

Hilti HIT-HY 200R V3 Injectable Mortar

(Anchorage) Submission Folder

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Injectable mortar HIT-HY 200-R V3



BASE MATERIALS

- Concrete (cracked)
- Concrete (uncracked)

APPLICATIONS

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

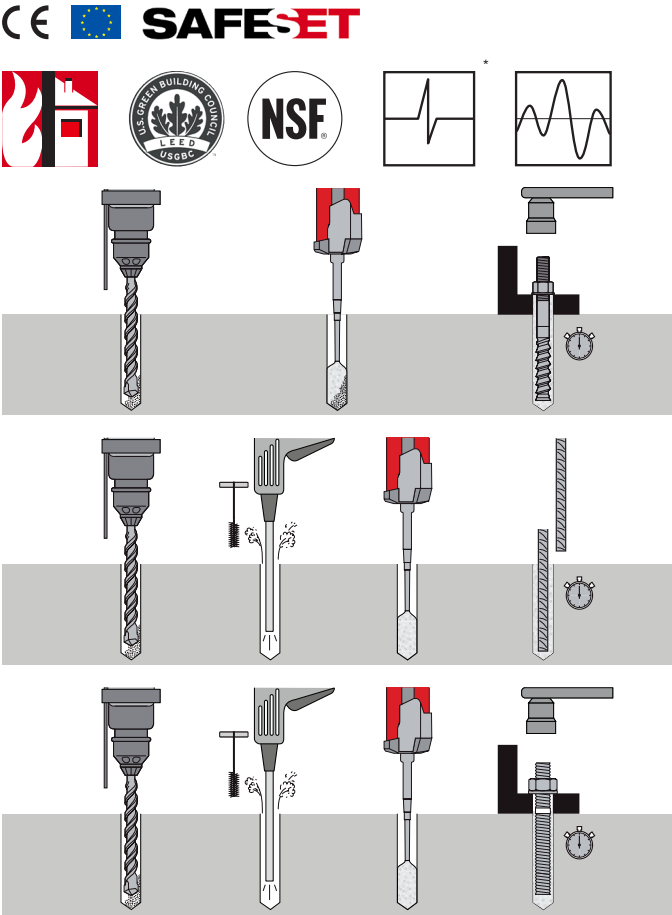
ADVANTAGES

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

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

Curing time		
Temperature in the base material T [°C]	Maximum working time t _{work} [min]	Minimum curing time t _{cure} [h]
5	60	4
6 to 10	40	2.5
11 to 20	15	1.5
21 to 30	9	1
31 to 40	6	1

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



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

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

Dispenser HDE 500-22



APPLICATIONS

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

ADVANTAGES

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

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



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

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

Mixers for Hilti injectable (RE&HY)



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



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

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

Safety glasses



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



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



Ordering designation	Sales pack quantity	Item number
Blow-out pump	1 pc	60579
Extension tube HIT-VL 16/0.7	10 pc	336646 ⁹⁾

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

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

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

Accessories for brushing



APPLICATIONS

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

Technical data

Dispenser, setting tool, accessory, tester type	Cleaning accessories
---	----------------------

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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 ¹⁾
Brush extension HIT-RBS-10/0.35	35 cm extension for machine cleaning fitting to all RB diameter.	1 pc	371722 ¹⁾
Holder TE-C	Connection end for C and SDS end. Works with RBS.	1 pc	263437 ¹⁾
Holder TE-Y	Connection end for Y end. Works with RBS.	1 pc	263439 ¹⁾
Round steel brush HIT-RB 12	Brush diameter - 12 mm. Use with HIT-RBH/RBV	1 pc	336548
Round steel brush HIT-RB 16	Brush diameter - 16 mm. Use with HIT-RBH/RBV	1 pc	336550 ¹⁾
Round steel brush HIT-RB 20	Brush diameter - 20 mm. Use with HIT-RBH/RBV	1 pc	336550
Round steel brush HIT-RB 25	Brush diameter - 25 mm. Use with HIT-RBH/RBV	1 pc	336553 ¹⁾
Round steel brush HIT-RB 32	Brush diameter - 32 mm. Use with HIT-RBH/RBV	1 pc	336554
Round steel brush HIT-RB 40	Brush diameter - 40 mm. Use with HIT-RBH/RBV	1 pc	382260 ¹⁾
Round steel brush HIT-RB 52	Brush diameter - 52 mm. Use with HIT-RBH/RBV	1 pc	382265

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

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



Ordering designation	Drill hole diameter	Sales pack quantity	Item number
Hose HIT-VL 11/1,0 (Plastic tube)	-	10 pc	2042533 ¹⁾
Coupler VL-K (connect HIT-VL)	-	10 pc	335021 ¹⁾
Piston plug HIT-SZ 20	20 mm	10 pc	2039312
Piston plug HIT-SZ 25	25 mm	10 pc	2039315
Piston plug HIT-SZ 30	30 mm	10 pc	2039317
Piston plug HIT-SZ 40	40 mm	10 pc	2039325 ¹⁾
Piston plug HIT-SZ 47	47 mm	10 pc	2039332 ¹⁾

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

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

Accessories for overhead applications



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



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

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



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, 5.8 grade, zinc-plated (min. 5µm)
Material, corrosion	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 M6x75	M6	75mm	8mm	7mm	20pc	2223936 ¹⁾
HAS-U 5.8 M6x105	M6	105mm	8mm	7mm	20pc	2223704 ¹⁾
HAS-U 5.8 M8x80	M8	80mm	10mm	9mm	20pc	2223852 ¹⁾
HAS-U 5.8 M8x110	M8	110mm	10mm	9mm	20pc	2223853
HAS-U 5.8 M8x150	M8	150mm	10mm	9mm	20pc	2223854 ¹⁾
HAS-U 5.8 M10x95	M10	95mm	12mm	12mm	20pc	2223705 ¹⁾
HAS-U 5.8 M10x115	M10	115mm	12mm	12mm	20pc	2223706 ¹⁾
HAS-U 5.8 M10x130	M10	130mm	12mm	12mm	20pc	2223707
HAS-U 5.8 M10x170	M10	170mm	12mm	12mm	20pc	2223709 ¹⁾
HAS-U 5.8 M10x190	M10	190mm	12mm	12mm	20pc	2223820 ¹⁾
HAS-U 5.8 M12x110	M12	110mm	14mm	14mm	20pc	2223821 ¹⁾
HAS-U 5.8 M12x120	M12	120mm	14mm	14mm	20pc	2223822 ¹⁾
HAS-U 5.8 M12x160	M12	160mm	14mm	14mm	20pc	2223823
HAS-U 5.8 M12x180	M12	180mm	14mm	14mm	20pc	2223825 ¹⁾
HAS-U 5.8 M12x200	M12	200mm	14mm	14mm	20pc	2223826 ¹⁾
HAS-U 5.8 M12x220	M12	220mm	14mm	14mm	20pc	2223827 ¹⁾
HAS-U 5.8 M12x260	M12	260mm	14mm	14mm	20pc	2223867 ¹⁾
HAS-U 5.8 M12x300	M12	300mm	14mm	14mm	20pc	2223868 ¹⁾
HAS-U 5.8 M16x150	M16	150mm	18mm	18mm	20pc	2223828 ¹⁾
HAS-U 5.8 M16x165	M16	165mm	18mm	18mm	20pc	2223829 ¹⁾
HAS-U 5.8 M16x190	M16	190mm	18mm	18mm	20pc	2223830
HAS-U 5.8 M16x220	M16	220mm	18mm	18mm	10pc	2223869 ¹⁾

¹⁾ 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 ¹⁾
HAS-U 5.8 M16x300	M16	300mm	18mm	18mm	10pc	2223870
HAS-U 5.8 M16x350	M16	350mm	18mm	18mm	10pc	2223871 ¹⁾
HAS-U 5.8 M16x500	M16	500mm	18mm	18mm	10pc	2223872 ¹⁾
HAS-U 5.8 M20x180	M20	180mm	22mm	22mm	10pc	2223873 ¹⁾
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 ¹⁾
HAS-U 5.8 M20x350	M20	350mm	22mm	22mm	10pc	2223878 ¹⁾
HAS-U 5.8 M20x400	M20	400mm	22mm	22mm	10pc	2223879 ¹⁾
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 ¹⁾

¹⁾ 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		Technical data	
ETA	ETA 15/0882 for HIT-RE 100 injection mortar for anchoring applications (ETAG 001-05, Option 7)	Head configuration	Externally threaded
	ETA 16/0143 for HIT-RE 500V3 injection mortar for anchoring applications (ETAG 001-05, Option 7)	Material composition	Steel, 5.8 grade, zinc-plated (min. 43µm)
ETA, seismic	ETA 12/0084 for HIT-HY 200-R injection mortar and standard element for anchoring applications (ETAG 001-05, Option 1)	Material, corrosion	Steel, zinc-plated

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

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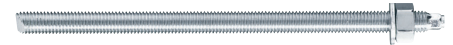


Ordering designation	Anchor size	Anchor length	Drill bit diameter	Base plate clearance hole	Sales pack quantity	Item number
HAS-U 5.8 HDG M8x80	M8	80mm	10mm	9mm	20pc	2223856 ¹⁾
HAS-U 5.8 HDG M8x110	M8	110mm	10mm	9mm	20pc	2223857 ¹⁾
HAS-U 5.8 HDG M8x150	M8	150mm	10mm	9mm	20pc	2223858 ¹⁾
HAS-U 5.8 HDG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

¹⁾ 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

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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 ¹⁾
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 ¹⁾
HAS-U 8.8 M16x300	M16	300mm	18mm	18mm	10pc	2223884 ¹⁾
HAS-U 8.8 M16x380	M16	380mm	18mm	18mm	10pc	2223885
HAS-U 8.8 M20x180	M20	180mm	22mm	22mm	10pc	2223886 ¹⁾
HAS-U 8.8 M20x260	M20	260mm	22mm	22mm	10pc	2223887 ¹⁾
HAS-U 8.8 M20x400	M20	400mm	22mm	22mm	10pc	2223888 ¹⁾
HAS-U 8.8 M24x300	M24	300mm	28mm	26mm	5pc	2223889 ¹⁾
HAS-U 8.8 M27x340	M27	340mm	30mm	30mm	5pc	2223890 ¹⁾
HAS-U 8.8 M30x380	M30	380mm	35mm	33mm	5pc	2223891 ¹⁾
HAS-U 8.8 M33x420	M33	420mm	37mm	36mm	5pc	2223892 ¹⁾
HAS-U 8.8 M36x460	M36	460mm	40mm	39mm	5pc	2223893 ¹⁾
HAS-U 8.8 M39x510	M39	510mm	42mm	42mm	5pc	2223894 ¹⁾

