failure in anchor and/or substrate member
F1 = Breaking of anchor
F2 = Failure of substrate concrete member in a shear cone
F3 = Pull out of anchor
F4 = Sign of separation, plastic deformation or deleterious effect of anchor
F5 = Failure in substrate concrete member with crack radiates outward from anchor
F6 = Other failure mode(s) : -

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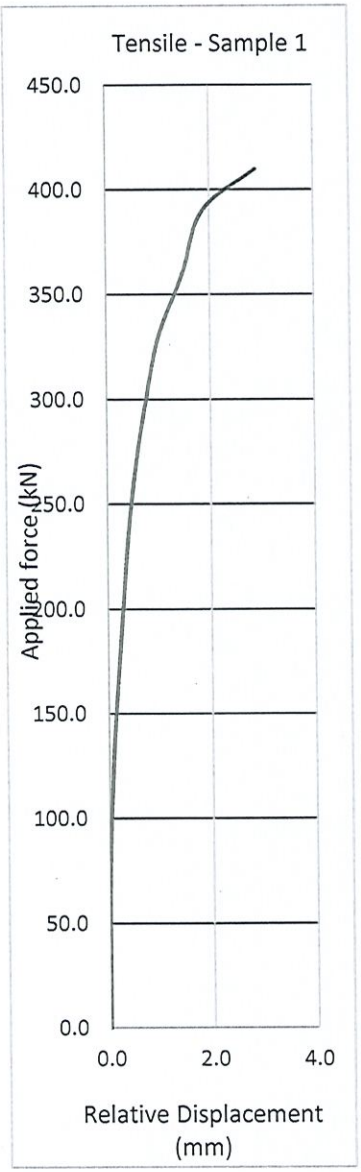
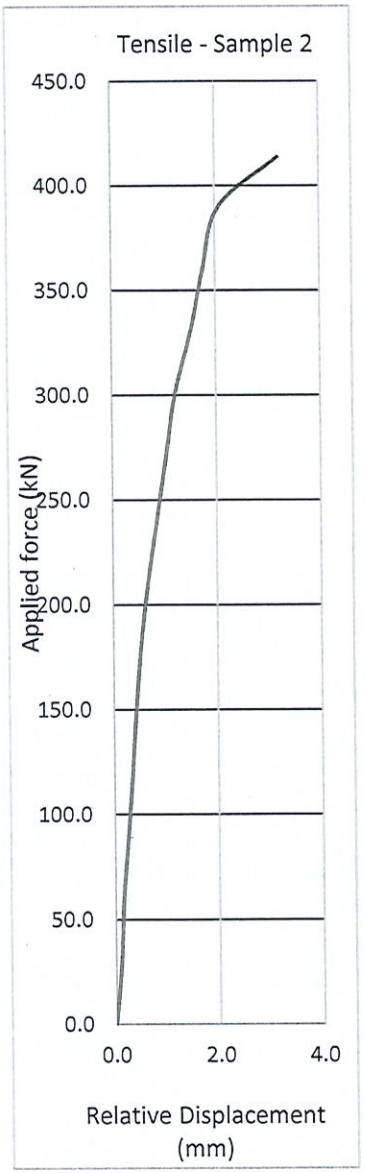
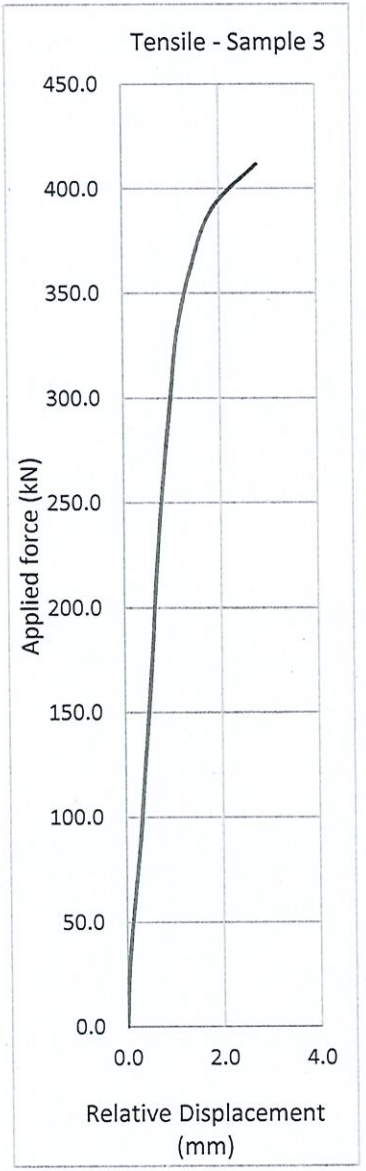
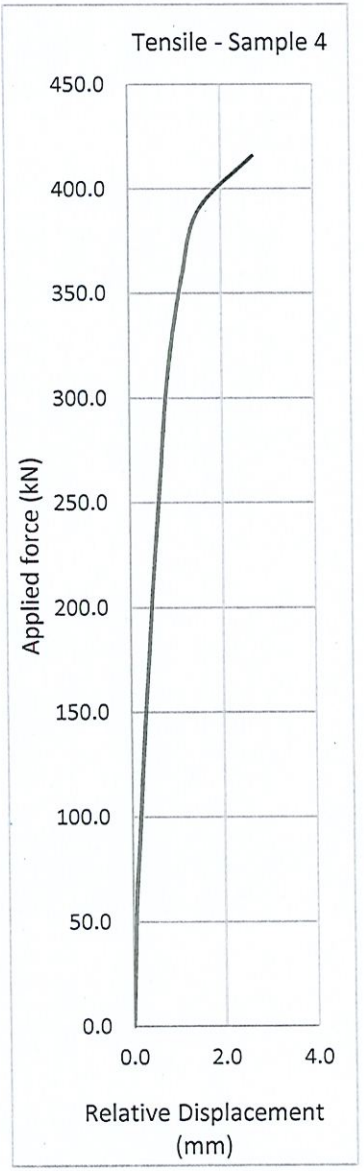
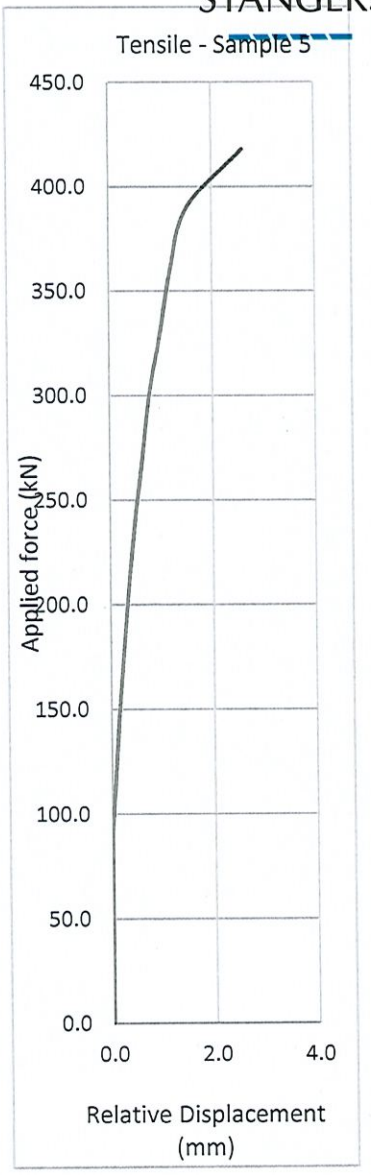
Hilti HY200R V3 + Y32 Grade 500B











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STANGERS

1.0 Introduction

(a) Manufacturer : Hilti (Hong Kong) Ltd.

(b) Anchor Type : HY200R V3 + Y40 Grade 500B

(c) Mass concrete block size : 2400mm x 2400mm x 800mm

(d) Concrete grade : C25/20

(e) Drill hole diameter : 50mm

(f) Drill hole depth : 400mm

(g) Embedment depth : 400mm

(h) Reference standard : BS 5080 Part 1: 1993 Cl. 6, 7.1.1 & 7.1.3

(i) Minimum Distance between the reaction frame and center of the fixing : 800mm

(j) Minimum Distance between the free edge and center of the fixing : 1200mm

2.0 Test results

Anchor type	Hilti HY200R V3 + Y40 Grade 500B				
Sample ID	1	2	3	4	5
Failure load (kN)	646.0	638.0	644.0	647.0	645.0
Failure mode	F4	F4	F4	F4	F4
Average failure load (kN)	644.0				
Standard deviation (kN)	3.5				

Failure mode

P = No sign of failure in anchor and/or substrate concrete member
F1 = Breaking of anchor
F2 = Failure of substrate concrete member in a shear cone
F3 = Pull out of anchor
F4 = Sign of separation, plastic deformation or deleterious effect of anchor
F5 = Failure in substrate concrete member with crack radiates outward from anchor
F6 = Other failure mode(s) : -

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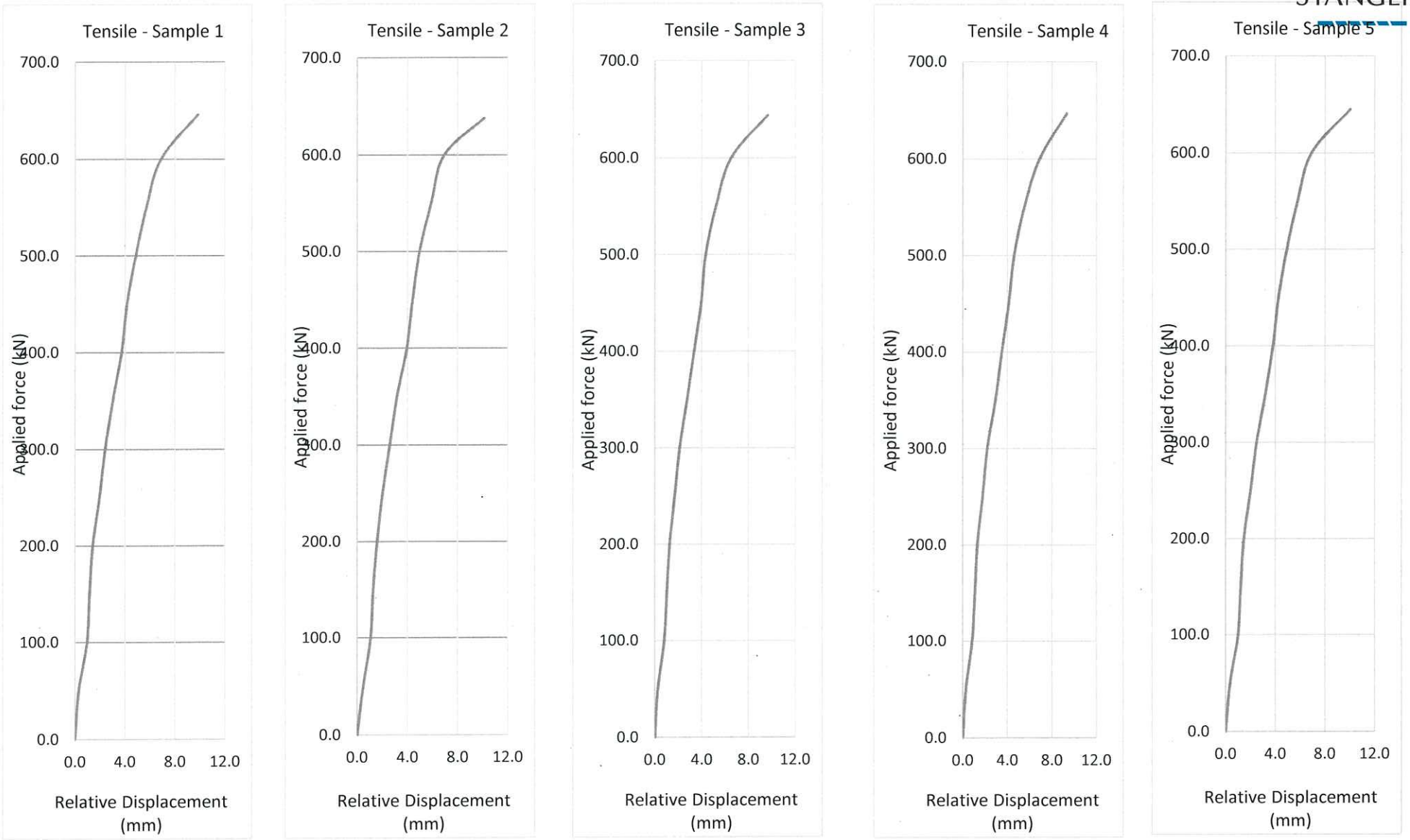
Hilti HY200R V3 + Y40 Grade 500B



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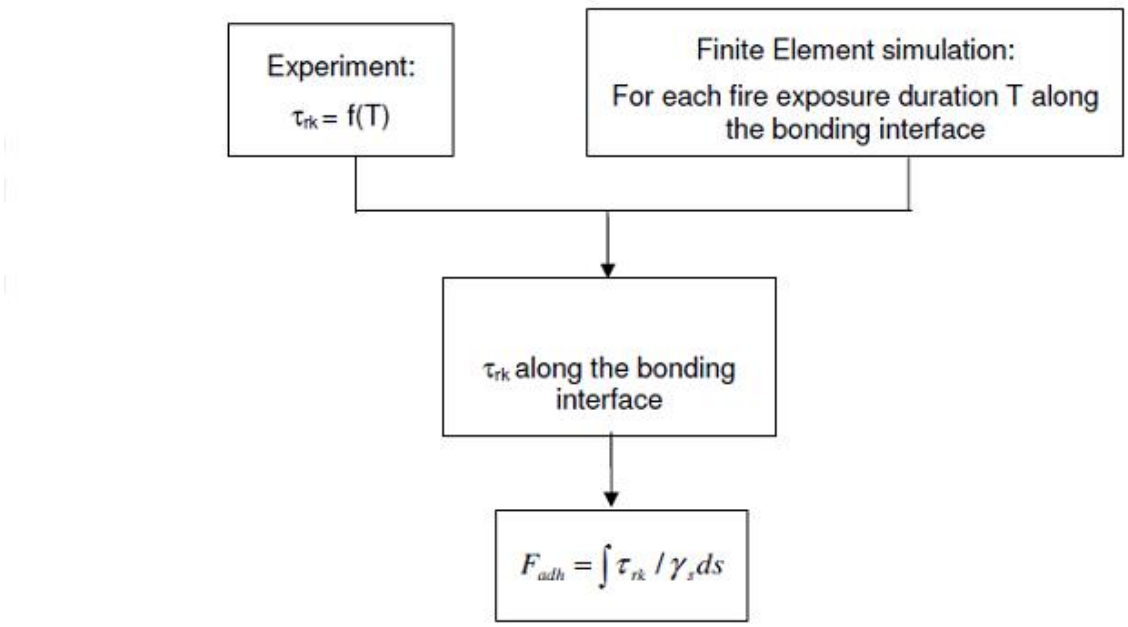
1. Introduction

When the Hilti injection resin system for the post - installed rebar concrete - to - concrete connection application subjected to fire exposure, the system performance would undergo certain degree of reduction due to the effect of elevated temperature. An evaluation of the performance behavior under fire condition (in accordance with Code of Practice for Fire Safety in Buildings 2011 or other related standards) of injection resin used in post - installed concrete connection with rebar (Size Ø8 to 40 mm type 2 deformed bar for HY - 200 R V3) is studied using Finite Element simulation method for supporting engineering design.

The maximum loads applicable through a rebar in concrete connection with Hilti injection resin as a function of both fire duration and anchorage length need to be assessed for the **slab to slab connections**, **wall to slab connections**, **beam to beam connections** and **wall to beam connections**.

The evaluation of the above characteristics needs three steps procedure:



Where:

τ_{rk} is the characteristic bonding stress

T is the temperature

F_{adh} is the maximum load applicable to the rebar.

γ_S is the appropriate safety factor.

Figure 1 Evaluation Procedure

Step 1: Hilti resin with rebar subject to fire exposure experiments in different anchorage depth and fire rating and development the relationship for the bonding strength and the temperature.

Step 2: Consists in the finite element modeling of the temperature profiles at the bonding interface of the four considered connection types.

Step 3: Determination of the bonding stress along the bonding interface using step 1 and 2. The maximum load applicable through a rebar anchored with Hilti resin is then calculated by integrating this bonding stress over the interface area.

Step 1 experiments were carried out by the European laboratories and the related data are provided by Hilti for **step 2** and **step 3** for analysis. The bonding relations between the temperature and the critical bond stress are given as below:

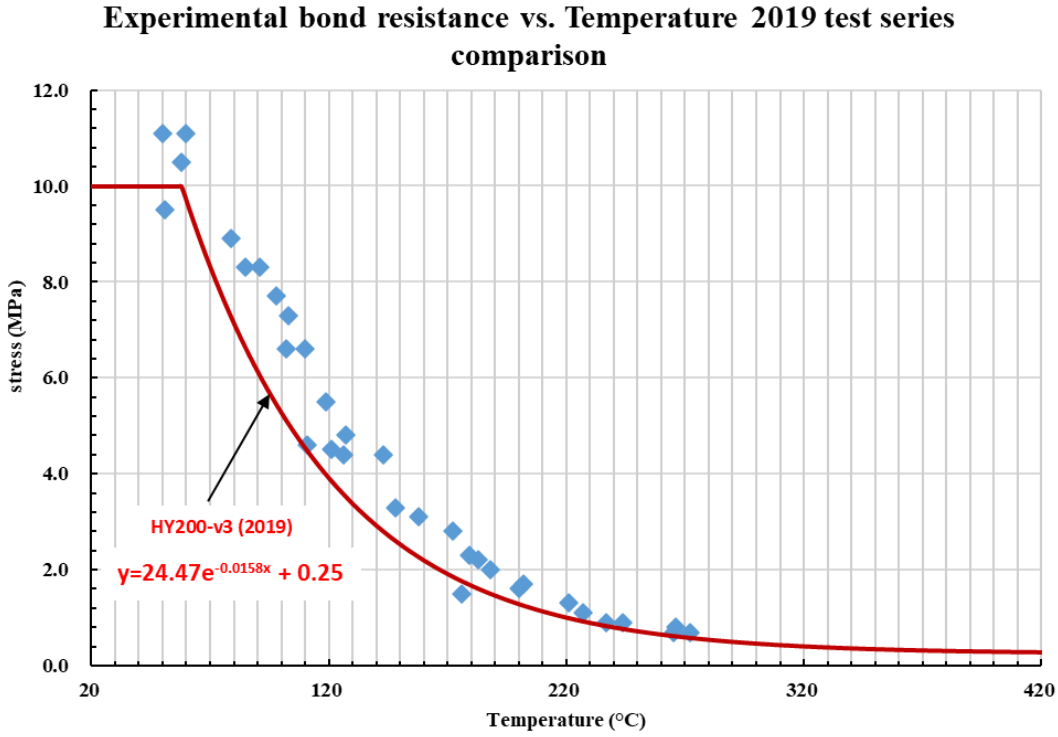


Figure 2 HILTI-HY-200 R V3 Characteristic bonding stress - temperature relationship

(**Blue points** are experimental results; **red points** are the corresponding characteristic values)

More details about the experimental program can be found in the test report as *"No MRF 1926082719/B On Fire Testing of Post installed rebar connections with HILTI - HY-200 R V3 Injection system*".

