



# Hilti HIT-HY 200 Injectable Mortar (Anchorage) Submission Folder

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# Injectable mortar HIT-HY 200-R



## BASE MATERIALS

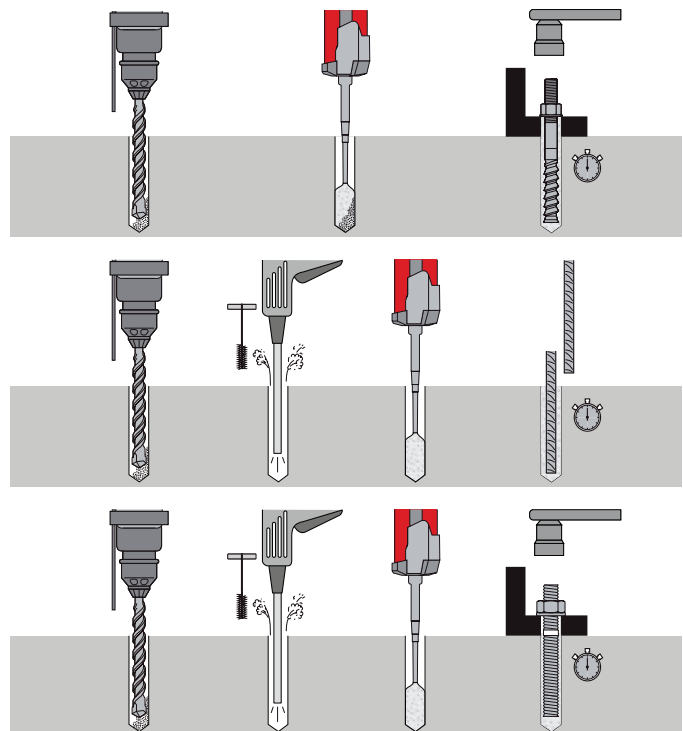
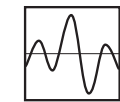
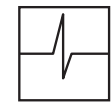
- Concrete (cracked)
- Concrete (uncracked)

## 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



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

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 t <sub>work</sub> [min]	Minimum curing time t <sub>ure</sub> [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

<sup>1)</sup>The curing time data are valid for dry base material only. In wet base material the curing times must be doubled.

Technical data						
Recommended load (kN), non-cracked concrete at 25N/mm <sup>2</sup> , safety factor (γ) =3						
Model	Size	M8	M10	M12	M16	M20
HIT-HY 200 R + HIT-Z	Tensile Load, Nrec	8.0	12.7	18.1	32.0	44.3
	Shear Load, Vrec	4.0	6.3	9.0	16.0	24.3

Recommended load (kN), cracked concrete at 25N/mm <sup>2</sup> , safety factor (γ) =3						
Model	Size	M8	M10	M12	M16	M20
HIT-HY 200 R + HIT-Z	Tensile Load, Nrec	7.5	11.0	14.8	22.4	31.0
	Shear Load, Vrec	4.0	6.3	9.0	16.0	24.3

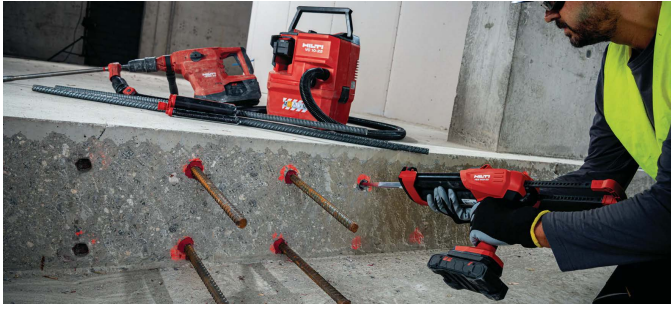
Remarks:  
 1) All the data applies to no edge distance, spacing and other influences 2) For detail design method please refer to Fastening Technology Manual \*) HY 200 with the use of HIT-Z/HIT-Z-R has shock approved

Ordering designation	Package contents	Sales pack quantity	Item number
<H<M&\$\$IF'' * \$#09	1x Foil pack, 2x Mixer, 1x Mixer extension	1 pc	2045036
<H<M&\$\$IF') \$\$#09	1x Foil pack, 2x Mixer, 1x Mixer extension	1 pc	2045032
HY 200-R 500/2/EE + HDE A22 Dispenser	80x Foil pack, 1x Dispenser HDE 500-A22, 1x Cartridge Holder	1 pc	3733215

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

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

**Order Now**



Ordering designation	Content per can/cartridge	Sales pack quantity	Item number
<b>HDE 500-22 + CB (Ultimate) 110V</b>	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	<b>3880132</b>
<b>HDE 500-22 + CR (Ultimate) 110V</b>	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	<b>3880183</b>
<b>HDE 500-22 + CB (Ultimate) 230V</b>	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	<b>3880184</b>
<b>HDE 500-22 + CR (Ultimate) 230V</b>	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	<b>3880186</b>
<b>Battery pack B 22-85 Li-ion</b>	-	1 pc	<b>2251351</b>
<b>Battery charger C 4-22 110V</b>	-	1 pc	<b>2372874</b>
<b>Battery charger C 4-22 230V</b>	-	1 pc	<b>2372873</b>

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



# HILTI SAFE<sup>SET</sup> TECHNOLOGY

A small step for engineers.  
And a giant leap forward for your next design.

Now you can design anchor rod and post-installed rebar connections with more confidence. Inadequately cleaning holes during installation can reduce the performance of conventional chemical anchor systems significantly. Hilti **SAFE<sup>SET</sup>** Technology eliminates this factor almost entirely – in both cracked or uncracked concrete and with anchor rods or post-installed rebar.

## APPLICATIONS

- Post-installed rebar connections for concrete slab, column or wall extensions
- Heavy-duty anchoring in cracked or uncracked concrete, e.g. for steel beams, column

## WHAT IS SAFE<sup>SET</sup>

Hilti **SAFE<sup>SET</sup>** Technology eliminates the most load-affecting and time-consuming step in the installation process: cleaning the hole before injection of the adhesive. As a consequence, engineers can now have peace of mind because the specified application will perform on the jobsite as it has been designed in the plan.



HIT-RE 500 V3





HIT-HY 200-R



HIT-RE 100

## SAFE<sup>SET</sup> Application Ranges

		Thread rod size	M8	M10	M12	M16	M20	M24	M27	M30
		Drill hole dia.	(10mm)	(12mm)	(14mm)	(18mm)	(22mm)	(28mm)	(30mm)	(35mm)
<b>Anchoring</b>  <p>HIT-HY 200-R, standard drill bit and HIT-Z Rod (zero cleaning)</p> <p>HIT-HY 200-R, HIT-RE100, HIT-RE 500 V3, Hollow Drill Bits and HAS-E Rod, HAS-U Rod or HIT-V Rod (auto-cleaning)</p>			SAFE <sup>SET</sup>							
					SAFE <sup>SET</sup>					
<b>Rebar</b>  <p>HIT-HY 200-R, HIT-RE100, HIT-RE 500 V3, Hollow Drill Bits and rebar (auto-cleaning)</p>			SAFE <sup>SET</sup>							
		Rebar size	Y8	Y10	Y12	Y16	Y20	Y25	Y32	
		Drill hole dia.	(12mm)	(14mm)	(16mm)	(20mm)	(25mm)	(32mm)	(40mm)	

## INTRODUCING HILTI SAFESET TECHNOLOGY

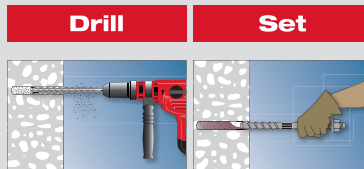
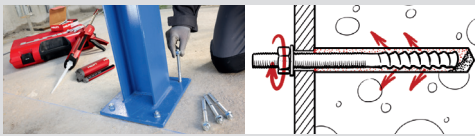
Once in a blue moon, something comes along with the power to accelerate the way you work.

# SAFESET

SAFEset is a registered trade mark of HILTI.

### 1 ZERO CLEANING SOLUTION. HIT-Z anchor rods + HIT-HY 200-R

The new Hilti HIT-Z anchor rod works as a torque-controlled bonded anchor. Because of their unique shape, HIT-Z anchor rods, used in hammer-drilled holes in dry or water-saturated concrete above 5°C, are not affected by uncleaned holes. The benefits are clear: fewer steps and more productivity in anchoring applications.



Hilti **SAFESET** Technology  
Up to 60% faster!



Anchor diameter range	M8 to M20
Material	Carbon or stainless steel (A4)
Embedment depth	Up to 12 times rod diameter
Concrete compressive strengths	C20/25 to C50/60
Installation temperature range	5°C to 40°C



### 2 AUTO-CLEANING SOLUTION. Hollow drill bits + HIT-HY 200-R / HIT-RE 100 / HIT-RE 500 V3

Hilti TE-CD and TE-YD hollow drill bits, in conjunction with HIT-HY 200-R, 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 working environment.



Hilti **SAFESET** Technology  
Up to 60% faster!

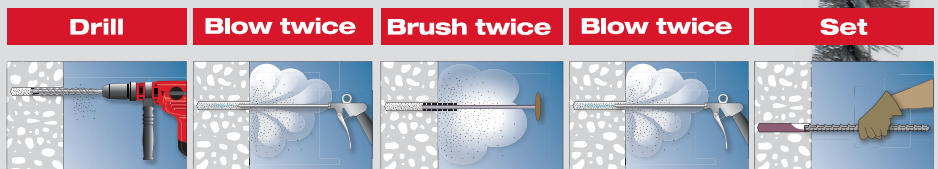


Rebar diameter range	Y8 to Y25
Threaded rod diameters	M10 to M30
Embedment depth	Up to 1000 mm
Concrete compressive strengths	C20/25 to C50/60
Installation temperature range	-10°C to 40°C



### 3 CONVENTIONAL SOLUTION. Brush and blow

Another option is to continue using the traditional hole cleaning method with any Hilti HIT system for superior performance.



\*Cleaning Sequence when using manual dust pump are : blow twice , brush twice , blow twice.



Rebar diameter range	Y8 to Y40
Threaded rod diameters	M8 to M39
Embedment depth	Up to 20 times element diameter
Concrete compressive strengths	C20/25 to C50/60
Installation temperature range	-10°C to 40°C



SUMMARY TABLE FOR CHEMICAL ANCHORS

		HIT-HY 200-R	HIT-RE 500 V3	HIT-RE 100	HIT-HY 270
HIT-Z		■			
HAS-U		■	■	■	■
HIS-N		■	■	■	■
Setting tool TE-C					
Setting tool HIS-S					
Mixer HIT-RE-M		■	■	■	■
Profi accessories for HIT		■	■	■	■
HIT-SC					■
CR Cartridge holder		■			
CB Cartridge holder			■	■	■
HDE Dispenser		■	■	■	■
TE-CD/YD Hollow drill bit		■	■	■	
VC 20/40 Vacuum cleaner		■	■	■	
Setting tool TE-C-E/ TE-Y-E					
Blow-out pump		■	■	■	■
Steel brush		■	■	■	■

## 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 <sup>9</sup>

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

### ADVANTAGES

- Fast, effective cleaning of drilled holes

### Technical data

Dispenser, setting tool, accessory, tester type	Cleaning accessories
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Order Now

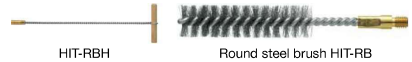


Ordering designation	Drill hole diameter	Sales pack quantity	Item number
Air nozzle HIT-DL 20	20 mm	1 pc	371719 <sup>1)</sup>
Air nozzle HIT-DL 25	25 mm	1 pc	371720 <sup>1)</sup>
Air nozzle HIT-DL 32	32 mm	1 pc	371721 <sup>1)</sup>

<sup>1)</sup> 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



### 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 extension used between RBH (handle) and all RB diameter.	1 pc	238727 <sup>1)</sup>
Brush extension HIT-RBS-10/0.35	35 cm extension for machine cleaning fitting to all RB diameter.	1 pc	371722 <sup>1)</sup>
Holder TE-C	Connection end for C and SDS end. Works with RBS.	1 pc	263437 <sup>1)</sup>
Holder TE-Y	Connection end for Y end. Works with RBS.	1 pc	263439 <sup>1)</sup>
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 <sup>1)</sup>
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 <sup>1)</sup>
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 <sup>1)</sup>
Round steel brush HIT-RB 52	Brush diameter - 52 mm. Use with HIT-RBH/RBV	1 pc	382265

<sup>1)</sup> 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 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 <sup>1)</sup>
Coupler VL-K (connect HIT-VL)	-	10 pc	335021 <sup>1)</sup>
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 <sup>1)</sup>
Piston plug HIT-SZ 47	47 mm	10 pc	2039332 <sup>1)</sup>

<sup>1)</sup> 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
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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

## Mixers for Hilti injectable (RE&HY)



#### Technical data

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

## Anchor rod HAS-U 5.8 (Galvanized, grade 5.8)



### Approvals

<b>ETA</b>	ETA 15/0882 for HIT-RE 100 injection mortar for anchoring applications (ETAG 001-05, Option 7)
	ETA 16/0143 for HIT-RE 500V3 injection mortar for anchoring applications (ETAG 001-05, Option 7)
<b>ETA, seismic</b>	ETA 12/0084 for HIT-HY 200-R injection mortar and standard element for anchoring applications (ETAG 001-05, Option 1)

Approvals and test reports may apply to selected products only. Please refer to the documents for details.



### Technical data

<b>Head configuration</b>	Externally threaded
<b>Material composition</b>	Steel, 5.8 grade, zinc-plated (min. 5µm)
<b>Material, corrosion</b>	Steel, zinc-plated

Order Now



8

Ordering designation	Anchor size	Anchor length	Drill bit diameter	Base plate clearance hole	Sales pack quantity	Item number
HAS-U 5.8 M6x75	M6	75mm	8mm	7mm	20pc	2223936 <sup>1)</sup>
HAS-U 5.8 M6x105	M6	105mm	8mm	7mm	20pc	2223704 <sup>1)</sup>
HAS-U 5.8 M8x80	M8	80mm	10mm	9mm	20pc	2223852 <sup>1)</sup>
HAS-U 5.8 M8x110	M8	110mm	10mm	9mm	20pc	2223853
HAS-U 5.8 M8x150	M8	150mm	10mm	9mm	20pc	2223854 <sup>1)</sup>
HAS-U 5.8 M10x95	M10	95mm	12mm	12mm	20pc	2223705 <sup>1)</sup>
HAS-U 5.8 M10x115	M10	115mm	12mm	12mm	20pc	2223706 <sup>1)</sup>
HAS-U 5.8 M10x130	M10	130mm	12mm	12mm	20pc	2223707
HAS-U 5.8 M10x170	M10	170mm	12mm	12mm	20pc	2223709 <sup>1)</sup>
HAS-U 5.8 M10x190	M10	190mm	12mm	12mm	20pc	2223820 <sup>1)</sup>
HAS-U 5.8 M12x110	M12	110mm	14mm	14mm	20pc	2223821 <sup>1)</sup>
HAS-U 5.8 M12x120	M12	120mm	14mm	14mm	20pc	2223822 <sup>1)</sup>
HAS-U 5.8 M12x160	M12	160mm	14mm	14mm	20pc	2223823
HAS-U 5.8 M12x180	M12	180mm	14mm	14mm	20pc	2223825 <sup>1)</sup>
HAS-U 5.8 M12x200	M12	200mm	14mm	14mm	20pc	2223826 <sup>1)</sup>
HAS-U 5.8 M12x220	M12	220mm	14mm	14mm	20pc	2223827 <sup>1)</sup>
HAS-U 5.8 M12x260	M12	260mm	14mm	14mm	20pc	2223867 <sup>1)</sup>
HAS-U 5.8 M12x300	M12	300mm	14mm	14mm	20pc	2223868 <sup>1)</sup>
HAS-U 5.8 M16x150	M16	150mm	18mm	18mm	20pc	2223828 <sup>1)</sup>
HAS-U 5.8 M16x165	M16	165mm	18mm	18mm	20pc	2223829 <sup>1)</sup>
HAS-U 5.8 M16x190	M16	190mm	18mm	18mm	20pc	2223830
HAS-U 5.8 M16x220	M16	220mm	18mm	18mm	10pc	2223869 <sup>1)</sup>

<sup>1)</sup> For detailed stock availability and lead time information please contact your Hilti representative.

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

Ordering designation	Anchor size	Anchor length	Drill bit diameter	Base plate clearance hole	Sales pack quantity	Item number
HAS-U 5.8 M16x260	M16	260mm	18mm	18mm	10pc	2223832 <sup>1)</sup>
HAS-U 5.8 M16x300	M16	300mm	18mm	18mm	10pc	2223870
HAS-U 5.8 M16x350	M16	350mm	18mm	18mm	10pc	2223871 <sup>1)</sup>
HAS-U 5.8 M16x500	M16	500mm	18mm	18mm	10pc	2223872 <sup>1)</sup>
HAS-U 5.8 M20x180	M20	180mm	22mm	22mm	10pc	2223873 <sup>1)</sup>
HAS-U 5.8 M20x240	M20	240mm	22mm	22mm	10pc	2223874
HAS-U 5.8 M20x260	M20	260mm	22mm	22mm	10pc	2223876
HAS-U 5.8 M20x300	M20	300mm	22mm	22mm	10pc	2223877 <sup>1)</sup>
HAS-U 5.8 M20x350	M20	350mm	22mm	22mm	10pc	2223878 <sup>1)</sup>
HAS-U 5.8 M20x400	M20	400mm	22mm	22mm	10pc	2223879 <sup>1)</sup>
HAS-U 5.8 M20x480	M20	480mm	22mm	22mm	10pc	2223880
HAS-U 5.8 M24x300	M24	300mm	28mm	26mm	5pc	2223881
HAS-U 5.8 M24x450	M24	450mm	28mm	26mm	5pc	2223882 <sup>1)</sup>

<sup>1)</sup> For detailed stock availability and lead time information please contact your Hilti representative.

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

## HAS-U 5.8 HDG



### Approvals

<b>ETA</b>	ETA 15/0882 for HIT-RE 100 injection mortar for anchoring applications (ETAG 001-05, Option 7)
	ETA 16/0143 for HIT-RE 500V3 injection mortar for anchoring applications (ETAG 001-05, Option 7)
<b>ETA, seismic</b>	ETA 12/0084 for HIT-HY 200-R injection mortar and standard element for anchoring applications (ETAG 001-05, Option 1)

Approvals and test reports may apply to selected products only. Please refer to the documents for details.

### Technical data

<b>Head configuration</b>	Externally threaded
<b>Material composition</b>	Steel, 5.8 grade, zinc-plated (min. 43µm)
<b>Material, corrosion</b>	Steel, zinc-plated

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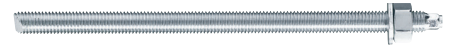


Ordering designation	Anchor size	Anchor length	Drill bit diameter	Base plate clearance hole	Sales pack quantity	Item number
HAS-U 5.8 HDG M8x80	M8	80mm	10mm	9mm	20pc	2223856 <sup>1)</sup>
HAS-U 5.8 HDG M8x110	M8	110mm	10mm	9mm	20pc	2223857 <sup>1)</sup>
HAS-U 5.8 HDG M8x150	M8	150mm	10mm	9mm	20pc	2223858 <sup>1)</sup>
HAS-U 5.8 HDG M10x95	M10	95mm	12mm	12mm	20pc	2223859 <sup>1)</sup>
HAS-U 5.8 HDG M10x115	M10	115mm	12mm	12mm	20pc	2223860 <sup>1)</sup>
HAS-U 5.8 HDG M10x130	M10	130mm	12mm	12mm	20pc	2223861 <sup>1)</sup>
HAS-U 5.8 HDG M10x170	M10	170mm	12mm	12mm	20pc	2223862 <sup>1)</sup>
HAS-U 5.8 HDG M10x190	M10	190mm	12mm	12mm	20pc	2223863 <sup>1)</sup>
HAS-U 5.8 HDG M12x110	M12	110mm	14mm	14mm	20pc	2223937 <sup>1)</sup>
HAS-U 5.8 HDG M12x120	M12	120mm	14mm	14mm	20pc	2223938 <sup>1)</sup>
HAS-U 5.8 HDG M12x160	M12	160mm	14mm	14mm	20pc	2223939 <sup>1)</sup>
HAS-U 5.8 HDG M12x180	M12	180mm	14mm	14mm	20pc	2223940 <sup>1)</sup>
HAS-U 5.8 HDG M12x200	M12	200mm	14mm	14mm	20pc	2223941 <sup>1)</sup>
HAS-U 5.8 HDG M12x220	M12	220mm	14mm	14mm	20pc	2223942 <sup>1)</sup>
HAS-U 5.8 HDG M12x260	M12	260mm	14mm	14mm	20pc	2223895 <sup>1)</sup>
HAS-U 5.8 HDG M12x300	M12	300mm	14mm	14mm	20pc	2223896 <sup>1)</sup>
HAS-U 5.8 HDG M16x150	M16	150mm	18mm	18mm	20pc	2223943 <sup>1)</sup>
HAS-U 5.8 HDG M16x165	M16	165mm	18mm	18mm	20pc	2223944 <sup>1)</sup>
HAS-U 5.8 HDG M16x190	M16	190mm	18mm	18mm	20pc	2223945 <sup>1)</sup>
HAS-U 5.8 HDG M16x220	M16	220mm	18mm	18mm	10pc	2223946 <sup>1)</sup>
HAS-U 5.8 HDG M16x260	M16	260mm	18mm	18mm	10pc	2223897 <sup>1)</sup>
HAS-U 5.8 HDG M16x300	M16	300mm	18mm	18mm	10pc	2223898 <sup>1)</sup>
HAS-U 5.8 HDG M16x350	M16	350mm	18mm	18mm	10pc	2223899 <sup>1)</sup>
HAS-U 5.8 HDG M16x500	M16	500mm	18mm	18mm	10pc	2223900 <sup>1)</sup>
HAS-U 5.8 HDG M20x180	M20	180mm	22mm	22mm	10pc	2223901 <sup>1)</sup>
HAS-U 5.8 HDG M20x240	M20	240mm	22mm	22mm	10pc	2223902 <sup>1)</sup>
HAS-U 5.8 HDG M20x260	M20	260mm	22mm	22mm	10pc	2223903 <sup>1)</sup>
HAS-U 5.8 HDG M20x300	M20	300mm	22mm	22mm	10pc	2223904 <sup>1)</sup>
HAS-U 5.8 HDG M20x350	M20	350mm	22mm	22mm	10pc	2223905 <sup>1)</sup>
HAS-U 5.8 HDG M20x400	M20	400mm	22mm	22mm	10pc	2223906 <sup>1)</sup>
HAS-U 5.8 HDG M20x480	M20	480mm	22mm	22mm	10pc	2223907 <sup>1)</sup>
HAS-U 5.8 HDG M24x300	M24	300mm	28mm	26mm	5pc	2223908 <sup>1)</sup>
HAS-U 5.8 HDG M24x450	M24	450mm	28mm	26mm	5pc	2223909 <sup>1)</sup>

<sup>1)</sup> For detailed stock availability and lead time information please contact your Hilti representative.

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

### Anchor rod HAS-U 8.8 (Galvanized, grade 8.8)



Approvals	
ETA	ETA 15/0882 for HIT-RE 100 injection mortar for anchoring applications (ETAG 001-05, Option 7)
	ETA 16/0143 for HIT-RE 500V3 injection mortar for anchoring applications (ETAG 001-05, Option 7)
ETA, seismic	ETA 12/0084 for HIT-HY 200-R injection mortar and standard element for anchoring applications (ETAG 001-05, Option 1)

Approvals and test reports may apply to selected products only. Please refer to the documents for details.



Technical data	
Head configuration	Externally threaded
Material composition	Steel, 8.8 grade, zinc-plated (min. 5µm)
Material, corrosion	Steel, zinc-plated

Order Now



Ordering designation	Anchor size	Anchor length	Drill bit diameter	Base plate clearance hole	Sales pack quantity	Item number
HAS-U 8.8 M8x150	M8	150mm	10mm	9mm	20pc	2223855 <sup>1)</sup>
HAS-U 8.8 M10x190	M10	190mm	12mm	12mm	20pc	2223833
HAS-U 8.8 M12x220	M12	220mm	14mm	14mm	20pc	2223834
HAS-U 8.8 M12x300	M12	300mm	14mm	14mm	20pc	2223883
HAS-U 8.8 M16x190	M16	190mm	18mm	18mm	20pc	2223835 <sup>1)</sup>
HAS-U 8.8 M16x300	M16	300mm	18mm	18mm	10pc	2223884 <sup>1)</sup>
HAS-U 8.8 M16x380	M16	380mm	18mm	18mm	10pc	2223885
HAS-U 8.8 M20x180	M20	180mm	22mm	22mm	10pc	2223886 <sup>1)</sup>
HAS-U 8.8 M20x260	M20	260mm	22mm	22mm	10pc	2223887 <sup>1)</sup>
HAS-U 8.8 M20x400	M20	400mm	22mm	22mm	10pc	2223888 <sup>1)</sup>
HAS-U 8.8 M24x300	M24	300mm	28mm	26mm	5pc	2223889 <sup>1)</sup>
HAS-U 8.8 M27x340	M27	340mm	30mm	30mm	5pc	2223890 <sup>1)</sup>
HAS-U 8.8 M30x380	M30	380mm	35mm	33mm	5pc	2223891 <sup>1)</sup>
HAS-U 8.8 M33x420	M33	420mm	37mm	36mm	5pc	2223892 <sup>1)</sup>
HAS-U 8.8 M36x460	M36	460mm	40mm	39mm	5pc	2223893 <sup>1)</sup>
HAS-U 8.8 M39x510	M39	510mm	42mm	42mm	5pc	2223894 <sup>1)</sup>

<sup>1)</sup> For detailed stock availability and lead time information please contact your Hilti representative.

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

### HAS-U 8.8 HDG



Approvals	
ETA	ETA 15/0882 for HIT-RE 100 injection mortar for anchoring applications (ETAG 001-05, Option 7)
	ETA 16/0143 for HIT-RE 500V3 injection mortar for anchoring applications (ETAG 001-05, Option 7)
ETA, seismic	ETA 12/0084 for HIT-HY 200-R injection mortar and standard element for anchoring applications (ETAG 001-05, Option 1)

Approvals and test reports may apply to selected products only. Please refer to the documents for details.



Technical data	
Head configuration	Externally threaded
Material composition	Steel, 8.8 grade, zinc-plated (min. 43µm)
Material, corrosion	Steel, zinc-plated

Order Now



Ordering designation	Anchor size	Anchor length	Drill bit diameter	Base plate clearance hole	Sales pack quantity	Item number
HAS-U 8.8 HDG M8x150	M8	150mm	10mm	9mm	20pc	2223947 <sup>1)</sup>
HAS-U 8.8 HDG M10x190	M10	190mm	12mm	12mm	20pc	2223948 <sup>1)</sup>
HAS-U 8.8 HDG M12x220	M12	220mm	14mm	14mm	20pc	2223949 <sup>1)</sup>
HAS-U 8.8 HDG M12x300	M12	300mm	14mm	14mm	20pc	2223910 <sup>1)</sup>
HAS-U 8.8 HDG M16x190	M16	190mm	18mm	18mm	20pc	2223703 <sup>1)</sup>
HAS-U 8.8 HDG M16x300	M16	300mm	18mm	18mm	10pc	2223911 <sup>1)</sup>
HAS-U 8.8 HDG M16x380	M16	380mm	18mm	18mm	10pc	2223912 <sup>1)</sup>
HAS-U 8.8 HDG M20x180	M20	180mm	22mm	22mm	10pc	2223913 <sup>1)</sup>
HAS-U 8.8 HDG M20x260	M20	260mm	22mm	22mm	10pc	2223914 <sup>1)</sup>
HAS-U 8.8 HDG M20x400	M20	400mm	22mm	22mm	10pc	2223915 <sup>1)</sup>
HAS-U 8.8 HDG M24x300	M24	300mm	28mm	26mm	5pc	2223916 <sup>1)</sup>
HAS-U 8.8 HDG M27x340	M27	340mm	30mm	30mm	5pc	2223917 <sup>1)</sup>
HAS-U 8.8 HDG M30x380	M30	380mm	35mm	33mm	5pc	2223918 <sup>1)</sup>

<sup>1)</sup> For detailed stock availability and lead time information please contact your Hilti representative.