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

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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

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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 ¹⁾
HAS-U 8.8 HDG M10x190	M10	190mm	12mm	12mm	20pc	2223948 ¹⁾
HAS-U 8.8 HDG M12x220	M12	220mm	14mm	14mm	20pc	2223949 ¹⁾
HAS-U 8.8 HDG M12x300	M12	300mm	14mm	14mm	20pc	2223910 ¹⁾
HAS-U 8.8 HDG M16x190	M16	190mm	18mm	18mm	20pc	2223703 ¹⁾
HAS-U 8.8 HDG M16x300	M16	300mm	18mm	18mm	10pc	2223911 ¹⁾
HAS-U 8.8 HDG M16x380	M16	380mm	18mm	18mm	10pc	2223912 ¹⁾
HAS-U 8.8 HDG M20x180	M20	180mm	22mm	22mm	10pc	2223913 ¹⁾
HAS-U 8.8 HDG M20x260	M20	260mm	22mm	22mm	10pc	2223914 ¹⁾
HAS-U 8.8 HDG M20x400	M20	400mm	22mm	22mm	10pc	2223915 ¹⁾
HAS-U 8.8 HDG M24x300	M24	300mm	28mm	26mm	5pc	2223916 ¹⁾
HAS-U 8.8 HDG M27x340	M27	340mm	30mm	30mm	5pc	2223917 ¹⁾
HAS-U 8.8 HDG M30x380	M30	380mm	35mm	33mm	5pc	2223918 ¹⁾

¹⁾ 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

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, A4 (SS316)
Material, corrosion	Steel, stainless

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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 ¹⁾
HAS-U A4 M10x130	M10	130mm	12mm	12mm	20pc	2223838
HAS-U A4 M10x170	M10	170mm	12mm	12mm	20pc	2223839 ¹⁾
HAS-U A4 M10x190	M10	190mm	12mm	12mm	20pc	2223840
HAS-U A4 M10x220	M10	220mm	12mm	12mm	20pc	2223841 ¹⁾
HAS-U A4 M12x110	M12	110mm	14mm	14mm	20pc	2223842 ¹⁾
HAS-U A4 M12x120	M12	120mm	14mm	14mm	20pc	2223843 ¹⁾
HAS-U A4 M12x160	M12	160mm	14mm	14mm	20pc	2223844
HAS-U A4 M12x180	M12	180mm	14mm	14mm	20pc	2223845 ¹⁾
HAS-U A4 M12x200	M12	200mm	14mm	14mm	20pc	2223846 ¹⁾
HAS-U A4 M12x220	M12	220mm	14mm	14mm	20pc	2223847
HAS-U A4 M12x260	M12	260mm	14mm	14mm	20pc	2223919 ¹⁾
HAS-U A4 M12x300	M12	300mm	14mm	14mm	20pc	2223920
HAS-U A4 M16x150	M16	150mm	18mm	18mm	20pc	2223848 ¹⁾
HAS-U A4 M16x165	M16	165mm	18mm	18mm	20pc	2223849 ¹⁾
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 ¹⁾
HAS-U A4 M16x300	M16	300mm	18mm	18mm	10pc	2223922 ¹⁾
HAS-U A4 M16x350	M16	350mm	18mm	18mm	10pc	2223923 ¹⁾
HAS-U A4 M16x380	M16	380mm	18mm	18mm	10pc	2223924
HAS-U A4 M20x180	M20	180mm	22mm	22mm	10pc	2223925 ¹⁾
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 ¹⁾
HAS-U A4 M20x350	M20	350mm	22mm	22mm	10pc	2223929 ¹⁾
HAS-U A4 M20x400	M20	400mm	22mm	22mm	10pc	2223930 ¹⁾
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 ¹⁾
HAS-U A4 M27x340	M27	340mm	30mm	30mm	5pc	2223934 ¹⁾
HAS-U A4 M30x380	M30	380mm	35mm	33mm	5pc	2223935 ¹⁾

¹⁾ 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	
ETA	ETA 04/0027 for HIT-RE 500 injection mortar for anchoring applications (ETAG 001-05, Option 7)
ETA, seismic	ETA 04/0027 for HIT-RE 500 V3 injection mortar for anchoring applications (ETAG 001-05, Option 7) 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	Inner thread
Material composition	Steel, 5.8 grade, zinc-plated (min. 5 µm)
Material, corrosion	Steel, zinc-plated
Anchor type	Internally threaded

Order Now



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

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

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

Internally threaded sleeve HIS-RN (A4 stainless steel)



Approvals	
ETA	ETA 04/0027 for HIT-RE 500 injection mortar for anchoring applications (ETAG 001-05, Option 7)
ETA, seismic	ETA 04/0027 for HIT-RE 500 V3 injection mortar for anchoring applications (ETAG 001-05, Option 7) 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	Inner thread
Material composition	Steel, A4 (SS316)
Material, corrosion	Steel, stainless
Anchor type	Internally threaded

Order Now



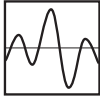
Ordering designation	Anchor size	Drill bit diameter	Drilling depth	Base plate clearance hole	Sales pack quantity	Item number
HIS-RN M8x90 A4	M8	14 mm	90 mm	9 mm	10 pc	258024 ¹⁾
HIS-RN M10x110 A4	M10	18 mm	110 mm	12 mm	10 pc	258025
HIS-RN M12x125 A4	M12	22 mm	125 mm	14 mm	5 pc	258026
HIS-RN M16x170 A4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

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

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



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

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



Order Now **Watch Video**

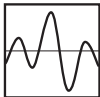


Ordering designation	Anchor size	Drill bit diameter	Max. fixture thickness at standard embedment depth	Base plate clearance hole	Required tightening torque	Sales pack quantity	Item number
HIT-Z M8x80	M8	10 mm	8 mm	9 mm	10 Nm	40 pc	2018364 ¹⁾
HIT-Z M8x100	M8	10 mm	28 mm	9 mm	10 Nm	40 pc	2018365
HIT-Z M8x120	M8	10 mm	48 mm	9 mm	10 Nm	40 pc	2018366 ¹⁾
HIT-Z M10x95	M10	12 mm	22 mm	12 mm	25 Nm	40 pc	2018367 ¹⁾
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 ¹⁾
HIT-Z M12x105	M12	14 mm	29 mm	14 mm	40 Nm	20 pc	2018411 ¹⁾
HIT-Z M12x140	M12	14 mm	64 mm	14 mm	40 Nm	20 pc	2018412 ¹⁾
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 ¹⁾
HIT-Z M16x155	M16	18 mm	38 mm	18 mm	80 Nm	12 pc	2018416 ¹⁾
HIT-Z M16x175	M16	18 mm	58 mm	18 mm	80 Nm	12 pc	2018417 ¹⁾
HIT-Z M16x205	M16	18 mm	88 mm	18 mm	80 Nm	12 pc	2018418 ¹⁾
HIT-Z M16x240	M16	18 mm	123 mm	18 mm	80 Nm	12 pc	2018419 ¹⁾
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 ¹⁾

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

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

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

Head configuration	Externally threaded
Material composition	Steel, A4 (SS316)
Material, corrosion	Steel, stainless
Anchor type	Off-the-shelf rods
Approvals / test reports	ETA
Tested/approved for diamond drilling	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 ¹⁾
HIT-Z-R M8x100	M8	10 mm	28 mm	10 Nm	40 pc	2018423 ¹⁾
HIT-Z-R M8x120	M8	10 mm	48 mm	10 Nm	40 pc	2018424 ¹⁾
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 ¹⁾
HIT-Z-R M12x105	M12	14 mm	29 mm	40 Nm	20 pc	2018429 ¹⁾
HIT-Z-R M12x140	M12	14 mm	64 mm	40 Nm	20 pc	2018430 ¹⁾
HIT-Z-R M12x155	M12	14 mm	79 mm	40 Nm	20 pc	2018431 ¹⁾
HIT-Z-R M12x196	M12	14 mm	120 mm	40 Nm	20 pc	2018433 ¹⁾
HIT-Z-R M16x155	M16	18 mm	38 mm	80 Nm	12 pc	2018434 ¹⁾
HIT-Z-R M16x175	M16	18 mm	58 mm	80 Nm	12 pc	2018435 ¹⁾
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 ¹⁾
HIT-Z-R M20x215	M20	22 mm	91 mm	150 Nm	6 pc	2018438 ¹⁾
HIT-Z-R M20x250	M20	22 mm	126 mm	150 Nm	6 pc	2018439 ¹⁾

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

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



HIT-HY 200-R V3 injection mortar

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

Injection mortar system



Hilti HIT-HY 200-R V3

500 ml foil pack
(also available as 330 ml foil pack)



Anchor rod:
HAS-U
HAS-U HDG
HAS-U A4
HAS-U HCR
(M8-M30)



Internally threaded sleeve:
HIS-N
HIS-RN
(M8-M20)



Anchor rod:
HIT-Z
HIT-Z-R
(M8-M20)

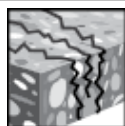
Benefits

- **SafeSet** technology: Simplified method of borehole preparation using either Hilti hollow drill bit for hammer drilling or Roughening tool for diamond cored applications
- Suitable for uncracked and cracked concrete C 20/25 to C 50/60
- ETA Approved for seismic performance category C1, C2^{a)}
- Maximum load performance in cracked concrete and uncracked concrete
- High corrosion / corrosion resistance^{b)}
- Small edge distance and anchor spacing possible
- Manual cleaning for borehole diameter up to 20mm and $h_{ef} \leq 10d$ for uncracked concrete only
- 100 years service lifetime resistance

Base material



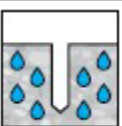
Concrete (uncracked)



Concrete (cracked)



Dry concrete



Wet concrete

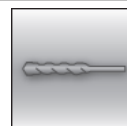
Installation conditions



Electrical Dispenser



Diamond drilled holes^{c)}



Hammer drilled holes

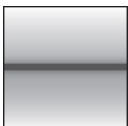


Variable embedment depth



Small edge distance and spacing

Load conditions



Static/
quasi-static



Seismic,
ETA-C1,
C2^{a)}

Other information



European
Technical
Assessment



120 Years
Design
Life



CE
conformity



Corrosion
resistance^{b)}



High
corrosion
resistance^{b)}



PROFIS
ENGINEERING

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.

c) Diamond drilling only with Roughening Tool (RT) for HAS-U and HIS-N.

Approvals / certificates

Description	Product	Authority	No. / date of issue
European Technical Assessment	HY 200-R V3	DIBt, Berlin	ETA-19/0601 / 2021-12-02
European Technical Assessment	HY 200-R V3	DIBt, Berlin	ETA-19/0632 / 2020-10-28

a) All data given in this section according to the ETA-19/0601, issue 2021-12-02.

b) All data given in this section according to the ETA-19/0632, issue 2020-10-28.