In this report, the following four types of connections (see **Figure 3** to **Figure 6**) are studied, and the related design tables are given for practical engineering usages.

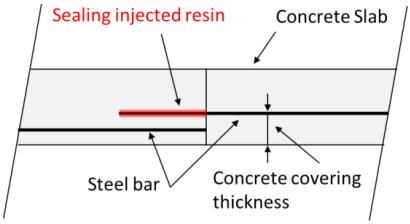


Figure 3 Slab to slab connection

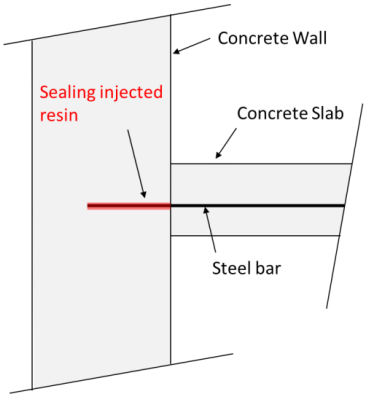


Figure 4 Wall to slab connection

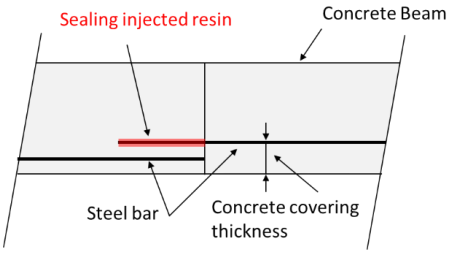


Figure 5 Beam to beam connection

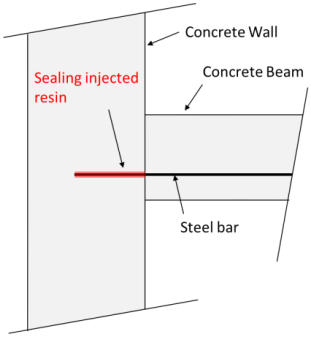
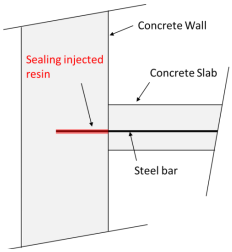


Figure 6 Wall to beam connection

Wall to slab connection



The maximum force in the rebar (resin adhesion strength) is given by:

$$F_{adh} = \int_0^{L_s} \frac{1}{\gamma_g} \pi * \emptyset * \tau_{rk}(x) dx$$

Where

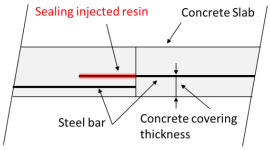
- F_{adh} is the maximum force in the rebar;
- $\emptyset$ is the rebar diameter;
- $\tau_{rk}(x)$ is the characteristic bonding stress at a depth of x;
- L_s is the anchorage length;
- γ_g is the global safety factor, $\gamma_g = 1.43$;

			Maximum Force in the Rebar (kN)			
			R60	R120	R180	R240
Rebar Diameter, φ(mm)	Rebar Maximum Load, F(kN)	Anchorage Depth, Ls(mm)	Cover = 25mm	Cover = 35mm	Cover = 45mm	Cover = 60mm
10	39.27	100	5.88	1.59	0.90	0.73
		120	10.27	3.14	1.55	1.11
		140	14.66	5.77	2.72	1.75
		160	19.06	9.63	4.64	2.84
		180	23.45	14.02	7.50	4.54
		200	27.84	18.42	11.37	7.01
		220	32.24	22.81	15.77	10.33
		240	36.63	27.20	20.16	14.52
		260	39.27	31.60	24.55	18.91
		280		35.99	28.95	23.31
		300		39.27	33.34	27.70
		320			37.74	32.09
		340			39.27	36.49
		360				39.27
12	56.55	120	12.32	3.77	1.86	1.33
		140	17.60	6.92	3.26	2.10
		160	22.87	11.55	5.57	3.41
		180	28.14	16.82	9.00	5.45
		200	33.41	22.09	13.65	8.41
		220	38.69	27.36	18.92	12.41
		240	43.96	32.64	24.19	17.44
		260	49.23	37.91	29.47	22.71
		280	54.50	43.18	34.74	27.99
		300		48.45	40.01	33.26
		320	56.55	53.73	45.28	38.53
		340		56.55	50.56	43.80
		360			55.83	49.08
		380			56.55	54.35
		400				56.55
16	100.53	160	30.49	15.39	7.43	4.54
		180	37.52	22.42	12.00	7.27
		200	44.55	29.45	18.20	11.22
		220	51.58	36.48	25.23	16.55
		240	58.61	43.51	32.26	23.25
		260	65.64	50.54	39.29	30.28
		280	72.67	54.05	46.32	37.31
		300	79.70	64.60	53.35	44.35
		320	86.73	71.63	60.38	51.38
		340	93.76	78.66	67.41	58.41
		360	100.53	85.69	74.44	65.44
		380		92.72	81.47	72.47
		400		99.75	88.50	79.50
		420		100.53	95.53	86.53
		440			100.53	93.56
		460				100.53

Rebar Diameter, φ(mm)	Rebar Maximum Load, F(kN)	Anchorage Depth, Ls(mm)	Maximum Force in the Rebar (kN)			
			R60	R120	R180	R240
			Cover = 25mm	Cover = 35mm	Cover = 45mm	Cover = 60mm
20	157.08	200	55.69	36.81	22.75	14.03
		220	64.48	45.60	31.54	20.68
		240	73.26	54.39	40.32	29.07
		260	82.05	63.17	49.11	37.86
		280	90.84	71.96	57.90	46.64
		300	99.63	80.75	66.69	55.43
		320	108.41	89.54	75.47	64.22
		340	117.20	98.32	84.26	73.01
		360	125.99	107.11	93.05	81.79
		380	134.78	115.90	101.84	90.58
		400	143.57	124.69	110.62	99.37
		420	152.35	133.48	119.41	108.16
		440	157.08	142.26	128.20	116.95
		460		151.05	136.99	125.73
		480		157.08	145.78	134.52
		500			154.56	143.31
		520			157.08	152.10
		540				157.08
25	245.44	250	97.07	73.46	55.90	41.83
		270	108.06	84.45	66.88	52.81
		290	119.04	95.43	77.87	63.80
		310	130.03	106.42	88.85	74.78
		330	141.01	117.40	99.83	85.77
		350	152.00	128.39	110.82	96.75
		370	162.98	139.37	121.80	107.74
		390	173.96	150.36	132.79	118.72
		410	184.95	161.34	143.77	129.70
		430	195.93	172.33	154.76	140.69
		450	206.92	183.31	165.74	151.67
		470	217.90	194.30	176.73	162.66
		490	228.89	205.28	187.71	173.64
		510	239.87	216.26	198.70	184.63
		530		227.25	209.68	195.61
		550	245.44	238.23	220.67	206.60
		570		245.44	231.65	217.58
		590			242.63	228.57
		610			245.44	239.55
		630				245.44

			Maximum Force in the Rebar (kN)			
			R60	R120	R180	R240
Rebar Diameter, φ(mm)	Rebar Maximum Load, F(kN)	Anchorage Depth, Ls(mm)	Cover = 25mm	Cover = 35mm	Cover = 45mm	Cover = 60mm
32	402.12	320	173.46	143.24	122.49	102.75
		340	187.52	157.30	136.55	116.81
		360	201.58	171.36	150.61	130.87
		380	215.64	185.42	164.67	144.93
		400	229.70	199.48	178.73	158.99
		420	243.77	213.54	192.79	173.05
		440	257.83	227.60	206.85	187.11
		460	271.89	241.66	220.91	201.17
		480	285.95	255.72	234.97	215.23
		500	300.01	269.78	249.03	229.29
		520	314.07	283.84	263.09	243.35
		540	328.13	297.90	277.15	257.41
		560	342.19	311.96	291.21	271.47
		580	356.25	326.02	305.27	285.53
		600	370.31	340.08	319.33	299.59
		620	384.37	354.14	333.39	313.65
		640	398.43	368.20	347.45	327.71
		660		382.26	361.51	341.78
		680	402.12	396.32	375.57	355.84
		700		402.12	389.63	369.90
		720			402.12	383.96
		740				398.02
		760				402.12
40	628.32	360		214.20	186.10	163.59
		380		231.77	203.67	181.16
		400		249.35	221.25	198.74
		420		266.92	238.82	216.31
		440		284.50	256.40	233.89
		460		302.07	273.97	251.47
		480		319.65	291.55	269.04
		500		337.22	309.13	286.62
		520		354.80	326.70	304.19
		540		372.37	344.28	321.77
		560		389.95	361.85	339.34
		580		407.52	379.43	356.92
		600		425.10	397.00	374.49
		620		442.68	414.58	392.07
		640		460.25	432.15	409.64
		660		477.83	449.73	427.22
		680		495.40	467.30	444.79
		700		512.98	484.88	462.37
		720		530.55	502.45	479.94
		740		548.13	520.03	497.52
		760		565.70	537.61	515.10
		780		583.28	555.18	532.67
		800		600.85	572.76	550.25
		820		618.43	590.33	567.82
		840		628.32	607.91	585.40
		860			625.48	602.97
		880			628.32	620.55

Slab to slab connection



The experimental temperature – bonding stress relationship is given by:

$$\tau = 24.47 * e^{(-0.0158*\theta)} + 0.25$$

Where:

- θ is the temperature in ℃
- τ is the bonding stress in MPa

Maximum Bonding Stress for a Slab to Slab Connection

	Bonding Stress (MPa)					
Concrete Depth(mm)	**R30**	**R60**	**R90**	**R120**	**R180**	**R240**
20	0.28	0.25	0.25	0.25	0.25	0.25
30	0.39	0.26	0.25	0.25	0.25	0.25
40	0.83	0.27	0.25	0.25	0.25	0.25
50	1.94	0.34	0.26	0.25	0.25	0.25
60	3.95	0.52	0.29	0.26	0.25	0.25
70	6.70	0.93	0.36	0.28	0.25	0.25
80	9.67	1.72	0.52	0.32	0.26	0.25
90	10.00	2.96	0.84	0.41	0.27	0.26
100		4.66	1.39	0.59	0.30	0.26
110		6.69	2.24	0.90	0.35	0.27
120		8.84	3.41	1.39	0.44	0.30
130		10.00	4.87	2.11	0.60	0.34
140			6.54	3.08	0.85	0.41
150			8.31	4.28	1.22	0.52
160			10.00	5.66	1.74	0.69
170				7.16	2.41	0.95
180				8.70	3.25	1.30
190				10.00	4.25	1.76
200	10.00				5.37	2.34
210					6.58	3.05
220		10.00			7.84	3.88
230					9.10	4.81
240			10.00		10.00	5.83
250				10.00		6.90
260						7.99
270					10.00	9.09
280						10.00
290						10.00
300 or above						

*Global safety factor (1.43) need to be apply to the bond stress

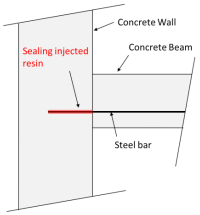
Wall to beam connection

The maximum force in the rebar (resin adhesion strength) is given by:

$$F_{adh} = \int_0^{L_s} \frac{1}{\gamma_g} \pi * \emptyset * \tau_{rk}(x) dx$$

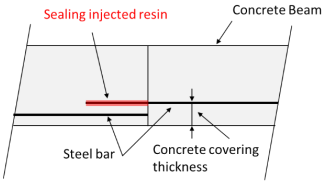
Where

- F_{adh} is the maximum force in the rebar;
- $\emptyset$ is the rebar diameter;
- $\tau_{rk}(x)$ is the characteristic bonding stress at a depth of x;
- L_s is the anchorage length;
- γ_g is the global safety factor, $\gamma_g = 1.43$;



		Rebar Anchorage Depth (mm)				
Rebar Diameter (mm)	Rebar Maximum Load (kN)	Cover (mm)	R60 (Beam Width =300mm)	R120 (Beam Width = 300mm)	R180 (Beam Width = 400mm)	R240 (Beam Width = 400mm)
10	39.27	30	262			
		35	260			
		40	258	307		
		45	255	305		
		50	255	303		
		55	248	301		
		60	244	299	339	370
12	56.55	30	298			
		35	296			
		40	294	343		
		45	291	341		
		50	287	339		
		55	284	337		
		60	280	335	374	406
16	100.53	30	370			
		35	368			
		40	365	415		
		45	363	414		
		50	359	412		
		55	356	409		
		60	352	407	447	479
20	157.08	30	442			
		35	440			
		40	437	488		
		45	434	486		
		50	431	484		
		55	427	482		
		60	400	458	519	551
25	245.44	30	531			
		35	529			
		40	527	577		
		45	524	575		
		50	520	573		
		55	517	571		
		60	513	569	609	641
32	402.12	30	657			
		35	654			
		40	652	704		
		45	649	702		
		50	645	700		
		55	642	698		
		60	638	695	735	768
40	628.32	30	800			
		35	798			
		40	795	849		
		45	792	848		
		50	789	846		
		55	785	844		
		60	781	842	877	910

Beam to beam connection



The experimental temperature – bonding stress relationship is given by:

$$\tau = 24.47 * e^{(-0.0158*\theta)} + 0.25$$

Where:

- θ is the temperature in ℃
- τ is the bonding stress in MPa

Beam's Width = 400mm, Fire duration = 240 min								
Bonding Stress (MPa)		X-Dir (mm)						
		80	100	120	140	160	180	200
Y-Dir (mm)	400	0.25	0.26	0.27	0.31	0.38	0.45	0.48
	350	0.25	0.26	0.27	0.36	0.60	0.95	1.14
	300	0.25	0.25	0.27	0.36	0.59	0.92	1.09
	250	0.25	0.25	0.27	0.34	0.51	0.76	0.89
	200	0.25	0.25	0.26	0.29	0.37	0.48	0.53
	150	0.25	0.25	0.25	0.26	0.27	0.28	0.29
	100	0.25	0.25	0.25	0.25	0.25	0.25	0.25

*Global safety factor (1.43) need to be apply to the bond stress

Deutsches Institut für Bautechnik

Public-law institution jointly founded by the federal states and the Federation

European Technical Assessment Body for construction products

Member of EOTA
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Designated according to Article 29 of Regulation (EU) No 305/2011 and member of EOTA (European Organisation for Technical Assessment)

European Technical Assessment ETA-19/0600 of 9 April 2024

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Injection System Hilti HIT-HY 200-A V3 and Hilti HIT-HY 200-R V3 for rebar connections
Product family to which the construction product belongs	Systems for post-installed rebar connections with mortar
Manufacturer	Hilti Aktiengesellschaft Feldkircherstrasse 100 9494 SCHAAN FÜRSTENTUM LIECHTENSTEIN
Manufacturing plant	Hilti Werke Hilti Plants
This European Technical Assessment contains	35 pages including 3 annexes which form an integral part of this assessment
This European Technical Assessment is issued in accordance with Regulation (EU) No 305/2011, on the basis of	EAD 330087-01-0601, Edition 06/2021
This version replaces	ETA-19/0600 issued on 11 October 2023

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Specific Part

1 Technical description of the product

The subject of this European Technical Assessment is the post-installed connection, by anchoring or overlap connection joint, of reinforcing bars (rebars) in existing structures made of normal weight concrete, using the injection mortar Hilti HIT-HY 200-A V3 and Hilti HIT-HY 200-R V3 in accordance with the regulations for reinforced concrete construction.

Reinforcing bars made of steel with a diameter ϕ from 8 to 40 mm or the Hilti tension anchor HZA-R in sizes M12, M16, M20 and M24 or the Hilti tension anchor HZA in sizes M12, M16, M20, M24 and M27 and Hilti HIT-HY 200-A V3 and Hilti HIT-HY 200-R V3 injection mortar are used for the rebar connection. The steel element is placed into a drilled hole filled with injection mortar and is anchored via the bond between embedded element, injection mortar and concrete.

The product description is given in Annex A.

2 Specification of the intended use in accordance with the applicable European assessment Document

The performances given in Section 3 are only valid if the rebar connection is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the rebar connections of at least 50 and/or 100 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

3 Performance of the product and references to the methods used for its assessment

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance under static and quasi-static loading	See Annex C1 to C3
Characteristic resistance under seismic loading	See Annex B6, C4 and C5

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Class A1
Resistance to fire	See Annex C6 and C7

4 Assessment and verification of constancy of performance (AVCP) system applied, with reference to its legal base

In accordance with European Assessment Document EAD No. 330087-01-0601, the applicable European legal act is: [96/582/EC].

The system to be applied is: 1

5 Technical details necessary for the implementation of the AVCP system, as provided for in the applicable European Assessment Document

Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited with Deutsches Institut für Bautechnik.