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

## Anchor rod HAS-U (A4 stainless steel)



### Approvals

<b>ETA</b>	ETA 15/0882 for HIT-RE 100 injection mortar for anchoring applications (ETAG 001-05, Option 7)
	ETA 16/0143 for HIT-RE 500V3 injection mortar for anchoring applications (ETAG 001-05, Option 7)
<b>ETA, seismic</b>	ETA 12/0084 for HIT-HY 200-R injection mortar and standard element for anchoring applications (ETAG 001-05, Option 1)

Approvals and test reports may apply to selected products only. Please refer to the documents for details.



### Technical data

<b>Head configuration</b>	Externally threaded
<b>Material composition</b>	Steel, A4 (SS316)
<b>Material, corrosion</b>	Steel, stainless

Order Now



Ordering designation	Anchor size	Anchor length	Drill bit diameter	Base plate clearance hole	Sales pack quantity	Item number
HAS-U A4 M8x80	M8	80mm	10mm	9mm	20pc	2223864
HAS-U A4 M8x110	M8	110mm	10mm	9mm	20pc	2223865
HAS-U A4 M8x150	M8	150mm	10mm	9mm	20pc	2223866
HAS-U A4 M10x95	M10	95mm	12mm	9mm	20pc	2223836
HAS-U A4 M10x115	M10	115mm	12mm	12mm	20pc	2223837 <sup>1)</sup>
HAS-U A4 M10x130	M10	130mm	12mm	12mm	20pc	2223838
HAS-U A4 M10x170	M10	170mm	12mm	12mm	20pc	2223839 <sup>1)</sup>
HAS-U A4 M10x190	M10	190mm	12mm	12mm	20pc	2223840
HAS-U A4 M10x220	M10	220mm	12mm	12mm	20pc	2223841 <sup>1)</sup>
HAS-U A4 M12x110	M12	110mm	14mm	14mm	20pc	2223842 <sup>1)</sup>
HAS-U A4 M12x120	M12	120mm	14mm	14mm	20pc	2223843 <sup>1)</sup>
HAS-U A4 M12x160	M12	160mm	14mm	14mm	20pc	2223844
HAS-U A4 M12x180	M12	180mm	14mm	14mm	20pc	2223845 <sup>1)</sup>
HAS-U A4 M12x200	M12	200mm	14mm	14mm	20pc	2223846 <sup>1)</sup>
HAS-U A4 M12x220	M12	220mm	14mm	14mm	20pc	2223847
HAS-U A4 M12x260	M12	260mm	14mm	14mm	20pc	2223919 <sup>1)</sup>
HAS-U A4 M12x300	M12	300mm	14mm	14mm	20pc	2223920
HAS-U A4 M16x150	M16	150mm	18mm	18mm	20pc	2223848 <sup>1)</sup>
HAS-U A4 M16x165	M16	165mm	18mm	18mm	20pc	2223849 <sup>1)</sup>
HAS-U A4 M16x190	M16	190mm	18mm	18mm	20pc	2223850
HAS-U A4 M16x220	M16	220mm	18mm	18mm	20pc	2223851
HAS-U A4 M16x260	M16	260mm	18mm	18mm	10pc	2223921 <sup>1)</sup>
HAS-U A4 M16x300	M16	300mm	18mm	18mm	10pc	2223922 <sup>1)</sup>
HAS-U A4 M16x350	M16	350mm	18mm	18mm	10pc	2223923 <sup>1)</sup>
HAS-U A4 M16x380	M16	380mm	18mm	18mm	10pc	2223924
HAS-U A4 M20x180	M20	180mm	22mm	22mm	10pc	2223925 <sup>1)</sup>
HAS-U A4 M20x240	M20	240mm	22mm	22mm	10pc	2223926
HAS-U A4 M20x260	M20	260mm	22mm	22mm	10pc	2223927
HAS-U A4 M20x300	M20	300mm	22mm	22mm	10pc	2223928 <sup>1)</sup>
HAS-U A4 M20x350	M20	350mm	22mm	22mm	10pc	2223929 <sup>1)</sup>
HAS-U A4 M20x400	M20	400mm	22mm	22mm	10pc	2223930 <sup>1)</sup>
HAS-U A4 M20x480	M20	480mm	22mm	22mm	10pc	2223931
HAS-U A4 M24x300	M24	300mm	28mm	26mm	5pc	2223932
HAS-U A4 M24x450	M24	450mm	28mm	26mm	5pc	2223933 <sup>1)</sup>
HAS-U A4 M27x340	M27	340mm	30mm	30mm	5pc	2223934 <sup>1)</sup>
HAS-U A4 M30x380	M30	380mm	35mm	33mm	5pc	2223935 <sup>1)</sup>

<sup>1)</sup> For detailed stock availability and lead time information please contact your Hilti representative.

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



## Internally threaded sleeve HIS-N (Galvanized, grade 5.8)



### Approvals

<b>ETA</b>	ETA 04/0027 for HIT-RE 500 injection mortar for anchoring applications (ETAG 001-05, Option 7)
	ETA 04/0027 for HIT-RE 500 V3 injection mortar for anchoring applications (ETAG 001-05, Option 7)
<b>ETA, seismic</b>	ETA 12/0084 for HIT-HY 200-R injection mortar and standard element for anchoring applications (ETAG 001-05, Option 1)

Approvals and test reports may apply to selected products only. Please refer to the documents for details.



### Technical data

<b>Head configuration</b>	Inner thread
<b>Material composition</b>	Steel, 5.8 grade, zinc-plated (min. 5 µm)
<b>Material, corrosion</b>	Steel, zinc-plated
<b>Anchor type</b>	Internally threaded

Order Now



Ordering designation	Anchor size	Drill bit diameter	Drilling depth	Base plate clearance hole	Sales pack quantity	Item number
<b>HIS-N M8x90</b>	M8	14 mm	90 mm	9 mm	10 pc	<b>258015<sup>1)</sup></b>
<b>HIS-N M10x110</b>	M10	18 mm	110 mm	12 mm	10 pc	<b>258016<sup>1)</sup></b>
<b>HIS-N M12x125</b>	M12	22 mm	125 mm	14 mm	5 pc	<b>258017<sup>1)</sup></b>
<b>HIS-N M16x170</b>	M16	28 mm	170 mm	18 mm	5 pc	<b>258018<sup>1)</sup></b>
<b>HIS-N M20x205</b>	M20	32 mm	205 mm	22 mm	5 pc	<b>258019<sup>1)</sup></b>

<sup>1)</sup> 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

## Internally threaded sleeve HIS-RN (A4 stainless steel)



### Approvals

<b>ETA</b>	ETA 04/0027 for HIT-RE 500 injection mortar for anchoring applications (ETAG 001-05, Option 7)
	ETA 04/0027 for HIT-RE 500 V3 injection mortar for anchoring applications (ETAG 001-05, Option 7)
<b>ETA, seismic</b>	ETA 12/0084 for HIT-HY 200-R injection mortar and standard element for anchoring applications (ETAG 001-05, Option 1)

Approvals and test reports may apply to selected products only. Please refer to the documents for details.



### Technical data

<b>Head configuration</b>	Inner thread
<b>Material composition</b>	Steel, A4 (SS316)
<b>Material, corrosion</b>	Steel, stainless
<b>Anchor type</b>	Internally threaded

Order Now

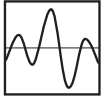


Ordering designation	Anchor size	Drill bit diameter	Drilling depth	Base plate clearance hole	Sales pack quantity	Item number
<b>HIS-RN M8x90 A4</b>	M8	14 mm	90 mm	9 mm	10 pc	<b>258024<sup>1)</sup></b>
<b>HIS-RN M10x110 A4</b>	M10	18 mm	110 mm	12 mm	10 pc	<b>258025</b>
<b>HIS-RN M12x125 A4</b>	M12	22 mm	125 mm	14 mm	5 pc	<b>258026</b>
<b>HIS-RN M16x170 A4</b>	M16	28 mm	170 mm	18 mm	5 pc	<b>258027<sup>1)</sup></b>
<b>HIS-RN M20x205 A4</b>	M20	32 mm	205 mm	22 mm	5 pc	<b>258028<sup>1)</sup></b>

<sup>1)</sup> 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

## Anchor rod HIT-Z (Galvanized)



**SAFESET**



### Approvals

ETA, seismic	ETA 12/0006 for HIT-HY 200-A injection mortar and HIT-Z(R) rod for anchoring applications (ETAG 001-05, Option 1)
	ETA 12/0006 for HIT-HY 200-R injection mortar and HIT-Z(R) rod for anchoring applications (ETAG 001-05, Option 1)

Approvals and test reports may apply to selected products only. Please refer to the documents for details.

### Technical data

<b>Head configuration</b>	Externally threaded
<b>Material composition</b>	Steel, zinc-plated (min. 5 µm)
<b>Material, corrosion</b>	Steel, zinc-plated
<b>Anchor type</b>	Off-the-shelf rods
<b>Approvals / test reports</b>	ETA
<b>Tested/approved for diamond drilling</b>	Yes



**Order Now** **Watch Video**

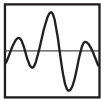


Ordering designation	Anchor size	Drill bit diameter	Max. fixture thickness at standard embedment depth	Base plate clearance hole	Required tightening torque	Sales pack quantity	Item number
HIT-Z M8x80	M8	10 mm	8 mm	9 mm	10 Nm	40 pc	2018364 <sup>1)</sup>
HIT-Z M8x100	M8	10 mm	28 mm	9 mm	10 Nm	40 pc	2018365
HIT-Z M8x120	M8	10 mm	48 mm	9 mm	10 Nm	40 pc	2018366 <sup>1)</sup>
HIT-Z M10x95	M10	12 mm	22 mm	12 mm	25 Nm	40 pc	2018367 <sup>1)</sup>
HIT-Z M10x115	M10	12 mm	42 mm	12 mm	25 Nm	40 pc	2018368
HIT-Z M10x135	M10	12 mm	62 mm	12 mm	25 Nm	40 pc	2018369
HIT-Z M10x160	M10	12 mm	87 mm	12 mm	25 Nm	40 pc	2018410 <sup>1)</sup>
HIT-Z M12x105	M12	14 mm	29 mm	14 mm	40 Nm	20 pc	2018411 <sup>1)</sup>
HIT-Z M12x140	M12	14 mm	64 mm	14 mm	40 Nm	20 pc	2018412 <sup>1)</sup>
HIT-Z M12x155	M12	14 mm	79 mm	14 mm	40 Nm	20 pc	2018413
HIT-Z M12x196	M12	14 mm	120 mm	14 mm	40 Nm	20 pc	2018415 <sup>1)</sup>
HIT-Z M16x155	M16	18 mm	38 mm	18 mm	80 Nm	12 pc	2018416 <sup>1)</sup>
HIT-Z M16x175	M16	18 mm	58 mm	18 mm	80 Nm	12 pc	2018417 <sup>1)</sup>
HIT-Z M16x205	M16	18 mm	88 mm	18 mm	80 Nm	12 pc	2018418 <sup>1)</sup>
HIT-Z M16x240	M16	18 mm	123 mm	18 mm	80 Nm	12 pc	2018419 <sup>1)</sup>
HIT-Z M20x215	M20	22 mm	91 mm	22 mm	150 Nm	6 pc	2018420
HIT-Z M20x250	M20	22 mm	126 mm	22 mm	150 Nm	6 pc	2018421 <sup>1)</sup>

<sup>1)</sup> 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

## Anchor rod HIT-Z-R (A4 stainless steel)



**SAFESET**



### Approvals

ETA, seismic	ETA 12/0006 for HIT-HY 200-A injection mortar and HIT-Z(R) rod for anchoring applications (ETAG 001-05, Option 1)
	ETA 12/0006 for HIT-HY 200-R injection mortar and HIT-Z(R) rod for anchoring applications (ETAG 001-05, Option 1)

Approvals and test reports may apply to selected products only. Please refer to the documents for details.

### Technical data

<b>Head configuration</b>	Externally threaded
<b>Material composition</b>	Steel, A4 (SS316)
<b>Material, corrosion</b>	Steel, stainless
<b>Anchor type</b>	Off-the-shelf rods
<b>Approvals / test reports</b>	ETA
<b>Tested/approved for diamond drilling</b>	Yes



**Order Now**





Ordering designation	Anchor size	Drill bit diameter	Max. fixture thickness at standard embedment depth	Required tightening torque	Sales pack quantity	Item number
HIT-Z-R M8x80	M8	10 mm	8 mm	10 Nm	40 pc	2018422 <sup>1)</sup>
HIT-Z-R M8x100	M8	10 mm	28 mm	10 Nm	40 pc	2018423 <sup>1)</sup>
HIT-Z-R M8x120	M8	10 mm	48 mm	10 Nm	40 pc	2018424 <sup>1)</sup>
HIT-Z-R M10x95	M10	12 mm	22 mm	25 Nm	40 pc	2018425
HIT-Z-R M10x115	M10	12 mm	42 mm	25 Nm	40 pc	2018426
HIT-Z-R M10x135	M10	12 mm	62 mm	25 Nm	40 pc	2018427
HIT-Z-R M10x160	M10	12 mm	87 mm	25 Nm	40 pc	2018428 <sup>1)</sup>
HIT-Z-R M12x105	M12	14 mm	29 mm	40 Nm	20 pc	2018429 <sup>1)</sup>
HIT-Z-R M12x140	M12	14 mm	64 mm	40 Nm	20 pc	2018430 <sup>1)</sup>
HIT-Z-R M12x155	M12	14 mm	79 mm	40 Nm	20 pc	2018431 <sup>1)</sup>
HIT-Z-R M12x196	M12	14 mm	120 mm	40 Nm	20 pc	2018433 <sup>1)</sup>
HIT-Z-R M16x155	M16	18 mm	38 mm	80 Nm	12 pc	2018434 <sup>1)</sup>
HIT-Z-R M16x175	M16	18 mm	58 mm	80 Nm	12 pc	2018435 <sup>1)</sup>
HIT-Z-R M16x205	M16	18 mm	88 mm	80 Nm	12 pc	2018436
HIT-Z-R M16x240	M16	18 mm	123 mm	80 Nm	12 pc	2018437 <sup>1)</sup>
HIT-Z-R M20x215	M20	22 mm	91 mm	150 Nm	6 pc	2018438 <sup>1)</sup>
HIT-Z-R M20x250	M20	22 mm	126 mm	150 Nm	6 pc	2018439 <sup>1)</sup>

<sup>1)</sup> 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



# HIT-HY 200 injection mortar

Anchor design (EN 1992-4/ETAG001) / Rods&Sleeves / Concrete

Injection mortar system		Benefits
	Hilti HIT- HY 200 500 ml foil pack (also available as 330 ml foil pack)	- <b>SafeSet</b> technology: Simplified method of borehole preparation using either Hilti hollow drill bit for hammer drilling or Roughening tool for diamond cored applications
	Anchor rod: HAS-U HAS-U HDG HAS-U A4 HAS-U HCR (M8-M30)	- Suitable for non-cracked and cracked concrete C 20/25 to C 50/60
	Internally threaded sleeve: HIS-N HIS-RN (M8-M20)	- ETA Approved for seismic performance category C1, C2 <sup>a)</sup> - Maximum load performance in cracked concrete and non-cracked concrete
	Anchor rod: HIT-Z HIT-Z-F HIT-Z-R (M8-M20)	- High corrosion / corrosion resistance <sup>b)</sup> - Small edge distance and anchor spacing possible - Manual cleaning for borehole diameter up to 20mm and $h_{ef} \leq 10d$ for non-cracked concrete only

a) HIS-N internally threaded sleeves not approved for Seismic.  
b) High Corrosion resistant rods available only for HAS-U. Corrosion resistant rods available for HAS-U and HIS-N

Base material	Installation conditions
Concrete (non-cracked)          Concrete (cracked)	Hammer drilled holes          Diamond drilled holes <sup>c)</sup> Hilti <b>SafeSet</b> technology          Variable embedment depth          Small edge distance and spacing

Load conditions	Other information
Static/quasi-static          Seismic, ETA-C1, C2 <sup>a)</sup> Fire resistance	European Technical Assessment          CE conformity          Corrosion resistance <sup>b)</sup> High corrosion resistance <sup>b)</sup> PROFIS Anchor design Software

- a) HIS-N internally threaded sleeves not approved for Seismic category C2.  
b) High Corrosion resistant rods available only for HAS-U. Corrosion resistant rods available for HAS-U and HIS-N.  
c) Diamond drilling covered for HIT-Z rods. Diamond drilling only with Roughening Tool (RT) for HAS-U and HIS-N.

### Approvals / certificates

Description	Product	Authority / Laboratory	No. / date of issue
European Technical Assessment <sup>a)</sup>	HY 200	DIBt, Berlin	ETA-12/0084 / 2019-08-28
European Technical Assessment <sup>a)</sup>	HY 200	DIBt, Berlin	ETA-12/0028 / 2019-04-11
European Technical Assessment <sup>a)</sup>	HY 200	DIBt, Berlin	ETA-12/0083 / 2019-06-21
Fire test report	HY 200-A/R	IBMB, Brunswick	3502/676/12 / 2017-09-15

a) All data given in this section according to the ETA approval for the product.

### Recommended general notes

- The below clauses based on Hilti product qualifications are for references only. Selection of clauses by the engineer shall be based on the specific application needs. Please contact Hilti's technical team for further details.

- Fast cure adhesive mortar for anchor fastenings in uncracked and cracked concrete
- HIT-Z application: Adhesive anchors system shall be bonded expansion anchor type to cracked and uncracked concrete.
- HIT-Z application: Anchor shall be approved for use in diamond cored holes.
- Anchor shall be approved for overhead installation.
- For overhead or deep embedment depth (>250mm) installation, specialized accessories shall be applied to ensure drill hole is fully grouted with no voids.
- Borehole drilled and cleaned in one step with Hilti hollow drill bit is recommended to reduce installation error.
- Anchors shall obtain the European Technical Assessment (ETA) report.
- The anchor bolt design shall be done either according to "ETAG001 Annex C Design Method" issued by EOTA or "Guides on design of post-installed anchor bolt systems in Hong Kong" issued by HKISC.
- Anchors shall be tested in accordance to either ETAG-001 Annex A or ACI 355.2 by accredited laboratories under HOKLAS Mutual Recognition Arrangement (MRA) Partners.
- Anchor to be approved by WRAS and NSF for use in contact with drinking water.

### Static and quasi-static resistance (for a single anchor)

#### All data in this section applies to:

- Correct setting (See setting instruction)
- No edge distance and spacing influence
- Steel failure
- Minimum base material thickness
- One typical embedment depth, as specified in the table
- One anchor material, as specified in the tables
- Concrete C 20/25,  $f_{ck,cube} = 25 \text{ N/mm}^2$
- Temperature range I (min. base material temp. -40°C, max. long/short term base material temp.: +24°C/40°C)
- Short term loading. For long term loading please apply  $\psi_{sus}$ .  
 Hammer drilled holes and Hammer drilled holes with Hollow Drill Bit:  $\psi_{sus} = 1.00$   
 Diamond cored holes:  $\psi_{sus} = 0.78$

#### For hammer drilled holes, hammer drilled holes with Hilti hollow drill bit:

##### Anchorage depth <sup>1)</sup>

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
<b>HAS-U</b>									
Embedment depth	[mm]	80	90	110	125	170	210	240	270
Base material thickness	[mm]	110	120	140	160	220	270	300	340
<b>HIS-N</b>									
Embedment depth	[mm]	90	110	125	170	205	-	-	-
Base material thickness	[mm]	120	150	170	230	270	-	-	-
<b>HIT-Z</b>									
Effective anchorage depth <sup>2)</sup> $h_{ef}=l_{Helix}$	[mm]	50	60	60	96	100	-	-	-
Effective embedment depth <sup>3)</sup> $h_{ef}=h_{nom,min}$	[mm]	70	90	110	145	180	-	-	-
Base material thickness	[mm]	130	150	170	245	280	-	-	-

1) The allowed range of embedment depth is shown in the setting details.

2) For combined pull-out and concrete cone failure

3) For concrete cone failure

a) Hilti anchor rod HIT-Z-F: M16 and M20



### Characteristic resistance

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rk}$	HAS-U 5.8	18,0	29,0	42,0	68,7	109	150	183	218
	HAS-U 8.8	29,0	42,0	56,8	68,7	109	150	183	218
	HAS-U A4	26,0	41,0	56,8	68,7	109	150	183	218
	HAS-U HCR	29,0	42,0	56,8	68,7	109	150	183	218
	HIS-N 8.8	25,0	46,0	67,0	109	116	-	-	-
	HIT-Z <sup>a)</sup>	24,0	38,0	54,3	96,0	133	-	-	-
Shear $V_{Rk}$	HAS-U 5.8	9,0	15,0	21,0	39,0	61,0	88,0	115	140
	HAS-U 8.8	15,0	23,0	34,0	63,0	98,0	141	184	224
	HAS-U A4	13,0	20,0	30,0	55,0	86,0	124	115	140
	HAS-U HCR	15,0	23,0	34,0	63,0	98,0	124	161	196
	HIS-N 8.8	13,0	23,0	34,0	63,0	58,0	-	-	-
	HIT-Z <sup>a)</sup>	12,0	19,0	27,0	48,0	73,0	-	-	-
<b>Cracked concrete</b>									
Tension $N_{Rk}$	HAS-U 5.8	15,1	21,2	35,2	48,1	76,3	105	128	153
	HAS-U 8.8	15,1	21,2	35,2	48,1	76,3	105	128	153
	HAS-U A4	15,1	21,2	35,2	48,1	76,3	105	128	153
	HAS-U HCR	15,1	21,2	35,2	48,1	76,3	105	128	153
	HIS-N 8.8	24,7	39,7	48,1	76,3	101	-	-	-
	HIT-Z <sup>a)</sup>	22,5	32,9	44,4	67,2	93,0	-	-	-
Shear $V_{Rk}$	HAS-U 5.8	9,0	15,0	21,0	39,0	61,0	88,0	115	140
	HAS-U 8.8	15,0	23,0	34,0	63,0	98,0	141	184	224
	HAS-U A4	13,0	20,0	30,0	55,0	86,0	124	115	140
	HAS-U HCR	15,0	23,0	34,0	63,0	98,0	124	161	196
	HIS-N 8.8	13,0	23,0	34,0	63,0	58,0	-	-	-
	HIT-Z <sup>a)</sup>	12,0	19,0	27,0	48,0	73,0	-	-	-

a) Hilti anchor rod HIT-Z-F: M16 and M20

### Design resistance

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rd}$	HAS-U 5.8	12,0	19,3	28,0	45,8	72,7	99,8	122	146
	HAS-U 8.8	19,3	28,0	37,8	45,8	72,7	99,8	122	146
	HAS-U A4	13,9	21,9	31,6	45,8	72,7	99,8	80,4	98,3
	HAS-U HCR	19,3	28,0	37,8	45,8	72,7	99,8	122	146
	HIS-N 8.8	16,7	30,7	44,7	72,7	77,3	-	-	-
	HIT-Z <sup>a)</sup>	16,0	25,3	36,2	57,3	79,2	-	-	-
Shear $V_{Rd}$	HAS-U 5.8	7,2	12,0	16,8	31,2	48,8	70,4	92,0	112
	HAS-U 8.8	12,0	18,4	27,2	50,4	78,4	113	147	179
	HAS-U A4	8,3	12,8	19,2	35,3	55,1	79,5	48,3	58,8
	HAS-U HCR	12,0	18,4	27,2	50,4	78,4	70,9	92,0	112
	HIS-N 8.8	10,4	18,4	27,2	50,4	46,4	-	-	-
	HIT-Z <sup>a)</sup>	9,6	15,2	21,6	38,4	58,4	-	-	-
<b>Cracked concrete</b>									
Tension $N_{Rd}$	HAS-U 5.8	10,1	14,1	23,5	32,1	50,9	69,9	85,4	102
	HAS-U 8.8	10,1	14,1	23,5	32,1	50,9	69,9	85,4	102
	HAS-U A4	10,1	14,1	23,5	32,1	50,9	69,9	80,4	98,3
	HAS-U HCR	10,1	14,1	23,5	32,1	50,9	69,9	85,4	102
	HIS-N 8.8	16,5	26,5	32,1	50,9	67,4	-	-	-
	HIT-Z <sup>a)</sup>	13,4	19,6	26,5	40,1	55,4	-	-	-

Shear $V_{Rd}$	HAS-U 5.8	7,2	12,0	16,8	31,2	48,8	70,4	92,0	112
	HAS-U 8.8	12,0	18,4	27,2	50,4	78,4	113	147	179
	HAS-U A4	8,3	12,8	19,2	35,3	55,1	79,5	48,3	58,8
	HAS-U HCR	12,0	18,4	27,2	50,4	78,4	70,9	92,0	112
	HIS-N 8.8	10,4	18,4	27,2	50,4	46,4	-	-	-
	HIT-Z <sup>a)</sup>	9,6	15,2	21,6	38,4	58,4	-	-	-

a) Hilti anchor rod HIT-Z-F: M16 and M20

### Recommended load<sup>b)</sup>

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
<b>Non-cracked concrete</b>									
Tension $N_{Rk}$	HAS-U 5.8	6,0	9,7	14,0	22,9	36,3	50,0	61,0	72,7
	HAS-U 8.8	9,7	14,0	18,9	22,9	36,3	50,0	61,0	72,7
	HAS-U A4	8,6	13,7	18,9	22,9	36,3	50,0	61,0	72,7
	HAS-U HCR	9,7	14,0	18,9	22,9	36,3	50,0	61,0	72,7
	HIS-N 8.8	8,3	15,3	22,3	36,3	38,7	-	-	-
	HIT-Z <sup>a)</sup>	8,0	12,7	18,1	32,0	44,3	-	-	-
Shear $V_{Rk}$	HAS-U 5.8	3,0	5,0	7,0	13,0	20,3	29,3	38,3	46,7
	HAS-U 8.8	5,0	7,7	11,3	21,0	32,7	47,0	61,3	74,7
	HAS-U A4	4,3	6,7	10,0	18,3	28,7	41,3	38,3	46,7
	HAS-U HCR	5,0	7,7	11,3	21,0	32,7	41,3	53,7	65,3
	HIS-N 8.8	4,3	7,7	11,3	21,0	19,3	-	-	-
	HIT-Z <sup>a)</sup>	4,0	6,3	9,0	16,0	24,3	-	-	-
<b>Cracked concrete</b>									
Tension $N_{Rk}$	HAS-U 5.8	5,0	7,1	11,7	16,0	25,4	35,0	42,7	51,5
	HAS-U 8.8	5,0	7,1	11,7	16,0	25,4	35,0	42,7	51,5
	HAS-U A4	5,0	7,1	11,7	16,0	25,4	35,0	42,7	51,5
	HAS-U HCR	5,0	7,1	11,7	16,0	25,4	35,0	42,7	51,5
	HIS-N 8.8	8,2	13,2	16,0	25,4	33,7	-	-	-
	HIT-Z <sup>a)</sup>	7,5	11,0	14,8	22,4	31,0	-	-	-
Shear $V_{Rk}$	HAS-U 5.8	3,0	5,0	7,0	13,0	20,3	29,3	38,3	46,7
	HAS-U 8.8	5,0	7,7	11,3	21,0	32,7	47,0	61,3	74,7
	HAS-U A4	4,3	6,7	10,0	18,3	28,7	41,3	38,3	46,7
	HAS-U HCR	5,0	7,7	11,3	21,0	32,7	41,3	53,7	65,3
	HIS-N 8.8	4,3	7,7	11,3	21,0	19,3	-	-	-
	HIT-Z <sup>a)</sup>	4,0	6,3	9,0	16,0	24,3	-	-	-

a) Hilti anchor rod HIT-Z-F: M16 and M20

b) With overall partial safety factor for action  $\gamma = 3.0$ . The recommended loads vary according to the safety factor requirement from national regulations