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
 - Embedment depth, as specified in the table
 - Anchor material, as specified in the tables
 - Concrete C 20/25, $f_{ck,cube} = 25 \text{ N/mm}^2$
 - in-service 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 $\psi_{sus} = 0.74$.

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

Embedment depth ¹⁾ and base material thickness

Anchor size			M8	M10	M12	M16	M20	M24	M27	M30
HAS-U										
Embedment depth	h_{ef}	[mm]	80	90	110	125	170	210	240	270
Base material thickness	h	[mm]	110	120	140	160	220	270	300	340
HIS-N										
Embedment depth	h_{ef}	[mm]	90	110	125	170	205	-	-	-
Base material thickness	h	[mm]	120	150	170	230	270	-	-	-
HIT-Z										
Embedment depth	h_{ef}	[mm]	70	90	110	145	180	-	-	-
Base material thickness	h	[mm]	130	150	170	245	280	-	-	-
HAS-D										
Embedment depth	h_{ef}	[mm]	-	-	100	125	170	-	-	-
Base material thickness	h	[mm]	-	-	130	160	220	-	-	-

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

Characteristic resistance

Anchor size				M8	M10	M12	M16	M20	M24	M27	M30
Uncracked concrete											
Tension	HAS-U 5.8	N _{Rk}	[kN]	18,3	29,0	42,2	68,7	109,0	149,7	182,9	218,2
	HAS-U 8.8			29,3	42,0	56,8	68,7	109,0	149,7	182,9	218,2
	HAS-U A4			25,6	40,6	56,8	68,7	109,0	149,7	182,9	218,2
	HAS-U HCR			29,3	42,0	56,8	68,7	109,0	149,7	182,9	218,2
	HIS-N 8.8			25,0	46,0	67,0	109,0	116	-	-	-
	HIT-Z			24,0	38,0	50,0	85,9	118,8	-	-	-
Shear	HAS-U 5.8	V _{Rk}	[kN]	11,0	17,4	25,3	47,1	73,5	105,9	137,7	168,3
	HAS-U 8.8			14,6	23,2	33,7	62,8	98,0	141,2	183,6	224,4
	HAS-U A4			12,8	20,3	29,5	55,0	85,8	123,6	114,8	140,3
	HAS-U HCR			14,6	23,2	33,7	62,8	98,0	123,6	160,7	196,4
	HIS-N 8.8			13,0	23,0	34,0	63,0	58,0	-	-	-
	HIT-Z			12,0	19,0	27,0	48,0	73,0	-	-	-
Cracked concrete											
Tension	HAS-U 5.8	N _{Rk}	[kN]	15,1	21,2	35,2	48,1	76,3	104,8	128,0	152,8
	HAS-U 8.8			15,1	21,2	35,2	48,1	76,3	104,8	128,0	152,8
	HAS-U A4			15,1	21,2	35,2	48,1	76,3	104,8	128,0	152,8
	HAS-U HCR			15,1	21,2	35,2	48,1	76,3	104,8	128,0	152,8
	HIS-N 8.8			24,7	39,7	48,1	76,3	101,1	-	-	-
	HIT-Z			20,2	29,4	39,7	60,1	83,2	-	-	-
Shear	HAS-U 5.8	V _{Rk}	[kN]	11,0	17,4	25,3	47,1	73,5	105,9	137,7	168,3
	HAS-U 8.8			14,6	23,2	33,7	62,8	98,0	141,2	183,6	224,4
	HAS-U A4			12,8	20,3	29,5	55,0	85,8	123,6	114,8	140,3
	HAS-U HCR			14,6	23,2	33,7	62,8	98,0	123,6	160,7	196,4
	HIS-N 8.8			13,0	23,0	34,0	63,0	58,0	-	-	-
	HIT-Z			12,0	19,0	27,0	48,0	73,0	-	-	-

Design resistance

Anchor size				M8	M10	M12	M16	M20	M24	M27	M30
Uncracked concrete											
Tension	HAS-U 5.8	N _{Rd}	[kN]	12,2	19,3	28,1	45,8	72,7	99,8	121,9	145,5
	HAS-U 8.8			19,5	28,0	37,8	45,8	72,7	99,8	121,9	145,5
	HAS-U A4			13,7	21,7	31,6	45,8	72,7	99,8	80,2	98,1
	HAS-U HCR			19,5	28,0	37,8	45,8	72,7	99,8	121,9	145,5
	HIS-N 8.8			16,7	30,7	44,7	72,7	77,3	-	-	-
	HIT-Z			16,0	25,3	33,3	57,3	79,2	-	-	-
Shear	HAS-U 5.8	V _{Rd}	[kN]	8,8	13,9	20,2	37,7	58,8	84,7	110,2	134,6
	HAS-U 8.8			11,7	18,6	27,0	50,2	78,4	113,0	146,9	179,5
	HAS-U A4			8,2	13,0	18,9	35,2	55,0	79,2	48,2	58,9
	HAS-U HCR			11,7	18,6	27,0	50,2	78,4	70,6	91,8	112,2
	HIS-N 8.8			10,4	18,4	27,2	50,4	46,4	-	-	-
	HIT-Z			9,6	15,2	21,6	38,4	58,4	-	-	-
Cracked concrete											
Tension	HAS-U 5.8	N _{Rd}	[kN]	10,0	14,1	23,5	32,1	50,9	69,9	85,4	101,8
	HAS-U 8.8			10,0	14,1	23,5	32,1	50,9	69,9	85,4	101,8
	HAS-U A4			10,0	14,1	23,5	32,1	50,9	69,9	80,2	98,1
	HAS-U HCR			10,0	14,1	23,5	32,1	50,9	69,9	85,4	101,8
	HIS-N 8.8			16,5	26,5	32,1	50,9	67,4	-	-	-
	HIT-Z			13,4	19,6	26,5	40,1	55,4	-	-	-
Shear	HAS-U 5.8	V _{Rd}	[kN]	8,8	13,9	20,2	37,7	58,8	84,7	110,2	134,6
	HAS-U 8.8			11,7	18,6	27,0	50,2	78,4	113,0	146,9	179,5
	HAS-U A4			8,2	13,0	18,9	35,2	55,0	79,2	48,2	58,9
	HAS-U HCR			11,7	18,6	27,0	50,2	78,4	70,6	91,8	112,2
	HIS-N 8.8			10,4	18,4	27,2	50,4	46,4	-	-	-
	HIT-Z			9,6	15,2	21,6	38,4	58,4	-	-	-

Recommended loads ^{b)}

Anchor size				M8	M10	M12	M16	M20	M24	M27	M30
Uncracked concrete											
Tension	HAS-U 5.8	N _{Rd}	[kN]	6.1	9.7	14.1	22.9	36.3	49.9	61.0	72.7
	HAS-U 8.8			9.8	14.0	18.9	22.9	36.3	49.9	61.0	72.7
	HAS-U A4			8.5	13.5	18.9	22.9	36.3	49.9	61.0	72.7
	HAS-U HCR			9.8	14.0	18.9	22.9	36.3	49.9	61.0	72.7
	HIS-N 8.8			8.3	15.3	22.3	36.3	38.7	-	-	-
	HIT-Z			8.0	12.7	16.7	28.6	39.6	-	-	-
Shear	HAS-U 5.8	V _{Rd}	[kN]	3.7	5.8	8.4	15.7	24.5	35.3	45.9	56.1
	HAS-U 8.8			4.9	7.7	11.2	20.9	32.7	47.1	61.2	74.8
	HAS-U A4			4.3	6.8	9.8	18.3	28.6	41.2	38.3	46.8
	HAS-U HCR			4.9	7.7	11.2	20.9	32.7	41.2	53.6	65.5
	HIS-N 8.8			4.3	7.7	11.3	21.0	19.3	-	-	-
	HIT-Z			4.0	6.3	9.0	16.0	24.3	-	-	-
Cracked concrete											
Tension	HAS-U 5.8	N _{Rd}	[kN]	5.0	7.1	11.7	16.0	25.4	34.9	42.7	50.9
	HAS-U 8.8			5.0	7.1	11.7	16.0	25.4	34.9	42.7	50.9
	HAS-U A4			5.0	7.1	11.7	16.0	25.4	34.9	42.7	50.9
	HAS-U HCR			5.0	7.1	11.7	16.0	25.4	34.9	42.7	50.9
	HIS-N 8.8			8.2	13.2	16.0	25.4	33.7	-	-	-
	HIT-Z			6.7	9.8	13.2	20.0	27.7	-	-	-
Shear	HAS-U 5.8	V _{Rd}	[kN]	3.7	5.8	8.4	15.7	24.5	35.3	45.9	56.1
	HAS-U 8.8			4.9	7.7	11.2	20.9	32.7	47.1	61.2	74.8
	HAS-U A4			4.3	6.8	9.8	18.3	28.6	41.2	38.3	46.8
	HAS-U HCR			4.9	7.7	11.2	20.9	32.7	41.2	53.6	65.5
	HIS-N 8.8			4.3	7.7	11.3	21.0	19.3	-	-	-
	HIT-Z			4.0	6.3	9.0	16.0	24.3	-	-	-

a) With overall global safety factor for action $\gamma = 3.0$. The partial safety factors for action depend on the type of loading and shall be taken from national regulations.

Materials

Mechanical properties for HAS-U

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

Mechanical properties for HIS-N

Anchor size		M8	M10	M12	M16	M20
Nominal tensile strength	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	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	HIS-(R)N	51,5	108	169	256	238
	Screw	36,6	58,0	84,3	157	245
Moment of resistance	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	HIT-Z-R	f _{uk}	[N/mm ²]	650	650	650	610	595
Yield strength	HIT-Z-R	f _{yk}	[N/mm ²]	520	520	520	490	480
Stressed cross-section of thread	HIT-Z-R	A _s	[mm ²]	36,6	58,0	84,3	157	245
Moment of resistance	HIT-Z-R	W	[mm ³]	31,9	62,5	109,7	278	542

Material quality for HAS-U

Part	Material
Zinc coated steel	
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 $\geq 45\mu\text{m}$
Stainless Steel	
Threaded rod, HAS-U A4	Strength class 70 for $\leq \text{M}24$ and strength class 50 for $> \text{M}24$; Elongation at fracture A5 > 12% 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	Strength class 70 for $\leq \text{M}24$ and strength class 50 for $> \text{M}24$; Stainless steel 1.4401, 1.4404, 1.4578, 1.4571, 1.4439, 1.4362 EN 10088-1:2014
High corrosion resistant steel	
Threaded rod, HAS-U HCR	Strength class 80 for $\leq \text{M}20$ and class 70 for $> \text{M}20$, Elongation at fracture A5 > 12% 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	Strength class 80 for $\leq \text{M}20$ and class 70 for $> \text{M}20$, 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 $\geq 5\mu\text{m}$
HIS-RN Int. threaded sleeve	Stainless steel 1.4401, 1.4571 EN 10088-1:2014

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-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

Installation temperature:

- -10 °C to +40 °C (for HAS-U, HIS-N)
- +5 °C to +40 °C (for HIT-Z)

In service temperature range

Hilti HIT-HY 200-R V3 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

Maximum 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.