The following standards are referred to in this European Technical Assessment:

- EN 1992-1-1:2004 + AC:2010	Eurocode 2: Design of concrete structures - Part 1-1: General rules and rules for buildings
- EN 1992-1-2:2004 + AC:2008	Eurocode 2: Design of concrete structures - Part 1-2: General rules - Structural fire design
- EN 1992-4:2018	Eurocode 2: Design of concrete structures - Part 4: Design of fastenings for use in concrete
- EN 1993-1-4:2006 + A1:2015	Eurocode 3: Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels
- EN 1998-1:2004 + AC:2009	Eurocode 8: Design of structures for earthquake resistance - Part 1: General rules, seismic actions and rules for buildings
- EN 10088-1:2014	Stainless steels - Part 1: List of stainless steels
- EN 206:2013 + A1:2016	Concrete - Specification, performance, production and conformity

Issued in Berlin on 9 April 2024 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Badeschneider

Installed condition

Figure A1:

Overlap joint with existing reinforcement for rebar connections of slabs and beams

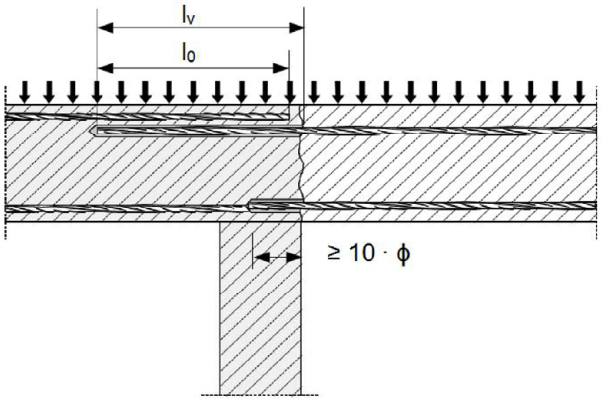


Figure A2:

Overlap joint with existing reinforcement at a foundation of a column or wall where the rebars are stressed in tension

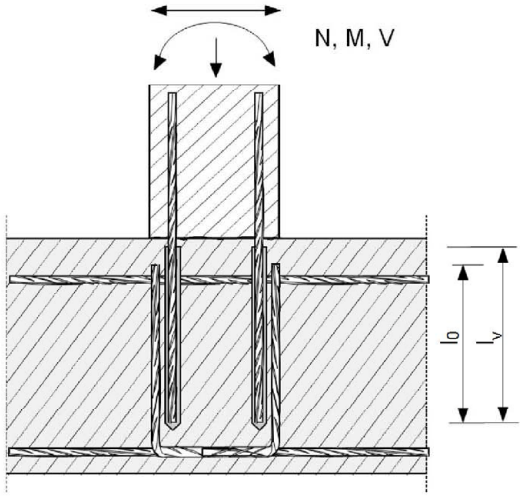
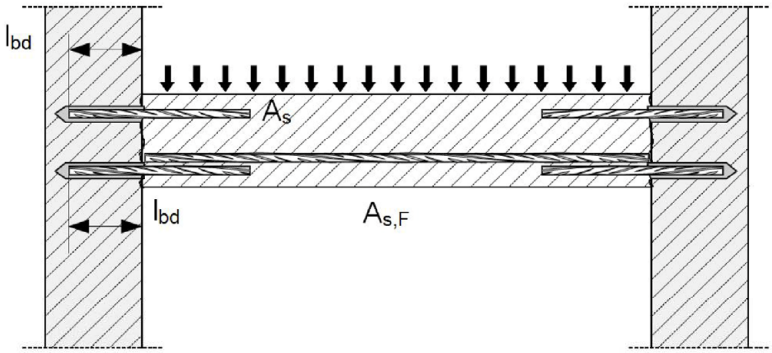


Figure A3:

End anchoring of slabs or beams



Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex A1**
Product description Installed condition and application examples of post-installed rebars	

Figure A4:

Rebar connection for components stressed primarily in compression

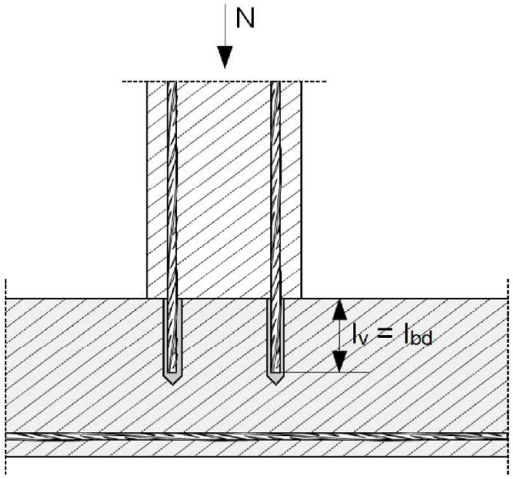
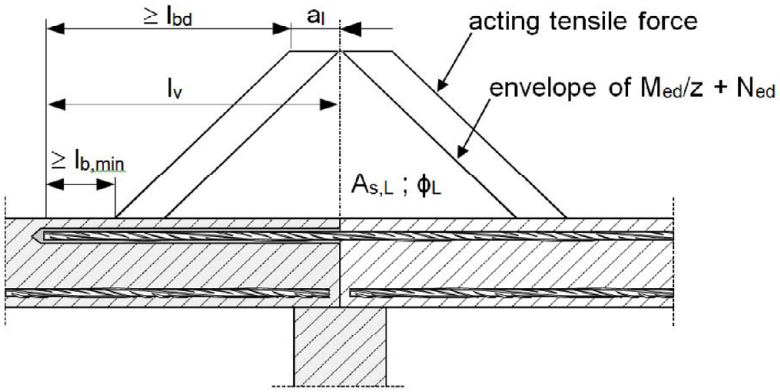


Figure A5:

Anchoring of reinforcement to cover the enveloped line of acting tensile force in the bending member



Note to Figure A1 to Figure A5:

- In the Figures no transverse reinforcement is plotted, the transverse reinforcement as required by EN 1992-1-1 or EN 1998-1 shall be present.
- The shear transfer between existing and new concrete shall be designed according to EN 1992-1-1 or EN 1998-1.
- Preparing of joints according to Annex B3.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex A2**
Product description Installed condition and application examples of post-installed rebars	

Figure A6:
Overlap joint for the anchorage of a column stressed in bending to a foundation

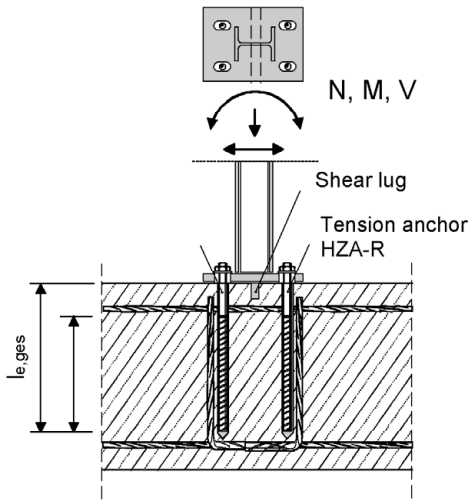


Figure A7:
Overlap joint for the anchorage of barrier posts

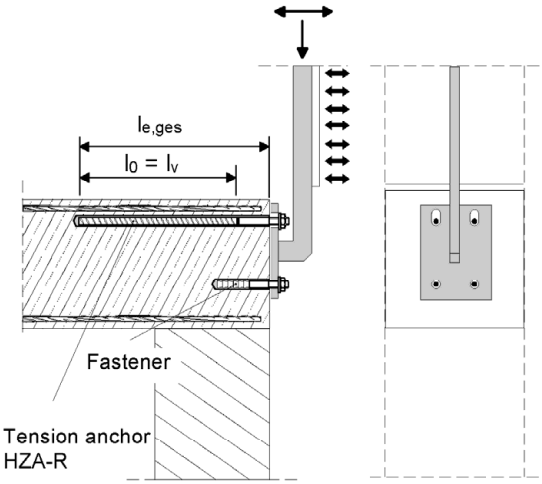
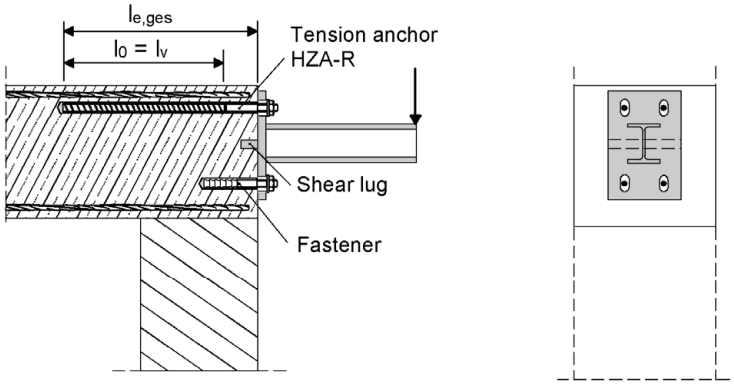


Figure A8:
Overlap joint for the anchorage of cantilever members



Note to Figure A6 to A8:
In the Figures no transverse reinforcement is plotted, the transverse reinforcement as required by EN 1992-1-1 shall be present.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex A3**
Product description Installed condition and application examples of HZA and HZA-R	

Product description: Injection mortar and steel elements

Injection mortar Hilti HIT-HY 200-A V3 and Hilti HIT-HY 200-R V3: hybrid system with aggregate
330 ml and 500 ml

Marking:
HILTI-HIT
HY 200-A V3
Production time and production line
Expiry date mm/yyyy



Product name: “Hilti HIT-HY 200-A V3”

Marking:
HILTI-HIT
HY 200-R V3
Production time and production line
Expiry date mm/yyyy



Product name: “Hilti HIT-HY 200-R V3”

Static mixer Hilti HIT-RE-M



Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex A4**
Product description Injection mortar / Static mixer	

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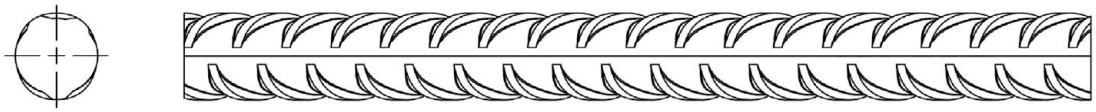
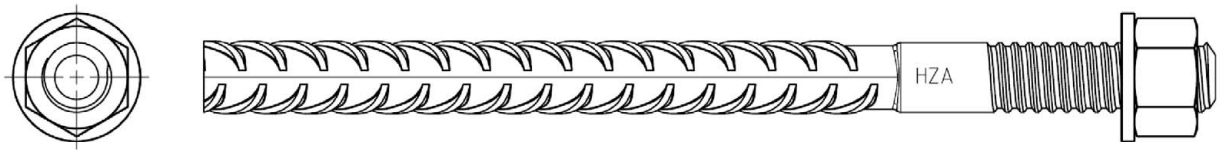
Steel elements



Reinforcing bar (rebar): ϕ 8 to ϕ 40

- Materials and mechanical properties according to Table A1.
- Minimum value of related rib area f_R according to EN 1992-1-1.
- Rib height of the bar h_{rib} shall be in the range:
  $0{,}05 \cdot \phi \le h_{rib} \le 0{,}07 \cdot \phi$
- The maximum outer rebar diameter over the ribs shall be:
  $\phi + 2 \cdot 0{,}07 \cdot \phi = 1{,}14 \cdot \phi$
  (ϕ: Nominal diameter of the bar; h_{rib}: Rib height of the bar)



Hilti Tension Anchor HZA: M12 to M27 and HZA-R: M12 to M24

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex A5**
Product description Steel elements	

Table A1: Materials

Designation	Material
Reinforcing bars (rebars)	
Rebar EN 1992-1-1	Bars and de-coiled rods class B or C with f_{yk} and k according to NDP or NCI of EN 1992-1-1 $f_{uk} = f_{tk} = k \cdot f_{yk}$
Metal parts made of zinc coated steel	
Hilti tension anchor HZA	Round steel with threaded part: electroplated zinc coated ≥ 5 µm Rebar: f_{yk} = 500 N/mm² class B according to NDP or NCI of EN 1992-1-1
Washer	Electroplated zinc coated ≥ 5 µm, hot dip galvanized ≥ 45 µm
Nut	Strength class of nut adapted to strength class of threaded rod. Electroplated zinc coated ≥ 5 µm, hot dip galvanized ≥ 45 µm
Metal parts made of stainless steel corrosion resistance class III according EN 1993-1-4	
Hilti tension anchor HZA-R	Round steel with threaded part: Stainless steel 1.4404, 1.4362, 1.4571 EN 10088-1 Rebar: f_{yk} = 500 N/mm² class B according to NDP or NCI of EN 1992-1-1
Washer	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1
Nut	Strength class of nut adapted to strength class of threaded rod. Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex A6**
Product description Materials	

Specifications of intended use

Hilti HIT-HY 200-A V3: Anchorages subject to:

- Static and quasi-static loading:
  rebar size ϕ 8 to ϕ 32 mm, HZA M12 to M27 and HZA-R M12 to M24.
- Seismic loading:
  rebar size ϕ 10 to ϕ 32 mm.
- Fire exposure:
  rebar size ϕ 8 to ϕ 32 mm, HZA M12 to M27 and HZA-R M12 to M24.

Hilti HIT-HY 200-R V3: Anchorages subject to:

- Static and quasi-static loading:
  rebar size ϕ 8 to ϕ 40 mm, HZA M12 to M27 and HZA-R M12 to M24.
- Seismic loading:
  rebar size ϕ 10 to ϕ 40 mm.
- Fire exposure:
  rebar size ϕ 8 to ϕ 40 mm, HZA M12 to M27 and HZA-R M12 to M24.

Base material:

- Compacted reinforced or unreinforced normal weight concrete without fibers in accordance with EN 206.
- Strength classes in accordance with EN 206:
  C12/15 to C50/60 for static and quasi-static loading and fire exposure
  C16/20 to C50/60 for seismic loading.
- Maximum chloride content of 0,40 % (CL 0.40) related to the cement content in accordance with EN 206.
- Non-carbonated concrete.
  Note: In case of a carbonated surface of the existing concrete structure the carbonated layer shall be removed in the area of the post-installed rebar connection with a diameter of ϕ + 60 mm prior to the installation of the new rebar. The depth of concrete to be removed shall correspond at least to the minimum concrete cover in accordance with EN 1992-1-1. The foregoing may be neglected if building components are new and not carbonated and if building components are in dry conditions.

Temperature in the base material:

- **at installation**
  -10 °C to +40 °C for rebar size ϕ 8 to ϕ 32 mm
  +5 °C to +25 °C for rebar size ϕ 34 to ϕ 40 mm
- **in-service**
  -40 °C to +80 °C (max. long term temperature +50 °C and max. short term temperature +80 °C)

Use conditions for HZA(-R) (Environmental conditions):

- Structures subject to dry internal conditions (all materials).
- For all other conditions according EN 1993-1-4 corresponding to corrosion resistance classes Annex A6 Table A1 (stainless steels).

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B1**
Intended Use Specifications	

Design:

- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the forces to be transmitted.
- Design of rebar under static or quasi-static loading in accordance with EN 1992-1-1 and Annex B3 and under seismic action in accordance with EN 1998-1.
- Design of Hilti Tension anchor part embedded in the concrete under static or quasi-static loading in accordance with EN 1992-1-1 and Annex B4.
- Design of Hilti Tension anchor part extending above the concrete surface for steel failure under static or quasi-static tension load in accordance with EN 1992-4.
- Design under fire exposure in accordance with EN 1992-1-2 and for Hilti Tension anchor in addition in accordance with EN 1992-4, Annex D.
- The actual position of the reinforcement in the existing structure shall be determined on the basis of the construction documentation and taken into account when designing.

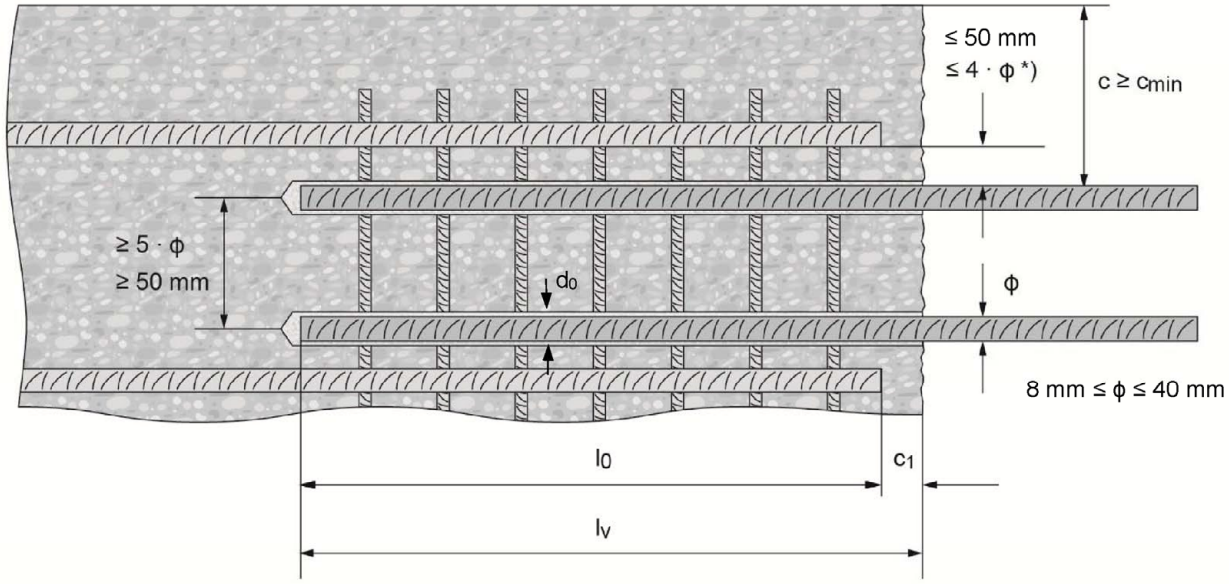
Installation:

- Use category: dry or wet concrete (not in flooded holes).
- Drilling technique: Rebar size ϕ 8 to ϕ 32 mm:
  Hammer drilling (HD), hammer drilling with Hilti hollow drill bit TE-CD, TE-YD (HDB), compressed air drilling (CA), diamond coring with roughening with Hilti roughening tool TE-YRT (RT).
- Drilling technique: Rebar size ϕ 34 to ϕ 40 mm:
  hammer drilling (HD), compressed air drilling (CA).
- Overhead installation is admissible up to diameter 32 mm.
- Rebar installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Check the position of the existing rebars (if the position of existing rebars is not known, it shall be determined using a rebar detector suitable for this purpose as well as on the basis of the construction documentation and then marked on the building component for the overlap joint).