## Materials

### Mechanical properties for HAS-U

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
Nominal tensile strength $f_{uk}$	HAS-U 5.8 (HDG)	500	500	500	500	500	500	-	-
	HAS-U 8.8 (HDG)	800	800	800	800	800	800	800	800
	AM 8.8 (HDG)								
	HAS-U A4	700	700	700	700	700	700	500	500
HAS-U HCR	800	800	800	800	800	700	-	-	
Yield strength $f_{yk}$	HAS-U 5.8 (HDG)	440	440	440	440	400	400	-	-
	HAS-U 8.8 (HDG)	640	640	640	640	640	640	640	640
	AM 8.8 (HDG)								
	HAS-U A4	450	450	450	450	450	450	210	210
	HAS-U HCR	640	640	640	640	640	400	-	-
Stressed cross-section $A_s$	HAS-U	36,6	58,0	84,3	157	245	353	459	561
Moment of resistance W	HAS-U	31,2	62,3	109	277	541	935	1387	1874

### Mechanical properties for HIS-N

Anchor size		M8	M10	M12	M16	M20
Nominal tensile strength $f_{uk}$	HIS-N	490	490	490	490	490
	Screw 8.8	800	800	800	800	800
	HIS-RN	700	700	700	700	700
	Screw A4-70	700	700	700	700	700
Yield strength $f_{yk}$	HIS-N	390	390	390	390	390
	Screw 8.8	640	640	640	640	640
	HIS-RN	350	350	350	350	350
	Screw A4-70	450	450	450	450	450
Stressed cross-section $A_s$	HIS-(R)N	51,5	108	169	256	238
	Screw	36,6	58,0	84,3	157	245
Moment of resistance W	HIS-(R)N	145	430	840	1595	1543
	Screw	31,2	62,3	109	277	541

### Mechanical properties for HIT-Z

Anchor size		M8	M10	M12	M16	M20
Nominal tensile strength $f_{uk}$	HIT-Z(-F) <sup>a)</sup>	650	650	650	610	595
	HIT-Z-R	650	650	650	610	595
Yield strength $f_{yk}$	HIT-Z(-F) <sup>a)</sup>	520	520	520	490	480
	HIT-Z-R	520	520	520	490	480
Stressed cross-section of thread $A_s$	HIT-Z(-F) <sup>a)</sup>	36,6	58,0	84,3	157	245
	HIT-Z-R					
Moment of resistance W	HIT-Z(-F) <sup>a)</sup>	31,9	62,5	109,7	278	542
	HIT-Z-R					

a) Hilti anchor rod HIT-Z-F: M16 and M20

### Material quality for HAS-U

Part	Material
<b>Zinc coated steel</b>	
Threaded rod, HAS-U 5.8 (HDG)	Strength class 5.8; Elongation at fracture A5 > 8% ductile Electroplated zinc coated $\geq 5\mu\text{m}$ ; (HDG) hot dip galvanized $\geq 45\mu\text{m}$
Threaded rod, HAS-U 8.8 (HDG)	Strength class 8.8; Elongation at fracture A5 > 12% ductile Electroplated zinc coated $\geq 5\mu\text{m}$ ; (HDG) hot dip galvanized $\geq 45\mu\text{m}$
Hilti Meter rod, AM 8.8 (HDG)	Strength class 8.8; Elongation at fracture A5 > 12% ductile Electroplated zinc coated $\geq 5\mu\text{m}$ (HDG) hot dip galvanized $\geq 45\mu\text{m}$
Washer	Electroplated zinc coated $\geq 5\mu\text{m}$ , hot dip galvanized $\geq 45\mu\text{m}$
Nut	Strength class of nut adapted to strength class of threaded rod. Electroplated zinc coated $\geq 5\mu\text{m}$ , (HDG) hot dip galvanized $\geq 45\mu\text{m}$
Hilti Filling set (F)	Filling washer: Electroplated zinc coated $\geq 5\mu\text{m}$ / (HDG) Hot dip galvanized $\geq 45\mu\text{m}$
	Spherical washer: Electroplated zinc coated $\geq 5\mu\text{m}$ / (HDG) Hot dip galvanized $\geq 45\mu\text{m}$
	Lock nut: Electroplated zinc coated $\geq 5\mu\text{m}$ / (HDG) Hot dip galvanized $\geq 45\mu\text{m}$
<b>Stainless Steel</b>	
Threaded rod, HAS-U A4	Strength class 70 for $\leq M24$ and strength class 50 for $> M24$ ; Elongation at fracture A5 > 8% ductile Stainless steel 1.4401; 1.4404; 1.4578; 1.4571; 1.4439; 1.4362 EN 10088-1:2014
Washer	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
Nut	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
<b>High corrosion resistant steel</b>	
Threaded rod, HAS-U HCR	Strength class 80 for $\leq M20$ and class 70 for $> M20$ , Elongation at fracture A5 > 8% ductile High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014
Washer	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014
Nut	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1:2014

### Material quality for HIS-N

Part	Material	
HIS-N	Int. threaded sleeve	Electroplated zinc coated $\geq 5\mu\text{m}$
	Screw 8.8	Strength class 8.8, A5 > 8 % Ductile; Steel galvanized $\geq 5\mu\text{m}$
HIS-RN	Int. threaded sleeve	Stainless steel 1.4401, 1.4571 EN 10088-1:2014
	Screw 70	Strength class 70, A5 > 8 % Ductile; Stainless steel 1.4401; 1.4404, 1.4578; 1.4571; 1.4439; 1.4362



### Material quality for HIT-Z

Part	Material
Threaded rod HIT-Z	Elongation at fracture > 8% ductile; Electroplated zinc coated $\geq 5 \mu\text{m}$
Washer	Electroplated zinc coated $\geq 5 \mu\text{m}$
Nut	Strength class of nut adapted to strength class of anchor rod. Electroplated zinc coated $\geq 5 \mu\text{m}$
HIT-Z-F	Elongation at fracture > 8% ductile Multilayer coating, ZnNi-galvanized according to DIN 50979:2008-07
Washer	Multilayer coating, ZnNi-galvanized according to DIN 50979:2008-07
Nut	Multilayer coating, ZnNi-galvanized according to DIN 50979:2008-07
HIT-Z-R	Elongation at fracture > 8% ductile; Stainless steel 1.4401, 1.4404 EN 10088-1:2014
Washer	Stainless steel A4 according to EN 10088-1:2014
Nut	Strength class of nut adapted to strength class of anchor rod. Stainless steel 1.4401, 1.4404 EN 10088-1:2014

### Setting information

#### In service temperature range

Hilti HIT-HY 200 injection mortar with anchor rod HAS-U / HIS-(R)N may be applied in the temperature ranges given below. An elevated base material temperature leads to a reduction of the design bond resistance.

#### Temperature in the base material

Temperature range	Base material temperature	Maximum long term base material temperature	Maximum short term base material temperature
Temperature range I	-40 °C to +40 °C	+24 °C	+40 °C
Temperature range II	-40 °C to +80 °C	+50 °C	+80 °C
Temperature range III	-40 °C to +120 °C	+72 °C	+120 °C

#### Max short term base material temperature

Short-term elevated base material temperatures are those that occur over brief intervals, e.g. as a result of diurnal cycling.

#### Max long term base material temperature

Long-term elevated base material temperatures are roughly constant over significant periods of time.

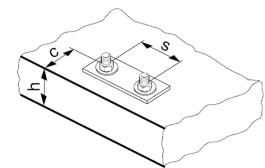
Temperature of the base material	HIT-HY 200-R	
	Maximum working time	minimum curing time
	$t_{\text{work}}$	$t_{\text{cure}}$
$-10^{\circ}\text{C} < T_{\text{BM}} \leq -5^{\circ}\text{C}$	3 h	20 h
$-5^{\circ}\text{C} < T_{\text{BM}} \leq 0^{\circ}\text{C}$	2 h	8 h
$0^{\circ}\text{C} < T_{\text{BM}} \leq 5^{\circ}\text{C}$	1 h	4 h
$5^{\circ}\text{C} < T_{\text{BM}} \leq 10^{\circ}\text{C}$	40 min	2,5 h
$10^{\circ}\text{C} < T_{\text{BM}} \leq 20^{\circ}\text{C}$	15 min	1,5 h
$20^{\circ}\text{C} < T_{\text{BM}} \leq 30^{\circ}\text{C}$	9 min	1 h
$30^{\circ}\text{C} < T_{\text{BM}} \leq 40^{\circ}\text{C}$	6 min	1 h

### Setting details for HAS-U

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30	
Nominal diameter of drill bit $d_0$	[mm]	10	12	14	18	22	28	30	35	
Eff. embedment depth and drill hole depth <sup>a)</sup>	$h_{ef,min}$	60	60	70	80	90	96	108	120	
	$h_{ef,max}$	160	200	240	320	400	480	540	600	
Minimum base material thickness	$h_{min}$	$h_{ef} + 30 \text{ mm} \geq 100 \text{ mm}$			$h_{ef} + 2 d_0$					
Maximum diameter of clearance hole in the fixture	$d_f$	9	12	14	18	22	26	30	33	
Thickness of Hilti filling set	$h_{fs}$	-	-	-	11	13	15	-	-	
Effective fixture thickness with Hilti filling set	$t_{fix,eff}$	$t_{fix} - h_{fs}$								
Max. torque moment <sup>b)</sup>	$T_{max}$	10	20	40	80	150	200	270	300	
Minimum spacing	$s_{min}$	40	50	60	75	90	115	120	140	
Minimum edge distance	$c_{min}$	40	45	45	50	55	60	75	80	
Critical spacing for splitting failure	$s_{cr,sp}$	$2 C_{cr,sp}$								
Critical edge distance for splitting failure <sup>c)</sup>	$C_{cr,sp}$	[mm]	$1,0 \cdot h_{ef}$		for $h / h_{ef} \geq 2,00$					
			$4,6 h_{ef} - 1,8 h$		for $2,00 > h / h_{ef} > 1,3$					
			$2,26 h_{ef}$		for $h / h_{ef} \leq 1,3$					
Critical spacing for concrete cone failure	$s_{cr,N}$	$2 C_{cr,sp}$								
Critical edge distance for concrete cone failure <sup>d)</sup>	$C_{cr,N}$	$1,5 h_{ef}$								

For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced.

- a)  $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$  ( $h_{ef}$ : embedment depth)
- b) Maximum recommended torque moment to avoid splitting failure during installation with minimum spacing and edge distance
- c)  $h$ : base material thickness ( $h \geq h_{min}$ )
- d) The critical edge distance for concrete cone failure depends on the embedment depth  $h_{ef}$  and the design bond resistance. The simplified formula given in this table is on the save side.



HAS-U...



#### Marking:

Steel grade number and length identification letter: e.g. 8L

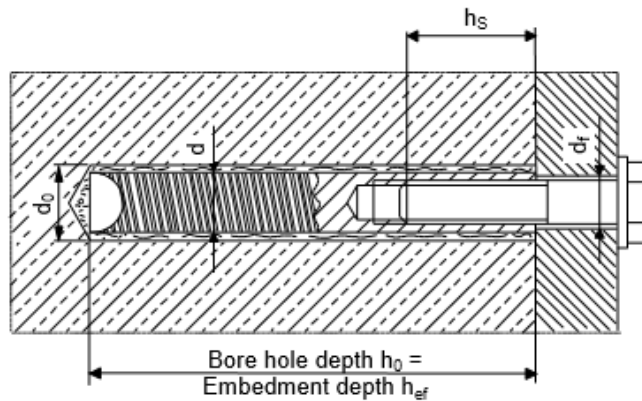
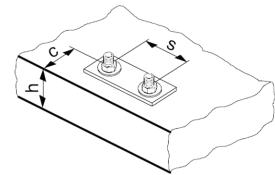


### Setting details for HIS-N

Anchor size		M8	M10	M12	M16	M20
Nominal diameter of drill bit $d_0$	[mm]	14	18	22	28	32
Diameter of element $d$	[mm]	12,5	16,5	20,5	25,4	27,6
Effective anchorage and drill hole depth $h_{ef}$	[mm]	90	110	125	170	205
Minimum base material thickness $h_{min}$	[mm]	120	150	170	230	270
Diameter of clearance hole in the fixture $d_f$	[mm]	9	12	14	18	22
Thread engagement length; min - max $h_s$	[mm]	8-20	10-25	12-30	16-40	20-50
Minimum spacing $s_{min}$	[mm]	60	75	90	115	130
Minimum edge distance $c_{min}$	[mm]	40	45	55	65	90
Critical spacing for splitting failure $s_{cr,sp}$	[mm]	$2 C_{cr,sp}$				
Critical edge distance for splitting failure <sup>b)</sup> $c_{cr,sp}$	[mm]	$1,0 \cdot h_{ef}$ for $h / h_{ef} \geq 2,0$				
		$4,6 h_{ef} - 1,8 h$ for $2,0 > h / h_{ef} > 1,3$				
		$2,26 h_{ef}$ for $h / h_{ef} \leq 1,3$				
Critical spacing for concrete cone failure $s_{cr,N}$	[mm]	$2 C_{cr,N}$				
Critical edge distance for concrete cone failure <sup>c)</sup> $c_{cr,N}$	[mm]	$1,5 h_{ef}$				
Max. torque moment <sup>a)</sup> $T_{max}$	[Nm]	10	20	40	80	150

For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced.

- a) Max. recommended torque moment to avoid splitting failure during Installation with minimum spacing and edge distance
- b)  $h$ : base material thickness ( $h \geq h_{min}$ )
- c) The critical edge distance for concrete cone failure depends on the embedment depth  $h_{ef}$  and the design bond resistance. The simplified formula given in this table is on the same side.

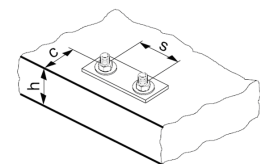


### Settings details HIT-Z, HIT-Z-F and HIT-Z-R

Anchor size		M8	M10	M12	M16	M20
Nominal diameter of drill bit	$d_0$ [mm]	10	12	14	18	22
Length of anchor	min l [mm]	80	95	105	155	215
	max l [mm]	120	160	196	420	450
Nominal embedment depth range <sup>a)</sup>	$h_{nom,min}$ [mm]	60	60	60	96	100
	$h_{nom,max}$ [mm]	100	120	144	192	220
Borehole condition 1 Min. base material thickness	$h_{min}$ [mm]	$h_{nom} + 60$ mm			$h_{nom} + 100$ mm	
Borehole condition 2 Min. base material thickness	$h_{min}$ [mm]	$h_{nom} + 30$ mm $\geq 100$ mm			$h_{nom} + 45$ mm $\geq 45$ mm	
Maximum depth of drill hole	$h_0$ [mm]	$h - 30$ mm			$h - 2 d_0$	
Pre-setting: Diameter of clearance hole in the fixture	$d_f$ [mm]	9	12	14	18	22
Through-setting: Diameter of clearance hole in the fixture	$d_f$ [mm]	11	14	16	20	24
Maximum fixture thickness	$t_{fix}$ [mm]	48	87	120	303	326
Maximum fixture thickness with seismic filling set	$t_{fix}$ [mm]	41	79	111	292	314
Installation torque moment <sup>b)</sup>	$T_{inst}$ [Nm]	10	25	40	80	150
Critical spacing for splitting failure	$s_{cr,sp}$ [mm]	$2 C_{cr,sp}$				
Critical edge distance for splitting failure <sup>c)</sup>	$c_{cr,sp}$ [mm]	$1,5 \cdot h_{nom}$ for $h / h_{nom} \geq 2,35$				
		$6,2 h_{nom} - 2,0 h$ for $2,35 > h / h_{nom} > 1,35$				
		$3,5 h_{nom}$ for $h / h_{nom} \leq 1,35$				
Critical spacing for concrete cone failure	$s_{cr,N}$ [mm]	$2 C_{cr,N}$				
Critical edge distance concrete cone failure <sup>d)</sup>	$c_{cr,N}$ [mm]	$1,5 h_{nom}$				

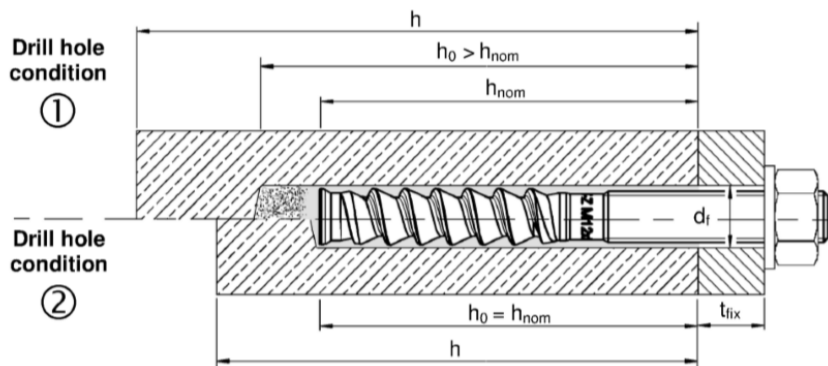
For spacing (edge distance) smaller than critical spacing (critical edge distance) the design loads have to be reduced.

- a)  $h_{nom,min} \leq h_{nom} \leq h_{nom,max}$  ( $h_{nom}$ : embedment depth)
- b) Recommended torque moment to avoid splitting failure during installation with minimum spacing and edge distance
- c)  $h$ : base material thickness ( $h \geq h_{min}$ )
- d) The critical edge distance for concrete cone failure depends on the embedment depth  $h_{ef}$  and the design bond resistance. The simplified formula given in this table is on the safe side.



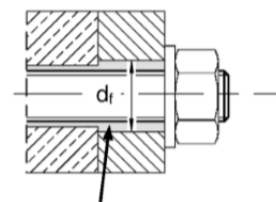
#### Pre-setting:

Install anchor before positioning fixture



- Drill hole condition 1 → non-cleaned borehole
- Drill hole condition 2 → drilling dust is completely removed

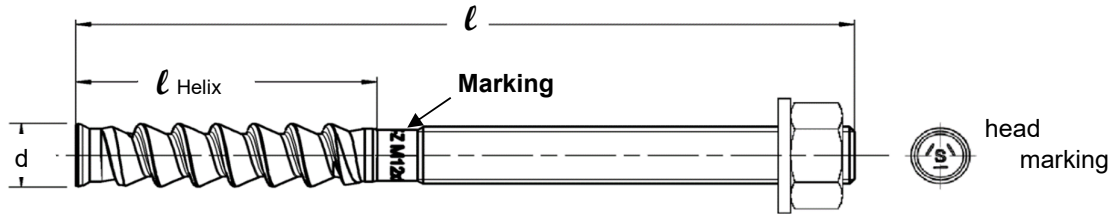
#### Through-setting: Install anchor through positioned fixture



Annular gap filled with Hilti HIT-HY 200-A

### Anchor dimension for HIT-Z

Anchor size		M8	M10	M12	M16	M20
Length of anchor	min $\ell$	80	95	105	155	215
	max $\ell$	120	160	196	420	450
Helix length	$\ell_{\text{Helix}}$	50	60	60	96	100



### Minimum edge distance and spacing for HIT-Z

For the calculation of minimum spacing and minimum edge distance of anchors in combination with different embedment depth and thickness of concrete member the following equation shall be fulfilled:  $A_{i,\text{req}} < A_{i,\text{cal}}$

### Required interaction area $A_{i,\text{cal}}$ for HIT-Z

Anchor size		M8	M10	M12	M16	M20
Cracked concrete	[mm <sup>2</sup> ]	19200	40800	58800	94700	148000
Non-cracked concrete	[mm <sup>2</sup> ]	22200	57400	80800	128000	198000

### Effective area $A_{i,\text{ef}}$ of HIT-Z

#### Member thickness $h \geq h_{\text{nom}} + 1,5 \cdot c$

Single anchor and group of anchors with $s > 3 \cdot c$	[mm <sup>2</sup> ] $A_{i,\text{cal}} = (6 \cdot c) \cdot (h_{\text{nom}} + 1,5 \cdot c)$ with $c \geq 5 \cdot d$
Group of anchors with $s \leq 3 \cdot c$	[mm <sup>2</sup> ] $A_{i,\text{cal}} = (3 \cdot c + s) \cdot (h_{\text{nom}} + 1,5 \cdot c)$ with $c \geq 5 \cdot d$ and $s \geq 5 \cdot d$

#### Member thickness $h \leq h_{\text{nom}} + 1,5 \cdot c$

Single anchor and group of anchors with $s >$	[mm <sup>2</sup> ] $A_{i,\text{cal}} = (6 \cdot c) \cdot h$ with $c \geq 5 \cdot d$
Group of anchors with $s \leq 3 \cdot c$	[mm <sup>2</sup> ] $A_{i,\text{cal}} = (3 \cdot c + s) \cdot h$ with $c \geq 5 \cdot d$ and $s \geq 5 \cdot d$

**Best case minimum edge distance and spacing with required member thickness and embedment depth**

Anchor size		M8	M10	M12	M16	M20
<b>Cracked concrete</b>						
Member thickness	$h \geq$ [mm]	140	200	240	300	370
Embedment depth	$h_{nom} \geq$ [mm]	80	120	150	200	220
Minimum spacing	$s_{min}$ [mm]	40	50	60	80	100
Corresponding edge distance	$c \geq$ [mm]	40	55	65	80	100
Minimum edge distance	$c_{min} =$ [mm]	40	50	60	80	100
Corresponding spacing	$s \geq$ [mm]	40	60	65	80	100
<b>Non-cracked concrete</b>						
Member thickness	$h \geq$ [mm]	140	230	270	340	410
Embedment depth	$h_{nom} \geq$ [mm]	80	120	150	200	220
Minimum spacing	$s_{min}$ [mm]	40	50	60	80	100
Corresponding edge distance	$c \geq$ [mm]	40	70	80	100	130
Minimum edge distance	$c_{min}$ [mm]	40	50	60	80	100
Corresponding spacing	$s \geq$ [mm]	40	145	160	160	235

**Best case minimum member thickness and embedment depth with required minimum edge distance and spacing (borehole condition 1)**

Anchor size		M8	M10	M12	M16	M20
<b>Cracked concrete</b>						
Member thickness	$h \geq$ [mm]	120	120	120	196	200
Embedment depth	$h_{nom} \geq$ [mm]	60	60	60	96	100
Minimum spacing	$s_{min}$ [mm]	40	50	60	80	100
Corresponding edge distance	$c \geq$ [mm]	40	100	140	135	215
Minimum edge distance	$c_{min} =$ [mm]	40	60	90	80	125
Corresponding spacing	$s \geq$ [mm]	40	160	220	235	365
<b>Non cracked concrete</b>						
Member thickness	$h \geq$ [mm]	120	120	120	196	200
Embedment depth	$h_{nom} \geq$ [mm]	60	60	60	96	100
Minimum spacing	$s_{min}$ [mm]	40	50	60	80	100
Corresponding edge distance	$c \geq$ [mm]	50	145	200	190	300
Minimum edge distance	$c_{min}$ [mm]	40	80	115	110	165
Corresponding spacing	$s \geq$ [mm]	65	240	330	310	495

## Minimum edge distance and spacing – Explanation

Minimum edge and spacing geometrical requirements are determined by testing the installation conditions in which two anchors with a given spacing can be set close to an edge without forming a crack in the concrete due to tightening torque.

The HIT-Z boundary conditions for edge and spacing geometry can be found in the tables to the left. If the embedment depth and slab thickness are equal to or greater than the values in the table, then the edge and spacing values may be utilized.

PROFIS Anchor software is programmed to calculate the referenced equations in order to determine the optimized related minimum edge and spacing based on the following variables:

<b>Cracked or non-cracked concrete</b>	For cracked concrete it is assumed that a reinforcement is present which limits the crack width to 0,3 mm, allowing smaller values for minimum edge distance and minimum spacing
<b>Anchor diameter</b>	For smaller anchor diameter a smaller installation torque is required, allowing smaller values for minimum edge distance and minimum spacing
<b>Slab thickness and embedment depth</b>	Increasing these values allows smaller values for minimum edge distance and minimum spacing

## Installation equipment




Anchor size	M8	M10	M12	M16	M20	M24	M27	M30
Rotary hammer	HAS-U	TE 2 – TE 16			TE 40 - TE 80			
	HIT-Z	TE 2 – TE 40		TE 40 – TE 80		-		
	HIS-N	TE (-A) – TE 16(-A)		TE 40 – TE 80		-		
Other tools	compressed air gun and blow out pump, set of cleaning brushes, dispenser Hollow Drill Bit							
	roughening tools TE-YRT							
Additional Hilti recommended tools	DD EC-1, DD 100 ... DD 160 <sup>a)</sup>							

a) For anchors in diamond drilled holes load values for combined pull-out and concrete cone resistance have to be reduced

## Cleaning, drilling and installation parameters

HAS-U	HIT-Z	HIS-N	Drill bit diameters d <sub>0</sub> [mm]				Cleaning and installation	
			Hammer drill (HD)	Hollow Drill Bit (HDB)	Diamond coring		Brush HIT-RB	Piston plug HIT-SZ
					Diamond coring (DD)	With roughening tool (RT)		
<b>M8</b>	<b>M8</b>	-	10	-	10	-	10	-
<b>M10</b>	<b>M10</b>	-	12	12	12	-	12	12
<b>M12</b>	<b>M12</b>	<b>M8</b>	14	14	14	-	14	14
<b>M16</b>	<b>M16</b>	<b>M10</b>	18	18	18	18	18	18
<b>M20</b>	<b>M20</b>	<b>M12</b>	22	22	22	22	22	22
<b>M24</b>	-	<b>M16</b>	28	28	28	28	28	28
<b>M27</b>	-	-	30	-	30	30	30	30
-	-	<b>M20</b>	32	32	32	32	32	32
<b>M30</b>	-	-	35	35	35	35	35	35

**Associated components for the use of Hilti Roughening tool TE-YRT**

Diamond coring		Roughening tool TE-YRT	Wear gauge RTG...
			
d <sub>0</sub> [mm]		d <sub>0</sub> [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

**Installation parameters for use of the Hilti Roughening tool TE-YRT**

h <sub>ef</sub> [mm]	Minimum roughening time t <sub>roughen</sub> [sec] (t <sub>roughen</sub> [sec] = h <sub>ef</sub> [mm] / 10)	Minimum blowing time t <sub>blowing</sub> [sec] (t <sub>blowing</sub> [sec] = t <sub>roughen</sub> [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

## Setting instructions for HAS-U rods and HIS-N internally threaded sleeves

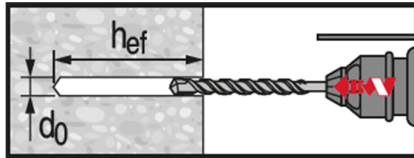
\*For detailed information on installation see instruction for use given with the package of the product



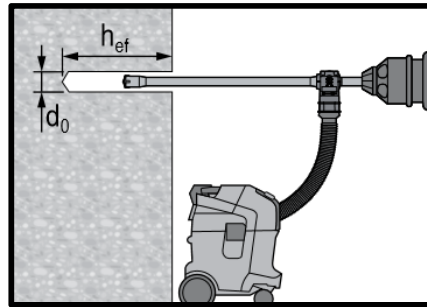
### Safety regulations.