Maximum long term base material temperature

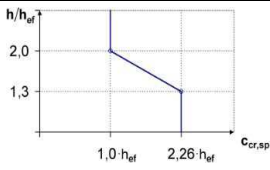
Long-term elevated base material temperatures are roughly constant over significant periods of time.

Curing and working time

Temperature of the base material	HIT-HY 200-R V3	
	Maximum working time	Minimum curing time
T_{BM}	t_{work}	t_{cure}
- 10°C < T_{BM} ≤ - 5°C ^{a)}	3 h	20 h
- 5°C < T_{BM} ≤ 0°C ^{a)}	1,5 h	8 h
0°C < T_{BM} ≤ 5°C ^{a)}	45 min	4 h
5°C < T_{BM} ≤ 10°C	30 min	2,5 h
10°C < T_{BM} ≤ 20°C	15 min	1,5 h
20°C < T_{BM} ≤ 30°C	9 min	1 h
30°C < T_{BM} ≤ 40°C	6 min	1 h

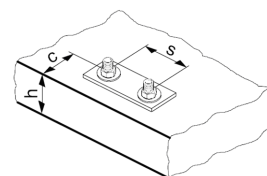
a) Installation of HIT-Z, HIT-Z-D only in range +5 °C to +40 °C

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
Effective embedment depth (= drill hole depth) ^{a)}	h _{ef,min} = h ₀		[mm]	60	60	70	80	90	96	108	120	
	h _{ef,max} = h ₀		[mm]	160	200	240	320	400	480	540	600	
Minimum base material thickness			h _{min}	[mm]	h _{ef} + 30 mm ≥100 mm			h _{ef} + 2 d ₀				
Maximum diameter of clearance hole in the fixture			d _f	[mm]	9	12	14	18	22	26	30	33
Thickness of Hilti filling set			h _{fs}	[mm]	-	-	-	11	13	15	-	-
Effective fixture thickness with Hilti filling set			t _{fix,eff}	[mm]	t _{fix} - h _{fs}							
Maximum torque moment ^{b)}			T _{max}	[Nm]	10	20	40	80	150	200	270	300
Minimum spacing			s _{min}	[mm]	40	50	60	75	90	115	120	140
Minimum edge distance			c _{min}	[mm]	40	45	45	50	55	60	75	80
Critical spacing for splitting failure			s _{cr,sp}	[mm]	2 C _{cr,sp}							
Critical edge distance for splitting failure ^{c)}	C _{cr,sp}	[mm]	1,0 · h _{ef}					for h / h _{ef} ≥ 2,00				
			4,6 h _{ef} – 1,8 h					for 2,0 > h / h _{ef} > 1,3				
			2,26 h _{ef}					for h / h _{ef} ≤ 1,3				
Critical spacing for concrete cone failure			s _{cr,N}	[mm]	2 C _{cr,N}							
Critical edge distance for concrete cone failure			C _{cr,N}	[mm]	1,5 h _{ef}							

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

- $h_{ef,min} \leq h_{ef} \leq h_{ef,max}$ (h_{ef} : embedment depth)
- Maximum recommended torque moment to avoid splitting failure during instalation with minimum spacing and edge distance
- h : base material thickness ($h \geq h_{min}$)
- 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.



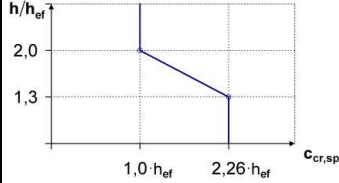
HAS-U-...



Marking:

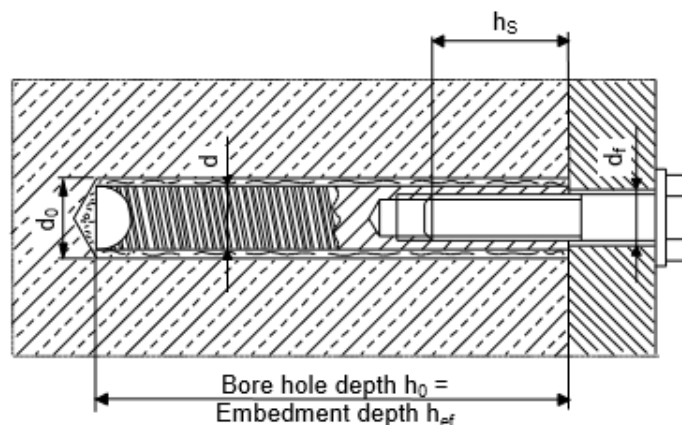
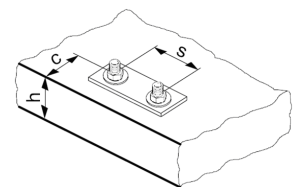
Steel grade number and length identification letter: e.g. 8L

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 embedment depth (=drill hole depth)	h _{ef} = h ₀	[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
Maximum torque moment ^{b)}	T _{max}	[Nm]	10	20	40	80	150
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 ^{a)}	c _{cr,sp}	[mm]	1,0 · h _{ef} for h / h _{ef} ≥ 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} ≤ 1,3				
Critical spacing for concrete cone failure	s _{cr,N}	[mm]	2 c _{cr,N}				
Critical edge distance for concrete cone failure	c _{cr,N}	[mm]	1,5 h _{ef}				

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 save side.



Setting details for HIT-Z and HIT-Z-R

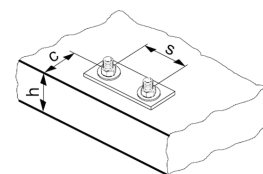
Anchor size			M8	M10	M12	M16	M20	
Nominal diameter of drill bit	d ₀	[mm]	10	12	14	18	22	
Length of anchor	min l	[mm]	80	95	105	155	215	
	max l	[mm]	120	160	196	420	450	
Nominal embedment depth a)	h _{nom,min}	[mm]	60	60	60	96	100	
	h _{nom,max}	[mm]	100	120	144	192	220	
Borehole condition 1 Min. base 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 ≥100 mm			h _{nom} + 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 ^{b)}	HIT-Z	T _{inst}	[Nm]	10	25	40	80	150
	HIT-Z-R	T _{inst}	[Nm]	30	55	75	155	215
Critical spacing for splitting failure	s _{cr,sp}	[mm]	2 C _{cr,sp}					
Critical edge distance for splitting failure ^{c)}	C _{cr,sp}	[mm]	1,5 · h _{nom} for h / h _{nom} ≥ 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} ≤ 1,35					
Critical spacing for concrete cone failure	s _{cr,N}	[mm]	2 C _{cr,N}					
Critical edge distance concrete cone failure	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 instalation with minimum spacing and edge distance.

c) h: base material thickness ($h \geq h_{min}$).

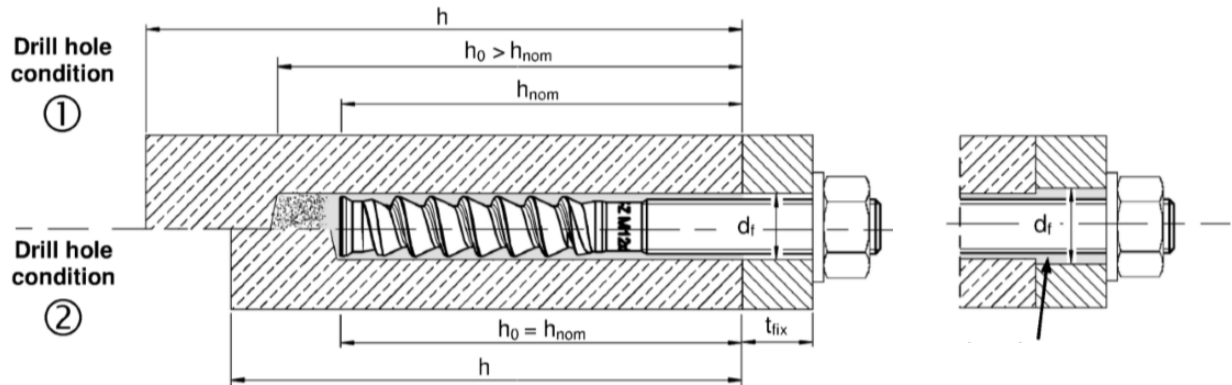


Pre-setting:

Install anchor before positioning fixture

Through-setting:

Install anchor through positioned fixture



Drill hole condition 1 → non-cleaned borehole

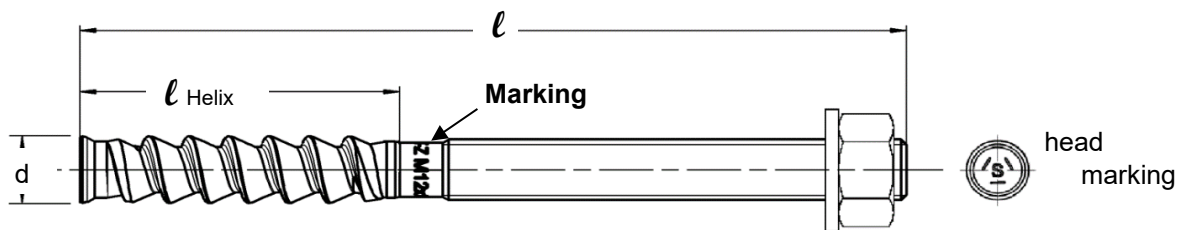
Drill hole condition 2 → drilling dust is completely removed

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 ℓ	[mm]	80	95	105	155	215
	max ℓ		120	160	196	420	450
Helix length	ℓ_{Helix}	[mm]	30 or 50	50 or 60	60	96	100

Combine with another table (setting details)



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: $A_{i,\text{req}} < A_{i,\text{cal}}$