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B2**
Intended Use Specifications	

Figure B1: General construction rules for post-installed rebars

- Post-installed rebars may be designed for tension and compression forces only.
- The transfer of shear forces between new concrete and existing structure shall be designed additionally according to EN 1992-1-1.
- The joints for concreting must be roughened to at least such an extent that aggregate protrudes.



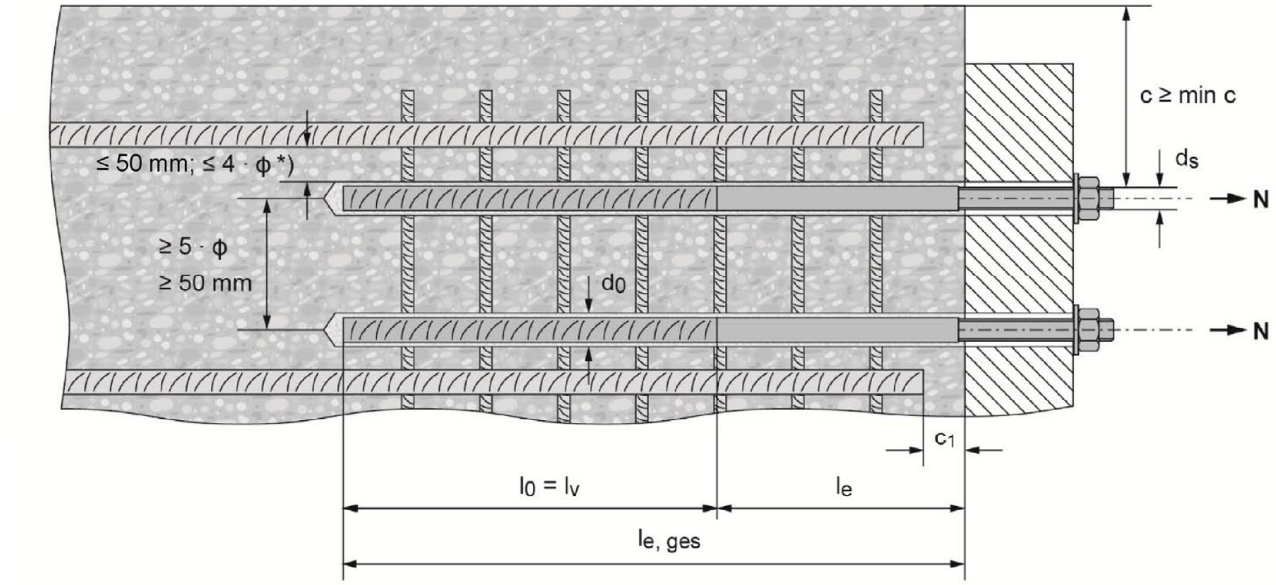
*) If the clear distance between lapped bars exceeds 4 · ϕ or 50 mm, then the lap length shall be increased by the difference between the clear bar distance and the smaller of 4 · ϕ or 50 mm.

c concrete cover of post-installed rebar
c_1 concrete cover at end-face of existing rebar
c_{min} minimum concrete cover according to Table B3 and to EN 1992-1-1
ϕ diameter of reinforcement bar
l_0 lap length
according to EN 1992-1-1 for static loading and
according to EN 1998-1, section 5.6.3 for seismic action
l_v embedment length ≥ $l_0 + c_1$
d_0 nominal drill bit diameter, see Table B7 to B9

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B3**
Intended Use General construction rules for post-installed rebars	

Figure B2: General construction rules for Hilti tension anchor HZA and HZA-R

- Hilti tension anchor HZA / HZA-R may be designed for tension forces only.
- The tension forces must be transferred via an overlap joint to the reinforcement in the existing structure.
- The length of the bonded-in smooth shaft may not be accounted as anchorage.
- The transfer of shear forces shall be ensured by appropriate additional measures, e.g. by shear lugs or by anchors with a European technical assessment (ETA).
- In the anchor plate the holes for the Hilti tension anchor shall be executed as elongated holes with the axis in the direction of the shear force.



*) If the clear distance between lapped bars exceeds 4 · ϕ or 50 mm, then the lap length shall be increased by the difference between the clear bar distance and the smaller of 4 · ϕ or 50 mm.

c concrete cover of Hilti tension anchor HZA / HZA-R
c_1 concrete cover at end-face of existing rebar
c_{min} minimum concrete cover according to Table B3 and to EN 1992-1-1
ϕ diameter of reinforcement bar
l_0 lap length, according to EN 1992-1-1
l_v embedment length
l_e length of the smooth shaft or the bonded-in threaded part
$l_{e,ges}$ overall embedment length
d_0 nominal drill bit diameter, see Table B1 and Table B2 or Table B7 to B9

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B4**
Intended Use General construction rules for HZA and HZA-R	

Table B1: Hilti tension anchor HZA dimensions

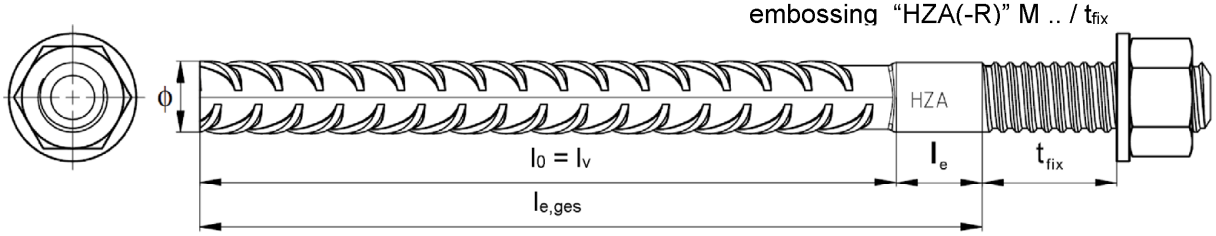
Hilti tension anchor HZA			**M12**	**M16**	**M20**	**M24**	**M27**
Rebar diameter	ϕ	[mm]	12	16	20	25	28
Overall embedment length and drill hole depth	$l_{e,ges}$	[mm]	90 to 800	100 to 1000	110 to 1000	120 to 1000	140 to 1000
Embedment length ($l_v = l_{e,ges} - l_e$)	l_v	[mm]	$l_{e,ges} - 20$				
Length of smooth shaft	l_e	[mm]	20				
Nominal diameter of drill bit	d_0	[mm]	16	20	25	32	35
Maximum diameter of clearance hole in the fixture	d_f	[mm]	14	18	22	26	30
Maximum torque moment	T_{max}	[Nm]	40	80	150	200	270

Table B2: Hilti tension anchor HZA-R dimensions

Hilti tension anchor HZA-R			**M12**	**M16**	**M20**	**M24**
Rebar diameter	ϕ	[mm]	12	16	20	25
Overall embedment length and drill hole depth	$l_{e,ges}$	[mm]	170 to 800	180 to 1000	190 to 1000	200 to 1000
Embedment length ($l_v = l_{e,ges} - l_e$)	l_v	[mm]	$l_{e,ges} - 100$			
Length of smooth shaft	l_e	[mm]	100			
Nominal diameter of drill bit	d_0	[mm]	16	20	25	32
Maximum diameter of clearance hole in the fixture	d_f	[mm]	14	18	22	26
Maximum torque moment	T_{max}	[Nm]	40	80	150	200

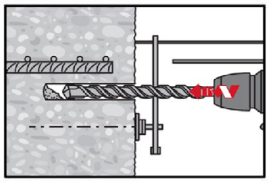
Hilti Tension Anchor HZA / HZA-R

Marking:
embossing "HZA(-R)" M .. / t_{fix}



Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B5**
Intended Use Installation parameters for HZA and HZA-R	

Table B3: Minimum concrete cover c_{min}[1)] of post-installed rebar or tension anchor HZA-(R) depending on drilling method and drilling tolerance

Drilling method	Bar diameter [mm]	Minimum concrete cover c_{min}[1)] [mm]		
		Without drilling aid[3)]	With drilling aid[3)]	
Hammer drilling **(HD)** and **(HDB)**[2)]	$\phi < 25$	$30 + 0{,}06 \cdot l_v \geq 2 \cdot \phi$	$30 + 0{,}02 \cdot l_v \geq 2 \cdot \phi$	
	$\phi \geq 25$	$40 + 0{,}06 \cdot l_v \geq 2 \cdot \phi$	$40 + 0{,}02 \cdot l_v \geq 2 \cdot \phi$	
Compressed air drilling **(CA)**	$\phi < 25$	$50 + 0{,}08 \cdot l_v$	$50 + 0{,}02 \cdot l_v$	
	$\phi \geq 25$	$60 + 0{,}08 \cdot l_v \geq 2 \cdot \phi$	$60 + 0{,}02 \cdot l_v \geq 2 \cdot \phi$	
Diamond coring with roughening with Hilti Roughening tool TE-YRT **(RT)**	$\phi < 25$	$30 + 0{,}06 \cdot l_v \geq 2 \cdot \phi$	$30 + 0{,}02 \cdot l_v \geq 2 \cdot \phi$	
	$\phi \geq 25$	$40 + 0{,}06 \cdot l_v \geq 2 \cdot \phi$	$40 + 0{,}02 \cdot l_v \geq 2 \cdot \phi$	

1) See Annexes B2 and B3, Figures B1 and B2.
2) HDB = hollow drill bit Hilti TE-CD and TE-YD
Comments: The minimum concrete cover acc. EN 1992-1-1 must be observed.
The same minimum concrete covers apply for rebar elements in the case of seismic loading, i.e. $c_{min,seis} = 2\ \phi$.
3) For HZA(-R) $l_{e,ges}$ instead of l_v.

Table B4: Hilti HIT-HY 200-A V3, maximum embedment length $l_{v,max}$ ($l_{e,ges,max}$ for HZA-(R)) depending on bar diameter and dispenser

Elements		Dispensers	
Rebar	Hilti Tension Anchor	HDE 500 HDM 330, HDM 500	HDE 500
		Concrete temperature ≥ -10 °C	Concrete temperature ≥ 0 °C
Size	Size	$l_{v,max}$ or $l_{e,ges,max}$ [mm]	$l_{v,max}$ or $l_{e,ges,max}$ [mm]
ϕ 8 - 32	HZA M12 to M27 HZA-R M12 to M24	700	1000

Table B5: Hilti HIT-HY 200-R V3, maximum embedment length $l_{v,max}$ ($l_{e,ges,max}$ for HZA-(R)) depending on bar diameter and dispenser

Elements		Dispensers		
Rebar	Hilti Tension Anchor	HDE 500 HDM 330, HDM 500	HDE 500	HDE 500
		Concrete temperature ≥ -10 °C	Concrete temperature ≥ 0 °C	Concrete temperature 5 °C to 25 °C
Size	Size	$l_{v,max}$ or $l_{e,ges,max}$ [mm]	$l_{v,max}$ or $l_{e,ges,max}$ [mm]	$l_{v,max}$ or $l_{e,ges,max}$ [mm]
ϕ 8 - 32	HZA M12 to M27 HZA-R M12 to M24	700	1000	1000
ϕ 34 - 40	-	-	-	1300

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections

Intended Use
Minimum concrete cover / Maximum embedment depth

Annex B6

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Table B6: Maximum working time and minimum curing time

Temperature in the base material T [1]	HIT-HY 200-A V3		HIT-HY 200-R V3	
	Maximum working time t_{work}	Minimum curing time t_{cure}	Maximum working time t_{work}	Minimum curing time t_{cure}
-10 °C to -5 °C	1,5 hours	7 hours	3 hours	20 hours
> -5 °C to 0 °C	50 min	4 hours	1,5 hours	8 hours
> 0 °C to 5 °C	25 min	2 hours	45 min	4 hours
>5 °C to 10 °C	15 min	75 min	30 min	2,5 hours
>10 °C to 20 °C	7 min	45 min	15 min	1,5 hours
>20 °C to 30 °C	4 min	30 min	9 min	1 hours
>30 °C to 40 °C	3 min	30 min	6 min	1 hours

[1] The minimum foil pack temperature is 0 °C.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B7**
Intended Use Maximum working time and minimum curing time	

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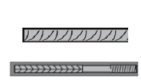
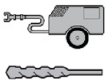
Table B7: Parameters of drilling, cleaning and setting tools for hammer drilling (HD) and compressed air drilling (CA)

Element	Drill and clean					Installation		
Rebar / Hilti Tension Anchor	Hammer drilling (HD)	Compressed air drilling (CA)	Brush HIT-RB	Air nozzle HIT-DL	Extension for air nozzle	Piston plug HIT-SZ	Extension for piston plug	Maximum embedment length
							 1)	-
Size	d_0 [mm]	d_0 [mm]	Size	Size	[-]	Size	[-]	$l_{v,max}$ 2) [mm]
ϕ 8	10	-	10	10	HIT-DL 10/0,8 or HIT-DL V10/1	-	HIT-VL 9/1,0	250
	12	-	12	12		12		1000
ϕ 10	12	-	12	12		12		250
	14	-	14	14		14	HIT-VL 11/1,0	1000
ϕ 12	14	-	14	14		14		250
ϕ 12 / HZA-(R) M12	16	-	16	16		16		1000
ϕ 12	-	17	18	16		18		
ϕ 14	18	-	18	18		18		1000
	-	17	18	18		18		
ϕ 16 / HZA-(R) M16	20	-	20	20	HIT-DL 16/0,8 or HIT-DL B and/or HIT-VL 16/0,7 and/or HIT-VL 16	20	HIT-VL 16/0,7 and/or HIT-VL 16	1000
	-	20	22	20		22		
ϕ 18	22	22	22	22		22		1000
ϕ 20 / HZA-(R) M20	25	-	25	25		25		1000
	-	26	28	25		28		
ϕ 22	28	28	28	28		28		1000
ϕ 24	32	32	32	32		32		1000
ϕ 25 / HZA-(R) M24	32	32	32			32		1000
ϕ 26	35	35	35			35		1000
ϕ 28 / HZA M27	35	35	35			35		1000
ϕ 30	-	35	35			35		1000
	37	-	37			37		
ϕ 32	40	40	40			40		1000
ϕ 34	-	42	42	32		42		1300
	45	-	45	32		45		
ϕ 36	45	-	45	32		45		1300
ϕ 40	55	-	55	32		55		1300
	-	57	55	32		55		

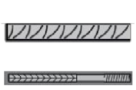
1) Assemble extension HIT-VL 16/0,7 with coupler HIT-VL K for deeper drill holes.
2) For HZA(-R) $l_{e,ges,max}$ instead of $l_{v,max}$.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections

Intended Use
Parameters of drilling, cleaning and setting tools for hammer drilling and compressed air drilling

Annex B8

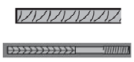
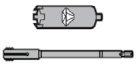
Table B8: Parameters of drilling and setting tools for hammer drilling with hollow drill bit (HDB)

Element	**Drill** (no cleaning required)				**Installation**		
Rebar / Hilti Tension Anchor	Hammer drilling, hollow drill bit[1] **(HDB)**	Brush HIT-RB	Air nozzle HIT-DL	Extension for air nozzle	Piston plug HIT-SZ	Extension for piston plug	Maximum embedment length
							-
Size	d_0 [mm]	Size	Size	[-]	Size	[-]	$l_{v,max}$[3] [mm]
ϕ 8	12	No cleaning required			12	HIT-VL 9/1,0	400
ϕ 10	12				12		400
	14				14	HIT-VL 11/1.0	400
ϕ 12	14				14		400
ϕ 12 / HZA-(R) M12	16				16		1000
ϕ 14	18				18		1000
ϕ 16 / M16	20				20	HIT-VL 16/0,7 and/or HIT-VL 16	1000
ϕ 18	22				22		1000
ϕ 20 / HZA-(R) M20	25				25		1000
ϕ 22	28				28		1000
ϕ 24	32				32		1000
ϕ 25 / HZA-(R) M24	32				32		1000

1) With vacuum cleaner Hilti VC 10/20/40 (automatic filter cleaning activated, eco-mode off) or a vacuum cleaner providing equivalent cleaning performance in combination with the specified Hilti hollow drill bit TE-CD or TE-YD.
2) Assemble extension HIT-VL 16/0,7 with coupler HIT-VL K for deeper drill holes.
3) For HZA(-R) $l_{e,ges,max}$ instead of $l_{v,max}$.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B9**
Intended Use Parameters of drilling and setting tools for hammer drilling with hollow drill bit	

Table B9: Parameters of drilling, cleaning and setting tools for diamond coring with roughening tool (RT)

Element	**Drill and clean**				**Installation**		
Rebar / Hilti Tension Anchor	Diamond coring with roughening (RT)	Brush HIT-RB	Air nozzle HIT-DL	Extension for air nozzle	Piston plug HIT-SZ	Extension for piston plug	Maximum embedment length
						 1)	-
Size	d_0 [mm]	Size	Size	[-]	Size	[-]	$l_{v,max}$ 2) [mm]
ϕ 14	18	18	18	HIT-DL V10/1	18	HIT-VL 11/1,0	1000
ϕ 16 / HZA-(R) M16	20	20	20	HIT-DL 16/0,8 or HIT-DL B and/or HIT-VL 16/0,7 and/or HIT-VL 16	20	HIT-VL 16/0,7 and/or HIT-VL 16	1000
ϕ 18	22	22	22		22		1000
ϕ 20 / HZA-(R) M20	25	25	25		25		1000
ϕ 22	28	28	28		28		1000
ϕ 24	32	32	32		32		1000
ϕ 25 / HZA-(R) M24	32	32			32		1000
ϕ 26	35	35			35		1000
ϕ 28 / HZA M27	35	35			35		1000

1) Assemble extension HIT-VL 16/0,7 with coupler HIT-VL K for deeper drill holes.
2) For HZA(-R) $l_{e,ges,max}$ instead of $l_{v,max}$.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B10**
Intended Use Parameters of drilling, cleaning and setting tools for diamond coring with roughening tool	

Table B10: Hilti roughening tool TE-YRT – tool parameters

Associated components			
Diamond coring		Roughening tool TE-YRT	Wear gauge RTG…
			
d_0 [mm]		d_0 [mm]	Size
Nominal	Measured		
18	17,9 to 18,2	18	18
20	19,9 to 20,2	20	20
22	21,9 to 22,2	22	22
25	24,9 to 25,2	25	25
28	27,9 to 28,2	28	28
30	29,9 to 30,2	30	30
32	31,9 to 32,2	32	32
35	34,9 to 35,2	35	35

Table B11: Hilti roughening tool TE-YRT – roughening and blowing times

	Roughening time $t_{roughen}$ [1)]	Minimum blowing time $t_{blowing}$ [1)]
l_v [mm]	$t_{roughen}$ [sec] = l_v [mm] / 10	$t_{blowing}$ [sec] = $t_{roughen}$ [sec] + 20
0 to 100	10	30
101 to 200	20	40
201 to 300	30	50
301 to 400	40	60
401 to 500	50	70
501 to 600	60	80
> 600	$t_{roughen}$ [sec] = l_v [mm] / 10	$t_{blowing}$ [sec] = $t_{roughen}$ [sec] + 20

[1)] For HZA(-R) $l_{e,ges}$ instead of l_v.