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 (R).

### Drilling

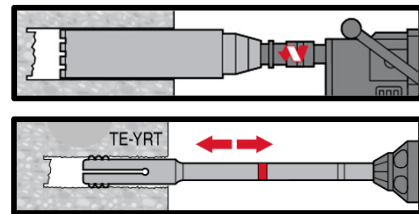


Hammer drilled hole (HD)



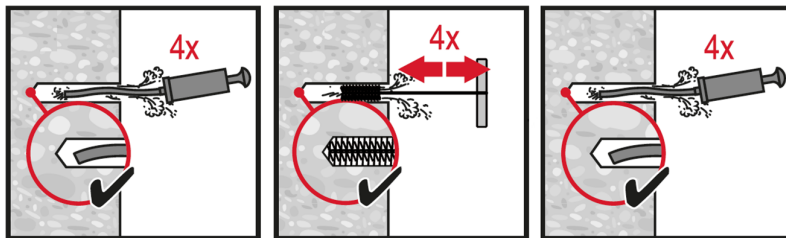
Hammer drilled hole with Hollow Drilled Bit (HDB)

No cleaning required



Diamond Drilling + Roughening Tool (DD+RT)

### Cleaning



#### Hammer drilling:

#### Manual cleaning (MC)

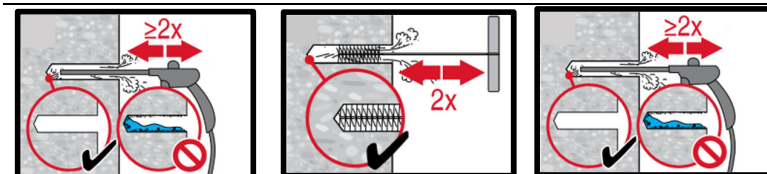
for drill diameters  $d_0 \leq 20$  mm and drill hole depth  $h_0 \leq 10 \cdot d_0$ .



#### Hammer drilling:

#### Compressed air cleaning (CAC)

for all drill hole diameters  $d_0$  and drill hole depths  $h_0 \leq 20 \cdot d_0$ .

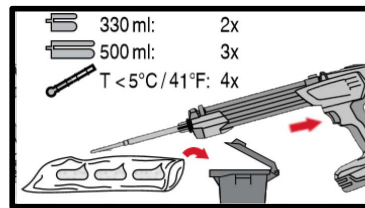
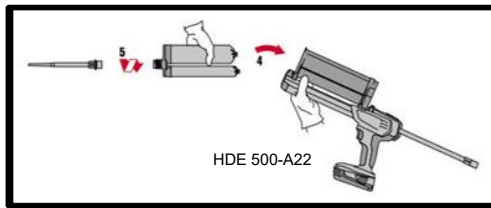


#### Diamond cored holes with Hilti roughening tool:

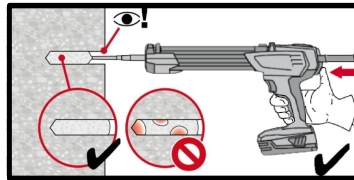
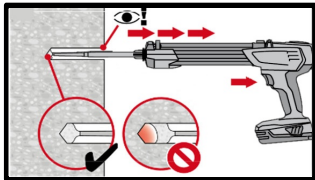
#### Compressed air cleaning (CAC)

for all drill hole diameters  $d_0$  and drill hole depths  $h_0$ .

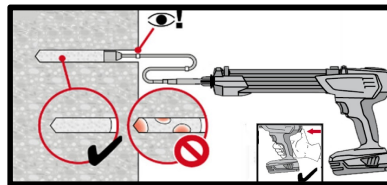
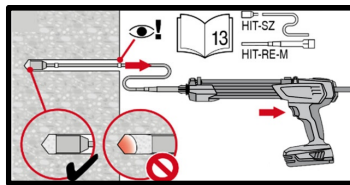
## Injection



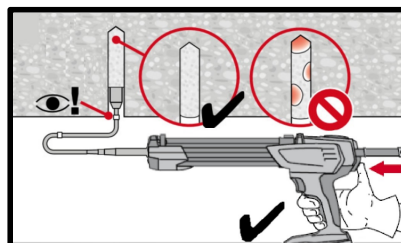
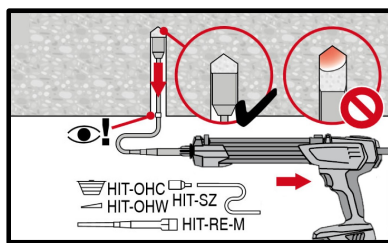
Injection system preparation.



Injection method for drill hole depth  
 $h_{ef} \leq 250$  mm.

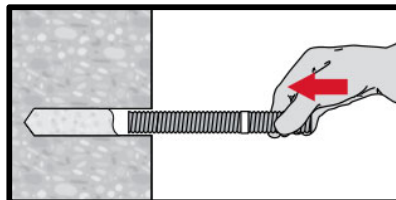


Injection method for drill hole depth  
 $h_{ef} > 250$  mm.

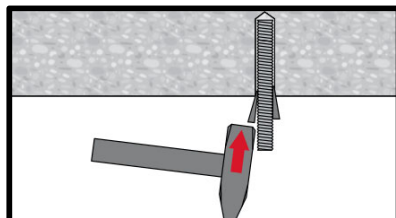


Injection method for overhead  
application and/or installation with  
embedment depth > 250 mm.

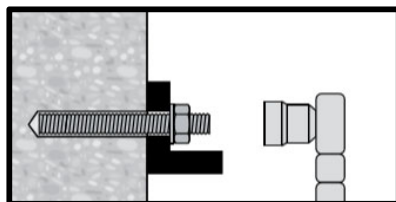
## Setting the element



Setting element, observe working time  
“ $t_{work}$ ”.



Setting element for overhead  
applications, observe working time “ $t_{work}$ ”.



Loading the anchor after required  
curing time  $t_{cure}$



## Setting instructions for HIT-Z rods

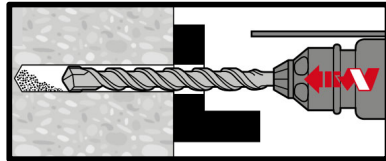
\*For detailed information on installation see instruction for use given with the package of the product.



### Safety regulations.

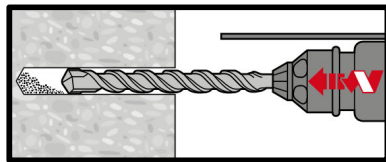
Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-HY 200 A (R)

## Drilling



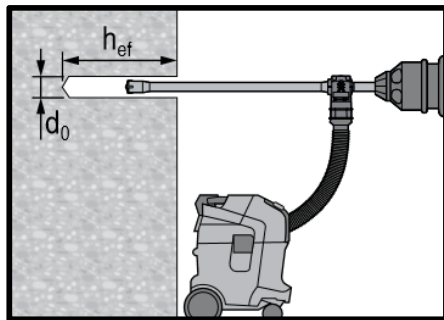
**Hammer drilling: Through-setting**

No cleaning required



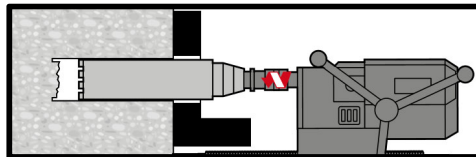
**Hammer drilling: Pre-setting**

No cleaning required

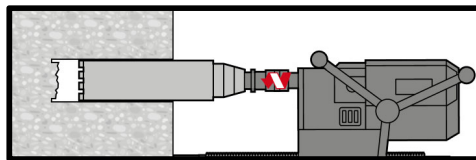


**Hammer drilling with hollow drill bit:  
Through / pre-setting**

No cleaning required

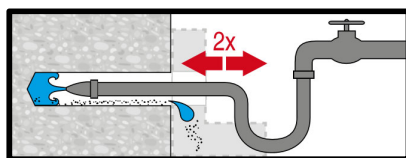


**Diamond coring: Through-setting**

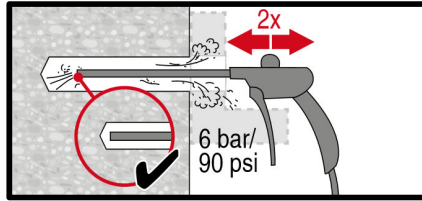


**Diamond coring: Pre-setting**

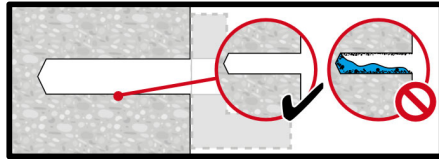
## Cleaning



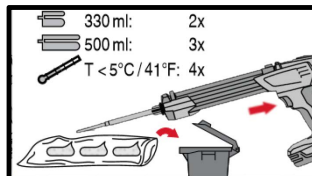
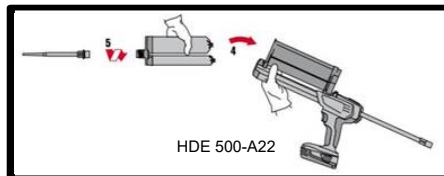
**Hole flushing** required for wet-drilled diamond cored holes.



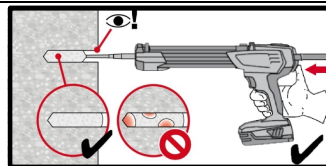
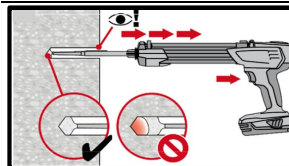
**Evacuation** required for wet-drilled diamond cored holes.



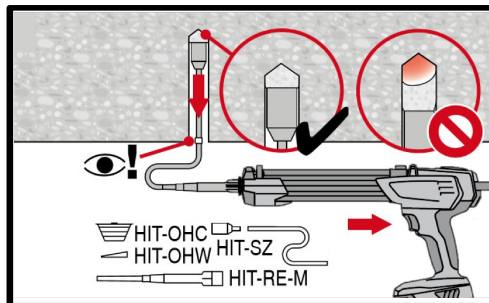
### Injection



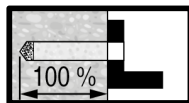
**Injection system preparation.**



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



**Overhead installation** only with the aid of extensions and piston plugs.



**Through-setting:**

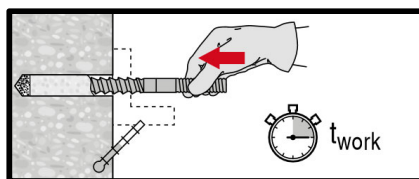
Fill 100% of the drill hole.



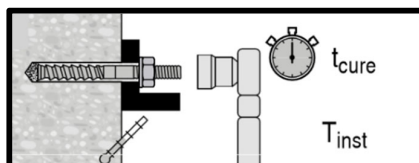
**Pre-setting:**

Fill approx. 2/3 of the drill hole.

### Setting the element



**Setting element** to the required embedment depth before working time "t<sub>work</sub>" has elapsed.



**Loading the anchor:** After required curing time t<sub>cure</sub>.

Approval body for construction products  
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and  
Laender Governments



## European Technical Assessment

**ETA-12/0084**  
**of 10 December 2021**

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-R

Product family  
to which the construction product belongs

Bonded fastener for use in concrete

Manufacturer

Hilti Aktiengesellschaft  
9494 SCHAAN  
FÜRSTENTUM LIECHTENSTEIN

Manufacturing plant

Hilti Plants

This European Technical Assessment  
contains

44 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 330499-01-0601 Edition 04/2020

This version replaces

ETA-12/0084 issued on 28 August 2019

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## Specific Part

### 1 Technical description of the product

The injection system Hilti HIT-HY 200-R is a bonded fastener consisting of a foil pack with injection mortar Hilti HIT-HY 200-R and a steel element according to Annex A.

The steel element is placed into a drilled hole filled with injection mortar and is anchored via the bond between metal part, 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 fastener 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 anchor of at least 50 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 to tension load (static and quasi-static loading)	See Annex C1, C2, C4, C5, C7, C8, C10, C11, B3 to B6
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C3, C6, C9, C12
Displacements under short-term and long-term loading	See Annex C13 to C16
Characteristic resistance and displacements for seismic performance categories C1 and C2	See Annex C17 to C21

#### 3.2 Hygiene, health and the environment (BWR 3)

Essential characteristic	Performance
Content, emission and/or release of dangerous substances	No performance assessed

English translation prepared by DIBt

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

In accordance with the European Assessment Document EAD 330499-01-0601 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 at Deutsches Institut für Bautechnik.

The following standards and documents 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
- EN 10204:2004 Metallic products - Types of inspection documents
- DIN 488-1:2009-08 Reinforcing steels - Part 1: Grades, properties, marking
- EOTA TR 055: Design of fastenings based on EAD 330232-00-0601, EAD 330499-00-0601 and EAD 330747-00-0601, February 2018

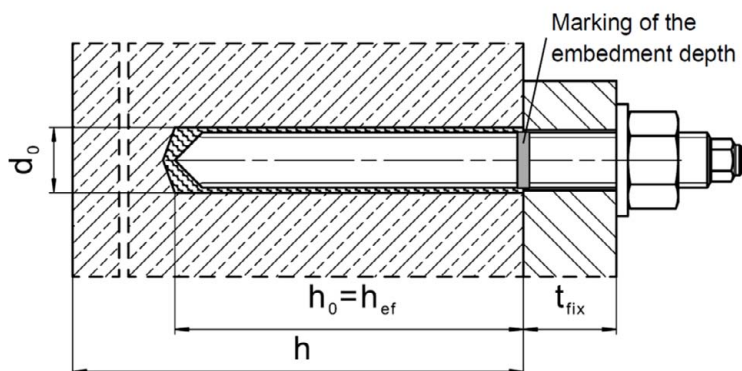
Issued in Berlin on 10 Dezember 2021 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock  
Head of Section

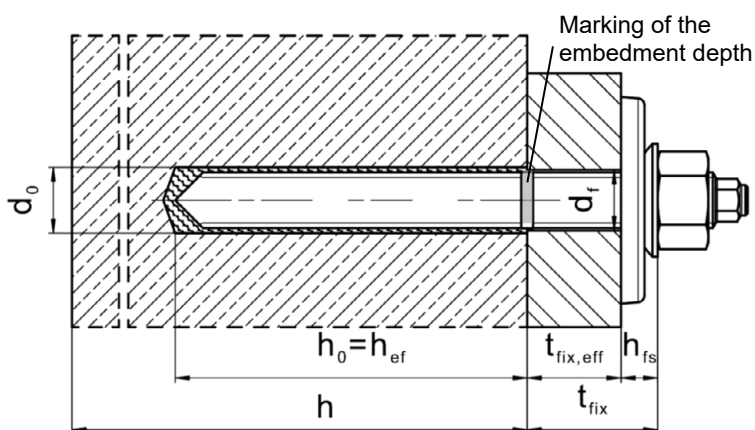
*beglaubigt:*  
Pascal Stiller

### Installed condition

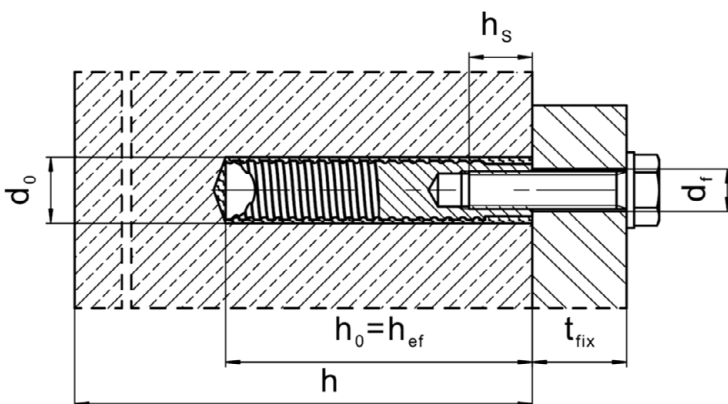
**Figure A1:**  
Threaded rod, HAS-U-..., HIT-V-... and AM 8.8



**Figure A2:**  
Threaded rod, HAS-U-..., HIT-V-... and AM 8.8 with Hilti Filling Set



**Figure A3:**  
Internally threaded sleeve HIS-(R)N



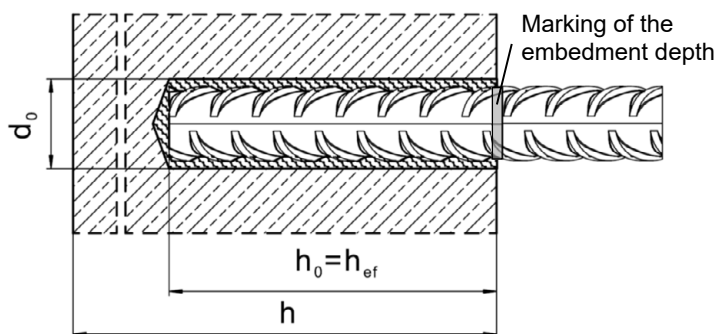
Injection system Hilti HIT-HY 200-R

Product description  
Installed condition

Annex A1

### Installed condition

**Figure A4:**  
**Reinforcing bar**



**Injection system Hilti HIT-HY 200-R**

**Product description**  
Installed condition

**Annex A2**



**Product description: Injection mortar and steel elements**

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

Marking:  
HILTI-HIT  
Production number and  
production line  
Expiry date mm/yyyy

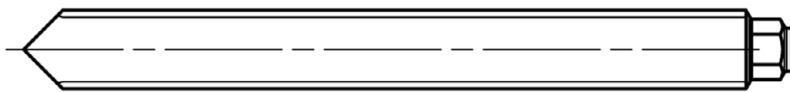


Product name: "Hilti HIT-HY 200-R"

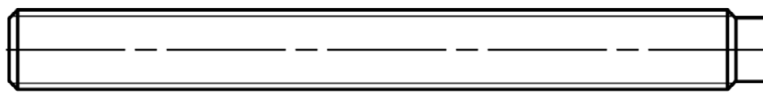
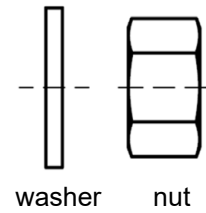
**Static mixer Hilti HIT-RE-M**



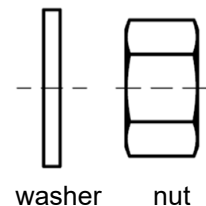
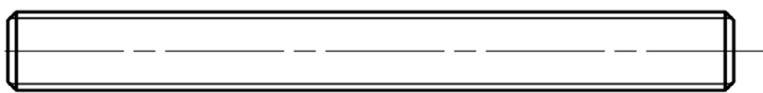
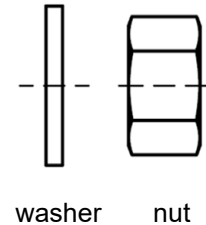
**Steel elements**



**HAS-U-....: M8 to M30**



**HIT-V-....: M8 to M30**



**Threaded rod: M8 to M30**

**Hilti AM 8.8 meter rod electroplated zinc coated: M8 to M30, 1m to 3m**

**Hilti AM HDG 8.8 meter rod hot dip galvanized: M8 to M30, 1m to 3m**

Commercial standard threaded rod:

- Materials and mechanical properties according to Table A1.
- Inspection certificate 3.1 according to EN 10204. The document shall be stored.
- Marking of embedment depth.

**Injection system Hilti HIT-HY 200-R**

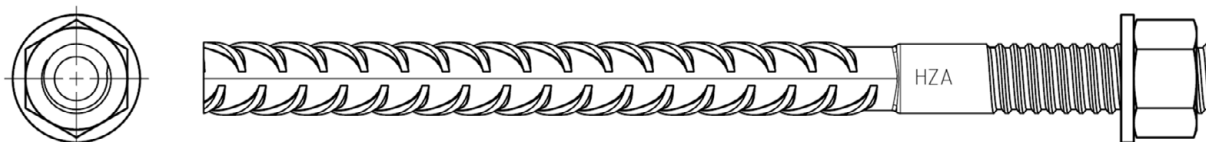
**Product description**  
Injection mortar / Static mixer / Steel elements

**Annex A3**

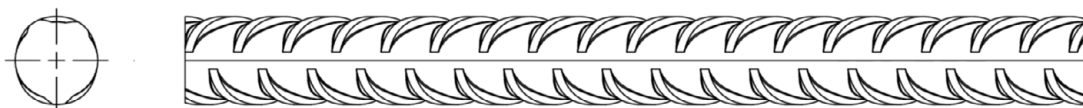
**Steel elements**



**Internally threaded sleeve: HIS-(R)N M8 to M20**



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

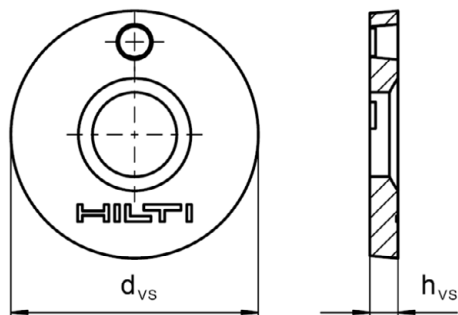


**Reinforcing bar (rebar):  $\phi$  8 to  $\phi$  32**

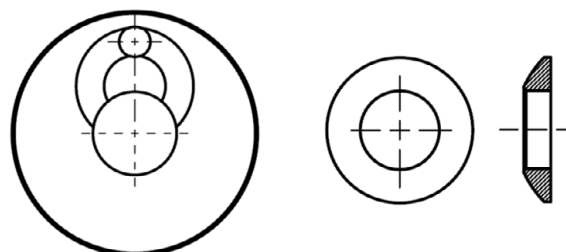
- Materials and mechanical properties according to Table A1
- Dimensions according to Annex B6

**Hilti Filling Set to fill the annular gap between steel element and fixture**

Sealing washer



Spherical washer



<b>Hilti Filling Set</b>		<b>M16</b>	<b>M20</b>	<b>M24</b>
Diameter of sealing washer	$d_{vs}$ [mm]	52	60	70
Thickness of sealing washer	$h_{vs}$ [mm]	6		
Thickness of Hilti Filling Set	$h_{fs}$ [mm]	11	13	15

**Injection system Hilti HIT-HY 200-R**

**Product description**  
Injection mortar / Static mixer / Steel elements

**Annex A4**

**Table A1: Materials**

Designation	Material
Reinforcing bars (rebars)	
Rebar EN 1992-1-1, Annex C	Bars and de-coiled rods class B or C with $f_{yk}$ and $k$ according to NDP or NCI of EN 1992-1-1/NA $f_{uk} = f_{tk} = k \cdot f_{yk}$
<b>Steel elements made of zinc coated steel</b>	
HAS-U 5.8 (HDG), HIT-V 5.8(F), Threaded rod	Strength class 5.8, $f_{uk} = 500 \text{ N/mm}^2$ , $f_{yk} = 400 \text{ N/mm}^2$ , Elongation at fracture ( $l_0=5d$ ) > 8% ductile Electroplated zinc coated $\geq 5 \mu\text{m}$ , (F) or (HDG) hot dip galvanized $\geq 45 \mu\text{m}$
HAS-U 8.8 (HDG), HIT-V 8.8 (F), Threaded rod	Strength class 8.8, $f_{uk} = 800 \text{ N/mm}^2$ , $f_{yk} = 640 \text{ N/mm}^2$ , Elongation at fracture ( $l_0=5d$ ) > 12% ductile Electroplated zinc coated $\geq 5 \mu\text{m}$ , (F) or (HDG) hot dip galvanized $\geq 45 \mu\text{m}$
Hilti Meter rod AM 8.8 (HDG)	Strength class 8.8, $f_{uk} = 800 \text{ N/mm}^2$ , $f_{yk} = 640 \text{ N/mm}^2$ Elongation at fracture ( $l_0 = 5d$ ) > 12% ductile, Electroplated zinc coated $\geq 5 \mu\text{m}$ , (F) hot dip galvanized $\geq 45 \mu\text{m}$
Hilti tension anchor HZA	Round steel with threaded part: electroplated zinc coated $\geq 5 \mu\text{m}$ Rebar: Bars class B according to NDP or NCI of EN 1992-1-1/NA
Internally threaded sleeve HIS-N	Electroplated zinc coated $\geq 5 \mu\text{m}$
Washer	Electroplated zinc coated $\geq 5 \mu\text{m}$ , hot dip galvanized $\geq 45 \mu\text{m}$
Nut	Strength class of nut adapted to strength class of threaded rod Electroplated zinc coated $\geq 5 \mu\text{m}$ , (F) hot dip galvanized $\geq 45 \mu\text{m}$
Hilti Filling Set (F)	Filling washer: Electroplated zinc coated $\geq 5 \mu\text{m}$ , (F) hot dip galvanized $\geq 45 \mu\text{m}$ Spherical washer: Electroplated zinc coated $\geq 5 \mu\text{m}$ , (F) hot dip galvanized $\geq 45 \mu\text{m}$ Lock nut: Electroplated zinc coated $\geq 5 \mu\text{m}$ , (F) hot dip galvanized $\geq 45 \mu\text{m}$

**Injection system Hilti HIT-HY 200-R**

**Product description**  
Materials

**Annex A5**

**Table A1: continued**

<b>Steel elements made of stainless steel</b> <b>corrosion resistance class (CRC) III according EN 1993-1-4</b>	
HAS-U A4, HIT-V-R	For $\leq$ M24: strength class 70, $f_{uk} = 700 \text{ N/mm}^2$ , $f_{yk} = 450 \text{ N/mm}^2$ ; For $>$ M24: strength class 50, $f_{uk} = 500 \text{ N/mm}^2$ , $f_{yk} = 210 \text{ N/mm}^2$ ; Elongation at fracture ( $l_0=5d$ ) $>$ 12% ductile
Threaded rod	For $\leq$ M24: strength class 70, $f_{uk} = 700 \text{ N/mm}^2$ , $f_{yk} = 450 \text{ N/mm}^2$ ; For $>$ M24: strength class 50, $f_{uk} = 500 \text{ N/mm}^2$ , $f_{yk} = 210 \text{ N/mm}^2$ ; Elongation at fracture ( $l_0=5d$ ) $>$ 12% ductile Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1
Hilti tension anchor HZA-R	Round steel with threaded part: Stainless steel 1.4404, 1.4362, 1.4571 EN 10088-1 Rebar: Bars class B according to NDP or NCI of EN 1992-1-1/NA
Internally threaded sleeve HIS-RN	Stainless steel 1.4401, 1.4571 EN 10088-1
Washer	Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1
Nut	For $\leq$ M24: strength class 70, $f_{uk} = 700 \text{ N/mm}^2$ , $f_{yk} = 450 \text{ N/mm}^2$ ; For $>$ M24: strength class 50, $f_{uk} = 500 \text{ N/mm}^2$ , $f_{yk} = 210 \text{ N/mm}^2$ ; Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1
<b>Steel elements made of high corrosion resistant steel</b> <b>corrosion resistance class (CRC) V according EN 1993-1-4</b>	
HAS-U HCR, HIT-V-HCR	For $\leq$ M20: $f_{uk} = 800 \text{ N/mm}^2$ , $f_{yk} = 640 \text{ N/mm}^2$ , For $>$ M20: $f_{uk} = 700 \text{ N/mm}^2$ , $f_{yk} = 400 \text{ N/mm}^2$ , Elongation at fracture ( $l_0=5d$ ) $>$ 12% ductile
Threaded rod	For $\leq$ M20: $f_{uk} = 800 \text{ N/mm}^2$ , $f_{yk} = 640 \text{ N/mm}^2$ , For $>$ M20: $f_{uk} = 700 \text{ N/mm}^2$ , $f_{yk} = 400 \text{ N/mm}^2$ , Elongation at fracture ( $l_0=5d$ ) $>$ 12% ductile High corrosion resistant steel 1.4529, 1.4565 EN 10088-1
Washer	High corrosion resistant steel 1.4529, 1.4565 EN 10088-1
Nut	For $\leq$ M20: $f_{uk} = 800 \text{ N/mm}^2$ , $f_{yk} = 640 \text{ N/mm}^2$ , For $>$ M20: $f_{uk} = 700 \text{ N/mm}^2$ , $f_{yk} = 400 \text{ N/mm}^2$ , High corrosion resistant steel 1.4529, 1.4565 EN 10088-1

**Injection system Hilti HIT-HY 200-R**

**Product description**  
Materials

**Annex A6**

## Specifications of intended use

### Anchorage subject to:

- Static and quasi static loading.
- Seismic performance category C1 and C2 (see Table B1).