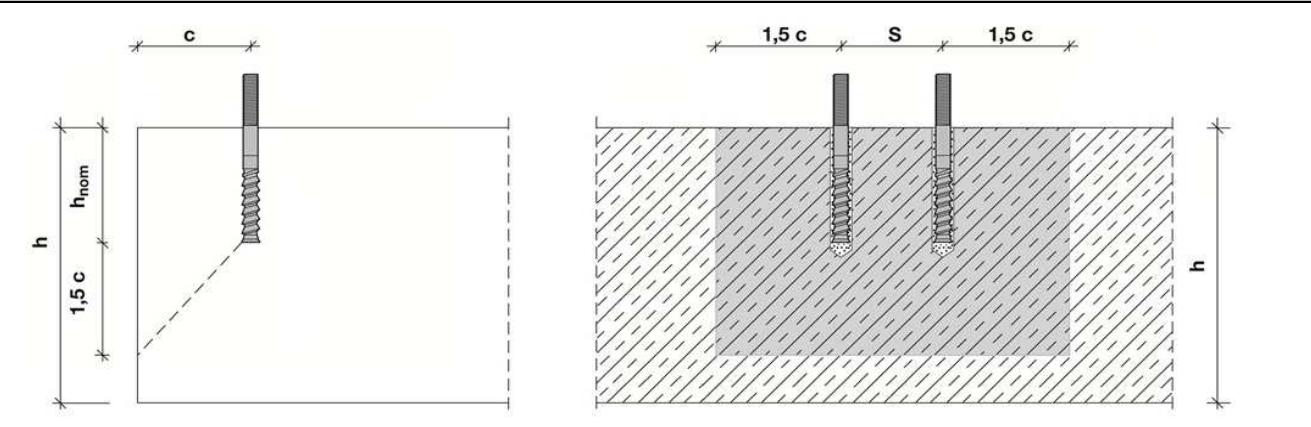
Required interaction area $A_{i,\text{cal}}$ for HIT-Z

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

Combine with another table (setting details)

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

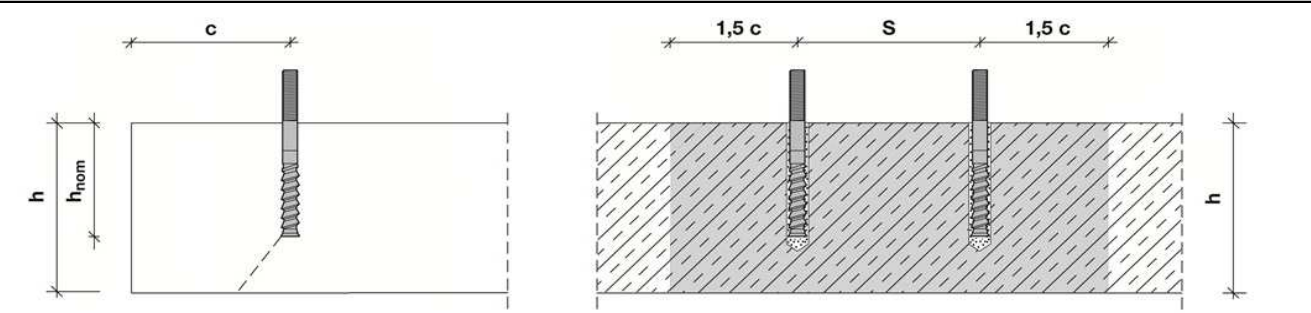
Member thickness $h \geq h_{nom} + 1,5 \cdot c$



Single anchor and group of anchors with $s > 3 \cdot c$ [mm²] $A_{i,cal} = (6 \cdot c) \cdot (h_{nom} + 1,5 \cdot c)$ with $c \geq 5 \cdot d$

Group of anchors with $s \leq 3 \cdot c$ [mm²] $A_{i,cal} = (3 \cdot c + s) \cdot (h_{nom} + 1,5 \cdot c)$ with $c \geq 5 \cdot d$ and $s \geq 5 \cdot d$

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



Single anchor and group of anchors with $s > 3 \cdot c$ [mm²] $A_{i,cal} = (6 \cdot c) \cdot h$ with $c \geq 5 \cdot d$

Group of anchors with $s \leq 3 \cdot c$ [mm²] $A_{i,cal} = (3 \cdot c + s) \cdot h$ 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
Cracked concrete						
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
Non-cracked concrete						
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
Cracked concrete							
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
Non cracked concrete							
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:

Cracked or non-cracked concrete	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
Anchor diameter	For smaller anchor diameter a smaller installation torque is required, allowing smaller values for minimum edge distance and minimum spacing
Slab thickness and embedment depth	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		blow out pump ($h_{ef} \leq 10 \cdot d$, $d_0 \leq 20$ mm) , compressed air gun, set of cleaning brushes, dispenser Hollow Drill Bit							
		roughening tools TE-YRT							
Additional Hilti recommended tools		DD EC-1, DD 100 ... DD 160 ^{a)}							

a) In case without roughening – diamond coring is applicable only for HIT-Z installation

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

a) Diamond cored holes without roughening can be used only for HIT-Z installation

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

Diamond coring		Roughening tool TE-YRT	Wear gauge RTG...
			
d ₀ [mm]		d ₀ [mm]	size
Nominal	measured		
18	17,9 to 18,2	18	18
20	19,9 to 20,2	20	20
22	21,9 to 22,2	22	22
25	24,9 to 25,2	25	25
28	27,9 to 28,2	28	28
30	29,9 to 30,2	30	30
32	31,9 to 32,2	32	32
35	34,9 to 35,2	35	35

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

h _{ef} [mm]	Minimum roughening time	Minimum blowing time
	t _{roughen} [sec] (t _{roughen} [sec] = h _{ef} [mm] / 10)	t _{blowing} [sec] (t _{blowing} [sec] = t _{roughen} [sec] + 20)
0 to 100	10	30
101 to 200	20	40
201 to 300	30	50
301 to 400	40	60
401 to 500	50	70
501 to 600	60	80

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

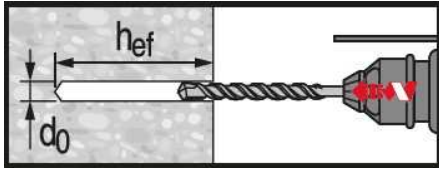
*For detailed information on installation see instruction for use given with the package of the product



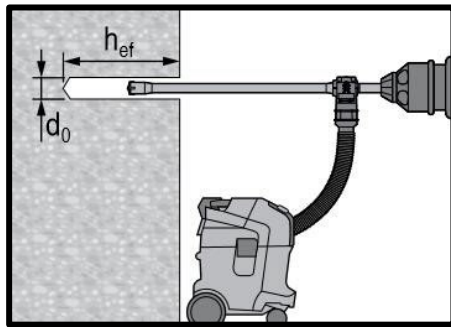
Safety regulations.

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-R V3.

Drilling

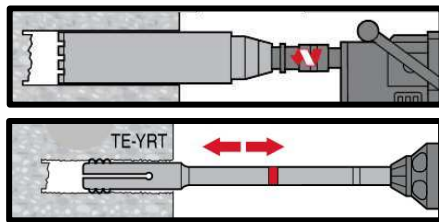


Hammer drilled hole (HD)



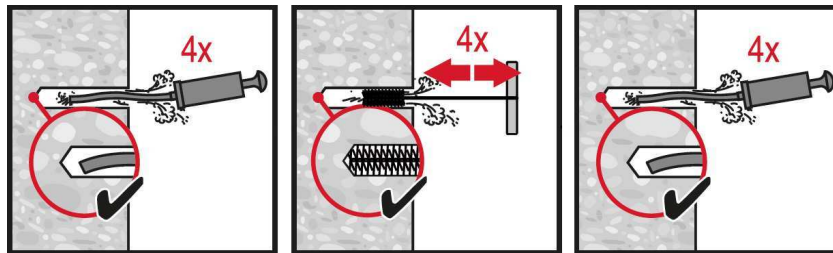
Hammer drilled hole with Hollow Drilled Bit (HDB)

No cleaning required



Diamond Drilling + Roughening Tool (DD+RT)

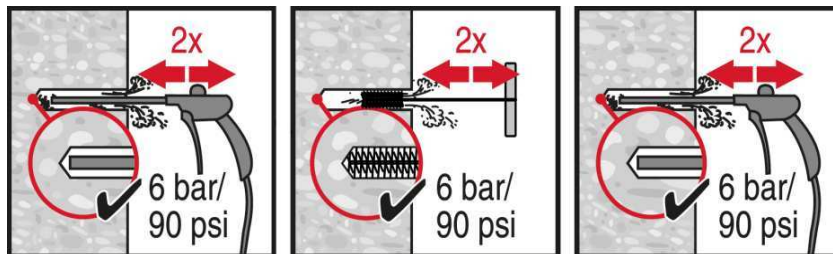
Cleaning



Hammer drilling:

Manual cleaning (MC)

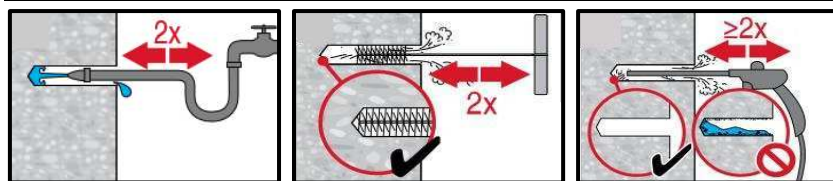
for drill diameters $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10 \cdot d$.



Hammer drilling:

Compressed air cleaning (CAC)

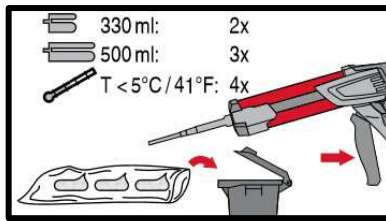
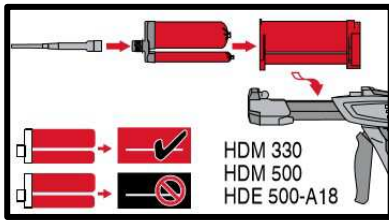
for all drill hole diameters d_0 and drill hole depths $h_0 \leq 20 \cdot d$.



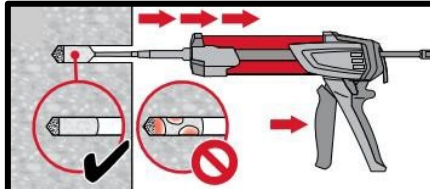
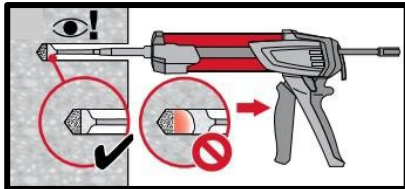
Diamond cored holes with Hilti roughening tool:

For all drill hole diameters d_0 and drill hole depths h_0 .