Hilti roughening tool TE-YRT and wear gauge RTG

Hilti roughening tool TE-YRT	
Wear gauge RTG	

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B11**
Intended Use Parameters for use of the Hilti roughening tool TE-YRT	

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Cleaning alternatives

Manual Cleaning (MC): Hilti hand pump for blowing out drill holes with diameters $d_0 \leq 20$ mm and drill hole depths $\leq 10 \cdot \phi$.	
Compressed Air Cleaning (CAC): Air nozzle with an orifice opening of minimum 3,5 mm in diameter.	
Automatic Cleaning (AC): Cleaning is performed during drilling with Hilti TE-CD and TE-YD drilling system including vacuum cleaner.	

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B12**
Intended Use Cleaning alternatives	

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Installation instruction

Safety Regulations:

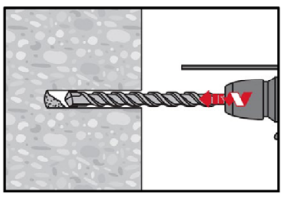


Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling!
Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3.
Important: Observe the installation instruction provided with each foil pack.

Hole drilling

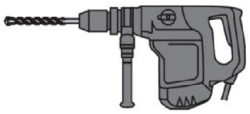
Before drilling remove carbonized concrete and clean contact areas (see Annex B1).
In case of aborted drill hole the drill hole shall be filled with mortar.

a) Hammer drilling

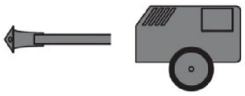


Drill hole to the required embedment length with a hammer drill set in rotation-hammer mode or a compressed air drill using an appropriately sized carbide drill bit.

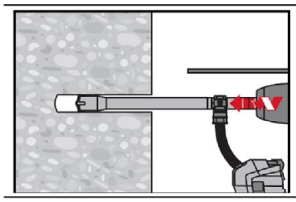
Hammer drill (HD)



Compressed air drill (CA)

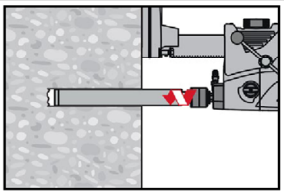


b) Hammer drilling with Hilti hollow drill bit TE-CD, TE-YD

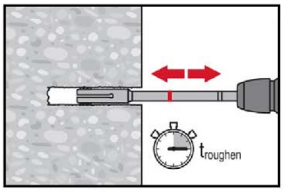


Drill hole to the required embedment depth with an appropriately sized Hilti TE-CD or TE-YD hollow drill bit with vacuum attachment following the requirements given in Table B8. This drilling system removes the dust and cleans the drill hole during drilling when used in accordance with the user's manual. After drilling is completed, proceed to the "injection preparation" step in the installation instruction.

c) Diamond coring with roughening with Hilti roughening tool TE-YRT

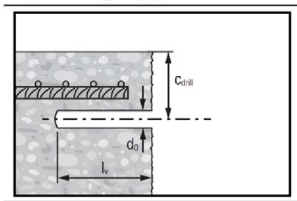
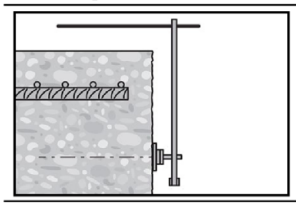
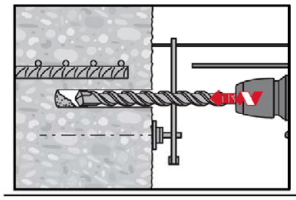
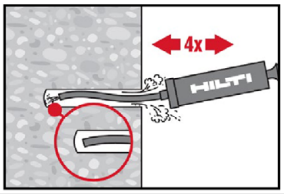
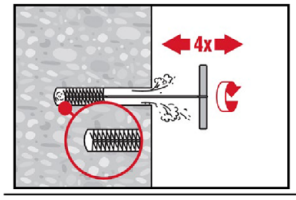
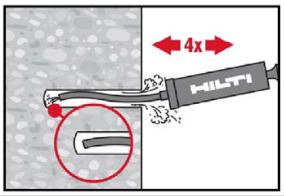


Diamond coring is permissible when suitable diamond core drilling machines and the corresponding core bits are used.
For the use in combination with Hilti roughening tool TE-YRT see parameters in Table B9 and Table B10.

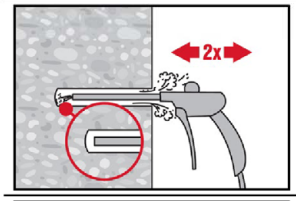
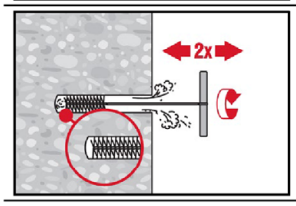
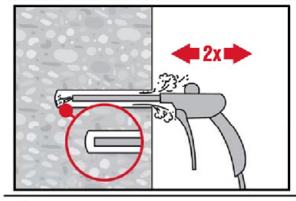
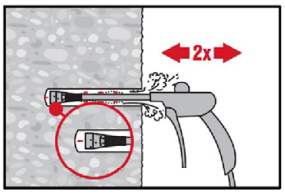
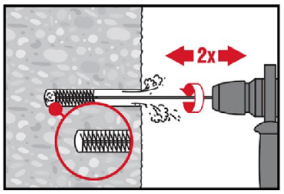
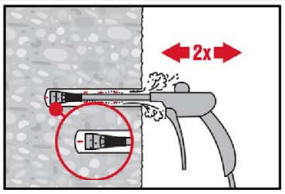


Before roughening water needs to be removed from the drill hole.
Check usability of the roughening tool with the wear gauge RTG.
Roughen the drill hole over the whole length to the required l_v.
Roughening time $t_{roughen}$ see Table B11.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B13**
Intended Use Installation instructions	

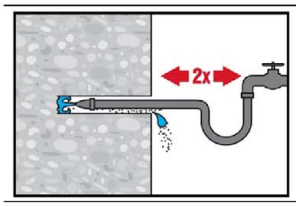
Splicing applications	
	• Measure and control concrete cover c. • $c_{drill} = c + d_0/2$. • Drill parallel to edge and to existing rebar. • Where applicable use Hilti drilling aid HIT-BH.
Drilling aid	For drill hole depths > 20 cm use drilling aid.
	Ensure that the drill hole is parallel to the existing rebar. Three different options can be considered: • Hilti drilling aid HIT-BH • Lath or spirit level • Visual check
	Hole drilling with Hilti drilling aid HIT-BH
Drill hole cleaning	Just before setting the bar the drill hole must be free of dust and debris. Inadequate hole cleaning = poor load values.
Manual Cleaning (MC)	For drill hole diameters $d_0 \leq 20$ mm and drill hole depths $\leq 10 \cdot \phi$.
	The Hilti hand pump may be used for blowing out drill holes up to diameters $d_0 \leq 20$ mm and drill hole depths $\leq 10 \cdot \phi$. Blow out at least 4 times from the back of the drill hole until return air stream is free of noticeable dust.
	Brush 4 times with the specified brush (see Table B7) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it. The brush must produce natural resistance as it enters the drill hole (brush Ø ≥ drill hole Ø) - if not the brush is too small and must be replaced with the proper brush diameter.
	Blow out again with the Hilti hand pump at least 4 times until return air stream is free of noticeable dust.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B14**
Intended Use Installation instructions	

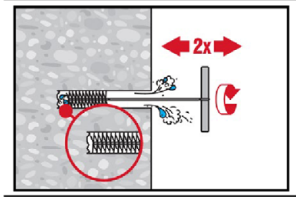
Compressed Air Cleaning (CAC)	For ϕ 8 to ϕ 12 and drill hole depths ≤ 250 mm or ϕ > 12 mm and drill hole depths ≤ 20 · ϕ.
	Blow 2 times from the back of the hole (if needed with nozzle extension) over the whole length with oil-free compressed air (min. 6 bar at 6 m³/h) until return air stream is free of noticeable dust. Safety tip: Do not inhale concrete dust.
	Brush 2 times with the specified brush (see Table B7) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it. The brush must produce natural resistance as it enters the drill hole (brush Ø ≥ drill hole Ø) - if not the brush is too small and must be replaced with the proper brush diameter.
	Blow again 2 times from the back of the hole over the whole length with compressed air until return air stream is free of noticeable dust.
Compressed Air Cleaning (CAC)	For ϕ 8 to ϕ 12 and drill hole depths > 250 mm or ϕ > 12 mm and drill hole depths > 20 · ϕ.
	Use the appropriate air nozzle Hilti HIT-DL (see Table B7). Blow 2 times from the back of the hole over the whole length with oil-free compressed air until return air stream is free of noticeable dust. For drill hole diameters ≥ 32 mm the compressor has to supply a minimum air flow of 140 m³/h. Safety tip: Do not inhale concrete dust.
	Screw the round steel brush HIT-RB in one end of the brush extension(s) HIT-RBS, so that the overall length of the brush is sufficient to reach the base of the drill hole. Attach the other end of the extension to the TE-C/TE-Y chuck. Brush 2 times with the specified brush (see Table B7) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) and removing it. Safety tip: Start machine brushing operation slowly. Start brushing operation once the brush is inserted in the drill hole.
	Use the appropriate air nozzle Hilti HIT-DL (see Table B7). Blow 2 times from the back of the hole over the whole length with oil-free compressed air until return air stream is free of noticeable dust.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B15**
Intended Use Installation instructions	

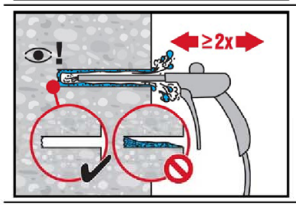
Cleaning of diamond cored holes with roughening with Hilti roughening tool TE-YRT:
For all drill hole diameters d_0 and all drill hole depths.



Flush 2 times by inserting a water hose (water-line pressure) to the back of the hole until water runs clear.

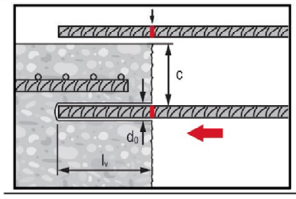


Brush 2 times with the specified brush (see Table B9) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it.
The brush must produce natural resistance as it enters the drill hole (brush Ø ≥ drill hole Ø) - if not the brush is too small and must be replaced with the proper brush diameter.



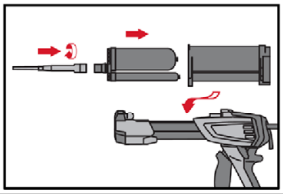
Blow 2 times from the back of the hole (if needed with nozzle extension) over the whole length with oil-free compressed air (min. 6 bar at 6 m³/h) until return air stream is free of noticeable dust and water. Remove all water from the drill hole until drill hole is completely dried before mortar injection. Blow time see Table B11. For drill hole diameters ≥ 32 mm the compressor has to supply a minimum air flow of 140 m³/h.

Rebar preparation

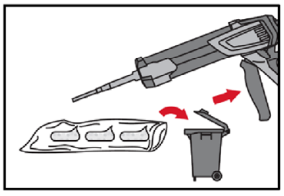


Before use, make sure the rebar is dry and free of oil or another residue.
Mark the embedment depth on the rebar (e.g. with tape) → l_v or $l_{e,ges.}$
Insert rebar in drill hole to verify hole and setting depth l_v or $l_{e,ges.}$.

Injection preparation



Tightly attach Hilti mixing nozzle HIT-RE-M to foil pack manifold. Do not modify the mixing nozzle.
Observe the instruction for use of the dispenser.
Check foil pack holder for proper function. Insert foil pack into foil pack holder and put holder into dispenser.

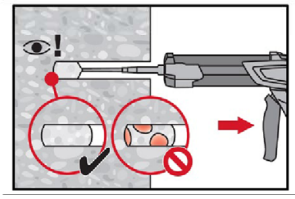


The foil pack opens automatically as dispensing is initiated. Depending on the size of the foil pack an initial amount of adhesive has to be discarded.
Discarded quantities are:
2 strokes for 330 ml foil pack,
3 strokes for 500 ml foil pack,
4 strokes for 500 ml foil pack < 5°C.
The minimum foil pack temperature is 0°C.

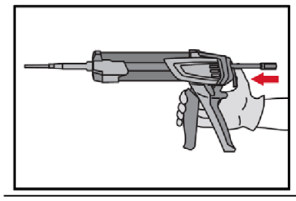
Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B16**
Intended Use Installation instructions	

Inject adhesive from the back of the drill hole without forming air voids.

Injection method for drill hole depth ≤ 250 mm (without overhead applications)

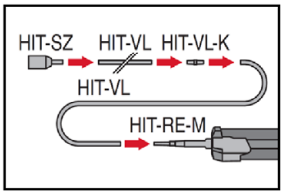


Inject the adhesive starting at the back of the hole, slowly withdrawing the mixer with each trigger pull.
Fill approximately 2/3 of the drill hole to ensure that the annular gap between the rebar or Hilti tension anchor and the concrete is completely filled with adhesive along the embedment length.

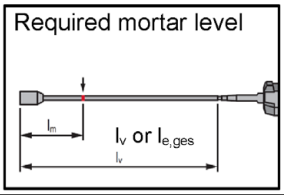


After injection is completed, depressurize the dispenser by pressing the release trigger. This will prevent further adhesive discharge from the mixer.

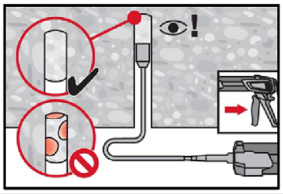
Injection method for drill hole depth > 250 mm or overhead applications



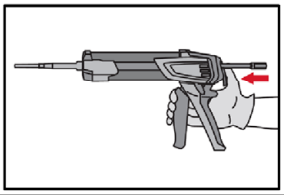
Assemble mixing nozzle HIT-RE-M, extension(s) and piston plug HIT-SZ (see Table B7 to Table B9).
For combinations of several injection extensions use coupler HIT-VL-K.
A substitution of the injection extension for a plastic hose or a combination of both is permitted.
The combination of HIT-SZ piston plug with HIT-VL 16 pipe and HIT-VL 16 tube supports proper injection.



Mark the required mortar level l_m and embedment depth l_v ($l_{e,ges}$ for HZA(-R)) with tape or marker on the injection extension.
Estimation:
$l_m = 1/3 \cdot l_v$ for rebar, $l_m = 1/3 \cdot l_{e,ges}$ for HZA(-R)
Precise formula for optimum mortar volume:
$l_m = l_v \cdot (1{,}2 \cdot (\phi^2 / d_0^2) - 0{,}2)$ for rebar, $l_m = l_{e,ges} \cdot (1{,}2 \cdot (\phi^2 / d_0^2) - 0{,}2)$ for HZA(-R)

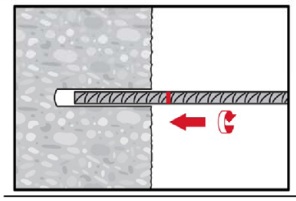
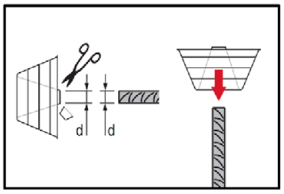
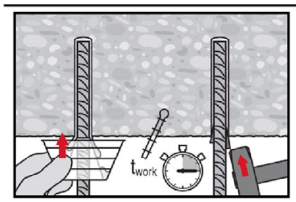
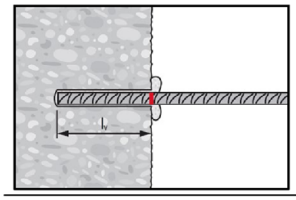
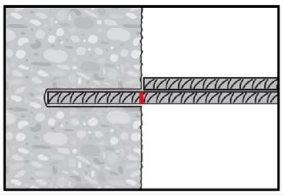
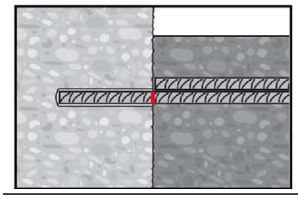


For overhead installation the injection is only possible with the aid of extensions and piston plugs. Assemble HIT-RE-M mixer, extension(s) and appropriately sized piston plug (see Table B7 to Table B9). Insert piston plug to back of the hole and inject adhesive. During injection the piston plug will be naturally extruded out of the drill hole by the adhesive pressure.