### Base material:

- Compacted reinforced or unreinforced normal weight concrete without fibres according to EN 206.
- Strength classes C20/25 to C50/60 according to EN 206.
- Cracked and uncracked concrete.

### Temperature in the base material:

- **at installation**  
-10 °C to +40 °C for the standard variation of temperature after installation
- **in-service**  
Temperature range I: -40 °C to +40 °C  
(max. long term temperature +24 °C and max. short term temperature +40 °C)  
Temperature range II: -40 °C to +80 °C  
(max. long term temperature +50 °C and max. short term temperature +80 °C)  
Temperature range III: -40 °C to +120 °C  
(max. long term temperature +72 °C and max. short term temperature +120 °C)

**Table B1: Specifications of intended use**

Steel elements	HIT-HY 200-R with ...			
	HAS-U-..., HIT-V-..., AM 8.8 	Rebar 	HZA(-R) 	HIS-(R)N 
Hammer drilling with hollow drill bit TE-CD or TE-YD 	✓	✓	✓	✓
Hammer drilling 	✓	✓	✓	✓
Diamond drilling with roughening tool TE-YRT 	✓	✓	✓	✓
Static and quasi static loading in cracked and uncracked concrete	M8 to M30	φ 8 to φ 32	M12 to M27	M8 to M20
Seismic performance category C1	M10 to M30	φ 10 to φ 32	M12 to M27	-
Seismic performance category C2	M16 to M24, HAS-U (-8.8, -8.8 HDG, A4, HCR) HIT-V 8.8 (-8.8, -8.8 F, -R, HCR), AM (8.8, 8.8 HDG) Threaded rod (electroplated zinc coated 8.8 and CRC III, V, Table A1)	-	-	-

### Injection system Hilti HIT-HY 200-R

Intended Use  
Specifications

**Annex B1**

**Use conditions (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).

**Design:**

- Fastenings are designed under the responsibility of an engineer experienced in fastenings and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be fastened. The position of the fastener is indicated on the design drawings (e. g. position of the fastener relative to reinforcement or to supports, etc.).
- The anchorages are designed in accordance with: EN 1992-4 and EOTA Technical Report TR 055.

**Installation:**

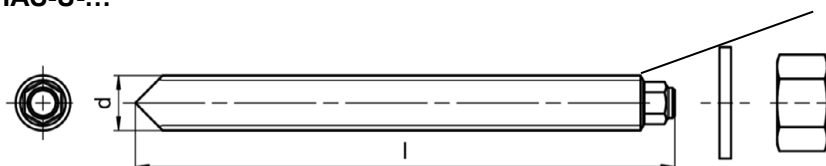
- Use category: dry or wet concrete (not in flooded holes) for all drilling techniques.
- Drilling technique:
  - Hammer drilling,
  - Hammer drilling with Hilti hollow drill bit TE-CD, TE-YD,
  - Diamond coring with roughening with Hilti roughening tool TE-YRT.
- Installation direction D3: downward, horizontal and upward (e.g. overhead) installation admissible for all elements.
- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

<b>Injection system Hilti HIT-HY 200-R</b>	<b>Annex B2</b>
<b>Intended Use Specifications</b>	

**Table B2: Installation parameters of threaded rod, HAS-U-..., HIT-V-... and AM 8.8**

Threaded rod, HAS-U- ..., HIT-V-..., AM 8.8		M8	M10	M12	M16	M20	M24	M27	M30
Diameter of element	d [mm]	8	10	12	16	20	24	27	30
Nominal diameter of drill bit	d <sub>0</sub> [mm]	10	12	14	18	22	28	30	35
Effective embedment depth and drill hole depth	h <sub>ef</sub> = h <sub>0</sub> [mm]	60 to 160	60 to 200	70 to 240	80 to 320	90 to 400	96 to 480	108 to 540	120 to 600
Maximum diameter of clearance hole in the fixture	d <sub>f</sub> [mm]	9	12	14	18	22	26	30	33
Thickness of Hilti Filling Set	h <sub>fs</sub> [mm]	-	-	-	11	13	15	-	-
Effective fixture thickness with Hilti Filling Set	t <sub>fix,eff</sub> [mm]	t <sub>fix,eff</sub> = t <sub>fix</sub> - h <sub>fs</sub>							
Minimum thickness of concrete member	h <sub>min</sub> [mm]	h <sub>ef</sub> + 30 ≥ 100 mm			h <sub>ef</sub> + 2 · d <sub>0</sub>				
Maximum installation torque	max T <sub>inst</sub> [Nm]	10	20	40	80	150	200	270	300
Minimum spacing	s <sub>min</sub> [mm]	40	50	60	75	90	115	120	140
Minimum edge distance	c <sub>min</sub> [mm]	40	45	45	50	55	60	75	80

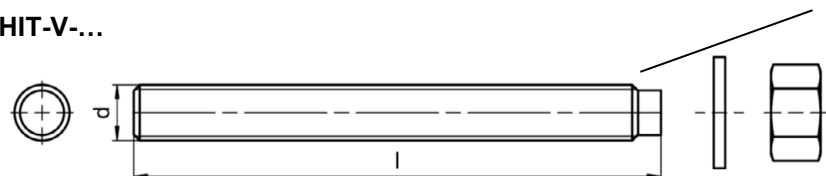
**HAS-U-...**



**Marking:**

Steel grade number and length identification letter: e.g. 8L

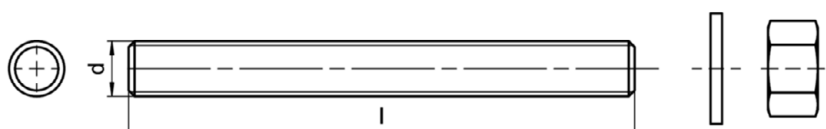
**HIT-V-...**



**Marking:**

- 5.8 - l = HIT-V-5.8 M...x l
- 5.8F - l = HIT-V-5.8F M...x l
- 8.8 - l = HIT-V-8.8 M...x l
- 8.8F - l = HIT-V-8.8F M...x l
- R - l = HIT-V-R M...x l
- HCR - l = HIT-V-HCR M...x l

**Hilti meter rod AM (HDG) 8.8**



**Injection system Hilti HIT-HY 200-R**

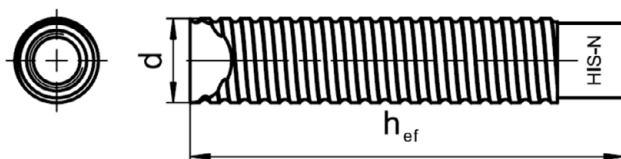
**Intended Use**  
Installation parameters of threaded rod, HAS-U-..., HIT-V-... and AM 8.8

**Annex B3**

**Table B3: Installation parameters of internally threaded sleeve HIS-(R)N**

Internally threaded sleeve HIS-(R)N...			M8	M10	M12	M16	M20
Outer diameter of sleeve	d	[mm]	12,5	16,5	20,5	25,4	27,6
Nominal diameter of drill bit	d <sub>0</sub>	[mm]	14	18	22	28	32
Effective embedment depth and drill hole depth	h <sub>ef</sub> = h <sub>0</sub>	[mm]	90	110	125	170	205
Maximum diameter of clearance hole in the fixture	d <sub>f</sub>	[mm]	9	12	14	18	22
Minimum thickness of concrete member	h <sub>min</sub>	[mm]	120	150	170	230	270
Maximum installation torque	max T <sub>inst</sub>	[Nm]	10	20	40	80	150
Thread engagement length min-max h <sub>s</sub>		[mm]	8-20	10-25	12-30	16-40	20-50
Minimum spacing	s <sub>min</sub>	[mm]	60	75	90	115	130
Minimum edge distance	c <sub>min</sub>	[mm]	40	45	55	65	90

**Internally threaded sleeve HIS-(R)N...**



**Marking:**

Identifying mark - HILTI and embossing "HIS-N" (for C-steel)  
embossing "HIS-RN" (for stainless steel)

**Injection system Hilti HIT-HY 200-R**

**Intended Use**

Installation parameters of internally threaded sleeve HIS-(R)N

**Annex B4**

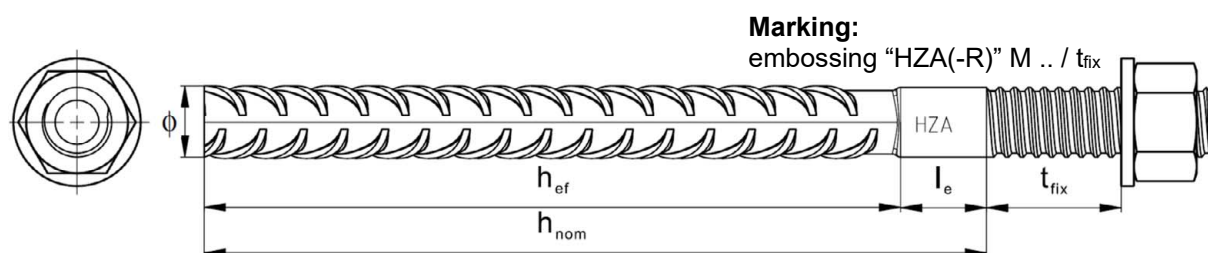


**Table B4: Installation parameters of Hilti tension anchor HZA-R**

Hilti tension anchor HZA-R ...			M12	M16	M20	M24
Rebar diameter	$\phi$	[mm]	12	16	20	25
Nominal embedment depth and drill hole depth	$h_{nom} = h_0$	[mm]	170 to 240	180 to 320	190 to 400	200 to 500
Effective embedment depth ( $h_{ef} = h_{nom} - l_e$ )	$h_{ef}$	[mm]	$h_{nom} - 100$			
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 installation torque	$\max T_{inst}$	[Nm]	40	80	150	200
Minimum thickness of concrete member	$h_{min}$	[mm]	$h_{nom} + 2 \cdot d_0$			
Minimum spacing	$s_{min}$	[mm]	65	80	100	130
Minimum edge distance	$c_{min}$	[mm]	45	50	55	60

**Table B5: Installation parameters of Hilti tension anchor HZA**

Hilti tension anchor HZA...			M12	M16	M20	M24	M27
Rebar diameter	$\phi$	[mm]	12	16	20	25	28
Nominal embedment depth and drill hole depth	$h_{nom} = h_0$	[mm]	90 to 240	100 to 320	110 to 400	120 to 500	140 to 560
Effective embedment depth ( $h_{ef} = h_{nom} - l_e$ )	$h_{ef}$	[mm]	$h_{nom} - 20$				
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 installation torque	$\max T_{inst}$	[Nm]	40	80	150	200	270
Minimum thickness of concrete member	$h_{min}$	[mm]	$h_{nom} + 2 \cdot d_0$				
Minimum spacing	$s_{min}$	[mm]	65	80	100	130	140
Minimum edge distance	$c_{min}$	[mm]	45	50	55	60	75



**Injection system Hilti HIT-HY 200-R**

**Intended Use**

Installation parameters of Hilti tension anchor HZA(-R)

**Annex B5**

**Table B6: Installation parameters of reinforcing bar**

Reinforcing bar (rebar)	$\phi$ 8	$\phi$ 10	$\phi$ 12	$\phi$ 14	$\phi$ 16	$\phi$ 20	$\phi$ 25	$\phi$ 26	$\phi$ 28	$\phi$ 30	$\phi$ 32
Diameter $\phi$ [mm]	8	10	12	14	16	20	25	26	28	30	32
Effective embedment depth and drill hole depth $h_{ef} = h_0$ [mm]	60 to 160	60 to 200	70 to 240	75 to 280	80 to 320	90 to 400	100 to 500	104 to 520	112 to 560	120 to 600	128 to 640
Nominal diameter of drill bit $d_0$ [mm]	10 / 12 <sup>1)</sup>	12 / 14 <sup>1)</sup>	14 <sup>1)</sup> / 16 <sup>1)</sup>	18	20	25	32	32	35	37	40
Minimum thickness of concrete member $h_{min}$ [mm]	$h_{ef} + 30$ $\geq 100$ mm			$h_{ef} + 2 \cdot d_0$							
Minimum spacing $s_{min}$ [mm]	40	50	60	70	80	100	125	130	140	150	160
Minimum edge distance $c_{min}$ [mm]	40	45	45	50	50	65	70	75	75	80	80

<sup>1)</sup> Each of the two given values can be used.

### Reinforcing bar



For rebar bolt

- Minimum value of related rib area  $f_{R,min}$  according to EN 1992-1-1
- Rib height of the bar  $h_{rib}$  shall be in the range  $0,05 \cdot \phi \leq h_{rib} \leq 0,07 \cdot \phi$   
( $\phi$ : Nominal diameter of the bar;  $h_{rib}$ : Rib height of the bar)

**Injection system Hilti HIT-HY 200-R**

**Intended Use**  
Installation parameters of reinforcing bar (rebar)

**Annex B6**

**Table B7: Maximum working time and minimum curing time HIT-HY 200-R**

Temperature in the base material T <sup>1)</sup>	Maximum working time t <sub>work</sub>	Minimum curing time t <sub>cure</sub>
-10 °C to -5 °C	3 h	20 h
> -5 °C to 0 °C	2 h	8 h
> 0 °C to 5 °C	1 h	4 h
> 5 °C to 10 °C	40 min	2,5 h
> 10 °C to 20 °C	15 min	1,5 h
> 20 °C to 30 °C	9 min	1 h
> 30 °C to 40 °C	6 min	1 h

<sup>1)</sup> The minimum foil pack temperature is 0 °C.

**Injection system Hilti HIT-HY 200-R**

**Intended Use**  
Maximum working time and minimum curing time




**Annex B7**

**Table B8: Parameters of drilling, cleaning and setting tools**

Steel elements				Drill and clean					Installation
Threaded rod, HAS-U-..., HIT-V-..., AM 8.8	HIS-(R)N	Rebar	HZA(-R)	Hammer drilling		Diamond coring		Brush	Piston plug
					Hollow drill bit <sup>1)</sup>		Roughening tool		
Size	size	size	size	d <sub>0</sub> [mm]	d <sub>0</sub> [mm]	d <sub>0</sub> [mm]	d <sub>0</sub> [mm]	HIT-RB	HIT-SZ
M8	-	φ8	-	10	-	-	-	10	-
M10	-	φ8 / φ10	-	12	12	-	-	12	12
M12	M8	φ10 / φ12	-	14	14	-	-	14	14
-	-	φ12	M12	16	16	-	-	16	16
M16	M10	φ14	-	18	18	18	18	18	18
-	-	φ16	M16	20	20	20	20	20	20
M20	M12	-	-	22	22	22	22	22	22
-	-	φ20	M20	25	25	25	25	25	25
M24	M16	-	-	28	28	28	28	28	28
M27	-	-	-	30	-	30	30	30	30
-	M20	φ25 / φ26	M24	32	32	32	32	32	32
M30	-	φ28	M27	35	35	35	35	35	35
-	-	φ30	-	37	-	-	-	37	37
-	-	φ32	-	40	-	-	-	40	40

<sup>1)</sup> With vacuum cleaner Hilti VC 20/40/60 (automatic filter cleaning activated) or vacuum cleaner with activated automatic filter cleaning as well as volumetric flow rate at turbine ≥ 57 l/s, volumetric flow rate at end of hose ≥ 106 m³/h and partial vacuum ≥ 16 kPa.

### Cleaning alternatives




<p><b>Manual Cleaning (MC):</b> Hilti hand pump for blowing out drill holes with diameters d<sub>0</sub> ≤ 20 mm and drill hole depths h<sub>0</sub> ≤ 10·d.</p>	
<p><b>Compressed air cleaning (CAC):</b> Air nozzle with an orifice opening of minimum 3,5 mm in diameter.</p>	
<p><b>Automatic Cleaning (AC):</b> Cleaning is performed during drilling with Hilti TE-CD and TE-YD drilling system including vacuum cleaner..</p>	

### Injection system Hilti HIT-HY 200-R

**Intended Use**  
Parameters of drilling, cleaning and setting tools  
Cleaning alternatives

**Annex B8**



**Table B9: Hilti roughening tool TE-YRT – tool parameters**

Associated components			
Diamond coring		Roughening tool TE-YRT	Wear gauge RTG...
			
d <sub>0</sub> [mm]		d <sub>0</sub> [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 B10: Hilti roughening tool TE-YRT – roughening and blowing times**

	Roughening time t <sub>roughen</sub>	Minimum blowing time t <sub>blowing</sub>
h <sub>ef</sub> [mm]	t <sub>roughen</sub> [sec] = h <sub>ef</sub> [mm] / 10	t <sub>blowing</sub> [sec] = t <sub>roughen</sub> [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

**Hilti roughening tool TE-YRT and wear gauge RTG**

Hilti roughening tool TE-YRT	
Wear gauge RTG	

Injection system Hilti HIT-HY 200-R

Intended Use

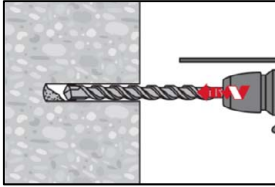
Parameters for use of the Hilti Roughening tool TE-YRT

Annex B9

## Installation instruction

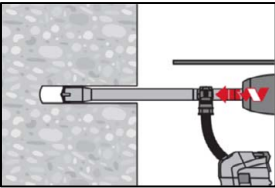
### Hole drilling

#### a) Hammer drilling



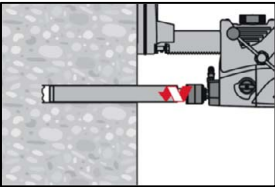
Drill hole to the required embedment depth with a hammer drill set in rotation-hammer mode using an appropriately sized carbide drill bit.

#### b) Hammer drilling with Hilti hollow drill bit

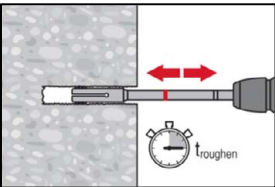


Drill hole to the required embedment depth with an appropriately sized Hilti TE-CD or TE-YD hollow drill bit attached to Hilti vacuum cleaner VC 20/40/60 or with a vacuum cleaner according to Table B8, in each case with automatic cleaning of the filter activated. This drilling system removes the dust 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.



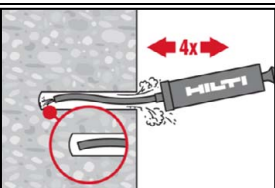
Before roughening water needs to be removed from the drill hole.  
Check usability of the roughening tool with the wear gauge RTG.  
Roughen the drill hole over the whole length to the required  $h_{ef}$ .  
Roughening time  $t_{roughen}$  see Table B10.

#### Drill hole cleaning

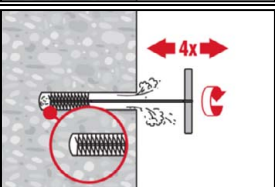
Just before injection of the mortar, the drill hole must be free of dust and debris.  
Inadequate hole cleaning = poor load values.

#### Manual Cleaning (MC)

Uncracked concrete only.  
For drill hole diameters  $d_0 \leq 20$  mm and drill hole depths  $h_0 \leq 10 \cdot d$ .



The Hilti hand pump may be used for blowing out drill holes up to diameters  $d_0 \leq 20$  mm and drill hole depths  $h_0 \leq 10 \cdot d$ .  
Blow out at least 4 times from the back of the drill hole until return air stream is free of noticeable dust.

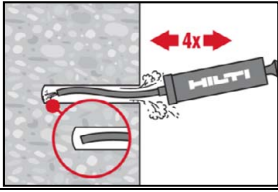
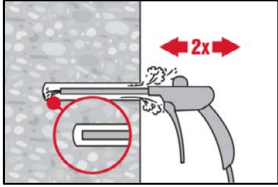
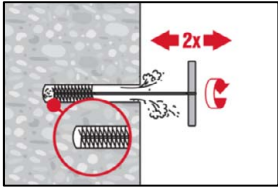
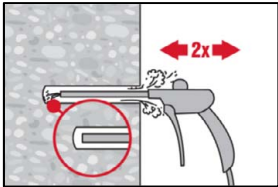
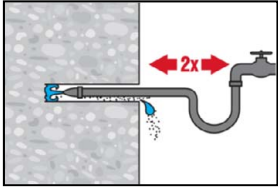
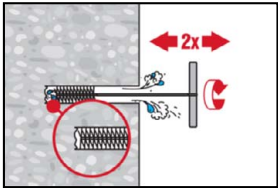
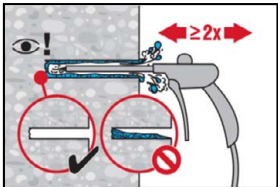


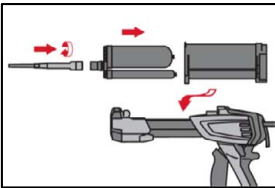
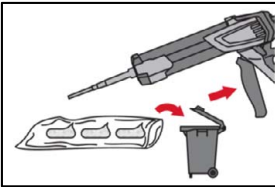
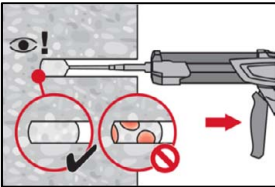
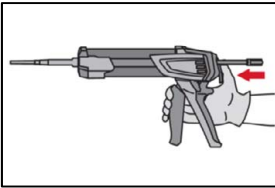
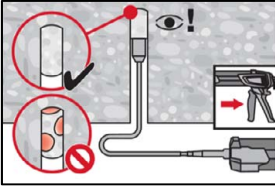
Brush 4 times with the specified brush (see Table B8) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it. The brush must produce natural resistance as it enters the drill hole (brush  $\varnothing \geq$  drill hole  $\varnothing$ ) - if not the brush is too small and must be replaced with the proper brush diameter.

### Injection system Hilti HIT-HY 200-R

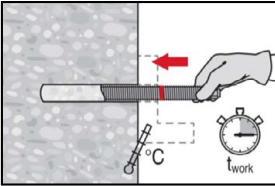
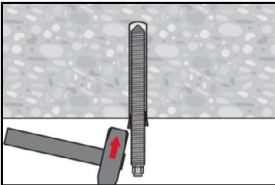
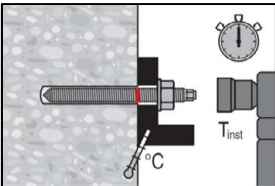
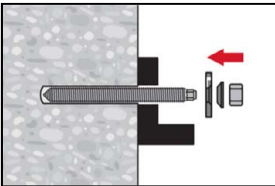
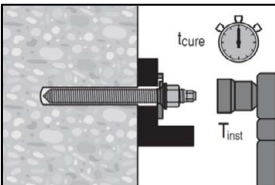
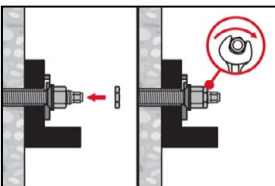
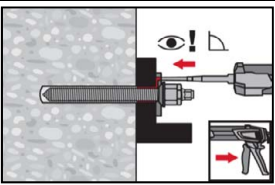
Intended Use  
Installation instructions

**Annex B10**

	<p>Blow out again with the Hilti hand pump at least 4 times until return air stream is free of noticeable dust.</p>
<p><b>Compressed air cleaning (CAC) for all drill hole diameters <math>d_0</math> and all drill hole depths <math>h_0</math></b></p>	
	<p>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. For drill hole diameters <math>\geq 32</math> mm the compressor has to supply a minimum air flow of 140 m³/h.</p>
	<p>Brush 2 times with the specified brush (see Table B8) 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 <math>\varnothing \geq</math> drill hole <math>\varnothing</math>) - if not the brush is too small and must be replaced with the proper brush diameter.</p>
	<p>Blow again with compressed air 2 times until return air stream is free of noticeable dust.</p>
<p><b>Cleaning of diamond cored holes with roughening with Hilti roughening tool TE-YRT.</b></p>	
	<p>Flush 2 times by inserting a water hose (water-line pressure) to the back of the hole until water runs clear.</p>
	<p>Brush 2 times with the specified brush (see Table B8) 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 <math>\varnothing \geq</math> drill hole <math>\varnothing</math>) - if not the brush is too small and must be replaced with the proper brush diameter.</p>
	<p>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 drillhole until drillhole is completely dried before mortar injection (<math>t_{blowing}</math> see Table B10). For drill hole diameters <math>\geq 32</math> mm the compressor has to supply a minimum air flow of 140 m³/h.</p>
<p><b>Injection system Hilti HIT-HY 200-R</b></p>	
<p><b>Intended Use</b> Installation instructions</p>	<p><b>Annex B11</b></p>

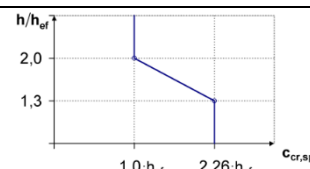
<p><b>Injection preparation</b></p>							
	<p>Tightly attach Hilti mixing nozzle HIT-RE-M to foil pack manifold. Do not modify the mixing nozzle. Observe the instruction for use of the dispenser. Check foil pack holder for proper function. Insert foil pack into foil pack holder and put holder into dispenser.</p>						
	<p>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</p> <table border="0"> <tr> <td>2 strokes</td> <td>for 330 ml foil pack,</td> </tr> <tr> <td>3 strokes</td> <td>for 500 ml foil pack,</td> </tr> <tr> <td>4 strokes</td> <td>for 500 ml foil pack ≤ 5 °C.</td> </tr> </table> <p>The minimum foil pack temperature is 0°C.</p>	2 strokes	for 330 ml foil pack,	3 strokes	for 500 ml foil pack,	4 strokes	for 500 ml foil pack ≤ 5 °C.
2 strokes	for 330 ml foil pack,						
3 strokes	for 500 ml foil pack,						
4 strokes	for 500 ml foil pack ≤ 5 °C.						
<p><b>Inject adhesive</b> from the back of the drill hole without forming air voids.</p>							
	<p>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 steel element and the concrete is completely filled with adhesive along the embedment length. In water saturated concrete it is required to set the fastener immediately after cleaning the drillhole.</p>						
	<p>After injection is completed, depressurize the dispenser by pressing the release trigger. This will prevent further adhesive discharge from the mixer.</p>						
	<p>Overhead installation and/or installation with embedment depth <math>h_{ef} &gt; 250\text{mm}</math>. 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 B8). 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.</p>						
<p><b>Injection system Hilti HIT-HY 200-R</b></p>							
<p><b>Intended Use</b> Installation instructions</p>	<p><b>Annex B12</b></p>						



<p><b>Setting the steel element</b></p>  <p>Before use, verify that the element is dry and free of oil and other contaminants. Mark and set steel element to the required embedment depth before working time <math>t_{work}</math> has elapsed. The working time <math>t_{work}</math> is given in Table B7.</p>  <p>For overhead installation use piston plugs and fix embedded parts with e.g. wedges (Hilti HIT-OHW).</p>  <p>Loading: After required curing time <math>t_{cure}</math> (see Table B7) the fastening can be loaded. The applied installation torque shall not exceed the values <math>\max T_{inst}</math> given in Table B2 to Table B5.</p>	
<p><b>Installation of Hilti Filling Set</b></p>  <p>Use Hilti Filling Set with standard nut. Observe the correct orientation of filling washer and spherical washer.</p>  <p>The applied installation torque shall not exceed the values <math>\max T_{inst}</math> given in Table B2 to Table B5.</p>  <p>Optional: Installation of lock nut. Tighten with a <math>\frac{1}{4}</math> to <math>\frac{1}{2}</math> turn. (Not for size M24.)</p>  <p>Fill the annular gap between steel element and fixture with 1-3 strokes of a Hilti injection mortar HIT-HY ... or HIT-RE ... . Follow the installation instructions supplied with the respective Hilti injection mortar. After required curing time <math>t_{cure}</math> the fastening can be loaded.</p>	
<p><b>Injection system Hilti HIT-HY 200-R</b></p>	<p><b>Annex B13</b></p>
<p><b>Intended Use</b> Installation instructions</p>	

**Table C1: Essential characteristics for threaded rod, HAS-U-..., HIT-V-... and AM 8.8 under tension load in concrete**

Threaded rod, HAS-U-..., HIT-V-... and AM 8.8			M8	M10	M12	M16	M20	M24	M27	M30	
<b>For a working life of 50 years</b>											
<b>Installation factor</b>											
Hammer drilling	$\gamma_{inst}$	[-]	1,0								
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD	$\gamma_{inst}$	[-]	1)	1,0							
Diamond coring with roughening with Hilti roughening tool TE-YRT	$\gamma_{inst}$	[-]	1)				1,0				
<b>Steel failure</b>											
Characteristic resistance	$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$								
Partial factor grade 5.8	$\gamma_{Ms,N^{(2)}}$	[-]	1,5								
Partial factor grade 8.8	$\gamma_{Ms,N^{(2)}}$	[-]	1,5								
Partial factor HAS-U A4, HIT-V-R, Threaded rod CRC III (Table A1)	$\gamma_{Ms,N^{(2)}}$	[-]	1,87						2,86		
Partial factor HAS-U HCR, HIT-V-HCR, Threaded rod CRC V (Table A1)	$\gamma_{Ms,N^{(2)}}$	[-]	1,5					2,1			
<b>Concrete cone failure</b>											
Factor for uncracked concrete	$K_{ucr,N}$	[-]	11,0								
Factor for cracked concrete	$K_{cr,N}$	[-]	7,7								
Edge distance	$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$								
Spacing	$s_{cr,N}$	[mm]	$3,0 \cdot h_{ef}$								
<b>Splitting failure</b>											
Edge distance $c_{cr,sp}$ [mm] for	$h / h_{ef} \geq 2,0$		$1,0 \cdot h_{ef}$								
	$2,0 > h / h_{ef} > 1,3$		$4,6 \cdot h_{ef} - 1,8 \cdot h$								
	$h / h_{ef} \leq 1,3$		$2,26 \cdot h_{ef}$								
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$								



- 1) No performance assessed.  
2) In absence of national regulations.