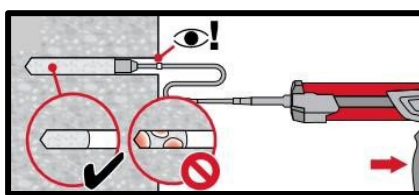
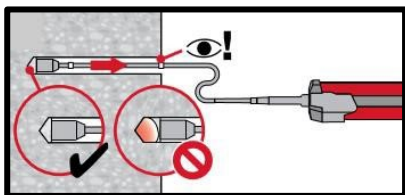
Injection



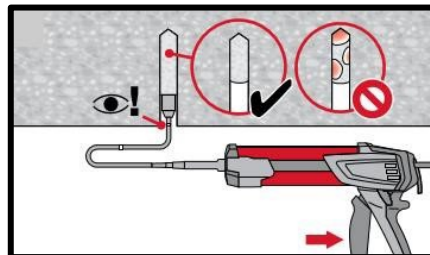
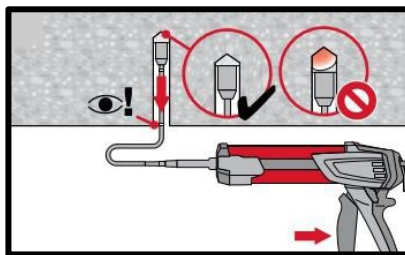
Injection system preparation.



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

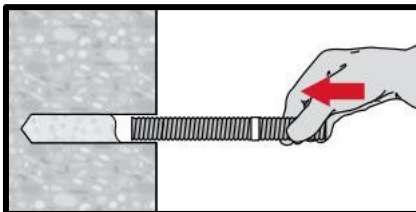


Injection method for drill hole depth
 $h_{ef} > 250 \text{ mm}$.

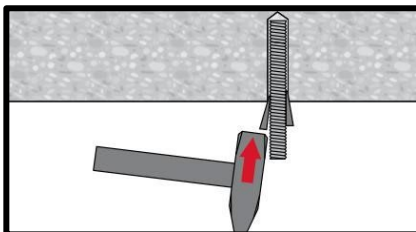


Injection method for overhead application and/or installation with embedment depth > 250 mm.

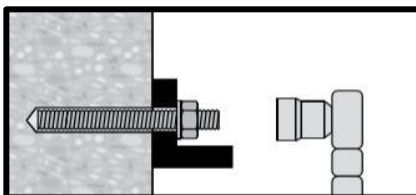
Setting the element



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 & HIT-Z-R rods

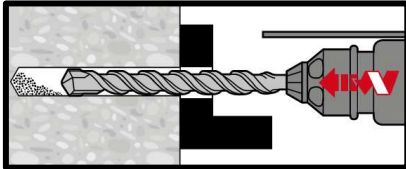
*For detailed information on installation see instruction for use given with the package of the product.



Safety regulations.

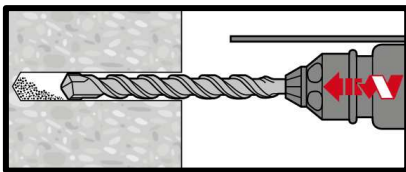
Review the Material Safety Data Sheet (MSDS) before use for proper and safe handling! Wear well-fitting protective goggles and protective gloves when working with Hilti HIT-HY 200-R V3

Drilling



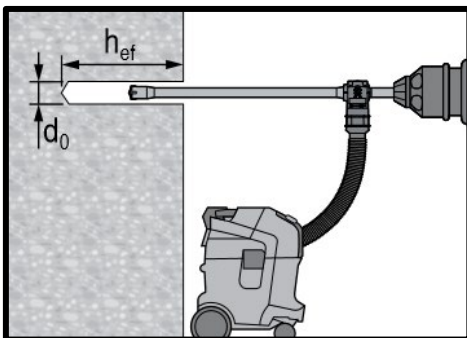
Hammer drilling: Through-setting

No cleaning required



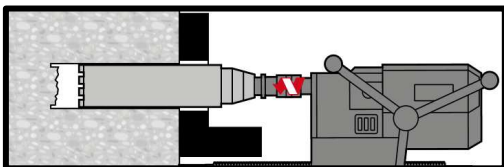
Hammer drilling: Pre-setting

No cleaning required

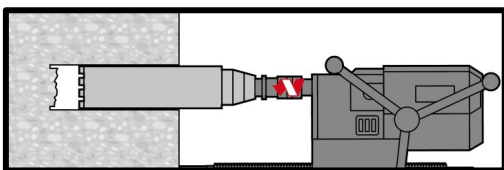


Hammer drilling with hollow drill bit: Through / pre-setting

No cleaning required

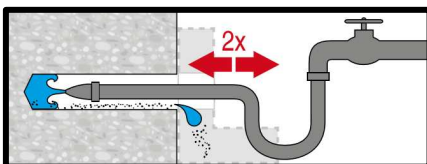


Diamond coring: Through-setting

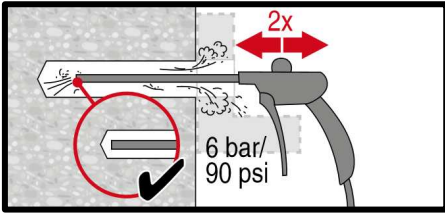


Diamond coring: Pre-setting

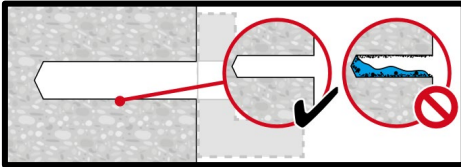
Cleaning



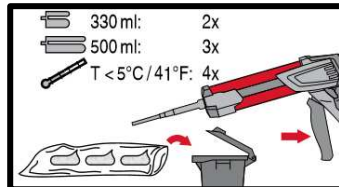
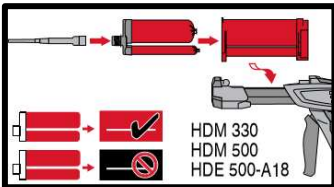
Hole flushing required for wet-drilled diamond cored holes.



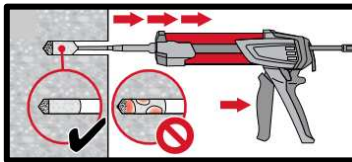
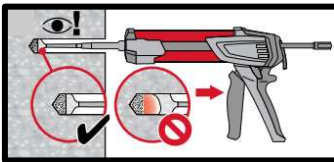
Evacuation required for wet-drilled diamond cored holes.



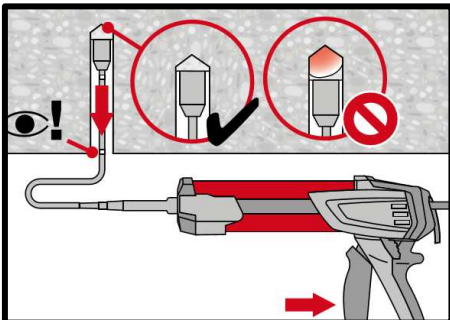
Injection



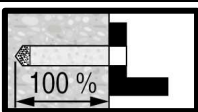
Injection system preparation.



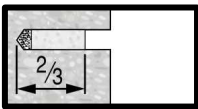
Injection of adhesive from the back of the drill hole without forming air voids.



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

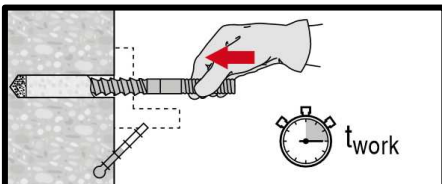


Through-setting:
Fill 100% of the drill hole.

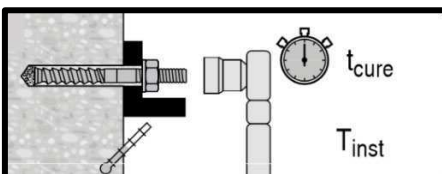


Pre-setting:
Fill approx. 2/3 of the drill hole.

Setting the element



Setting element to the required embedment depth before working time " t_{work} " has elapsed.



Loading the anchor: After required curing time t_{cure} .

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

European Technical Assessment Body
for construction products



European Technical
Assessment

ETA-19/0601
of 29 January 2024

English translation prepared by DIBt - Original version in German language

General Part

Technical Assessment Body issuing the European Technical Assessment:	Deutsches Institut für Bautechnik
Trade name of the construction product	Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3
Product family to which the construction product belongs	Bonded fastener and bonded expansion fasteners for use in concrete
Manufacturer	Hilti Aktiengesellschaft Feldkircherstrasse 100 9494 SCHAAN FÜRSTENTUM LIECHTENSTEIN
Manufacturing plant	Hilti Plants
This European Technical Assessment contains	54 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 330499-02-0601, Edition 12/2023
This version replaces	ETA-19/0601 issued on 2 June 2023

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Specific Part

1 Technical description of the product

The injection system Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3 is a bonded fastener consisting of a foil pack with injection mortar Hilti HIT-HY 200-A V3 or HIT-HY 200-R V3 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 and / or 100 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance to tension load (static and quasi-static loading)	See Annex C1 to C3, C5 to C6, C8 to C10, C12 to C14, B3 to B7
Characteristic resistance to shear load (static and quasi-static loading)	See Annex C4, C7, C11, C15
Displacements under short-term and long-term loading	See Annex C16 to C19
Characteristic resistance and displacements for seismic performance categories C1 and C2	See Annex C20 to C24

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	class A1
Resistance to fire	See Annex C25 to C28

3.3 Hygiene, health and the environment (BWR 3)

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

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 330499-02-0601 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 1992-4:2018 | 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 10088-1:2014 | Stainless steels - Part 1: List of stainless steels |
| - EN 206:2013 + A2:2021 | 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 |
| - EOTA TR 082 | Design of bonded fasteners in concrete under fire conditions, June 2023 |

Issued in Berlin on 29 January 2024 by Deutsches Institut für Bautechnik

Dipl.-Ing. Beatrix Wittstock
Head of Section

beglaubigt:
Stiller

Installed condition

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

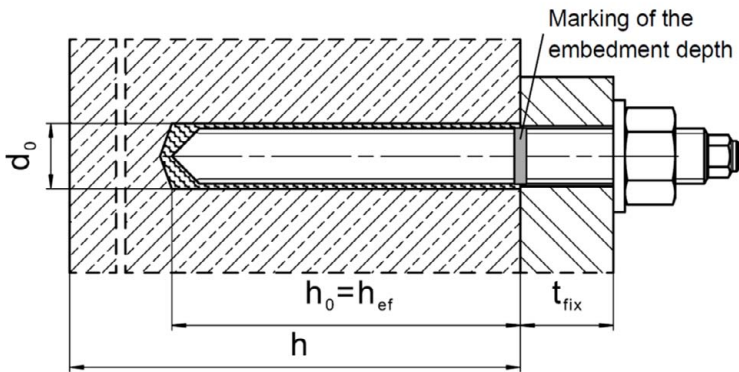


Figure A2:
Threaded rod, HAS..., HAS-U..., HIT-V-... and AM 8.8 with Hilti Filling Set