After injection is completed, depressurize the dispenser by pressing the release trigger. This will prevent further adhesive discharge from the mixer.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B17**
Intended Use Installation instructions	

Setting the element	Before use, verify that the element is dry and free of oil and other contaminants.
	For easy installation insert the rebar into the drill hole while slowly twisting until the embedment mark is at the concrete surface level.
	For overhead application: During insertion of the rebar mortar might flow out of the drill hole. For collection of the flowing mortar overhead dripping cup HIT-OHC may be used.
	Support the rebar and secure it from falling until mortar has started to harden, e.g. using wedges HIT-OHW.
	After installing the rebar the annular gap must be completely filled with mortar. Proper installation: • desired anchoring embedment l_v is reached: embedment mark at concrete surface. • excess mortar flows out of the drill hole after the rebar has been fully inserted until the embedment mark.
	Observe the working time t_{work} (see Table B6), which varies according to temperature of base material. Minor adjustments to the rebar position may be performed during the working time.
	Full load may be applied only after the curing time t_{cure} has elapsed (see Table B6).

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex B18**
Intended Use Installation instructions	

Minimum anchorage length and minimum lap length under static loading

The minimum anchorage length $l_{b,min}$ and the minimum lap length $l_{0,min}$ according to EN 1992-1-1 shall be multiplied by the respective amplification factor α_{lb} or $\alpha_{lb,100y}$ given in Table C1.

Table C1: Amplification factor α_{lb} and $\alpha_{lb,100y}$ for hammer drilling (HD) and (HDB), compressed air drilling (CA) and diamond coring with roughening with Hilti roughening tool TE-YRT (RT)

	Amplification factor $\alpha_{lb} = \alpha_{lb,100y}$ [-]								
Size	Concrete class								
[mm]	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
ϕ 8 to ϕ 40 HZA M12 to M27 HZA-R M12 to M24	1,0								

Table C2: HIT-HY 200-A V3, bond efficiency factor k_b and $k_{b,100y}$ for hammer drilling (HD) and (HDB), compressed air drilling (CA) and diamond coring with roughening with Hilti roughening tool TE-YRT (RT)

	Bond efficiency factor $k_b = k_{b,100y}$ [-]								
Size	Concrete class								
[mm]	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
ϕ 8 to ϕ 32 HZA M12 to M27 HZA-R M12 to M24	1,0								

Table C3: HIT-HY 200-R V3, bond efficiency factor k_b and $k_{b,100y}$ for hammer drilling (HD) and (HDB), compressed air drilling (CA) and diamond coring with roughening with Hilti roughening tool TE-YRT (RT)

	Bond efficiency factor $k_b = k_{b,100y}$ [-]								
Size	Concrete class								
[mm]	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
ϕ 8 to ϕ 32 HZA M12 to M27 HZA-R M12 to M24	1,0								
ϕ 34	1,0								
ϕ 36	1,0								0,93
ϕ 40	1,0							0,92	0,86

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex C1**
Performances Amplification factor and bond efficiency factor	

$f_{bd,PIR} = k_b \cdot f_{bd}$

$f_{bd,PIR,100y} = k_{b,100y} \cdot f_{bd}$

f_{bd}: Design value of the bond strength in N/mm² considering

- the concrete strength class
- good bond condition (for all other bond conditions multiply the values by $\eta_1 = 0,7$)
- recommended partial factor $\gamma_c = 1,5$ according to EN 1992-1-1.
- rebar diameter for $\phi > 32$ mm ($\eta_2 = (132 - \phi) / 100$)

k_b, $k_{b,100y}$: Bond efficiency factor according to Table C2 and Table C3

Table C4: HIT-HY 200-A V3, design values of the bond strength $f_{bd,PIR}$ and $f_{bd,PIR,100y}$ for hammer drilling (HD) and (HDB), compressed air drilling (CA) and diamond coring with roughening with Hilti roughening tool TE-YRT (RT)

	Bond strength $f_{bd,PIR} = f_{bd,PIR,100y}$ [N/mm²]								
size	concrete class								
[mm]	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
ϕ 8 to ϕ 32 HZA M12 to M27 HZA-R M12 to M24	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3

Table C5: HIT-HY 200-R V3, design values of the bond strength $f_{bd,PIR}$ and $f_{bd,PIR,100y}$ for hammer drilling (HD) and (HDB), compressed air drilling (CA) and diamond coring with roughening with Hilti roughening tool TE-YRT (RT)

	Bond strength $f_{bd,PIR} = f_{bd,PIR,100y}$ [N/mm²]								
Size	Concrete class								
[mm]	C12/15	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
ϕ 8 to ϕ 32 HZA M12 to M27 HZA-R M12 to M24	1,6	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
ϕ 34	1,6	2,0	2,3	2,7	2,9	3,3	3,6	3,9	4,2
ϕ 36	1,6	1,9	2,2	2,6	2,9	3,3	3,6	3,8	3,8
ϕ 40	1,5	1,8	2,1	2,5	2,8	3,1	3,4	3,4	3,4

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex C2**
Performances Design values of the bond strength $f_{bd,PIR}$ and $f_{bd,PIR,100y}$ for static loading	

Tensile steel strength of Hilti tension anchor HZA / HZA-R

Table C6: Characteristic tensile yield strength for rebar part of Hilti tension anchor HZA / HZA-R

Hilti tension anchor HZA, HZA-R			M12	M16	M20	M24	M27
Rebar diameter	ϕ	[mm]	12	16	20	25	28
Characteristic tensile yield strength	f_{yk}	[N/mm^2]	500	500	500	500	500[1)]
Partial factor for rebar part	$\gamma_{Ms,N}$[2)]	[-]	1,15				

1) HZA-R size M27 not available.
2) In absence of national regulations.

Table C7: Characteristic tensile steel strength for threaded/smooth part of Hilti tension anchor HZA / HZA-R

Hilti tension anchor HZA, HZA-R			M12	M16	M20	M24	M27
Steel failure							
Characteristic resistance HZA	$N_{Rk,s}$	[kN]	46	86	135	194	253
Characteristic resistance HZA-R	$N_{Rk,s}$	[kN]	62	111	173	248	-[1)]
Partial factor for threaded part	$\gamma_{Ms,N}$[2)]	[-]	1,4				

1) HZA-R size M27 not available.
2) In absence of national regulations.

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex C3**
Performances Characteristic tensile steel strength for Hilti tension anchor	

Minimum anchorage length and minimum lap length under seismic action

The minimum anchorage length $l_{b,min}$ and the minimum lap length $l_{0,min}$ according to EN 1992-1-1 shall be multiplied by the relevant amplification factor α_{lb} or $\alpha_{lb,100y}$ given in Table C1.

The minimum concrete cover according to Table B3 and $c_{min,seis} = 2 \cdot \phi$ applies.

Table C8: HIT-HY 200-A V3, seismic bond efficiency factors $k_{b,seis}$ and $k_{b,seis,100y}$ for hammer drilling (HD) and (HDB), compressed air drilling (CA) and diamond coring with roughening with Hilti roughening tool TE-YRT (RT)

	Bond efficiency factor $k_{b,seis} = k_{b,seis,100y}$ [-]							
Size	Concrete class							
[mm]	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
ϕ 10 to ϕ 18	1,0				0,90	0,82	0,76	0,71
ϕ 20 to ϕ 30	1,0						0,92	0,86
ϕ 32	1,0							

Table C9: HIT-HY 200-R V3, seismic bond efficiency factors $k_{b,seis}$ and $k_{b,seis,100y}$ for hammer drilling (HD) and (HDB), compressed air drilling (CA) and diamond coring with roughening with Hilti roughening tool TE-YRT (RT)

	Bond efficiency factor $k_{b,seis} = k_{b,seis,100y}$ [-]							
Size	Concrete class							
[mm]	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
ϕ 10 to ϕ 18	1,0				0,90	0,82	0,76	0,71
ϕ 20 to ϕ 30	1,0						0,92	0,86
ϕ 32	1,0							
ϕ 34	1,0				0,90	0,83	0,76	0,71
ϕ 36	1,0				0,90	0,82	0,76	0,71
ϕ 40	1,0			0,91	0,80	0,73	0,67	0,63

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex C4**
Performances Seismic bond efficiency factor	

$f_{bd,PIR,seis} = k_{b,seis} \cdot f_{bd}$

$f_{bd,PIR,seis,100y} = k_{b,seis,100y} \cdot f_{bd}$

f_{bd}: Design value of the bond strength in N/mm² considering

- the concrete strength class
- good bond condition (for all other bond conditions multiply the values by $\eta_1 = 0,7$)
- recommended partial factor $\gamma_c = 1,5$ according to EN 1992-1-1.
- rebar diameter for $\phi > 32$ mm ($\eta_2 = (132 - \phi) / 100$)

$k_{b,seis}$, $k_{b,seis,100y}$: Bond efficiency factor according to table C10 and Table C11

Table C10: HIT-HY 200-A V3, design values of the bond strength $f_{bd,PIR,seis}$ and $f_{bd,PIR,seis,100y}$ for seismic action for hammer drilling (HD) and (HDB), compressed air drilling (CA) and diamond coring with roughening with Hilti roughening tool TE-YRT (RT)

	Bond strength $f_{bd,PIR,seis} = f_{bd,PIR,seis,100y}$ [N/mm²]							
Size	Concrete class							
[mm]	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
ϕ 10 to ϕ 18	2,0	2,3	2,7	3,0	3,0	3,0	3,0	3,0
ϕ 20 to ϕ 30	2,0	2,3	2,7	3,0	3,4	3,7	3,7	3,7
ϕ 32	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3

Table C11: HIT-HY 200-R V3, design values of the bond strength $f_{bd,PIR,seis}$ and $f_{bd,PIR,seis,100y}$ for seismic action for hammer drilling (HD) and (HDB), compressed air drilling (CA) and diamond coring with roughening with Hilti roughening tool TE-YRT (RT)

	Bond strength $f_{bd,PIR,seis} = f_{bd,PIR,seis,100y}$ [N/mm²]							
Size	Concrete class							
[mm]	C16/20	C20/25	C25/30	C30/37	C35/45	C40/50	C45/55	C50/60
ϕ 10 to ϕ 18	2,0	2,3	2,7	3,0	3,0	3,0	3,0	3,0
ϕ 20 to ϕ 30	2,0	2,3	2,7	3,0	3,4	3,7	3,7	3,7
ϕ 32	2,0	2,3	2,7	3,0	3,4	3,7	4,0	4,3
ϕ 34	2,0	2,3	2,7	2,9	3,0	3,0	3,0	3,0
ϕ 36	1,9	2,2	2,6	2,9	2,9	2,9	2,9	2,9
ϕ 40	1,8	2,1	2,5	2,5	2,5	2,5	2,5	2,5

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections

Performances
Design values of the bond strengths $f_{bd,PIR,seis}$ and $f_{bd,PIR,seis,100y}$ for seismic action

Annex C5

Bond strengths $f_{bd,fi}$ and $f_{bd,fi,100y}$ at increased temperature for concrete strength classes C12/15 to C50/60 with all drilling methods under static loading

The bond strengths $f_{bd,fi}$ for a working life of 50 years and $f_{bd,fi,100y}$ for a working life of 100 years at increased temperature have to be calculated by the following equations:

$f_{bd,fi} = k_{fi}(\theta) \cdot f_{bd,PIR} \cdot \gamma_c / \gamma_{M,fi}$ for a working life of 50 years

$f_{bd,fi,100y} = k_{fi,100y}(\theta) \cdot f_{bd,PIR,100y} \cdot \gamma_c / \gamma_{M,fi}$ for a working life of 100 years

with: $\theta \leq 268$ °C: $k_{fi}(\theta) = 24{,}661 \cdot e^{(-0{,}013 \cdot \Theta)} / (f_{bd,PIR} \cdot 4{,}3) \leq 1{,}0$ 50 years

$k_{fi,100y}(\theta) = 24{,}661 \cdot e^{(-0{,}013 \cdot \Theta)} / (f_{bd,PIR,100y} \cdot 4{,}3) \leq 1{,}0$ 100 years

and $\theta > \theta_{max}$: $k_{fi}(\theta) = k_{fi,100y}(\theta) = 0{,}0$

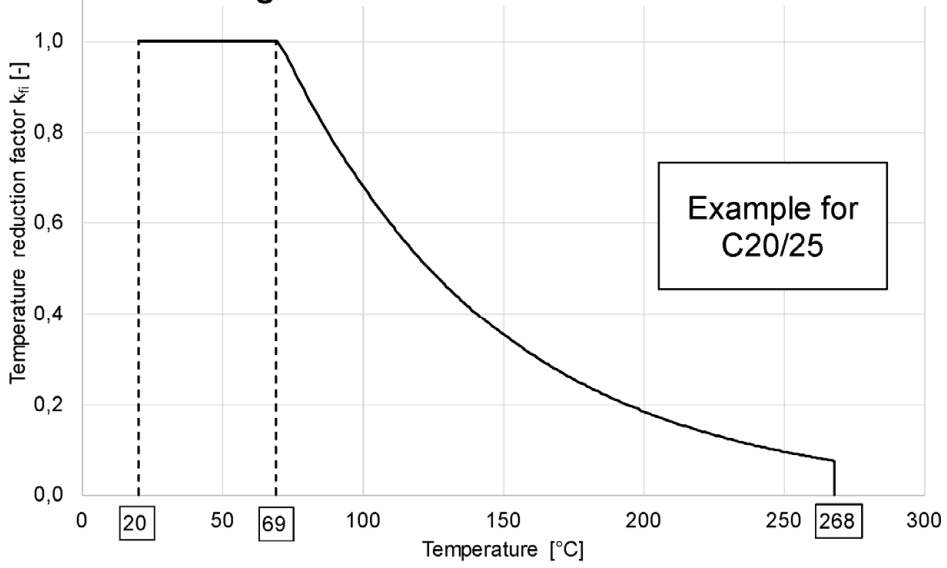
$\theta_{max} = 268$ °C

$f_{bd,fi}$; $f_{bd,fi,100y}$	Design value of bond strength at increased temperature in N/mm² for a working life of 50 years; 100 years
θ	Temperature in °C in the mortar
θ_{max}	Temperature in °C at which the mortar can no longer transfer bond stresses
$k_{fi}(\theta)$; $k_{fi,100y}(\theta)$	Temperature reduction factor for a working life of 50 years; 100 years
$f_{bd,PIR}$; $f_{bd,PIR,100y}$	Design value of bond strength in N/mm² in cold condition according to Table C4 and Table C5 considering concrete class, rebar diameter, drilling method and bond condition according to EN 1992-1-1 for a working life of 50 years; 100 years
γ_c	1,5 Partial factor according to EN 1992-1-1
$\gamma_{M,fi}$	1,0 Partial factor according to EN 1992-1-2

At increased temperature the anchorage length shall be calculated according to EN 1992-1-1 Equation 8.3 using the temperature-dependent ultimate bond strength $f_{bd,fi}$.

Please note that for a tension anchor application with HZA(-R) the temperature distribution in the concrete at increased temperature differs from the temperature distribution of an embedded post-installed rebar.

Figure C1 Example graph of reduction factor $k_{fi}(\theta) = k_{fi,100y}(\theta)$ for concrete strength class C20/25 for good bond conditions:



Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections	**Annex C6**
Performances Bond strengths $f_{bd,fi}$ and $f_{bd,fi,100y}$ at increased temperature Temperature reduction factors $k_{fi}(\theta)$ and $k_{fi,100y}(\theta)$ at increased temperature	

Deutsches Institut für Bautechnik DIBt

Table C12: Characteristic tensile steel strength under direct fire exposure for Hilti tension anchor HZA, all drilling methods

Hilti tension anchor HZA				M12	M16	M20	M24	M27
Characteristic tensile strength	R30	$N_{Rk,s,fi}$	[kN]	1,7	3,1	4,9	7,1	9,2
	R60			1,3	2,4	3,7	5,3	6,9
	R90			1,1	2,0	3,2	4,6	6,0
	R120			0,8	1,6	2,5	3,5	4,6

Table C13: Characteristic tensile steel strength under direct fire exposure for Hilti tension anchor HZA-R, all drilling methods

Hilti tension anchor HZA-R				M12	M16	M20	M24
Characteristic tensile strength	R30	$N_{Rk,s,fi}$	[kN]	2,5	4,7	7,4	10,6
	R60			2,1	3,9	6,1	8,8
	R90			1,7	3,1	4,9	7,1
	R120			1,3	2,5	3,9	5,6

Injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 for rebar connections

Performances
Design values of tensile steel strength $N_{Rk,s,fi}$ for HZA and HZA-R under fire exposure

Annex C7

Attestation

AgBB

On the 25th of April 2023, Eurofins Product Testing A/S received a sample of a chemical anchor with the product name:

HIT-HY 200-R V3

supplied by

Hilti Entwicklungsgesellschaft mbH

The emissions were tested according to AgBB (AgBB - Committee for Health-related Evaluation of Building Products). Sampling, testing and evaluation were performed according to ISO 16000-3, ISO 16000-6, ISO 16000-9, and ISO 16000-11 (see the test report no. 392-2023-00192601_D_EN).

Evaluation of the emission test result according to AgBB:

- The sum of VOC ("TVOC") after 3 days was in compliance with the limit of ≤ 10 mg/m³.
- The sum of VOC ("TVOC") after 28 days was in compliance with the limit of ≤ 1 mg/m³.
- The sum of SVOC after 28 days was in compliance with the limit of ≤ 0.1 mg/m³.
- After 28 days the value R was calculated from the detected VOC with single concentrations above 5 µg/m³. This value R was in compliance with the limit of ≤ 1.
- The sum of VOC without LCI-value after 28 days was in compliance with the limit of ≤ 0.1 mg/m³.
- The concentration of formaldehyde after 28 days was in compliance with the limit of ≤ 0.1 mg/m³.
- Carcinogenic substances were not detectable after 3 and after 28 days

The tested product complies with the requirements of AgBB including the LCI-values (June 2021) for use in the indoor environment.