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension load in concrete

**Annex C1**

**Table C1: continued**

Threaded rod, HAS-U-..., HIT-V-... and AM 8.8	M8	M10	M12	M16	M20	M24	M27	M30
<b>Combined pullout and concrete cone failure for a working life of 50 years</b>								
Characteristic bond resistance in uncracked concrete C20/25								
Temperature range I: 40 °C / 24 °C $\tau_{Rk,ucr}$ [N/mm <sup>2</sup> ]	18							
Temperature range II: 80 °C / 50 °C $\tau_{Rk,ucr}$ [N/mm <sup>2</sup> ]	15							
Temperature range III: 120 °C / 72 °C $\tau_{Rk,ucr}$ [N/mm <sup>2</sup> ]	13							
Characteristic bond resistance in cracked concrete C20/25								
Temperature range I: 40 °C / 24 °C $\tau_{cr}$ [N/mm <sup>2</sup> ]	7,5	8,5		9,0				
Temperature range II: 80 °C / 50 °C $\tau_{Rk,cr}$ [N/mm <sup>2</sup> ]	6,0	7,0		7,5				
Temperature range III: 120 °C / 72 °C $\tau_{Rk,cr}$ [N/mm <sup>2</sup> ]	5,5	6,0		6,5				
<b>Influence factors <math>\psi</math> on bond resistance <math>\tau_{Rk}</math> in cracked and uncracked concrete</b>								
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$								
Temperature range I to III :	$\psi_c$	[-] $(f_{ck}/20)^{0,1}$						
Influence of sustained load								
Temperature range I: 40 °C / 24 °C $\psi_{sus}^0$ [-]	0,74							
Temperature range II: 80 °C / 50 °C $\psi_{sus}^0$ [-]	0,89							
Temperature range III: 120 °C / 72 °C $\psi_{sus}^0$ [-]	0,72							

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension load in concrete

**Annex C2**

**Table C2: Essential characteristics for threaded rod, HAS-U-..., HIT-V-... and AM 8.8 under shear load in concrete**

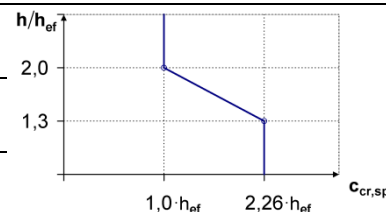
Threaded rod, HAS-U-..., HIT-V-..., AM 8.8			M8	M10	M12	M16	M20	M24	M27	M30	
<b>For a working life of 50 years</b>											
<b>Steel failure without lever arm</b>											
Characteristic resistance	$V_{Rk,s}^0$	[kN]	$k_6 \cdot A_s \cdot f_{uk}$								
Factor grade 5.8	$k_6$	[-]	0,6								
Factor grade 8.8	$k_6$	[-]	0,5								
Factor HAS-U A4, HIT-V-R, Threaded rod CRC III (Table A1)	$k_6$	[-]	0,5								
Factor HAS-U HCR, HIT-V-HCR, Threaded rod CRC V (Table A1)	$k_6$	[-]	0,5								
Partial factor grade 5.8	$\gamma_{Ms,V}^{1)}$	[-]	1,25								
Partial factor grade 8.8	$\gamma_{Ms,V}^{1)}$	[-]	1,25								
Partial factor HAS-U A4, HIT-V-R, Threaded rod CRC III (Table A1)	$\gamma_{Ms,V}^{1)}$	[-]	1,56						2,38		
Partial factor HAS-U HCR, HIT-V-HCR, Threaded rod CRC V (Table A1)	$\gamma_{Ms,V}^{1)}$	[-]	1,25				1,75				
Ductility factor	$k_7$	[-]	1,0								
<b>Steel failure with lever arm</b>											
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	$1,2 \cdot W_{el} \cdot f_{uk}$								
Ductility factor	$k_7$	[-]	1,0								
<b>Concrete pry-out failure</b>											
Pry-out factor	$k_8$	[-]	2,0								
<b>Concrete edge failure</b>											
Effective length of fastener	$l_f$	[mm]	$\min(h_{ef}, 12 \cdot d_{nom})$							$\min(h_{ef}, 8 \cdot d_{nom}, 300)$	
Outside diameter of fastener	$d_{nom}$	[mm]	8	10	12	16	20	24	27	30	

<sup>1)</sup> In absence of national regulations.

<b>Injection system Hilti HIT-HY 200-R</b>	<b>Annex C3</b>
<b>Performances</b> Essential characteristics under shear load in concrete	

**Table C3: Essential characteristics for internally threaded sleeve HIS-(R)N under tension load in concrete**

HIS-(R)N			M8	M10	M12	M16	M20
<b>For a working life of 50 years</b>							
<b>Installation factor</b>							
Hammer drilling	$\gamma_{inst}$	[-]	1,0				
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD	$\gamma_{inst}$	[-]	1,0				
Diamond coring with roughening with Hilti roughening tool TE-YRT	$\gamma_{inst}$	[-]	1)	1,0			
<b>Steel failure</b>							
Characteristic resistance HIS-N with screw or threaded rod grade 8.8	$N_{Rk,s}$	[kN]	25	46	67	125	116
Partial factor	$\gamma_{Ms,N^{2)}$	[-]	1,50				
Characteristic resistance HIS-RN with screw or threaded rod grade 70	$N_{Rk,s}$	[kN]	26	41	59	110	166
Partial factor	$\gamma_{Ms,N^{2)}$	[-]	1,87				2,4
<b>Concrete cone failure</b>							
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0				
Factor for cracked concrete	$k_{cr,N}$	[-]	7,7				
Edge distance	$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$				
Spacing	$s_{cr,N}$	[mm]	$3,0 \cdot h_{ef}$				
<b>Splitting failure</b>							
Edge distance $c_{cr,sp}$ [mm] for	$h / h_{ef} \geq 2,0$		$1,0 \cdot h_{ef}$				
	$2,0 > h / h_{ef} > 1,3$		$4,6 h_{ef} - 1,8 h$				
	$h / h_{ef} \leq 1,3$		$2,26 h_{ef}$				
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$				



- 1) No performance assessed.  
2) In absence of national regulations.

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension load in concrete

**Annex C4**

**Table C3: continued**

HIS-(R)N		M8	M10	M12	M16	M20
<b>Combined pullout and concrete cone failure for a working life of 50 years</b>						
Effective embedment depth	$h_{ef}$ [mm]	90	110	125	170	205
Effective fastener diameter	$d_1$ [mm]	12,5	16,5	20,5	25,4	27,6
Characteristic bond resistance in uncracked concrete C20/25						
Temperature range I:	40 °C / 24 °C	$\tau_{Rk,ucr}$ [N/mm <sup>2</sup> ]	13			
Temperature range II:	80 °C / 50 °C	$\tau_{Rk,ucr}$ [N/mm <sup>2</sup> ]	11			
Temperature range III:	120 °C / 72 °C	$\tau_{Rk,ucr}$ [N/mm <sup>2</sup> ]	9,5			
Characteristic bond resistance in cracked concrete C20/25						
Temperature range I:	40 °C / 24 °C	$\tau_{Rk,cr}$ [N/mm <sup>2</sup> ]	7			
Temperature range II:	80 °C / 50 °C	$\tau_{Rk,cr}$ [N/mm <sup>2</sup> ]	5,5			
Temperature range III:	120 °C / 72 °C	$\tau_{Rk,cr}$ [N/mm <sup>2</sup> ]	5			
<b>Influence factors <math>\psi</math> on bond resistance <math>\tau_{Rk}</math> in cracked and uncracked concrete</b>						
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$						
Temperature range I to III :	$\psi_c$ [-]	$(f_{ck}/20)^{0,1}$				
Influence of sustained load						
Temperature range I:	40 °C / 24 °C	$\psi_{sus}^0$ [-]	0,74			
Temperature range II:	80 °C / 50 °C	$\psi_{sus}^0$ [-]	0,89			
Temperature range III:	120 °C / 72 °C	$\psi_{sus}^0$ [-]	0,72			

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension load in concrete

**Annex C5**

**Table C4: Essential characteristics for internally threaded sleeve HIS-(R)N under shear load in concrete**

HIS-(R)N		M8	M10	M12	M16	M20
<b>For a working life of 50 years</b>						
<b>Steel failure without lever arm</b>						
Characteristic resistance HIS-N with screw or threaded rod grade 8.8	$V_{Rk,s}^0$ [kN]	13	23	34	63	58
Partial factor	$\gamma_{Ms,V}^{1)}$ [-]	1,25				
Characteristic resistance HIS-RN with screw or threaded rod grade 70	$V_{Rk,s}^0$ [kN]	13	20	30	55	83
Partial factor	$\gamma_{Ms,V}^{1)}$ [-]	1,56				2,0
Ductility factor	$k_7$ [-]	1,0				
<b>Steel failure with lever arm</b>						
Characteristic resistance HIS-N with screw or threaded rod grade 8.8	$M_{Rk,s}^0$ [Nm]	30	60	105	266	519
Characteristic resistance HIS-RN with screw or threaded rod grade 70	$M_{Rk,s}^0$ [Nm]	26	52	92	233	454
Ductility factor	$k_7$ [-]	1,0				
<b>Concrete pry-out failure</b>						
Pry-out factor	$k_8$ [-]	2,0				
<b>Concrete edge failure</b>						
Effective length of fastener	$l_f$ [mm]	90	110	125	170	205
Outside diameter of fastener	$d_{nom}$ [mm]	12,5	16,5	20,5	25,4	27,6

<sup>1)</sup> In absence of national regulations.

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under shear load in concrete

**Annex C6**

**Table C5: Essential characteristics for Hilti tension anchor HZA / HZA-R under tension load in concrete**

Hilti tension anchor HZA, HZA-R			M12	M16	M20	M24	M27
<b>For a working life of 50 years</b>							
<b>Installation factor</b>							
Hammer drilling	$\gamma_{inst}$	[-]	1,0				
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD	$\gamma_{inst}$	[-]	1,0				
Diamond coring with roughening with Hilti roughening tool TE-YRT	$\gamma_{inst}$	[-]	1)	1,0			
<b>Steel failure</b>							
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	$\gamma_{Ms,N^2)}$	[-]	1,4				
<b>Concrete cone failure</b>							
Effective anchorage depth	HZA	$h_{ef}$	[mm]		$h_{nom}$		
	HZA-R	$h_{ef}$	[mm]		$h_{nom}$		1)
Factor for uncracked concrete	$k_{ucr,N}$	[-]	11,0				
Factor for cracked concrete	$k_{cr,N}$	[-]	7,7				
Edge distance	$c_{cr,N}$	[mm]	$1,5 \cdot h_{ef}$				
Spacing	$s_{cr,N}$	[mm]	$3,0 \cdot h_{ef}$				
<b>Splitting failure relevant for uncracked concrete</b>							
Edge distance $c_{cr,sp}$ [mm] for	$h / h_{ef} \geq 2,0$		$1,0 \cdot h_{ef}$				
	$2,0 > h / h_{ef} > 1,3$		$4,6 \cdot h_{ef} - 1,8 \cdot h$				
	$h / h_{ef} \leq 1,3$		$2,26 \cdot h_{ef}$				
Spacing	$s_{cr,sp}$	[mm]	$2 \cdot c_{cr,sp}$				

1) No performance assessed.

2) In absence of national regulations.

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension load in concrete

**Annex C7**



**Table C5: continued**

<b>Hilti tension anchor HZA, HZA-R</b>				<b>M12</b>	<b>M16</b>	<b>M20</b>	<b>M24</b>	<b>M27</b>
Diameter of rebar	d	[mm]		12	16	20	25	28
Effective anchorage depth	HZA	$h_{ef}$	[mm]	$h_{nom} - 20$				
	HZA-R	$h_{ef}$	[mm]	$h_{nom} - 100$				
<b>Combined pull-out and concrete cone failure for a working life of 50 years</b>								
Characteristic bond resistance in uncracked concrete C20/25								
Temperature range I:	40 °C / 24 °C	$\tau_{RK,ucr}$	[N/mm <sup>2</sup> ]	12				
Temperature range II:	80 °C / 50 °C	$\tau_{RK,ucr}$	[N/mm <sup>2</sup> ]	10				
Temperature range III:	120 °C / 72 °C	$\tau_{RK,ucr}$	[N/mm <sup>2</sup> ]	8,5				
Characteristic bond resistance in cracked concrete C20/25								
Temperature range I:	40 °C / 24 °C	$\tau_{RK,cr}$	[N/mm <sup>2</sup> ]	7				
Temperature range II:	80 °C / 50 °C	$\tau_{RK,cr}$	[N/mm <sup>2</sup> ]	5,5				
Temperature range III:	120 °C / 72 °C	$\tau_{RK,cr}$	[N/mm <sup>2</sup> ]	5				
<b>Influence factors <math>\psi</math> on bond resistance <math>\tau_{RK}</math> in cracked and uncracked concrete</b>								
Influence of concrete strength class: $\tau_{RK} = \tau_{RK,(C20/25)} \cdot \psi_c$								
Temperature range I to III :	$\psi_c$	[-]		$(f_{ck}/20)^{0,1}$				
Influence of sustained load								
Temperature range I:	40 °C / 24 °C	$\psi_{sus}^0$	[-]	0,74				
Temperature range II:	80 °C / 50 °C	$\psi_{sus}^0$	[-]	0,89				
Temperature range III:	120 °C / 72 °C	$\psi_{sus}^0$	[-]	0,72				

<sup>1)</sup> No performance assessed

**Injection system Hilti HIT-HY 200-R**

**Performances**

Essential characteristics under tension load in concrete

**Annex C8**

**Table C6: Essential characteristics for Hilti tension anchor HZA, HZA-R under shear load in concrete**

Hilti tension anchor HZA, HZA-R			M12	M16	M20	M24	M27	
<b>For a working life of 50 years</b>								
<b>Steel failure without lever arm</b>								
Characteristic resistance HZA	$V_{Rk,s}^0$	[kN]	23	43	67	97	126	
Characteristic resistance HZA-R	$V_{Rk,s}^0$	[kN]	31	55	86	124	<sup>1)</sup>	
Partial factor	$\gamma_{Ms,V}^{2)}$	[-]	1,5					
Ductility factor	$k_7$	[-]	1,0					
<b>Steel failure with lever arm</b>								
Characteristic resistance HZA	$M_{Rk,s}^0$	[Nm]	72	183	357	617	915	
Characteristic resistance HZA-R	$M_{Rk,s}^0$	[Nm]	97	234	457	790	<sup>1)</sup>	
Ductility factor	$k_7$	[-]	1,0					
<b>Concrete pry-out failure</b>								
Pry-out factor	$k_8$	[-]	2,0					
<b>Concrete edge failure</b>								
Effective length of fastener	$l_f$	[mm]	min ( $h_{nom}$ ; $12 \cdot d_{nom}$ )				min ( $h_{nom}$ ; $8 \cdot d_{nom}$ ; 300)	
Outside diameter of fastener	$d_{nom}$	[mm]	12	16	20	24	27	

<sup>1)</sup> No performance assessed.

<sup>2)</sup> In absence of national regulations.

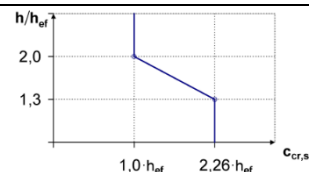
**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under shear load in concrete

**Annex C9**

**Table C7: Essential characteristics for rebar under tension load in concrete**

Rebar		Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 26	Ø 28	Ø 30	Ø 32	
<b>For a working life of 50 years</b>													
<b>Installation factor</b>													
Hammer drilling	$\gamma_{inst}$	[-]		1,0									
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD	$\gamma_{inst}$	[-]		1,0									
Diamond coring with roughening with Hilti roughening tool TE-YRT	$\gamma_{inst}$	[-]		1)		1,0							
<b>Steel failure</b>													
Characteristic resistance	$N_{RK,s}$	[kN]		$A_s \cdot f_{uk}^{2)}$									
Characteristic resistance Rebar B500B acc. to DIN 488-1	$N_{RK,s}$	[kN]	28	43	62	85	111	173	270	292	339	388	442
Partial factor	$\gamma_{Ms,N}^{3)}$	[-]		1,4									
<b>Concrete cone failure</b>													
Factor for uncracked concrete	$k_{ucr,N}$	[-]		11,0									
Factor for cracked concrete	$k_{cr,N}$	[-]		7,7									
Edge distance	$c_{cr,N}$	[mm]		$1,5 \cdot h_{ef}$									
Spacing	$s_{cr,N}$	[mm]		$3,0 \cdot h_{ef}$									
<b>Splitting failure relevant for uncracked concrete</b>													
Edge distance $c_{cr,sp}$ [mm] for	$h / h_{ef} \geq 2,0$		$1,0 \cdot h_{ef}$										
	$2,0 > h / h_{ef} > 1,3$		$4,6 \cdot h_{ef} - 1,8 \cdot h$										
	$h / h_{ef} \leq 1,3$		$2,26 \cdot h_{ef}$										
Spacing	$s_{cr,sp}$	[mm]		$2 c_{cr,sp}$									



- 1) No performance assessed.  
2)  $f_{uk}$  according to rebar specification.  
3) In absence of national regulations.

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension load in concrete

**Annex C10**

**Table C7: continued**

Rebar	$\phi$ 8	$\phi$ 10	$\phi$ 12	$\phi$ 14	$\phi$ 16	$\phi$ 20	$\phi$ 25	$\phi$ 26	$\phi$ 28	$\phi$ 30	$\phi$ 32
Diameter of rebar d [mm]	8	10	12	14	16	20	25	26	28	30	32
<b>Combined pull-out and concrete cone failure for a working life of 50 years</b>											
Characteristic bond resistance in uncracked concrete C20/25											
Temperature range I: 40°C/24°C $\tau_{Rk,ucr}$ [N/mm <sup>2</sup> ]	12										
Temperature range II: 80°C/50°C $\tau_{Rk,ucr}$ [N/mm <sup>2</sup> ]	10										
Temperature range III: 120°C/72°C $\tau_{Rk,ucr}$ [N/mm <sup>2</sup> ]	8,5										
Characteristic bond resistance in cracked concrete C20/25											
Temperature range I: 40°C/24°C $\tau_{Rk,cr}$ [N/mm <sup>2</sup> ]	1) <sup>1)</sup>	5	7								
Temperature range II: 80°C/50°C $\tau_{Rk,cr}$ [N/mm <sup>2</sup> ]	1) <sup>1)</sup>	4	5,5								
Temperature range III: 120°C/72°C $\tau_{Rk,cr}$ [N/mm <sup>2</sup> ]	1) <sup>1)</sup>	3,5	5								
<b>Influence factors <math>\psi</math> on bond resistance <math>\tau_{Rk}</math> in cracked and uncracked concrete</b>											
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$											
Temperature range I to III : $\psi_c$ [-]	$(f_{ck}/20)^{0,1}$										
Influence of sustained load											
Temperature range I: 40°C/24°C $\psi_{sus}^0$ [-]	0,74										
Temperature range II: 80°C/50°C $\psi_{sus}^0$ [-]	0,89										
Temperature range III: 120°C/72°C $\psi_{sus}^0$ [-]	0,72										

<sup>1)</sup> No performance assessed.

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension load in concrete

**Annex C11**

**Table C8: Essential characteristics for rebar under shear load in concrete**

Rebar		φ 8	φ 10	φ 12	φ 14	φ 16	φ 20	φ 25	φ 26	φ 28	φ 30	φ 32	
<b>For a working life of 50 years</b>													
<b>Steel failure without lever arm</b>													
Characteristic resistance	$V_{Rk,s}^0$ [kN]	$0,5 \cdot A_s \cdot f_{uk}^{1)}$											
Characteristic resistance Rebar B500B acc. to DIN 488-1	$V_{Rk,s}^0$ [kN]	14	22	31	42	55	86	135	146	169	194	221	
Partial factor	$\gamma_{Ms,V}^{2)}$ [-]	1,5											
Ductility factor	$k_7$ [-]	1,0											
<b>Steel failure with lever arm</b>													
Characteristic resistance	$M_{Rk,s}^0$ [Nm]	$1,2 \cdot W_{el} \cdot f_{uk}^{1)}$											
Characteristic resistance Rebar B500B acc. to DIN 488-1	$M_{Rk,s}^0$ [Nm]	33	65	112	178	265	518	1012	1139	1422	1749	2123	
Ductility factor	$k_7$ [-]	1,0											
<b>Concrete pry-out failure</b>													
Pry-out factor	$k_8$ [-]	2,0											
<b>Concrete edge failure</b>													
Effective length of fastener	$l_f$ [mm]	$\min(h_{ef}; 12 \cdot d_{nom})$						$\min(h_{nom}; 8 \cdot d_{nom}; 300)$					
Outside diameter of fastener	$d_{nom}$ [mm]	8	10	12	14	16	20	25	26	28	30	32	

<sup>1)</sup>  $f_{uk}$  according to rebar specification

<sup>2)</sup> In absence of national regulations.