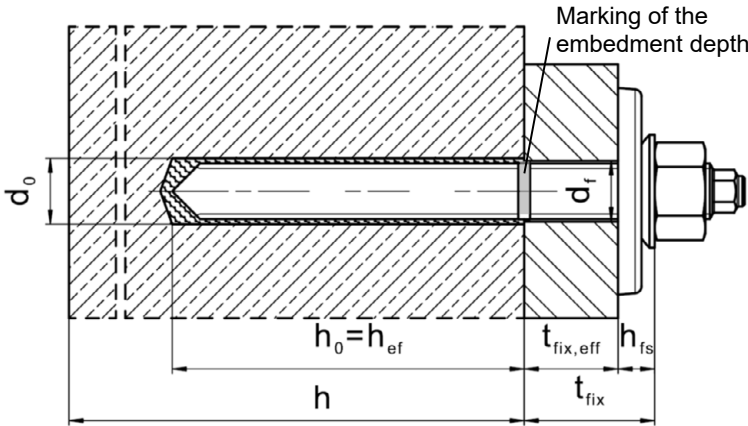
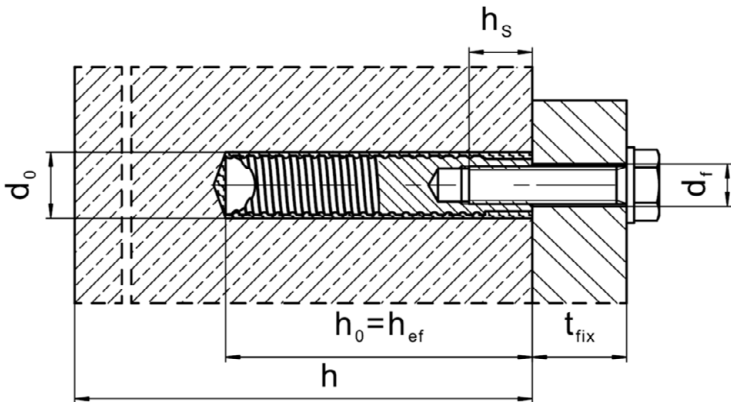


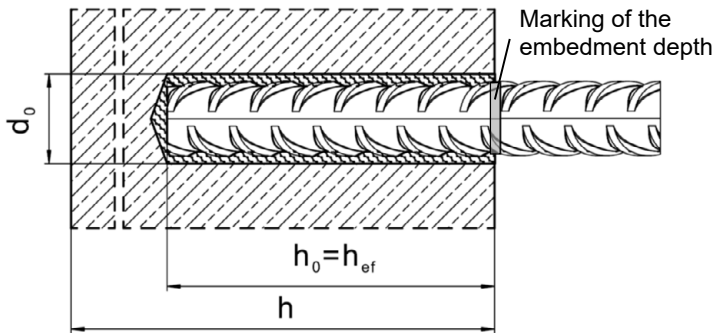
Figure A3:
Internally threaded sleeve HIS-(R)N



Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	Annex A1
Product description Installed condition	

Installed condition

Figure A4:
Reinforcing bar



Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	
Product description Installed condition	Annex A2

Product description: Injection mortar

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

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



Product name: "Hilti HIT-HY 200-A V3"

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



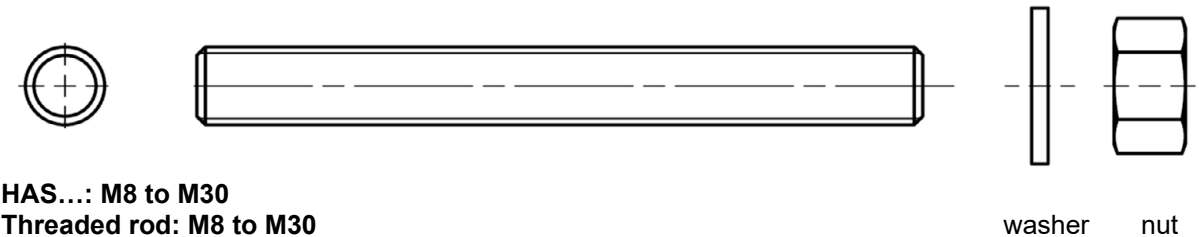
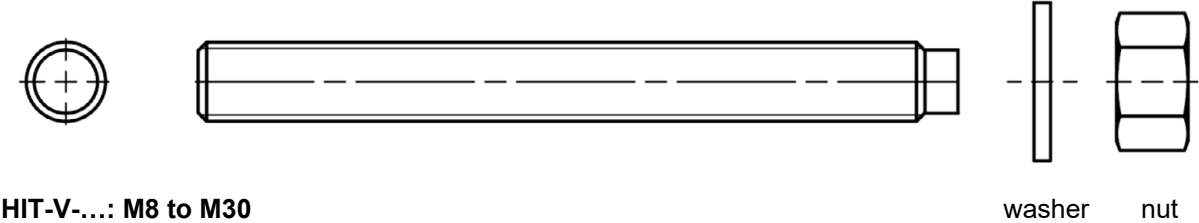
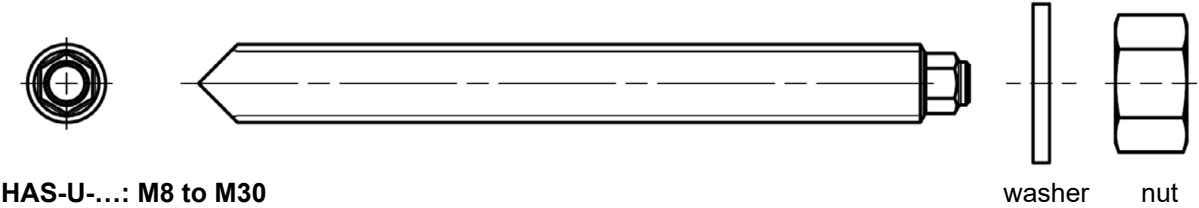
Product name: "Hilti HIT-HY 200-R V3"

Static mixer Hilti HIT-RE-M



Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	
Product description Injection mortar / Static mixer	Annex A3

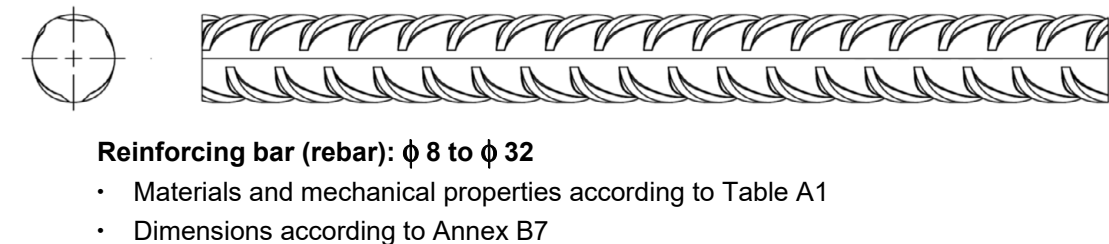
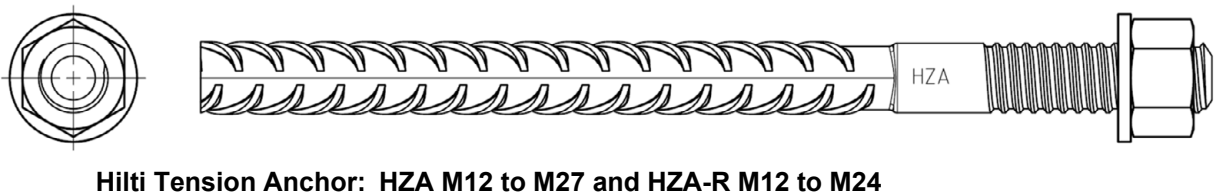
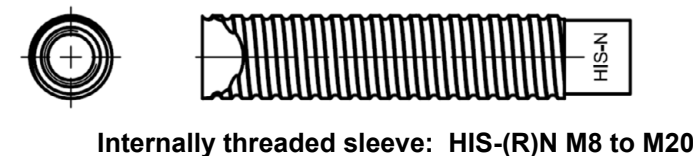
Steel elements



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:

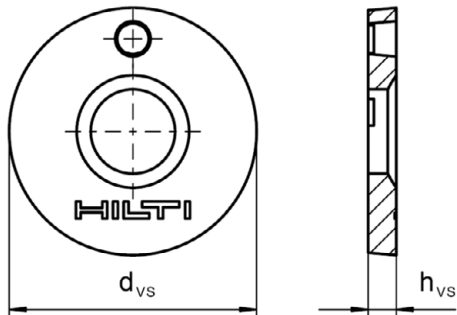
- Materials and mechanical properties according to Table A1.
- Inspection certificate 3.1 according to EN 10204. The document shall be stored.
- Marking of embedment depth.



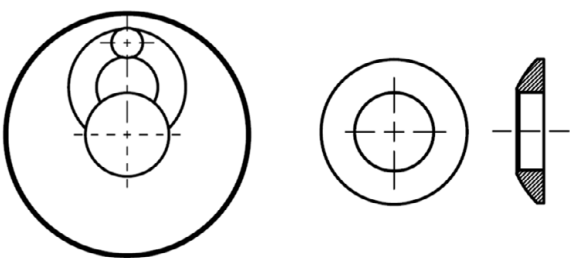
Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	
Product description Steel elements	Annex A4

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

Sealing washer



Spherical washer



Hilti Filling Set			M10	M12	M16	M20	M24
Diameter of sealing washer	d _{vs}	[mm]	42	44	52	60	70
Thickness of sealing washer	h _{vs}	[mm]	5	5	6	6	6
Thickness of Hilti Filling Set	h _{fs}	[mm]	9	10	11	13	15

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	Annex A5
Product description Hilti Filling Set	

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 $f_{uk} = f_{tk} = k \cdot f_{yk}$
Steel elements made of zinc coated steel	
HAS 5.8 (HDG), HAS-U 5.8 (HDG), HIT-V 5.8(F), Threaded rod 5.8	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 $\geq 50 \mu\text{m}$
Threaded rod 6.8	Strength class 6.8, $f_{uk} = 600 \text{ N/mm}^2$, $f_{yk} = 480 \text{ N/mm}^2$, Elongation at fracture ($l_0=5d$) > 8% ductile Electroplated zinc coated $\geq 5 \mu\text{m}$ or hot dip galvanized $\geq 50 \mu\text{m}$
HAS 8.8 (HDG), HAS-U 8.8 (HDG), HIT-V 8.8 (F), Threaded rod 8.8	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 $\geq 50 \mu\text{m}$
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 $\geq 50 \mu\text{m}$
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 $\geq 50 \mu\text{m}$
Nut	Strength class of nut adapted to strength class of threaded rod Electroplated zinc coated $\geq 5 \mu\text{m}$, (F) hot dip galvanized $\geq 50 \mu\text{m}$
Hilti Filling Set (F)	Filling washer: Electroplated zinc coated $\geq 5 \mu\text{m}$, (F) hot dip galvanized $\geq 50 \mu\text{m}$ Spherical washer: Electroplated zinc coated $\geq 5 \mu\text{m}$, (F) hot dip galvanized $\geq 50 \mu\text{m}$ Lock nut: Electroplated zinc coated $\geq 5 \mu\text{m}$, (F) Electroplated zinc-nickel coated $\geq 6 \mu\text{m}$