14 June 2023

Laura Hartung Sørensen
Analytical Service Manager

Rasmus Verdier
Analytical Service Manager

Eurofins Product Testing A/S • Smedeskovvej 38, 8464 Galten, Denmark • Tel. +45 70 22 42 76
www.eurofins.dk/product-testing

HIT-HY 200-R V3

Safety information for 2-Component-products

Issue date: 09/07/2021 Revision date: 09/07/2021 Version: 1.0

SECTION 1: Kit identification

1.1 Product identifier

Product name HIT-HY 200-R V3



Product code BU Anchor

1.2 Details of the supplier of the Safety information for 2-Component-products

Hilti, Inc.
Legacy Tower, Suite 1000
7250 Dallas Parkway
TX 75024 Plano - USA
T +1 9724035800
1-800-879-8000 toll free - F +1 918 254 0522

SECTION 2: General information

Storage Storage temperature : 5 - 25 °C

A SDS for each of these components is included. Please do not separate any component SDS from this cover page

This Kit should be handled in accordance with good laboratory practices and appropriate personal protective equipment should be used

SECTION 3: Kit contents

Classification of the Product

GHS-US classification

Eye Irrit. 2 H319 - Causes serious eye irritation.
Skin Sens. 1 H317 - May cause an allergic skin reaction.

Label elements

GHS US labelling

Hazard pictograms (GHS US)



GHS07

Signal word (GHS US) Warning

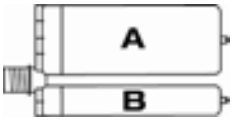
Hazardous ingredients methacrylates, dibenzoyl peroxide

Hazard statements (GHS US) May cause an allergic skin reaction.
Causes serious eye irritation.

Precautionary statements (GHS US) Wear eye protection, protective clothing, protective gloves.
Do not get in eyes, on skin, or on clothing.
IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
If skin irritation or rash occurs: Get medical advice/attention.
If eye irritation persists: Get medical advice/attention.
If on skin: Wash with plenty of water.

Additional information

2-Component-foilpack, contains:
Component A: Urethane methacrylate resin, inorganic filler
Component B: Dibenzoyl peroxide, phlegmatized



Name	General description	Quantity	Unit	GHS-US classification
HIT-HY 200-R V3, B		1	Stck. (Stück/e)	Eye Irrit. 2, H319 Skin Sens. 1, H317
HIT-HY 200-R V3, A		1	Stck. (Stück/e)	Skin Sens. 1, H317

SECTION 4: General advice

General advice	For professional users only

SECTION 5: Safe handling advice

General measures	Spilled material may present a slipping hazard
Environmental precautions	Prevent entry to sewers and public waters Notify authorities if liquid enters sewers or public waters
Storage conditions	Keep cool. Protect from sunlight.
Precautions for safe handling	Wear personal protective equipment Avoid contact with skin and eyes Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work Provide good ventilation in process area to prevent formation of vapour
Methods for cleaning up	This material and its container must be disposed of in a safe way, and as per local legislation Mechanically recover the product Store away from other materials.
For containment	Collect spillage.
Incompatible materials	Sources of ignition Direct sunlight
Incompatible products	Strong bases Strong acids

SECTION 6: First aid measures

First-aid measures after eye contact	Rinse immediately with plenty of water Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persists
First-aid measures after ingestion	Rinse mouth Get medical advice/attention. Do not induce vomiting Obtain emergency medical attention
First-aid measures after inhalation	Remove person to fresh air and keep comfortable for breathing. Allow affected person to breathe fresh air Allow the victim to rest
First-aid measures after skin contact	Wash contaminated clothing before reuse. Wash with plenty of water/... If skin irritation or rash occurs: Get medical advice/attention.
First-aid measures general	Take off immediately all contaminated clothing.

	Never give anything by mouth to an unconscious person If you feel unwell, seek medical advice (show the label where possible)
Symptoms/effects after eye contact	May cause severe irritation
Symptoms/effects after skin contact	May cause an allergic skin reaction.

SECTION 7: Fire fighting measures

Firefighting instructions	Use water spray or fog for cooling exposed containers Exercise caution when fighting any chemical fire Prevent fire fighting water from entering the environment
Protection during firefighting	Self-contained breathing apparatus Do not enter fire area without proper protective equipment, including respiratory protection
Hazardous decomposition products in case of fire	Thermal decomposition generates : Carbon dioxide Carbon monoxide

SECTION 8: Other information

No data available

HIT-HY 200-R V3, A

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Issue date: 07/09/2021 Revision date: 07/09/2021 Version: 1.0

SECTION 1: Identification

1.1. Identification

Product form	Mixture
Product name	HIT-HY 200-R V3, A
Product code	BU Anchor

1.2. Recommended use and restrictions on use

Use of the substance/mixture	Composite mortar component for fasteners in the construction industry
Restrictions on use	For professional use only

1.3. Supplier

Supplier
Hilti, Inc.
Legacy Tower, Suite 1000
7250 Dallas Parkway
Plano, TX 75024 - USA
T +1 9724035800
1-800-879-8000 toll free - F +1 918 254 0522

Department issuing data specification sheet
Hilti Entwicklungsgesellschaft mbH
Hiltistraße 6
Kaufering, 86916 - Deutschland
T +49 8191 906876
anchor.hse@hilti.com

1.4. Emergency telephone number

Emergency number

Chem-Trec
Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada)
Tel.: 703 527 3887 (Other countries)
+1 918 8723000
1-800-879-8000 toll free

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin sensitisation, Category 1	H317	May cause an allergic skin reaction.

Full text of H-statements: see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labelling

Hazard pictograms (GHS US)



Signal word (GHS US)	Warning
Hazard statements (GHS US)	H317 - May cause an allergic skin reaction.
Precautionary statements (GHS US)	P280 - Wear eye protection, protective clothing, protective gloves. P262 - Do not get in eyes, on skin, or on clothing. P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P333+P313 - If skin irritation or rash occurs: Get medical advice/attention. P337+P313 - If eye irritation persists: Get medical advice/attention. P302+P352 - If on skin: Wash with plenty of water.

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS-US classification
Quartz (SiO2)	(CAS-No.) 14808-60-7	40 – 60	Carc. 1A, H350
2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester	(CAS-No.) 2082-81-7	10 – 25	Skin Sens. 1B, H317
2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol	(CAS-No.) 27813-02-1	5 – 10	Eye Irrit. 2A, H319 Skin Sens. 1, H317

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general: Take off immediately all contaminated clothing. Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing. Allow affected person to breathe fresh air. Allow the victim to rest.

4.2. Most important symptoms and effects (acute and delayed)

Potential adverse human health effects and symptoms: No additional information available.

Symptoms/effects after skin contact: May cause an allergic skin reaction.

Symptoms/effects after eye contact: May cause severe irritation.

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Water spray. Carbon dioxide. Dry powder. Foam. Sand.

Unsuitable extinguishing media: Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Hazardous decomposition products in case of fire: Thermal decomposition generates : Carbon dioxide. Carbon monoxide.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions: Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment.

Protection during firefighting: Self-contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Spilled material may present a slipping hazard.

6.1.1. For non-emergency personnel

Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment: Use personal protective equipment as required. Equip cleanup crew with proper protection.

Emergency procedures: Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment: Collect spillage.

Methods for cleaning up: This material and its container must be disposed of in a safe way, and as per local legislation. Mechanically recover the product. Store away from other materials.

Other information: Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling: Wear personal protective equipment. Avoid contact with skin and eyes. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour.

Hygiene measures: Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions: Keep cool. Protect from sunlight.

Incompatible products: Strong bases. Strong acids.

Incompatible materials: Sources of ignition. Direct sunlight.

Storage temperature: 5 – 25 °C

Heat and ignition sources: Keep away from heat and direct sunlight.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

HIT-HY 200-R V3, A	
No additional information available	

Quartz (SiO2) (14808-60-7)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Silica crystaline - quartz
ACGIH OEL TWA	0.025 mg/m³ (Respirable fraction)
Remark (ACGIH)	TLV® Basis: Pulm fibrosis; lung cancer. Notations: A2 (Suspected Human Carcinogen)
Regulatory reference	ACGIH 2021
USA - OSHA - Occupational Exposure Limits	
Local name	Silica, crystalline quartz, respirable dust

Remark (OSHA)	(3) See Table Z-3.

2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)
No additional information available

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)
No additional information available

Additional information: The product has a pasty consistency. Exposure limit values for respirable dusts are not relevant for this product.

8.2. Appropriate engineering controls

Appropriate engineering controls: Ensure good ventilation of the work station.

Environmental exposure controls: Not applicable.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Safety glasses. Gloves. Protective clothing. Avoid all unnecessary exposure.

Hand protection:

Wear protective gloves. The permeation time is not the maximum wearing time! Generally speaking, it must be reduced. Contact with either mixtures of substances or different substances may shorten the protective function's effective duration.

Type	Material	Permeation	Thickness (mm)	Penetration
Disposable gloves	Nitrile rubber (NBR)	6 (> 480 minutes)	0,12	

Eye protection:

Wear security glasses which protect from splashes

Type	Field of application	Characteristics
Safety glasses	Droplet	clear

Skin and body protection:

Wear suitable protective clothing

Personal protective equipment symbol(s):



Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid
Appearance	Thixotropic paste.
Colour	Black
Odour	characteristic
Odour threshold	Not determined
pH	No data available
Melting point	No data available
Freezing point	No data available
Boiling point	No data available
Flash point	> 109 °C DIN EN ISO 1523

Relative evaporation rate (butylacetate=1)	No data available
Flammability (solid, gas)	Non flammable.
Vapour pressure	No data available
Relative vapour density at 20 °C	No data available
Relative density	No data available
Density	1.8 g/ml AW 4.3.23
Solubility	Water: % Not miscible
Partition coefficient n-octanol/water (Log Pow)	No data available
Auto-ignition temperature	Not self-igniting
Decomposition temperature	No data available
Viscosity, kinematic	27777.778 mm²/s
Viscosity, dynamic	50 Pa·s HN-0333
Explosive limits	No data available
Explosive properties	Product is not explosive.
Oxidising properties	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No additional information available.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

fume. Carbon monoxide. Carbon dioxide. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	Not classified
Acute toxicity (dermal)	Not classified
Acute toxicity (inhalation)	Not classified

2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)	
LD50 oral rat	10066 mg/kg
LD50 dermal rat	> 3000 mg/kg

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
LD50 oral rat	> 5000 mg/kg (Rat; OECD 401: Acute Oral Toxicity; Literature study; >=2000 mg/kg bodyweight; Rat; Experimental value)
LD50 dermal rabbit	≥ 5000 mg/kg bodyweight (Rabbit; Experimental value)

Skin corrosion/irritation	Not classified
Serious eye damage/irritation	Not classified

Respiratory or skin sensitisation	May cause an allergic skin reaction.
Germ cell mutagenicity	Not classified
Carcinogenicity	Not classified

Quartz (SiO2) (14808-60-7)	
IARC group	1 - Carcinogenic to humans

Reproductive toxicity	Not classified
STOT-single exposure	Not classified
STOT-repeated exposure	Not classified
Aspiration hazard	Not classified
Viscosity, kinematic	27777.778 mm²/s
Potential adverse human health effects and symptoms	No additional information available.
Symptoms/effects after skin contact	May cause an allergic skin reaction.
Symptoms/effects after eye contact	May cause severe irritation.

SECTION 12: Ecological information

12.1. Toxicity

2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)	
LC50 - Other aquatic organisms [1]	9.79 mg/l
NOEC (acute)	7.51 mg/l
NOEC (chronic)	20 mg/l

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
LC50 - Fish [1]	493 mg/l (48 h; Leuciscus idus; GLP)
EC50 - Crustacea [1]	> 143 mg/l (48 h; Daphnia magna; GLP)
ErC50 algae	97.2 mg/l (OECD 201: Alga, Growth Inhibition Test, 72 h, Pseudokirchneriella subcapitata, Static system, Fresh water, Experimental value, GLP)
Threshold limit - Algae [1]	> 97.2 mg/l (72 h; Pseudokirchneriella subcapitata; GLP)
Threshold limit - Algae [2]	> 97.2 mg/l (72 h; Pseudokirchneriella subcapitata; GLP)

12.2. Persistence and degradability

HIT-HY 200-R V3, A	
Persistence and degradability	Not established.

Quartz (SiO2) (14808-60-7)	
Persistence and degradability	Biodegradability: not applicable.
Chemical oxygen demand (COD)	Not applicable (inorganic)
ThOD	Not applicable (inorganic)

2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)	
Biodegradation	84 %

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
Persistence and degradability	Readily biodegradable in water.

12.3. Bioaccumulative potential

HIT-HY 200-R V3, A	
Bioaccumulative potential	Not established.

Quartz (SiO2) (14808-60-7)	
Bioaccumulative potential	No bioaccumulation data available.

2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)	
Partition coefficient n-octanol/water (Log Pow)	3.1

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
BCF - Fish [1]	≤ 100
BCF - Fish [2]	3.2 Quantitative structure-activity relationship (QSAR)
Partition coefficient n-octanol/water (Log Pow)	0.97 (OECD 102 method)
Bioaccumulative potential	Low bioaccumulation potential (BCF < 500).

12.4. Mobility in soil

Quartz (SiO2) (14808-60-7)	
Surface tension	No data available in the literature
Ecology - soil	Low potential for mobility in soil.

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
Partition coefficient n-octanol/water (Log Koc)	1.9 (log Koc, Calculated value)
Ecology - soil	Highly mobile in soil.

12.5. Other adverse effects

Other information: Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Disposal methods

Regional legislation (waste): Disposal must be done according to official regulations.

Product/Packaging disposal recommendations: After curing, the product can be disposed of with household waste. . Full or only partially emptied cartridges must be disposed of as special waste in accordance with official regulations. Packaging contaminated by the product : Dispose in a safe manner in accordance with local/national regulations.

Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / RID

ADR	IMDG	IATA	RID
14.1. UN number			
Not regulated	Not regulated	Not regulated	Not regulated
14.2. UN proper shipping name			
Not regulated	Not regulated	Not regulated	Not regulated
14.3. Transport hazard class(es)			
Not regulated	Not regulated	Not regulated	Not regulated
14.4. Packing group			
Not regulated	Not regulated	Not regulated	Not regulated
14.5. Environmental hazards			
Not regulated	Not regulated	Not regulated	Not regulated
No supplementary information available			

14.6. Special precautions for user

Overland transport
Not regulated

Transport by sea
Not regulated

Air transport
Not regulated

Rail transport
Not regulated

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed as Active, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

15.2. International regulations

CANADA

Quartz (SiO2) (14808-60-7)
Listed on the Canadian DSL (Domestic Substances List)

2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)
Listed on the Canadian DSL (Domestic Substances List)

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

No additional information available

National regulations

Quartz (SiO2) (14808-60-7)
Listed on IARC (International Agency for Research on Cancer)

15.3. US State regulations

⚠ **WARNING:** This product can expose you to 1,2-dihydroxybenzene, which is known to the State of California to cause cancer. For more information go to www.P65Warnings.ca.gov.

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date	07/09/2021
Other information	None.

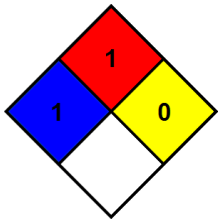
Full text of H-statements:

H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H350	May cause cancer.

Abbreviations and acronyms:

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC50	Median effective concentration
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
vPvB	Very Persistent and Very Bioaccumulative

NFPA health hazard	1 - Materials that, under emergency conditions, can cause significant irritation.
NFPA fire hazard	1 - Materials that must be preheated before ignition can occur.
NFPA reactivity	0 - Material that in themselves are normally stable, even under fire conditions.



SDS_US_Hilti

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

HIT-HY 200-R V3, B

Safety Data Sheet

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Issue date: 07/09/2021 Revision date: 07/09/2021 Version: 1.0

SECTION 1: Identification

1.1. Identification

Product form	Mixture
Product name	HIT-HY 200-R V3, B
Product code	BU Anchor

1.2. Recommended use and restrictions on use

Use of the substance/mixture	Composite mortar component for fasteners in the construction industry
Restrictions on use	For professional use only

1.3. Supplier

Supplier
Hilti, Inc.
Legacy Tower, Suite 1000
7250 Dallas Parkway
Plano, TX 75024 - USA
T +1 9724035800
1-800-879-8000 toll free - F +1 918 254 0522

Department issuing data specification sheet
Hilti Entwicklungsgesellschaft mbH
Hiltistraße 6
Kaufering, 86916 - Deutschland
T +49 8191 906876
anchor.hse@hilti.com

1.4. Emergency telephone number

Emergency number

Chem-Trec
Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada)
Tel.: 703 527 3887 (Other countries)
+1 918 8723000
1-800-879-8000 toll free

SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Serious eye damage/eye irritation, Category 2	H319	Causes serious eye irritation.
Skin sensitisation, Category 1	H317	May cause an allergic skin reaction.

Full text of H-statements: see section 16

2.2. GHS Label elements, including precautionary statements

GHS US labelling

Hazard pictograms (GHS US)



Signal word (GHS US)	Warning
Hazard statements (GHS US)	H317 - May cause an allergic skin reaction. H319 - Causes serious eye irritation.
Precautionary statements (GHS US)	P280 - Wear eye protection, protective clothing, protective gloves. P262 - Do not get in eyes, on skin, or on clothing. P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. P333+P313 - If skin irritation or rash occurs: Get medical advice/attention. P337+P313 - If eye irritation persists: Get medical advice/attention. P302+P352 - If on skin: Wash with plenty of water.

2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

Name	Product identifier	%	GHS-US classification
Quartz (SiO2)	(CAS-No.) 14808-60-7	40 – 60	Carc. 1A, H350
dibenzoyl peroxide	(CAS-No.) 94-36-0	10 – 25	Org. Perox. B, H241 Eye Irrit. 2A, H319 Skin Sens. 1, H317

Full text of hazard classes and H-statements : see section 16

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general: Take off immediately all contaminated clothing. Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).

First-aid measures after inhalation: Remove person to fresh air and keep comfortable for breathing. Allow affected person to breathe fresh air. Allow the victim to rest.

First-aid measures after skin contact: Wash contaminated clothing before reuse. Wash with plenty of water/... If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures after eye contact: Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persists.

First-aid measures after ingestion: Rinse mouth. Get medical advice/attention. Do not induce vomiting. Obtain emergency medical attention.

4.2. Most important symptoms and effects (acute and delayed)

Potential adverse human health effects and symptoms: No additional information available.