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under shear load in concrete

**Annex C12**

**Table C9: Displacements under tension load**

Threaded rod, HAS-U-..., HIT-V-..., AM 8.8		M8	M10	M12	M16	M20	M24	M27	M30	
Uncracked concrete temperature range I : 40°C / 24°C										
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,04	0,05	0,06	0,08	0,10	0,13	0,14	0,16
Uncracked concrete temperature range II : 80°C / 50°C										
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,03	0,04	0,05	0,06	0,08	0,09	0,10	0,12
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,04	0,05	0,06	0,09	0,11	0,13	0,15	0,16
Uncracked concrete temperature range III : 120°C / 72°C										
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,04	0,05	0,06	0,08	0,10	0,12	0,13	0,16
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,04	0,05	0,07	0,09	0,11	0,13	0,15	0,17
Cracked concrete temperature range I : 40°C / 24°C										
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,07							
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,16							
Cracked concrete temperature range II : 80°C / 50°C										
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,10							
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,22							
Cracked concrete temperature range III : 120°C / 72°C										
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,13							
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,29							

**Table C10: Displacements under shear load**

Threaded rod, HAS-U-..., HIT-V-..., AM 8.8		M8	M10	M12	M16	M20	M24	M27	M30	
Displacement	$\delta_{V0}$	[mm/kN]	0,06	0,06	0,05	0,04	0,04	0,03	0,03	0,03
	$\delta_{V\infty}$	[mm/kN]	0,09	0,08	0,08	0,06	0,06	0,05	0,05	0,05

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Displacements with threaded rod, HAS-U-..., HIT-V-... and AM 8.8

**Annex C13**

**Table C11: Displacements under tension load**

HIS-(R)N		M8	M10	M12	M16	M20	
Uncracked concrete temperature range I : 40°C / 24°C							
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,03	0,05	0,06	0,07	0,08
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,06	0,09	0,11	0,13	0,14
Uncracked concrete temperature range II : 80°C / 50°C							
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,05	0,06	0,08	0,10	0,11
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,07	0,09	0,11	0,13	0,15
Uncracked concrete temperature range III : 120°C / 72°C							
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,06	0,08	0,10	0,13	0,14
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,07	0,09	0,11	0,14	0,15
Cracked concrete temperature range I : 40°C / 24°C							
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,11				
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,16				
Cracked concrete temperature range II : 80°C / 50°C							
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,15				
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,22				
Cracked concrete temperature range III : 120°C / 72°C							
Displacement	$\delta_{N0}$	[mm/(N/mm <sup>2</sup> )]	0,20				
	$\delta_{N\infty}$	[mm/(N/mm <sup>2</sup> )]	0,29				

**Table C12: Displacements under shear load**

HIS-(R)N		M8	M10	M12	M16	M20	
Displacement	$\delta_{V0}$	[mm/kN]	0,06	0,06	0,05	0,04	0,04
	$\delta_{V\infty}$	[mm/kN]	0,09	0,08	0,08	0,06	0,06

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Displacements with HIS-(R)N

**Annex C14**

**Table C13: Displacements under tension load**

Hilti tension anchor HZA, HZA-R		M12	M16	M20	M24	M27
Uncracked concrete temperature range I : 40°C / 24°C						
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]	0,03	0,04	0,06	0,07	0,08
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]	0,06	0,08	0,13	0,13	0,15
Uncracked concrete temperature range II : 80°C / 50°C						
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]	0,05	0,06	0,08	0,10	0,11
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]	0,06	0,09	0,14	0,14	0,15
Uncracked concrete temperature range III : 120°C / 72°C						
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]	0,06	0,08	0,10	0,12	0,14
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]	0,07	0,09	0,14	0,14	0,16
Cracked concrete temperature range I : 40°C / 24°C						
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]	0,11				
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]	0,16				
Cracked concrete temperature range II : 80°C / 50°C						
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]	0,15				
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]	0,22				
Cracked concrete temperature range III : 120°C / 72°C						
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]	0,20				
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]	0,29				

**Table C14: Displacements under shear load**

Hilti tension anchor HZA, HZA-R		M12	M16	M20	M24	M27
Displacement	$\delta_{V0}$ [mm/kN]	0,05	0,04	0,04	0,03	0,03
	$\delta_{V\infty}$ [mm/kN]	0,08	0,06	0,06	0,05	0,05

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Displacements with HZA and HZA-R

**Annex C15**



**Table C15: Displacements under tension load**

Rebar		φ 8	φ 10	φ 12	φ 14	φ 16	φ 20	φ 25	φ 26	φ 28	φ 30	φ 32	
Uncracked concrete temperature range I : 40°C / 24°C													
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]	0,02	0,03	0,03	0,04	0,04	0,06	0,07	0,08	0,08	0,09	0,09	
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]	0,04	0,05	0,06	0,07	0,08	0,10	0,13	0,14	0,15	0,16	0,17	
Uncracked concrete temperature range II : 80°C / 50°C													
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]	0,03	0,04	0,05	0,05	0,06	0,08	0,10	0,11	0,11	0,12	0,12	
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]	0,04	0,05	0,06	0,07	0,09	0,11	0,14	0,15	0,15	0,16	0,17	
Uncracked concrete temperature range III : 120°C / 72°C													
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]	0,04	0,05	0,06	0,07	0,08	0,10	0,12	0,13	0,14	0,15	0,16	
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]	0,04	0,05	0,07	0,08	0,09	0,11	0,14	0,15	0,16	0,17	0,18	
Cracked concrete temperature range I : 40°C / 24°C													
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]							0,11					
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]							0,16					
Cracked concrete temperature range II : 80°C / 50°C													
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]							0,15					
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]							0,22					
Cracked concrete temperature range III : 120°C / 72°C													
Displacement	$\delta_{N0}$ [mm/(N/mm <sup>2</sup> )]							0,20					
	$\delta_{N\infty}$ [mm/(N/mm <sup>2</sup> )]							0,29					

**Table C16: Displacements under shear load**

Rebar		φ 8	φ 10	φ 12	φ 14	φ 16	φ 20	φ 25	φ 26	φ 28	φ 30	φ 32
Displacement	$\delta_{V0}$ [mm/kN]	0,06	0,05	0,05	0,04	0,04	0,04	0,03	0,03	0,03	0,03	0,03
	$\delta_{V\infty}$ [mm/kN]	0,09	0,08	0,07	0,06	0,06	0,05	0,05	0,05	0,04	0,04	0,04

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Displacements with rebar

**Annex C16**

**Table C17: Essential characteristics for threaded rod, HAS-U-..., HIT-V-... and AM 8.8 under tension load for seismic performance category C1**

Threaded rod, HAS-U-..., HIT-V-... and AM 8.8	M10	M12	M16	M20	M24	M27	M30
<b>For a working life of 50 years</b>							
<b>Steel failure</b>							
Characteristic resistance	$N_{Rk,s,C1}$ [kN]			$A_s \cdot f_{uk}$			
<b>Combined pullout and concrete cone failure for a working life of 50 years</b>							
Characteristic bond resistance in cracked concrete C20/25							
Temperature range I: 40 °C / 24 °C	$\tau_{Rk,C1}$ [N/mm <sup>2</sup> ]	5,2	7,0				
Temperature range II: 80 °C / 50 °C	$\tau_{Rk,C1}$ [N/mm <sup>2</sup> ]	3,9	5,7				
Temperature range III: 120 °C / 72 °C	$\tau_{Rk,C1}$ [N/mm <sup>2</sup> ]	3,5	4,8				

**Table C18: Essential characteristics for threaded rod, HAS-U-..., HIT-V-... and AM 8.8 under shear load for seismic performance category C1**

Threaded rod, HAS-U-..., HIT-V-..., AM 8.8	M10	M12	M16	M20	M24	M27	M30
<b>For a working life of 50 years</b>							
Annular gap factor without Hilti filling set	$\alpha_{gap}$ [-]	0,5					
Annular gap factor with Hilti filling set	$\alpha_{gap}$ [-]	1,0					
<b>Steel failure without lever arm</b>							
Characteristic resistance	$V_{Rk,s,C1}$ [kN]			$0,35 \cdot A_s \cdot f_{uk}$			

**Injection system Hilti HIT-HY 200-R**

**Performances**

Essential characteristics under tension and shear load for seismic performance category C1

**Annex C17**

**Table C19: Essential characteristics for Hilti tension anchor HZA, HZA-R under tension load for seismic performance category C1**

Hilti tension anchor HZA, HZA-R			M12	M16	M20	M24	M27
<b>For a working life of 50 years</b>							
<b>Steel failure</b>							
Characteristic resistance HZA	$N_{Rk,s,C1}$	[kN]	46	86	135	194	253
Characteristic resistance HZA-R	$N_{Rk,s,C1}$	[kN]	62	111	173	248	<sup>1)</sup>
Partial factor	$\gamma_{Ms,N,C1}$ <sup>2)</sup>	[-]	1,4				
<b>Combined pull-out and concrete cone failure</b>							
Diameter of rebar	d	[mm]	12	16	20	25	28
Characteristic bond resistance in cracked concrete C20/25							
Temperature range I:	40°C / 24°C	$\tau_{Rk,C1}$	[N/mm <sup>2</sup> ]		6,1		
Temperature range II:	80°C / 50°C	$\tau_{Rk,C1}$	[N/mm <sup>2</sup> ]		4,8		
Temperature range III:	120°C / 72°C	$\tau_{Rk,C1}$	[N/mm <sup>2</sup> ]		4,4		
<b>Influence factors <math>\psi</math> on bond resistance <math>\tau_{Rk,C1}</math> in cracked concrete</b>							
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$							
Temperature range I to III :	$\psi_c$	[-]	1,0				

<sup>1)</sup> No performance assessed.

<sup>2)</sup> In absence of national regulations.

**Table C20: Essential characteristics for Hilti tension anchor HZA, HZA-R under shear load for seismic performance category C1**

Hilti tension anchor HZA, HZA-R			M12	M16	M20	M24	M27
<b>For a working life of 50 years</b>							
Annular gap factor without Hilti filling set	$\alpha_{gap}$	[-]	0,5				
<b>Steel failure without lever arm</b>							
Characteristic resistance HZA	$V_{Rk,s,C1}$	[kN]	16	30	47	68	88
Characteristic resistance HZA-R	$V_{Rk,s,C1}$	[kN]	22	39	60	124	<sup>1)</sup>
Partial factor	$\gamma_{Ms,V,C1}$ <sup>2)</sup>	[-]	1,5				

<sup>1)</sup> No performance assessed.

<sup>2)</sup> In absence of national regulations.

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension and shear load for seismic performance category C1

**Annex C18**

**Table C21: Essential characteristics for rebar under tension load for seismic performance category C1**

Rebar		φ 10	φ 12	φ 14	φ 16	φ 20	φ 25	φ 26	φ 28	φ 30	φ 32	
<b>For a working life of 50 years</b>												
<b>Steel failure</b>												
Characteristic resistance	$N_{Rk,s,C1}$	[kN]	$A_s \cdot f_{uk}^{1)}$									
Characteristic resistance for rebar B500B acc. to DIN 488-1	$N_{Rk,s,C1}$	[kN]	43	62	85	111	173	270	292	339	388	442
<b>Combined pull-out and concrete cone failure</b>												
Diameter of rebar	d	[mm]	10	12	14	16	20	25	26	28	30	32
<b>Characteristic bond resistance in cracked concrete C20/25</b>												
Temperature range I: 40°C/24°C	$\tau_{Rk,C1}$	[N/mm <sup>2</sup> ]	4,4	6,1								
Temperature range II: 80°C/50°C	$\tau_{Rk,C1}$	[N/mm <sup>2</sup> ]	3,5	4,8								
Temperature range III: 120°C/72°C	$\tau_{Rk,C1}$	[N/mm <sup>2</sup> ]	3	4,4								
<b>Influence factors <math>\psi</math> on bond resistance <math>\tau_{Rk,C1}</math> in cracked concrete</b>												
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$												
Temperature range I to III :	$\psi_c$	[-]	1,0									

<sup>1)</sup>  $f_{uk}$  according to rebar specification

**Table C22: Essential characteristics for rebar under shear loads for seismic performance category C1**

Rebar		φ 10	φ 12	φ 14	φ 16	φ 20	φ 25	φ 26	φ 28	φ 30	φ 32	
<b>For a working life of 50 years</b>												
Annular gap factor without Hilti filling set	$\alpha_{gap}$	[-]	0,5									
<b>Steel failure without lever arm</b>												
Characteristic resistance	$V_{Rk,s,C1}$	[kN]	$0,35 \cdot A_s \cdot f_{uk}^{1)}$									
Characteristic resistance for rebar B500B acc. to DIN 488-1	$V_{Rk,s,C1}$	[kN]	15	22	29	39	60	95	102	118	135	155

<sup>1)</sup>  $f_{uk}$  according to rebar specification

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension and shear load for seismic performance category C1

**Annex C19**

**Table C23: Essential characteristics for threaded rod, HAS-U-..., HIT-V... and AM 8.8 under tension load for seismic performance category C2**

Threaded rod, HAS-U-..., HIT-V-..., AM 8.8	M16	M20	M24	
<b>For a working life of 50 years</b>				
<b>Steel failure</b>				
Characteristic resistance HAS-U (-8.8, -8.8 HDG, A4, HCR), HIT-V (-8.8, -8.8 F, -,R, HCR) , AM (8.8, 8.8 HDG) Threaded rod (electroplated zinc coated 8.8 and CRC III, V, Table A1)	$N_{Rk,s,C2}$ [kN]	$A_s \cdot f_{uk}$		
<b>Combined pullout and concrete cone failure</b>				
Characteristic bond resistance in cracked concrete C20/25 in hammer drilled holes and hammer drilled holes with Hilti hollow drill bit TE-CD or TE-YD				
Temperature range I: 40 °C/24 °C	$\tau_{Rk,C2}$ [N/mm <sup>2</sup> ]	3,9	4,3	3,5
Temperature range II: 80 °C/50 °C	$\tau_{Rk,C2}$ [N/mm <sup>2</sup> ]	3,3	3,7	2,9
Temperature range III: 120 °C/72 °C	$\tau_{Rk,C2}$ [N/mm <sup>2</sup> ]	2,8	3,2	2,5
<b>Influence factors <math>\psi</math> on bond resistance <math>\tau_{Rk,C2}</math> in cracked concrete</b>				
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$				
Temperature range I to III :	$\psi_c$ [-]	1,0		

**Table C24: Essential characteristics for threaded rod, HAS-U-..., HIT-V... and AM 8.8 under shear load for seismic performance category C2**

Threaded rod, HAS-U-..., HIT-V-..., AM 8.8	M16	M20	M24	
<b>For a working life of 50 years</b>				
Annular gap factor without Hilti filling set	$\alpha_{gap}$ [-]	0,5		
Annular gap factor with Hilti filling set	$\alpha_{gap}$ [-]	1,0		
<b>Steel failure without lever arm with Hilti Filling Set</b>				
Characteristic resistance				
HAS-U 8.8, HIT-V 8.8, AM 8.8	$V_{Rk,s,C2}$ [kN]	46	77	103
<b>Steel failure without lever arm without Hilti Filling Set</b>				
Characteristic resistance				
HAS-U 8.8, HIT-V 8.8, AM 8.8	$V_{Rk,s,C2}$ [kN]	40	71	90
HAS-U A4, HIT-V-R	$V_{Rk,s,C2}$ [kN]	35	62	79
HAS-U-HCR, HIT-V-HCR	$V_{Rk,s,C2}$ [kN]	40	71	79
HAS-U 8.8 HDG, HIT-V-F 8.8, AM-HDG 8.8	$V_{Rk,s,C2}$ [kN]	30	46	66
Threaded rod, electroplated zinc coated 8.8	$V_{Rk,s,C2}$ [kN]	28	50	63
Threaded rod CRC III (Table A1)	$V_{Rk,s,C2}$ [kN]	25	43	55
Threaded rod CRC V (Table A1)	$V_{Rk,s,C2}$ [kN]	28	50	55

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Essential characteristics under tension and shear load  
for seismic performance category C2

**Annex C20**

**Table C25: Displacements under tension load for seismic performance category C2**

Threaded rod, HAS-U-..., HIT-V-..., AM 8.8...		M16	M20	M24
Displacement DLS, HAS-U (-8.8, -8.8 HDG, A4, HCR), HIT-V (-8.8, -8.8 F, -,R, HCR), AM (8.8, 8.8 HDG), Threaded rod (electroplated zinc coated 8.8 and CRC III, V, Table A1)	$\delta_{N,C2(DLS)}$ [mm]	0,2	0,5	0,4
Displacement ULS, HAS-U (-8.8, -8.8 HDG, A4, HCR), HIT-V (-8.8, -8.8 F, -,R, HCR), AM (8.8, 8.8 HDG), Threaded rod (electroplated zinc coated 8.8 and CRC III, V, Table A1)	$\delta_{N,C2(ULS)}$ [mm]	0,6	0,8	1,0

**Table C26: Displacements under shear load for seismic performance category C2**

Threaded rod, HAS-U-..., HIT-V-..., AM 8.8...		M16	M20	M24
<b>Installation with Hilti Filling Set</b>				
Displacement DLS, HAS-U 8.8, HIT-V 8.8, AM 8.8	$\delta_{V,C2(DLS)}$ [mm]	1,2	1,4	1,1
Displacement ULS, HAS-U 8.8, HIT-V 8.8, AM 8.8	$\delta_{V,C2(ULS)}$ [mm]	3,2	3,8	2,6
<b>Installation without Hilti Filling Set</b>				
Displacement DLS, HAS-U (-8.8, A4, HCR), HIT-V (-8.8, -R, HCR), AM 8.8, Threaded rod (electroplated zinc coated 8.8 and CRC III, V, Table A1)	$\delta_{V,C2(DLS)}$ [mm]	3,2	2,5	3,5
Displacement DLS, HAS-U 8.8 HDG, HIT-V-F 8.8, AM HDG 8.8	$\delta_{V,C2(DLS)}$ [mm]	2,3	3,8	3,7
Displacement ULS, HAS-U (-8.8, A4, HCR), HIT-V (-8.8, -R, HCR), AM 8.8, Threaded rod (electroplated zinc coated 8.8 and CRC III, V, Table A1)	$\delta_{V,C2(ULS)}$ [mm]	9,2	7,1	10,2
Displacement ULS, HAS-U 8.8 HDG, HIT-V-F 8.8, AM HDG 8.8	$\delta_{V,C2(ULS)}$ [mm]	4,3	9,1	8,4

**Injection system Hilti HIT-HY 200-R**

**Performances**  
Displacements for seismic performance category C2

**Annex C21**



88 Empire Drive • St. Paul, Minnesota • 55103  
 (651) 642-1150 • fax (651) 642-1239

## VOC Content Test Certificate

October 25, 2011

Supplier: Hilti Entwicklungsgesellschaft mbH  
 BU Anchors  
 Hiltistrasse 6  
 86916 Kaufering  
 GERMANY

Sample Description: Hilti HIT-HY 200-R

Date Tested: October 4, 2011

Test Method: SCAQMD method 304-91 "Determination of Volatile Organic Compounds (VOC) in Various Materials" as referenced by South Coast Air Quality Management District (SCAQMD) Rule 1168. The values also comply with the requirements of EPA test method #24.

Test Data:

Specification	Product
<b>LEED 2009 (LEED 3.0)</b> <b>LEED 2.2</b> IEQ-4.1: Low-Emitting Materials – Adhesives and Sealants	<b>Hilti</b> <b>HIT-HY 200-R</b>
<b>Green Building Council of Australia</b> Green Star Office Design 3.0, IEQ-13 Green Star Office Design 2.0, IEQ-13 Green Star Office Interiors 1.1, IEQ-11	
<b>Multipurpose Construction Adhesive;</b> <b>VOC Limit: 70 g/L</b>	
<b>Product contains: 13 g/L of VOC</b>	

Tom Barrett  
 Vice President/Strategic Analytical Services

Kelly French  
 Chemist III/Lab Supervisor



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D July 8, 2019

## **Confirmation of performance equivalence for replacing HILTI HIT-V anchor rod with HILTI HAS-U**

To whom it may concern,

Hilti has launched HAS-U anchor rods to replace HIT-V; in order to better serve the customer needs and simplify the product portfolio. HAS-U anchor rod was tested according to European Assessment Document: EAD 330499 to take ETA approval and fully complies with ISO standard.

HAS-U includes the chiseling tip like HAS (-E) rods which makes it also suitable for Hilti HVU2 capsule anchor system. Both Hilti internal tests and European Technical Assessment shows that this chiseling tip has no effect on the performance when HAS-U is used together with injection system, like RE500V3, HY200 or HY170 etc. HAS-U has the same steel strength with the other anchor rods based on 5.8 and 8.8 steel grades.

HAS-U has hex head (like HAS rod) is designed to provide an easy installation to the user with HVU2 capsules. Hex head should not be included in the anchor length therefore it is strongly recommended to take only threaded part into consideration.

HAS-U shows the same performance with HIT-V for post-installed anchor applications in masonry and concrete as long as same embedment depth and same anchor plate width remains. **HAS-U's embedment depth must comply with design specification parameters.**

HAS-U (-R, -HDG)'s corrosion resistance is the same with HIT-V (-R, -HDG)'s.

The installation procedure does not need to be changed with the replacement of HAS-U. ETA document of HAS-U shows the same installation parameters with HIT-V.

Profis Engineering will be updated with HAS-U in September 2019 and you will be able to perform necessary calculations and explore all the potential applications for the new anchor rod.

In case of questions, please do not hesitate to contact one of our technical experts or sales representatives.

Yours sincerely,

  
**Andrea Copponi**  
Global Product Manager  
BU Anchors, Schaan

  
**Emre Can Turkes**  
Global Technical Marketing Manager  
BU Anchors, Schaan

**Hilti Corporation**  
9494 Schaan  
Liechtenstein

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[www.hilti.com](http://www.hilti.com)

Rechtsform: Aktiengesellschaft | Sitz: 9494 Schaan  
HR-Nr.: FL-1.011.557-0 | MWST-Nr.: 50 555



Attn. : To whom it may concern

Date : 26 September 2023  
Ref. : 116/AC/DY/23

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

Dear Sir / Madam,

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

Brand Name : Hilti

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

Manufacturer : Hilti Corporation

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

Manufacturer Contact Person : Dennis Yeung

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 : Dennis Yeung (+852 9723 4621)

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](mailto:hksales@hilti.com).

Yours faithfully,



Dennis Yeung  
Head of Product Leadership Strategy, F&P

**Hilti (Hong Kong) Ltd.**  
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223 Wai Yip Street | Kwun Tong  
Kowloon | Hong Kong  
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[www.hilti.com.hk](http://www.hilti.com.hk)

Attn. : To whom it may concern

Date : 18 October 2023  
Ref. : 163/AN/RV/23

Subject : Country of Origin - Anchor Rod Portfolio

Dear Sir / Madam,

Enclosed please find the information of Hilti anchor rod portfolio.

Brand Name : Hilti

Manufacturer : Hilti Corporation

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

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

Country of Origin : *(Attached)*

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](mailto:hksales@hilti.com).

Yours faithfully,



Dennis Yeung  
Head of Product Leadership Strategy, F&P

Item number	Model name	Country of Origin
2223936	HAS-U 5.8 M6x75	China
2223704	HAS-U 5.8 M6x105	China
2223852	HAS-U 5.8 M8x80	China
2223853	HAS-U 5.8 M8x110	China
2223854	HAS-U 5.8 M8x150	China
2223705	HAS-U 5.8 M10x95	China
2223706	HAS-U 5.8 M10x115	China
2223707	HAS-U 5.8 M10x130	China
2223709	HAS-U 5.8 M10x170	China
2223820	HAS-U 5.8 M10x190	China
2223821	HAS-U 5.8 M12x110	China
2223822	HAS-U 5.8 M12x120	China
2223823	HAS-U 5.8 M12x160	China
2223825	HAS-U 5.8 M12x180	China
2223826	HAS-U 5.8 M12x200	China
2223827	HAS-U 5.8 M12x220	China
2223867	HAS-U 5.8 M12x260	China
2223868	HAS-U 5.8 M12x300	China
2223828	HAS-U 5.8 M16x150	China
2223829	HAS-U 5.8 M16x165	China
2223830	HAS-U 5.8 M16x190	China
2223869	HAS-U 5.8 M16x220	China
2223832	HAS-U 5.8 M16x260	China
2223870	HAS-U 5.8 M16x300	China
2223871	HAS-U 5.8 M16x350	China
2223872	HAS-U 5.8 M16x500	China
2223873	HAS-U 5.8 M20x180	China
2223874	HAS-U 5.8 M20x240	China
2223876	HAS-U 5.8 M20x260	China
2223877	HAS-U 5.8 M20x300	China
2223878	HAS-U 5.8 M20x350	China
2223879	HAS-U 5.8 M20x400	China
2223880	HAS-U 5.8 M20x480	China
2223881	HAS-U 5.8 M24x300	China
2223882	HAS-U 5.8 M24x450	China
2223856	HAS-U 5.8 HDG M8x80	China
2223857	HAS-U 5.8 HDG M8x110	China
2223858	HAS-U 5.8 HDG M8x150	China
2223859	HAS-U 5.8 HDG M10x95	China
2223860	HAS-U 5.8 HDG M10x115	China
2223861	HAS-U 5.8 HDG M10x130	China
2223862	HAS-U 5.8 HDG M10x170	China
2223863	HAS-U 5.8 HDG M10x190	China
2223937	HAS-U 5.8 HDG M12x110	China
2223938	HAS-U 5.8 HDG M12x120	China
2223939	HAS-U 5.8 HDG M12x160	China
2223940	HAS-U 5.8 HDG M12x180	China

2223941	HAS-U 5.8 HDG M12x200	China
2223942	HAS-U 5.8 HDG M12x220	China
2223895	HAS-U 5.8 HDG M12x260	China
2223896	HAS-U 5.8 HDG M12x300	China
2223943	HAS-U 5.8 HDG M16x150	China
2223944	HAS-U 5.8 HDG M16x165	China
2223945	HAS-U 5.8 HDG M16x190	China
2223946	HAS-U 5.8 HDG M16x220	China
2223897	HAS-U 5.8 HDG M16x260	China
2223898	HAS-U 5.8 HDG M16x300	China
2223899	HAS-U 5.8 HDG M16x350	China
2223900	HAS-U 5.8 HDG M16x500	China
2223901	HAS-U 5.8 HDG M20x180	China
2223902	HAS-U 5.8 HDG M20x240	China
2223903	HAS-U 5.8 HDG M20x260	China
2223904	HAS-U 5.8 HDG M20x300	China
2223905	HAS-U 5.8 HDG M20x350	China
2223906	HAS-U 5.8 HDG M20x400	China
2223907	HAS-U 5.8 HDG M20x480	China
2223908	HAS-U 5.8 HDG M24x300	China
2223909	HAS-U 5.8 HDG M24x450	China
2223855	HAS-U 8.8 M8x150	China
2223833	HAS-U 8.8 M10x190	China
2223834	HAS-U 8.8 M12x220	China
2223883	HAS-U 8.8 M12x300	China
2223835	HAS-U 8.8 M16x190	China
2223884	HAS-U 8.8 M16x300	China
2223885	HAS-U 8.8 M16x380	China
2223886	HAS-U 8.8 M20x180	China
2223887	HAS-U 8.8 M20x260	China
2223888	HAS-U 8.8 M20x400	China
2223889	HAS-U 8.8 M24x300	China
2223890	HAS-U 8.8 M27x340	China
2223891	HAS-U 8.8 M30x380	China
2223892	HAS-U 8.8 M33x420	China
2223893	HAS-U 8.8 M36x460	China
2223894	HAS-U 8.8 M39x510	China
2223947	HAS-U 8.8 HDG M8x150	China
2223948	HAS-U 8.8 HDG M10x190	China
2223949	HAS-U 8.8 HDG M12x220	China
2223910	HAS-U 8.8 HDG M12x300	China
2223703	HAS-U 8.8 HDG M16x190	China
2223911	HAS-U 8.8 HDG M16x300	China
2223912	HAS-U 8.8 HDG M16x380	China
2223913	HAS-U 8.8 HDG M20x180	China
2223914	HAS-U 8.8 HDG M20x260	China
2223915	HAS-U 8.8 HDG M20x400	China
2223916	HAS-U 8.8 HDG M24x300	China
2223917	HAS-U 8.8 HDG M27x340	China

2223918	HAS-U 8.8 HDG M30x380	China
2223864	HAS-U A4 M8x80	China
2223865	HAS-U A4 M8x110	China
2223866	HAS-U A4 M8x150	China
2223836	HAS-U A4 M10x95	China
2223837	HAS-U A4 M10x115	China
2223838	HAS-U A4 M10x130	China
2223839	HAS-U A4 M10x170	China
2223840	HAS-U A4 M10x190	China
2223841	HAS-U A4 M10x220	China
2223842	HAS-U A4 M12x110	China
2223843	HAS-U A4 M12x120	China
2223844	HAS-U A4 M12x160	China
2223845	HAS-U A4 M12x180	China
2223846	HAS-U A4 M12x200	China
2223847	HAS-U A4 M12x220	China
2223919	HAS-U A4 M12x260	China
2223920	HAS-U A4 M12x300	China
2223848	HAS-U A4 M16x150	China
2223849	HAS-U A4 M16x165	China
2223850	HAS-U A4 M16x190	China
2223851	HAS-U A4 M16x220	China
2223921	HAS-U A4 M16x260	Denmark
2223922	HAS-U A4 M16x300	China
2223923	HAS-U A4 M16x350	China
2223924	HAS-U A4 M16x380	China
2223925	HAS-U A4 M20x180	China
2223926	HAS-U A4 M20x240	China
2223927	HAS-U A4 M20x260	China
2223928	HAS-U A4 M20x300	China
2223929	HAS-U A4 M20x350	China
2223930	HAS-U A4 M20x400	China
2223931	HAS-U A4 M20x480	China
2223932	HAS-U A4 M24x300	China
2223933	HAS-U A4 M24x450	China
2223934	HAS-U A4 M27x340	China
2223935	HAS-U A4 M30x380	China
258015	HIS-N M8x90	China
258016	HIS-N M10x110	China
258017	HIS-N M12x125	China
258018	HIS-N M16x170	China
258019	HIS-N M20x205	China
258024	HIS-RN M8x90 A4	China
258025	HIS-RN M10x110 A4	China
258026	HIS-RN M12x125 A4	China
258027	HIS-RN M16x170 A4	China
258028	HIS-RN M20x205 A4	China
2018364	HIT-Z M8x80	Liechtenstein
2018365	HIT-Z M8x100	Liechtenstein

2018366	HIT-Z M8x120	Liechtenstein
2018367	HIT-Z M10x95	Liechtenstein
2018369	HIT-Z M10x135	Liechtenstein
2018410	HIT-Z M10x160	Liechtenstein
2018411	HIT-Z M12x105	Liechtenstein
2018412	HIT-Z M12x140	Liechtenstein
2018413	HIT-Z M12x155	Liechtenstein
2018415	HIT-Z M12x196	Liechtenstein
2018416	HIT-Z M16x155	Liechtenstein
2018418	HIT-Z M16x205	Liechtenstein
2018419	HIT-Z M16x240	Liechtenstein
2018420	HIT-Z M20x215	Liechtenstein
2018421	HIT-Z M20x250	Liechtenstein
2018422	HIT-Z-R M8x80	Liechtenstein
2018423	HIT-Z-R M8x100	Liechtenstein
2018424	HIT-Z-R M8x120	Liechtenstein
2018425	HIT-Z-R M10x95	Liechtenstein
2018426	HIT-Z-R M10x115	Liechtenstein
2018427	HIT-Z-R M10x135	Liechtenstein
2018428	HIT-Z-R M10x160	Liechtenstein
2018429	HIT-Z-R M12x105	Liechtenstein
2018430	HIT-Z-R M12x140	Liechtenstein
2018431	HIT-Z-R M12x155	Liechtenstein
2018433	HIT-Z-R M12x196	Liechtenstein
2018434	HIT-Z-R M16x155	Liechtenstein
2018435	HIT-Z-R M16x175	Liechtenstein
2018436	HIT-Z-R M16x205	Liechtenstein
2018437	HIT-Z-R M16x240	Liechtenstein
2018438	HIT-Z-R M20x215	Liechtenstein
2018439	HIT-Z-R M20x250	Liechtenstein

**Attention: To whom it may concern**

Date: 9 July 2014  
Ref: 025/CA/TT/14

**Subject: Hong Kong available option of Hilti HIT-HY 200, R version**

Dear Sir / Madam,

HIT-HY 200 Adhesive is available in two options globally, Hilti HIT-HY 200-A and Hilti HIT-HY 200-R. Both options are subject to the same technical data but with different working times for different countries. Hilti HIT-HY 200-A will have shorter working times and curing times than Hilti HIT-HY 200-R. The packaging for each option employs a different color, which helps the user distinguish between the two adhesives.