Symptoms/effects after skin contact: May cause an allergic skin reaction.

Symptoms/effects after eye contact: May cause severe irritation.

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media: Water spray. Carbon dioxide. Dry powder. Foam. Sand.

Unsuitable extinguishing media: Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Hazardous decomposition products in case of fire: Thermal decomposition generates : Carbon dioxide. Carbon monoxide.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions	Use water spray or fog for cooling exposed containers. Exercise caution when fighting any chemical fire. Prevent fire fighting water from entering the environment.
Protection during firefighting	Self-contained breathing apparatus. Do not enter fire area without proper protective equipment, including respiratory protection.

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures: Spilled material may present a slipping hazard.

6.1.1. For non-emergency personnel

Emergency procedures: Evacuate unnecessary personnel.

6.1.2. For emergency responders

Protective equipment	Use personal protective equipment as required. Equip cleanup crew with proper protection.
Emergency procedures	Ventilate area.

6.2. Environmental precautions

Prevent entry to sewers and public waters. Notify authorities if liquid enters sewers or public waters.

6.3. Methods and material for containment and cleaning up

For containment	Collect spillage.
Methods for cleaning up	This material and its container must be disposed of in a safe way, and as per local legislation. Mechanically recover the product. Store away from other materials.
Other information	Dispose of materials or solid residues at an authorized site.

6.4. Reference to other sections

For further information refer to section 8: "Exposure controls/personal protection". For further information refer to section 13.

SECTION 7: Handling and storage

7.1. Precautions for safe handling

Precautions for safe handling	Wear personal protective equipment. Avoid contact with skin and eyes. Wash hands and other exposed areas with mild soap and water before eating, drinking or smoking and when leaving work. Provide good ventilation in process area to prevent formation of vapour.
Hygiene measures	Do not eat, drink or smoke when using this product. Always wash hands after handling the product. Contaminated work clothing should not be allowed out of the workplace. Wash contaminated clothing before reuse.

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions	Keep cool. Protect from sunlight.
Incompatible products	Strong bases. Strong acids.
Incompatible materials	Sources of ignition. Direct sunlight.
Storage temperature	5 – 25 °C
Heat and ignition sources	Keep away from heat and direct sunlight.

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

HIT-HY 200-R V3, B	
USA - ACGIH - Occupational Exposure Limits	
Local name	Benzoyl peroxide

ACGIH OEL TWA	5 mg/m³
Remark (ACGIH)	TLV® Basis: URT & skin irr. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2021
USA - OSHA - Occupational Exposure Limits	
Local name	Benzoyl peroxide
OSHA PEL TWA [1]	5 mg/m³
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1

Quartz (SiO2) (14808-60-7)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Silica crystaline - quartz
ACGIH OEL TWA	0.025 mg/m³ (Respirable fraction)
Remark (ACGIH)	TLV® Basis: Pulm fibrosis; lung cancer. Notations: A2 (Suspected Human Carcinogen)
Regulatory reference	ACGIH 2021
USA - OSHA - Occupational Exposure Limits	
Local name	Silica, crystalline quartz, respirable dust
Remark (OSHA)	(3) See Table Z-3.

dibenzoyl peroxide (94-36-0)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Benzoyl peroxide
ACGIH OEL TWA	5 mg/m³
Remark (ACGIH)	TLV® Basis: URT & skin irr. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2020
USA - OSHA - Occupational Exposure Limits	
Local name	Benzoyl peroxide
OSHA PEL TWA [1]	5 mg/m³
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1

Additional information: The product has a pasty consistency. Exposure limit values for respirable dusts are not relevant for this product.

8.2. Appropriate engineering controls

Appropriate engineering controls: Ensure good ventilation of the work station.

Environmental exposure controls: No specific measures are required provided the product is handled in accordance with the general rules of occupational hygiene and safety.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

Safety glasses. Gloves. Protective clothing. Avoid all unnecessary exposure.

Hand protection:

Wear protective gloves. The permeation time is not the maximum wearing time! Generally speaking, it must be reduced. Contact with either mixtures of substances or different substances may shorten the protective function's effective duration.

Type	Material	Permeation	Thickness (mm)	Penetration
Disposable gloves	Nitrile rubber (NBR)	6 (> 480 minutes)	0,12	

Eye protection:

Wear security glasses which protect from splashes

Type	Field of application	Characteristics
Safety glasses	Droplet	clear

Skin and body protection:

Wear suitable protective clothing

Personal protective equipment symbol(s):



Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid
Appearance	Thixotropic paste.
Colour	white
Odour	characteristic
Odour threshold	Not determined
pH	No data available
Melting point	No data available
Freezing point	No data available
Boiling point	No data available
Flash point	No data available
Relative evaporation rate (butylacetate=1)	No data available
Flammability (solid, gas)	Non flammable.
Vapour pressure	No data available
Relative vapour density at 20 °C	No data available
Relative density	No data available
Density	1.9 g/ml AW 4.3.23
Solubility	Water: % Not miscible
Partition coefficient n-octanol/water (Log Pow)	No data available
Auto-ignition temperature	Not self-igniting
Decomposition temperature	No data available
Viscosity, kinematic	21052.632 mm²/s
Viscosity, dynamic	40 Pa·s HN-0333
Explosive limits	No data available
Explosive properties	Product is not explosive.
Oxidising properties	No data available

9.2. Other information

SADT	65 °C

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No additional information available.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

fume. Carbon monoxide. Carbon dioxide. Under normal conditions of storage and use, hazardous decomposition products should not be produced.

SECTION 11: Toxicological information

11.1. Information on toxicological effects

Acute toxicity (oral)	Not classified
Acute toxicity (dermal)	Not classified
Acute toxicity (inhalation)	Not classified
Skin corrosion/irritation	Not classified
Serious eye damage/irritation	Causes serious eye irritation.
Respiratory or skin sensitisation	May cause an allergic skin reaction.
Germ cell mutagenicity	Not classified
Carcinogenicity	Not classified

Quartz (SiO2) (14808-60-7)	
IARC group	1 - Carcinogenic to humans

dibenzoyl peroxide (94-36-0)	
IARC group	3 - Not classifiable

Reproductive toxicity	Not classified
STOT-single exposure	Not classified
STOT-repeated exposure	Not classified
Aspiration hazard	Not classified
Viscosity, kinematic	21052.632 mm²/s
Potential adverse human health effects and symptoms	No additional information available.
Symptoms/effects after skin contact	May cause an allergic skin reaction.
Symptoms/effects after eye contact	May cause severe irritation.

SECTION 12: Ecological information

12.1. Toxicity

dibenzoyl peroxide (94-36-0)	
EC50 - Crustacea [1]	0.11 mg/l (OECD 202: Daphnia sp. Acute Immobilisation Test, 48 h, Daphnia magna, Static system, Fresh water, Experimental value, GLP)
LC50 - Fish [2]	0.0602 mg/l (96h; Oncorhynchus mykiss; ECHA)
ErC50 algae	0.0711 mg/l (OECD 201: Alga, Growth Inhibition Test, 72 h, Pseudokirchneriella subcapitata, Static system, Fresh water, Experimental value, GLP)
NOEC (acute)	0.0316 mg/l (96h; Oncorhynchus mykiss; ECHA)
NOEC chronic fish	0.001 mg/l

12.2. Persistence and degradability

HIT-HY 200-R V3, B	
Persistence and degradability	Not established.

Quartz (SiO2) (14808-60-7)	
Persistence and degradability	Biodegradability: not applicable.
Chemical oxygen demand (COD)	Not applicable (inorganic)
ThOD	Not applicable (inorganic)

dibenzoyl peroxide (94-36-0)	
Persistence and degradability	Readily biodegradable in water. Not established. May cause long-term adverse effects in the environment.

12.3. Bioaccumulative potential

HIT-HY 200-R V3, B	
Bioaccumulative potential	Not established.

Quartz (SiO2) (14808-60-7)	
Bioaccumulative potential	No bioaccumulation data available.

dibenzoyl peroxide (94-36-0)	
Partition coefficient n-octanol/water (Log Pow)	3.71
Bioaccumulative potential	Low bioaccumulation potential (Log Kow < 4).

12.4. Mobility in soil

Quartz (SiO2) (14808-60-7)	
Surface tension	No data available in the literature
Ecology - soil	Low potential for mobility in soil.

dibenzoyl peroxide (94-36-0)	
Surface tension	No data available (test not performed)
Partition coefficient n-octanol/water (Log Koc)	3.8 (log Koc, OECD 121: Estimation of the Adsorption Coefficient (Koc) on Soil and on Sewage Sludge using High Performance Liquid Chromatography (HPLC), Experimental value)
Ecology - soil	Low potential for mobility in soil.

12.5. Other adverse effects

Other information: Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Disposal methods

Regional legislation (waste): Disposal must be done according to official regulations.

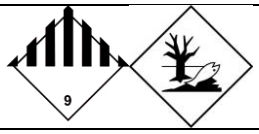
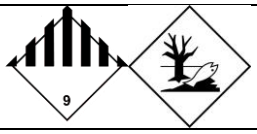
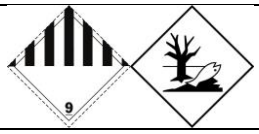
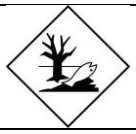
Product/Packaging disposal recommendations: After curing, the product can be disposed of with household waste. . Full or only partially emptied cartridges must be disposed of as special waste in accordance with official regulations. Packaging contaminated by the product : Dispose in a safe manner in accordance with local/national regulations.

Ecology - waste materials: Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / RID

ADR	IMDG	IATA	RID
14.1. UN number			
UN 3077	UN 3077	UN 3077	UN 3077

ADR	IMDG	IATA	RID
14.2. UN proper shipping name			
ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (dibenzoyl peroxide)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (dibenzoyl peroxide)	Environmentally hazardous substance, solid, n.o.s. (dibenzoyl peroxide)	ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (dibenzoyl peroxide)
Transport document description			
UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (dibenzoyl peroxide), 9, III	UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (dibenzoyl peroxide), 9, III, MARINE POLLUTANT	UN 3077 Environmentally hazardous substance, solid, n.o.s. (dibenzoyl peroxide), 9, III	UN 3077 ENVIRONMENTALLY HAZARDOUS SUBSTANCE, SOLID, N.O.S. (dibenzoyl peroxide), III
14.3. Transport hazard class(es)			
9	9	9	Not applicable
			
14.4. Packing group			
III	III	III	III
14.5. Environmental hazards			
Dangerous for the environment: Yes	Dangerous for the environment: Yes Marine pollutant: Yes	Dangerous for the environment: Yes	Dangerous for the environment: Yes
No supplementary information available			

14.6. Special precautions for user

Overland transport

Classification code (ADR)	M7
Special provisions (ADR)	375
Limited quantities (ADR)	5kg
Packing instructions (ADR)	P002, IBC08, LP02, R001
Mixed packing provisions (ADR)	MP10

Transport by sea

Special provisions (IMDG)	IMDG-Code 2.10.2.7
Limited quantities (IMDG)	5 kg
Packing instructions (IMDG)	LP02, P002
EmS-No. (Fire)	F-A
EmS-No. (Spillage)	S-F
Stowage category (IMDG)	A

Air transport

PCA packing instructions (IATA)	956
PCA max net quantity (IATA)	400kg
CAO packing instructions (IATA)	956
Special provisions (IATA)	A197

Rail transport

Special provisions (RID)	274, 335, 375, 601
Limited quantities (RID)	5kg

Packing instructions (RID) P002, IBC08, LP02, R001

14.7. Transport in bulk according to Annex II of Marpol and the IBC Code

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

All components of this product are listed as Active, or excluded from listing, on the United States Environmental Protection Agency Toxic Substances Control Act (TSCA) inventory

Chemical(s) subject to the reporting requirements of Section 313 or Title III of the Superfund Amendments and Reauthorization Act (SARA) of 1986 and 40 CFR Part 372.

dibenzoyl peroxide	CAS-No. 94-36-0	10 – 25%

15.2. International regulations

CANADA

Quartz (SiO2) (14808-60-7)
Listed on the Canadian DSL (Domestic Substances List)

dibenzoyl peroxide (94-36-0)
Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

No additional information available

National regulations

Quartz (SiO2) (14808-60-7)
Listed on IARC (International Agency for Research on Cancer)

15.3. US State regulations

California Proposition 65 - This product does not contain any substances known to the state of California to cause cancer, developmental and/or reproductive harm

SECTION 16: Other information

according to Federal Register / Vol. 77, No. 58 / Monday, March 26, 2012 / Rules and Regulations

Revision date 07/09/2021

Other information None.

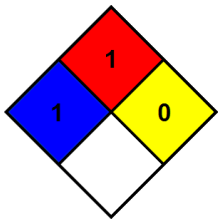
Full text of H-statements:

H241	Heating may cause a fire or explosion.
H317	May cause an allergic skin reaction.
H319	Causes serious eye irritation.
H350	May cause cancer.

Abbreviations and acronyms:

ADN	European Agreement concerning the International Carriage of Dangerous Goods by Inland Waterways
ADR	European Agreement concerning the International Carriage of Dangerous Goods by Road
ATE	Acute Toxicity Estimate
BCF	Bioconcentration factor
CLP	Classification Labelling Packaging Regulation; Regulation (EC) No 1272/2008
DMEL	Derived Minimal Effect level
DNEL	Derived-No Effect Level
EC50	Median effective concentration
IARC	International Agency for Research on Cancer
IATA	International Air Transport Association
IMDG	International Maritime Dangerous Goods
LC50	Median lethal concentration
LD50	Median lethal dose
LOAEL	Lowest Observed Adverse Effect Level
NOAEC	No-Observed Adverse Effect Concentration
NOAEL	No-Observed Adverse Effect Level
NOEC	No-Observed Effect Concentration
OECD	Organisation for Economic Co-operation and Development
PBT	Persistent Bioaccumulative Toxic
PNEC	Predicted No-Effect Concentration
REACH	Registration, Evaluation, Authorisation and Restriction of Chemicals Regulation (EC) No 1907/2006
RID	Regulations concerning the International Carriage of Dangerous Goods by Rail
SDS	Safety Data Sheet
vPvB	Very Persistent and Very Bioaccumulative

NFPA health hazard	1 - Materials that, under emergency conditions, can cause significant irritation.
NFPA fire hazard	1 - Materials that must be preheated before ignition can occur.
NFPA reactivity	0 - Material that in themselves are normally stable, even under fire conditions.



SDS_US_Hilti

This information is based on our current knowledge and is intended to describe the product for the purposes of health, safety and environmental requirements only. It should not therefore be construed as guaranteeing any specific property of the product.

Ref. no : 003/AC/DY/25
Date : 10 Jan 2025

Subject : **Phase in of HIT-HY 200-R V3 Adhesive anchor**

To whom it may concern,

Hilti has always been devoted in innovating and improving our products. We are pleased to introduce you **HIT-HY 200-R V3 Adhesive anchor (i.e. Injectable mortar)**, an upgraded product which is equivalent to HIT-HY 200-R Adhesive anchor. **HIT-HY 200-R V3** will be officially launched in **Jan 2025**, meanwhile HIT-HY 200-R will be phased out until stock lasts in 2025.

Please refer to the below table for more details:

Phased-out item		**Phased-in item**	
2045032	Injectable mortar HIT-HY 200-R 500/2/EE	2262131	Injectable mortar HIT-HY 200-R V3 500/2

The new **HIT-HY 200-R V3 Adhesive anchor** is equivalent or better specifications than current HIT-HY 200-R Adhesive anchor.

Should you have further questions, please do not hesitate to contact our Technical Representatives, Customer Service Hotline at 8228-8118, or email us at hksales@hilti.com.

Yours faithfully,



Dennis Yeung
Head of Product Leadership Strategy, F&P

Hilti (Hong Kong) Ltd.
701-704 & 708A&B | Tower A | Manulife Financial Centre
223 Wai Yip Street | Kwun Tong
Kowloon | Hong Kong
P +852-8228 8118 I **F** +852-2954 1751
www.hilti.com.hk

Attn. : To whom it may concern

Date : 1 April 2025
Ref. : 058/FP/SC/25

Subject : Country of Origin- Hilti HIT-HY 200-R V3 Adhesive Anchor

Dear Sir / Madam,

Enclosed please find the information of Hilti HIT-HY 200-R V3 Adhesive Anchor

Brand Name : Hilti

Model Name : Hilti HIT-HY 200-R V3 Adhesive Anchor

Manufacturer : Hilti Corporation

Address of Manufacturer : FL-9494, Principality of Liechtenstein.

Manufacturer Contact Person : Spencer Cheung

Supplier : Hilti (Hong Kong) Ltd

Address of Supplier : 701-704, 7/F, Tower A, Manulife Financial Centre,
223 Wai Yip Street, Kwun Tong, Kowloon, Hong Kong

Supplier Contact Person : Spencer Cheung (+852 9732 1231)

Country of Origin : Germany

Should you have further questions, please do not hesitate to contact our Technical Representatives, Customer Service Hotline at 8228-8118, or email us at hksales@hilti.com.

Yours faithfully,



Spencer Cheung
Head of Product Leadership Strategy

Hilti (Hong Kong) Ltd.
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Kowloon | Hong Kong
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Hilti HY200R v3 Job Reference

Year	Project Name	Customer Name	Project type
2024	SAI SHA SHK SHAP SZE HEUNG, TPTL 157 DD165, 20	G & M ENGINEERING COMPANY LIMITED	Residential
2024	KAI TAK SPORTS PARK	EASY SMART ENGINEERING LIMITED	Sport & Recreation
2025	North District Hospital	KING FAI CONSTRUCTION GROUP LIMITED	Health
2025	CHINESE MEDICINE HOSPITAL TKO	CHINA STATE CONSTRUCTION	Health
2025	TAI PO RD, TAI PO KAU LOT 230	CR CONSTRUCTION COMPANY LIMITED	Residential
2025	KAI TAK AREA 1F1 (6568) ELDERLY	KAM KEE STEEL'S WORKS LIMITED	Residential
2025	SIU HO WAN MTR STATION (CONTRACT NO. 1701)	WONG PO KEE LIMITED	Transport