Hilti HIT-HY 200-A



Hilti HIT-HY 200-R

Due to Hong Kong typical weather condition, HIT-HY 200-R have a longer working time and is easier to use. Hilti (Hong Kong) is now offer **Hilti HY 200-R only**.

Except the working times difference of HIT-HY 200-A and HIT-HY 200-R, they can be treated as **equivalent product** and replace each other without any design change.

All the testing reports enclosed in this HIT-HY 200 submission folder is referring to HIT-HY 200-R.

Other details can be referred to the technical data in our Fastening Technology Manual. Should you have further questions, please do not hesitate to contact our Technical Representatives or Customer Service Hotline at 8228-8118.

Yours sincerely,

Terry Tsang  
Product Engineer

**Hilti (Hong Kong) Ltd.**  
701-704 & 708B | Tower A | Manulife Financial Centre  
223 Wai Yip Street | Kwun Tong  
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# HIT-HY 200-R

## Safety information for 2-Component-products

Issue date: 13/09/2022

Revision date: 13/09/2022

Supersedes: 27/09/2018

Version: 3.3

### SECTION 1: Kit identification

#### 1.1 Product identifier

Product name

HIT-HY 200-R



Product code

BU Anchor

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

Hilti (Hong Kong) Ltd.  
701-704, 7/F, Tower A, Manulife Financial Centre  
223 Wai Yip Street, Kwun Tong  
Kowloon - Hong Kong  
T +852 27734 700  
[hksales@hilti.com](mailto:hksales@hilti.com)

### 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:

#### Classification of the Product

##### Classification according to the United Nations GHS

Eye Irrit. 2A	H319
Skin Sens. 1	H317
Aquatic Acute 1	H400
Aquatic Chronic 1	H410

#### Label elements

##### Labelling according to the United Nations GHS

Hazard pictograms (GHS UN)



GHS07

GHS09

Signal word (GHS UN)

Warning

Hazardous ingredients

methacrylates, dibenzoyl peroxide

Hazard statements (GHS UN)

H317 - May cause an allergic skin reaction.

H319 - Causes serious eye irritation.

H410 - Very toxic to aquatic life with long lasting effects.

Precautionary statements (GHS UN)

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.

P302+P352 - IF ON SKIN: Wash with plenty of water.



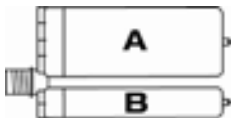
# HIT-HY 200-R

## Safety information for 2-Component-products

P337+P313 - If eye irritation persists: Get medical advice/attention.  
 P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.

### Additional information

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



Name	General description	Quantity	Unit	Classification according to the United Nations GHS
HIT-HY 200-R, A		1	pcs (pieces)	Skin Sens. 1, H317
HIT-HY 200-R, B		1	pcs (pieces)	Org. Perox. Not classified Eye Irrit. 2A, H319 Skin Sens. 1, H317 Aquatic Acute 1, H400 Aquatic Chronic 1, H410

### 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

# HIT-HY 200-R

## Safety information for 2-Component-products

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First-aid measures after skin contact	Wash contaminated clothing before reuse. Wash with plenty of water/...
First-aid measures general	If skin irritation or rash occurs: Get medical advice/attention. Take off immediately all contaminated clothing. Never give anything by mouth to an unconscious person
Symptoms/effects after eye contact	If you feel unwell, seek medical advice (show the label where possible)
Symptoms/effects after skin contact	May cause severe irritation
Other medical advice or treatment	May cause an allergic skin reaction. Treat symptomatically

### 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, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Issue date: 13/09/2022 Revision date: 13/09/2022

Supersedes: 27/09/2018

Version: 3.3

### SECTION 1: Identification

#### 1.1. GHS Product identifier

Product form	Mixture
Product name	HIT-HY 200-R, B
UN-No. (ADR)	3077
Product code	BU Anchor

#### 1.2. Other means of identification

No additional information available

#### 1.3. Recommended use of the chemical and restrictions on use

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

#### 1.4. Supplier's details

##### Supplier

Hilti (Hong Kong) Ltd.  
701-704, 7/F, Tower A, Manulife Financial Centre  
223 Wai Yip Street, Kwun Tong  
HK– Kowloon  
Hong Kong  
T +852 27734 700  
[hksales@hilti.com](mailto:hksales@hilti.com)

##### Department issuing data specification sheet

Hilti Entwicklungsgesellschaft mbH  
Hiltistraße 6  
DE– 86916 Kaufering  
Deutschland  
T +49 8191 906876  
[anchor.hse@hilti.com](mailto:anchor.hse@hilti.com)

#### 1.5. Emergency phone number

Emergency number	Schweizerisches Toxikologisches Informationszentrum – 24h Service +41 44 251 51 51 (international) +852 27734 700
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### SECTION 2: Hazard identification

#### 2.1. Classification of the substance or mixture

##### Classification according to the United Nations GHS

Organic peroxide Not classified		Expert judgment
Serious eye damage/eye irritation, Category 2A	H319	Expert judgment
Skin sensitisation, Category 1	H317	Calculation method
Hazardous to the aquatic environment – Acute Hazard, Category 1	H400	Calculation method
Hazardous to the aquatic environment – Chronic Hazard, Category 1	H410	Calculation method
Full text of H-statements: see section 16		

#### 2.2. GHS Label elements, including precautionary statements

##### Labelling according to the United Nations GHS

Hazard pictograms (GHS UN)



Signal word (GHS UN)

Warning

Hazardous ingredients

dibenzoyl peroxide

Hazard statements (GHS UN)

H317 - May cause an allergic skin reaction

H319 - Causes serious eye irritation

H410 - Very toxic to aquatic life with long lasting effects

# HIT-HY 200-R, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Precautionary statements (GHS UN)

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, medical attention.  
 P337+P313 - If eye irritation persists: Get medical advice, medical 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

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Name	Product identifier	%	Classification according to the United Nations GHS
dibenzoyl peroxide	CAS-No.: 94-36-0	10 – 25	Organic Peroxides, Type B, H241 Serious eye damage/eye irritation, Category 2, H319 Skin sensitisation, Category 1, H317 Hazardous to the aquatic environment – Acute Hazard, Category 1, H400 (M=10) Hazardous to the aquatic environment – Chronic Hazard, Category 1, H410 (M=10)

Full text of H-statements: see section 16

## SECTION 4: First-aid measures

### 4.1. Description of necessary 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/effects, acute and delayed

Symptoms/effects after skin contact	May cause an allergic skin reaction.
Symptoms/effects after eye contact	May cause severe irritation.
Potential adverse human health effects and symptoms	No additional information available.

### 4.3. Indication of immediate medical attention and special treatment needed, if necessary

Treat symptomatically.

# HIT-HY 200-R, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### SECTION 5: Fire-fighting measures

#### 5.1. Suitable 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 actions 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 materials 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.

### 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.  
Heat and ignition sources Keep away from heat and direct sunlight.  
Storage temperature 5 – 25 °C

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

No additional information available

# HIT-HY 200-R, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### 8.2. Appropriate engineering controls

Appropriate engineering controls	Ensure adequate ventilation.
Environmental exposure controls	Avoid release to the environment.
Consumer exposure controls	Avoid contact during pregnancy/while nursing.
Other information	Do not eat, drink or smoke during use.

### 8.3. Individual protection measures, such as personal protective equipment (PPE)

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	Standard
Disposable gloves	Nitrile rubber (NBR)	6 (> 480 minutes)	0,12		EN ISO 374

Eye protection      Wear security glasses which protect from splashes

Type	Field of application	Characteristics	Standard
Safety glasses	Droplet	clear	EN 166, EN 170

Personal protective equipment symbol(s)



### 8.4. Exposure limit values for the other components

No additional information available

## SECTION 9: Physical and chemical properties

### 9.1. Basic physical and chemical properties

Physical state	Solid
Appearance	Thixotropic paste
Colour	white.
Odour	characteristic.
Odour threshold	Not determined
Melting point	Not available
Freezing point	Not available
Boiling point	Not available
Flammability	Flammable
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Flash point	Not applicable
Auto-ignition temperature	Not self-igniting
Decomposition temperature	Not available
SADT	65 °C
pH	Not available
pH solution	Not available
Viscosity, kinematic (calculated value) (40 °C)	21052.632 mm <sup>2</sup> /s
Partition coefficient n-octanol/water (Log Kow)	Not available
Vapour pressure	Not available
Vapour pressure at 50 °C	Not available
Density	1.9 g/ml AW 4.3.23
Relative density	Not available
Relative vapour density at 20 °C	Not applicable
Solubility	Water: Not miscible
Viscosity, dynamic	40 Pa·s HN-0333

# HIT-HY 200-R, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Particle size Not available

### 9.2. Data relevant with regard to physical hazard classes (supplemental)

Explosive properties Product is not explosive

## 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
Reproductive toxicity	Not classified
STOT-single exposure	Not classified
STOT-repeated exposure	Not classified
Aspiration hazard	Not classified

<b>HIT-HY 200-R, B</b>	
Viscosity, kinematic	21052.632 mm <sup>2</sup> /s
<b>dibenzoyl peroxide</b>	
Animal studies and expert judgment for classification	False

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

## SECTION 12: Ecological information

### 12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute)	Very toxic to aquatic life.
Classification procedure (Hazardous to the aquatic environment, short-term (acute))	Calculation method

# HIT-HY 200-R, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Hazardous to the aquatic environment, long-term (chronic) Very toxic to aquatic life with long lasting effects.

Classification procedure (Hazardous to the aquatic environment, long-term (chronic)) Calculation method

<b>dibenzoyl peroxide (94-36-0)</b>	
LC50 - Fish [2]	0.0602 mg/l (96h; Oncorhynchus mykiss; ECHA)
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)
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

<b>HIT-HY 200-R, B</b>	
Persistence and degradability	Not established.
<b>dibenzoyl peroxide (94-36-0)</b>	
Persistence and degradability	Readily biodegradable in water. Not established. May cause long-term adverse effects in the environment.

### 12.3. Bioaccumulative potential

<b>HIT-HY 200-R, B</b>	
Bioaccumulative potential	Not established.
<b>dibenzoyl peroxide (94-36-0)</b>	
Partition coefficient n-octanol/water (Log Kow)	3.71
Bioaccumulative potential	Low bioaccumulation potential (Log Kow < 4).

### 12.4. Mobility in soil

<b>HIT-HY 200-R, B</b>	
Mobility in soil	No additional information available
<b>dibenzoyl peroxide (94-36-0)</b>	
Surface tension	No data available (test not performed)
Organic Carbon Normalized Adsorption Coefficient (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

Ozone	Not classified
Other adverse effects	No additional information available
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.



# HIT-HY 200-R, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

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

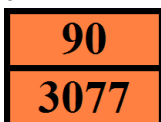
In accordance with ADR / IMDG / IATA / RID

ADR	IMDG	IATA	RID
<b>14.1. UN number</b>			
UN 3077	UN 3077	UN 3077	UN 3077
<b>14.2. UN proper shipping name</b>			
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)
<b>Transport document description</b>			
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), 9, III
<b>14.3. Transport hazard class(es)</b>			
9	9	9	9
<b>14.4. Packing group</b>			
III	III	III	III
<b>14.5. Environmental hazards</b>			
Dangerous for the environment: Yes	Dangerous for the environment: Yes Marine pollutant: Yes	Dangerous for the environment: Yes	Dangerous for the environment: Yes
not restricted according ADR Special Provision SP375, IATA-DGR Special Provision A197 and IMDG-Code 2.10.2.7			

### 14.6. Special precautions for user

#### Overland transport

Classification code (ADR)	M7
Special provisions (ADR)	274, 335, 375, 601
Limited quantities (ADR)	5kg
Packing instructions (ADR)	P002, IBC08, LP02, R001
Mixed packing provisions (ADR)	MP10
Transport category (ADR)	3
Orange plates	





# HIT-HY 200-R, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Tunnel restriction code (ADR) -

### Transport by sea

Special provisions (IMDG)	274, 335, 966, 967, 969
Limited quantities (IMDG)	5 kg
Packing instructions (IMDG)	LP02, P002
EmS-No. (Fire)	F-A
EmS-No. (Spillage)	S-F
Stowage category (IMDG)	A
Stowage and handling (IMDG)	SW23

### Air transport

PCA packing instructions (IATA)	956
PCA max net quantity (IATA)	400kg
CAO packing instructions (IATA)	956
Special provisions (IATA)	A97, A158, A179, A197, A215

### 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. Safety, health and environmental regulations specific for the product in question

No additional information available

## SECTION 16: Other information

SDS Major/Minor	None
Issue date	13/09/2022
Revision date	13/09/2022
Supersedes	27/09/2018

Section	Changed item	Change	Comments
3	Composition/information on ingredients	Modified	
14	Transport information	Added	

### 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



# HIT-HY 200-R, B

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

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  
TLM - Median Tolerance Limit  
vPvB - Very Persistent and Very Bioaccumulative

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
H400	Very toxic to aquatic life
H410	Very toxic to aquatic life with long lasting effects

SDS\_UN\_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, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Issue date: 13/09/2022 Revision date: 13/09/2022

Supersedes: 27/09/2018

Version: 3.4

### SECTION 1: Identification

#### 1.1. GHS Product identifier

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

#### 1.2. Other means of identification

No additional information available

#### 1.3. Recommended use of the chemical and restrictions on use

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

#### 1.4. Supplier's details

##### Supplier

Hilti (Hong Kong) Ltd.  
701-704, 7/F, Tower A, Manulife Financial Centre  
223 Wai Yip Street, Kwun Tong  
HK– Kowloon  
Hong Kong  
T +852 27734 700  
[hksales@hilti.com](mailto:hksales@hilti.com)

##### Department issuing data specification sheet

Hilti Entwicklungsgesellschaft mbH  
Hiltistraße 6  
DE– 86916 Kaufering  
Deutschland  
T +49 8191 906876  
[anchor.hse@hilti.com](mailto:anchor.hse@hilti.com)

#### 1.5. Emergency phone number

Emergency number	Schweizerisches Toxikologisches Informationszentrum – 24h Service +41 44 251 51 51 (international) +852 27734 700
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### SECTION 2: Hazard identification

#### 2.1. Classification of the substance or mixture

##### Classification according to the United Nations GHS

Skin sensitisation, Category 1	H317	Calculation method
Full text of H-statements: see section 16		

#### 2.2. GHS Label elements, including precautionary statements

##### Labelling according to the United Nations GHS

Hazard pictograms (GHS UN)



Signal word (GHS UN)

Warning

Hazardous ingredients

2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester, 2,2'-(m-tolylimino)diethanol, 2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol

Hazard statements (GHS UN)

H317 - May cause an allergic skin reaction

Precautionary statements (GHS UN)

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, medical attention.

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according to the United Nations GHS (Rev. 4, 2011)

P337+P313 - If eye irritation persists: Get medical advice, medical 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

## SECTION 3: Composition/information on ingredients

### 3.1. Substances

Not applicable

### 3.2. Mixtures

Name	Product identifier	%	Classification according to the United Nations GHS
2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester	CAS-No.: 2082-81-7	10 – 25	Acute toxicity (oral) Not classified Skin sensitisation, category 1B, H317
2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol	CAS-No.: 27813-02-1	5 – 10	Flammable liquids Not classified Acute toxicity (oral) Not classified Serious eye damage/eye irritation, Category 2A, H319 Skin sensitisation, Category 1, H317
1,1'-(p-tolylimino)dipropan-2-ol	CAS-No.: 38668-48-3	0.1 – 1	Acute toxicity (oral), Category 2, H300 Serious eye damage/eye irritation, Category 2A, H319 Hazardous to the aquatic environment – Acute Hazard, Category 3, H402 Hazardous to the aquatic environment – Chronic Hazard, Category 3, H412

Full text of H-statements: see section 16

## SECTION 4: First-aid measures

### 4.1. Description of necessary 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/effects, acute and delayed

Symptoms/effects after skin contact

May cause an allergic skin reaction.

Symptoms/effects after eye contact

May cause severe irritation.

Potential adverse human health effects and symptoms

No additional information available.

### 4.3. Indication of immediate medical attention and special treatment needed, if necessary

Treat symptomatically.

# HIT-HY 200-R, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### SECTION 5: Fire-fighting measures

#### 5.1. Suitable 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 actions 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

Emergency procedures Ventilate area.

#### 6.2. Environmental precautions

No additional information available

#### 6.3. Methods and materials for containment and cleaning up

No additional information available

### SECTION 7: Handling and storage

#### 7.1. Precautions for safe handling

No additional information available

#### 7.2. Conditions for safe storage, including any incompatibilities

Incompatible products Strong bases. Strong acids.  
 Incompatible materials Sources of ignition. Direct sunlight.  
 Heat and ignition sources Keep away from heat and direct sunlight.

### SECTION 8: Exposure controls/personal protection

#### 8.1. Control parameters

No additional information available

#### 8.2. Appropriate engineering controls

Appropriate engineering controls Ensure adequate ventilation.

#### 8.3. Individual protection measures, such as personal protective equipment (PPE)

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	Standard
Disposable gloves	Nitrile rubber (NBR)	6 (> 480 minutes)	0,12		EN ISO 374

# HIT-HY 200-R, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Eye protection	Wear security glasses which protect from splashes		
Type	Field of application	Characteristics	Standard
Safety glasses	Droplet	clear	EN 166, EN 170

Personal protective equipment symbol(s)



### 8.4. Exposure limit values for the other components

No additional information available

## SECTION 9: Physical and chemical properties

### 9.1. Basic physical and chemical properties

Physical state	Solid
Appearance	Thixotropic paste
Colour	Light grey.
Odour	characteristic.
Odour threshold	Not determined
Melting point	Not available
Freezing point	Not available
Boiling point	Not available
Flammability	Flammable
Lower explosion limit	Not applicable
Upper explosion limit	Not applicable
Flash point	> 109 °C DIN EN ISO 1523
Auto-ignition temperature	Not self-igniting
Decomposition temperature	Not available
pH	Not available
pH solution	Not available
Viscosity, kinematic (calculated value) (40 °C)	27777.778 mm <sup>2</sup> /s
Partition coefficient n-octanol/water (Log Kow)	Not available
Vapour pressure	Not available
Vapour pressure at 50 °C	Not available
Density	1.8 g/ml AW 4.3.23
Relative density	Not available
Relative vapour density at 20 °C	Not applicable
Solubility	Water: Not miscible
Viscosity, dynamic	50 Pa·s HN-0333
Particle size	Not available

### 9.2. Data relevant with regard to physical hazard classes (supplemental)

Explosive properties	Product is not explosive
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## SECTION 10: Stability and reactivity

### 10.1. Reactivity

No additional information available

### 10.2. Chemical stability

No additional information available

### 10.3. Possibility of hazardous reactions

No additional information available

# HIT-HY 200-R, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### 10.4. Conditions to avoid

No additional information available

### 10.5. Incompatible materials

Strong acids. Strong bases.

### 10.6. Hazardous decomposition products

No additional information available

## 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

1,1'-(p-tolylimino)dipropan-2-ol (38668-48-3)	
LD50 oral rat	25 mg/kg
LD50 dermal rat	> 2000 mg/kg
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; $\geq 2000$ mg/kg bodyweight; Rat; Experimental value)
LD50 dermal rabbit	$\geq 5000$ 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
Reproductive toxicity	Not classified
STOT-single exposure	Not classified
STOT-repeated exposure	Not classified
Aspiration hazard	Not classified
HIT-HY 200-R, A	
Viscosity, kinematic	27777.778 mm <sup>2</sup> /s
1,1'-(p-tolylimino)dipropan-2-ol	
Animal studies and expert judgment for classification	False
2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester	
Animal studies and expert judgment for classification	False
2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol	
Animal studies and expert judgment for classification	False

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



# HIT-HY 200-R, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### SECTION 12: Ecological information

#### 12.1. Toxicity

Hazardous to the aquatic environment, short-term (acute) Not classified

Hazardous to the aquatic environment, long-term (chronic) Not classified

1,1'-(p-tolylimino)dipropan-2-ol (38668-48-3)	
LC50 - Fish [1]	≈ 17 mg/l
LC50 - Other aquatic organisms [1]	245 mg/l
EC50 - Crustacea [1]	28.8 mg/l
NOEC (acute)	57.8 mg/l

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, A	
Persistence and degradability	Not established.

2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)	
Not rapidly degradable	
Biodegradation	84 %

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
Not rapidly degradable	
Persistence and degradability	Readily biodegradable in water.

#### 12.3. Bioaccumulative potential

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

1,1'-(p-tolylimino)dipropan-2-ol (38668-48-3)	
Partition coefficient n-octanol/water (Log Pow)	2.1

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

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
BCF - Fish [1]	≤ 100

# HIT-HY 200-R, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

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

### 12.4. Mobility in soil

HIT-HY 200-R, A	
Mobility in soil	No additional information available
2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
Organic Carbon Normalized Adsorption Coefficient (Log Koc)	1.9 (log Koc, Calculated value)
Ecology - soil	Highly mobile in soil.

### 12.5. Other adverse effects

Ozone	Not classified
Other adverse effects	No additional information available
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
<b>14.1. UN number</b>			
Not regulated	Not regulated	Not regulated	Not regulated
<b>14.2. UN proper shipping name</b>			
Not regulated	Not regulated	Not regulated	Not regulated
<b>14.3. Transport hazard class(es)</b>			
Not regulated	Not regulated	Not regulated	Not regulated
<b>14.4. Packing group</b>			
Not regulated	Not regulated	Not regulated	Not regulated
<b>14.5. Environmental hazards</b>			
Not regulated	Not regulated	Not regulated	Not regulated
No supplementary information available			

### 14.6. Special precautions for user

#### Overland transport

Not regulated

14/09/2022

EN (English)

19/21



# HIT-HY 200-R, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

### 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. Safety, health and environmental regulations specific for the product in question

No additional information available

## SECTION 16: Other information

SDS Major/Minor	None
Issue date	13/09/2022
Revision date	13/09/2022
Supersedes	27/09/2018

Section	Changed item	Change	Comments
3	Composition/information on ingredients	Modified	

### 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



# HIT-HY 200-R, A

## Safety Data Sheet

according to the United Nations GHS (Rev. 4, 2011)

Other information None.

Full text of H-statements:	
H300	Fatal if swallowed
H317	May cause an allergic skin reaction
H319	Causes serious eye irritation
H402	Harmful to aquatic life
H412	Harmful to aquatic life with long lasting effects

SDS\_UN\_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.



## Hilti HIT-HY 200 Injectable Mortar Job Reference

Year	Project Name	Customer Name	Project type
2022	WEST KOWLOON - LYRIC THEATRE - (IPS)	GAMMON CONSTRUCTION LIMITED	Community & Cultural
2022	KAI TAK SPORTS PARK	HIP HING ENGINEERING CO LTD	Sport & Recreation
2022	WONG CHUK HANG STATION PH3 (SITE C)	CHINA OVERSEAS BUILDING	Residential
2022	75 PEAK RD EX-HO TUNG GARDEN	DESON DEVELOPMENT LIMITED	Residential
2022	SIU HONG, AREA 54 DD 132 TMTL 483	SANFIELD (MANAGEMENT) LIMITED	Residential
2022	TAI PO RD, TAI PO KAU LOT 230	CR CONSTRUCTION COMPANY LIMITED	Residential
2022	6-8 LAI YING ST, NKIL 6549	CHINA OVERSEAS BUILDING	Residential
2022	R6 CTL KLN ROUTE-CENTRAL TUNNEL HY/2018/08	BOUYGUES TRAVAUX PUBLICS	Infrastructure
2022	HKIA 3508 TERMINAL 2	WELL PARK CONSTRUCTION LIMITED	Transport
2022	SIU LANG SHUI RD, AREA 49, TMTL 544 - LOGISTICS	CHINA STATE CONSTRUCTION	Industrial
2023	WEST KOWLOON - LYRIC THEATRE - (IPS)	GAMMON CONSTRUCTION LIMITED	Community & Cultural
2023	KAI TAK SPORTS PARK	HIP HING ENGINEERING CO LTD	Sport & Recreation
2023	HKIA 3508 TERMINAL 2	WELL PARK CONSTRUCTION LIMITED	Transport
2023	WONG CHUK HANG STATION PH3 (SITE C)	CHINA OVERSEAS BUILDING	Residential
2023	KAM SHEUNG RD STATION PH1, LOT 1040 DD 103	CHINA OVERSEAS BUILDING	Residential
2023	SAI SHA SHK SHAP SZE HEUNG, TPTL 157 DD165, 20	SANFIELD (MANAGEMENT) LIMITED	Residential
2023	R6 CTL KLN ROUTE-CENTRAL TUNNEL HY/2018/08	BOUYGUES TRAVAUX PUBLICS	Infrastructure
2023	KAI TAK NEW ACUTE HOSPITAL (SITE B)	CHINA STATE CONSTRUCTION	Health
2023	KAI TAK AREA 1F1 (6568) ELDERLY	SANFIELD (MANAGEMENT) LIMITED	Residential
2023	TIN SHUI WAI T.L.23 TIN WING STOP	SANFIELD (MANAGEMENT) LIMITED	Residential
2024	MTR NEW EXT. (REF. 1601)-KWU TUNG STATION ON	DRAGAGES HONG KONG LIMITED	Transport
2024	CHINESE MEDICINE HOSPITAL TKO	CHINA STATE CONSTRUCTION	Health
2024	WEST KOWLOON - LYRIC THEATRE - (IPS)	GAMMON CONSTRUCTION LIMITED	Community & Cultural
2024	KAI TAK SPORTS PARK	HIP HING ENGINEERING CO LTD	Sport & Recreation
2024	KAM SHEUNG RD STATION PH1, LOT 1040 DD 103	CHINA OVERSEAS BUILDING	Residential
2024	HKIA 3408 3RW CONCOURSE	BUCCG - CCCL JOINT VENTURE	Transport
2024	TMTL 496, SO KWUN WAT, AREA 56, TUEN MUN	TEAMFIELD-HANISON JOINT VENTURE	Residential
2024	SAI SHA SHK SHAP SZE HEUNG, TPTL 157 DD165, 20	SANFIELD (MANAGEMENT) LIMITED	Residential
2024	HO MAN TIN STATION RES (PACKAGE 2)	GAMMON ENGINEERING & CONSTRUCTION	Residential
2024	UNITED CHRISTIAN HOSPITAL	BUILD KING - HYUNDAI JOINT VENTURE	Health