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Product description
Materials

Annex A6

Table A1: continued

Steel elements made of stainless steel corrosion resistance class (CRC) II according EN 1993-1-4	
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 1.4301, 1.4307, 1.4311, 1.4541, 1.4306, 1.4567 EN 10088-1
Washer	Stainless steel 1.4301, 1.4307, 1.4311, 1.4541, 1.4306, 1.4567 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 1.4301, 1.4307, 1.4311, 1.4541, 1.4306, 1.4567 EN 10088-1
Steel elements made of stainless steel corrosion resistance class (CRC) III according EN 1993-1-4	
HAS A4, 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
Hilti Filling Set A4	Filling washer: Stainless steel according to EN 10088-1 Spherical washer: Stainless steel according to EN 10088-1 Lock nut: Stainless steel according to EN 10088-1
Steel elements made of high corrosion resistant steel corrosion resistance class (CRC) V according EN 1993-1-4	
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-A V3 and HIT-HY 200-R V3

Product description
Materials

Annex A7

Specifications of intended use

Anchorage subject to:

- Static and quasi-static loading.
- Seismic performance category C1 and C2 (see Table B1).
- Fire exposure: threaded rod size M8 to M30

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)

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	Annex B1
Intended Use Specifications	

Table B1: Specifications of intended use

Steel elements	HIT-HY 200-A V3 and HIT-HY 200-R V3 with ...			
	Threaded rods according to Annex A 	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  	✓	✓	✓	✓
Installation in waterfilled hole	✓	✓	✓	- ¹⁾
Static and quasi static loading in uncracked concrete	M8 to M30	φ 8 to φ 32	M12 to M27	M8 to M20
Static and quasi static loading in cracked concrete	M8 to M30	φ 10 to φ 32	M12 to M27	M8 to M20
Seismic performance category C1	M10 to M30	φ 10 to φ 32	M12 to M27	- ¹⁾
Seismic performance category C2	M12 to M24	- ¹⁾	- ¹⁾	- ¹⁾
Working life 50 or 100 years	50 and 100	50 and 100	50 and 100	50
Exposure under fire	✓	✓	- ¹⁾	- ¹⁾

¹⁾ No performance assessed.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Intended Use
Specifications

Annex B2

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 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.
- Design under fire exposure in accordance with: EOTA Technical Report TR 082.

Installation:

- Concrete condition I1: Installation in dry or wet (water saturated) concrete and use in service in dry or wet concrete for all drilling techniques
- Concrete condition I2: Installation in water-filled drill holes (not sea water) and use in service in dry or wet concrete for hammer drilling and hammer drilling with Hilti hollow drill bit TE-CD, TE-YD
- 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.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Intended Use Specifications

Annex B3

Table B2: Installation parameters of threaded rods according to Annex A

Threaded rods according to Annex A			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 ₀	[mm]	10	12	14	18	22	28	30	35
Effective embedment depth and drill hole depth	h _{ef} = h ₀	[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 _f	[mm]	9	12	14	18	22	26	30	33
Thickness of Hilti Filling Set	h _{fs}	[mm]	-	9	10	11	13	15	-	-
Effective fixture thickness with Hilti Filling Set	t _{fix,eff}	[mm]	t _{fix,eff} = t _{fix} - h _{fs}							
Minimum thickness of concrete member	h _{min}	[mm]	h _{ef} + 30 ≥ 100 mm			h _{ef} + 2 · d ₀				
Maximum installation torque	max T _{inst}	[Nm]	10	20	40	80	150	200	270	300
Minimum spacing	s _{min}	[mm]	40	50	60	75	90	115	120	140
Minimum edge distance	c _{min}	[mm]	40	45	45	50	55	60	75	80

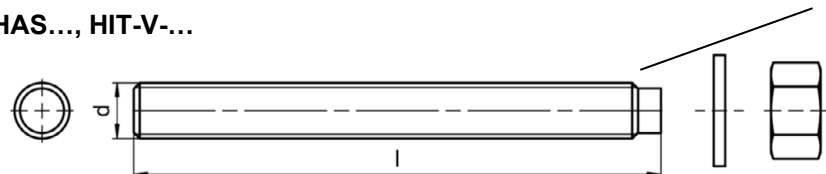
HAS-U...



Marking:

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

HAS..., HIT-V-...



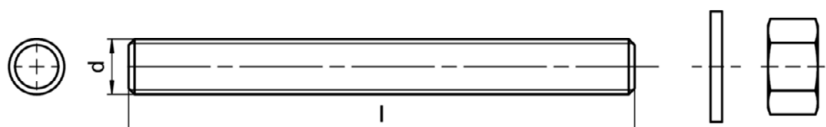
HIT-V Marking:

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

HAS Color code marking:

5.8 = RAL 5010 (blue)
8.8 = RAL 1023 (yellow)
A4 = RAL 3000 (red)

Hilti meter rod AM (HDG) 8.8



Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Intended Use

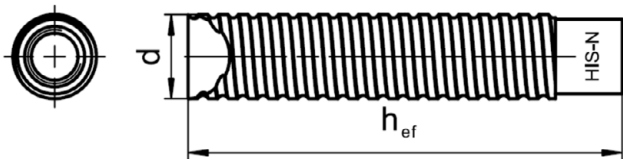
Installation parameters of threaded rod, HAS..., HAS-U..., HIT-V-... and AM 8.8

Annex B4

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 ₀	[mm]	14	18	22	28	32
Effective embedment depth and drill hole depth	h _{ef} = h ₀	[mm]	90	110	125	170	205
Maximum diameter of clearance hole in the fixture	d _f	[mm]	9	12	14	18	22
Minimum thickness of concrete member	h _{min}	[mm]	120	150	170	230	270
Maximum installation torque	max T _{inst}	[Nm]	10	20	40	80	150
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

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

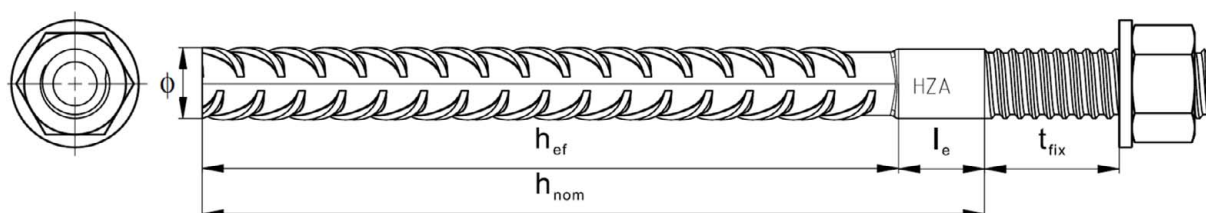


Marking:
Identifying mark - HILTI and
embossing "HIS-N" (for C-steel)
embossing "HIS-RN" (for stainless steel)

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	Annex B5
Intended Use Installation parameters of internally threaded sleeve HIS-(R)N	

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

Hilti tension anchor HZA		M12	M16	M20	M24	M27
Hilti tension anchor HZA-R		M12	M16	M20	M24	-
Rebar diameter	ϕ [mm]	12	16	20	25	28
Nominal embedment depth and drill hole depth HZA	$h_{nom} = h_0$ [mm]	90 to 240	100 to 320	110 to 400	120 to 500	140 to 560
Nominal embedment depth and drill hole depth HZA-R	$h_{nom} = h_0$ [mm]	170 to 240	180 to 320	190 to 400	200 to 500	-
Effective embedment depth ($h_{ef} = h_{nom} - l_e$) HZA	h_{ef} [mm]	$h_{nom} - 20$				
Effective embedment depth ($h_{ef} = h_{nom} - l_e$) HZA-R	h_{ef} [mm]	$h_{nom} - 100$				
Length of smooth shaft HZA	l_e [mm]	20				
Length of smooth shaft HZA-R	l_e [mm]	100				
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
Thickness of Hilti Filling Set	h_{fs} [mm]	10	11	13	15	-
Effective fixture thickness with Hilti Filling Set	$t_{fix,eff}$ [mm]	$t_{fix,eff} = t_{fix} - h_{fs}$				
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



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

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Intended Use

Installation parameters of Hilti tension anchor HZA and HZA-R

Annex B6

Table B5: Installation parameters of reinforcing bar

Reinforcing bar (rebar)	ϕ 8	ϕ 10	ϕ 12	ϕ 14	ϕ 16	ϕ 20	ϕ 25	ϕ 26	ϕ 28	ϕ 30	ϕ 32
Diameter ϕ [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 ¹⁾	12 / 14 ¹⁾	14 ¹⁾ / 16 ¹⁾	18	20	25	32	32	35	37	40
Minimum thickness of concrete member h _{min} [mm]	h _{ef} + 30 ≥ 100 mm			h _{ef} + 2 · 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

1) 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 $0,05 \cdot \phi \leq h_{rib} \leq 0,07 \cdot \phi$
(ϕ : Nominal diameter of the bar; h_{rib} : Rib height of the bar)

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Intended Use
Installation parameters of reinforcing bar (rebar)

Annex B7











Table B6: Maximum working time and minimum curing time

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

¹⁾ The minimum foil pack temperature is 0 °C.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	Annex B8
Intended Use Maximum working time and minimum curing time	

Table B7: Parameters of drilling, cleaning and setting tools

Steel elements				Drill and clean				Installation	
Threaded rods (Annex A)	HIS-(R)N	Rebar	HZA(-R)	Hammer drilling		Diamond coring		Brush	Piston plug
					Hollow drill bit ¹⁾		Roughening tool		
									
Size	size	size	size	d ₀ [mm]	d ₀ [mm]	d ₀ [mm]	d ₀ [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

¹⁾ With vacuum cleaner Hilti VC 10/20/40 (automatic filter cleaning activated, eco mode off) or a vacuum cleaner providing equivalent cleaning performance in combination with the specified Hilti hollow drill bit TE-CD or TE-YD.

Cleaning alternatives

Manual Cleaning (MC):

Hilti hand pump for blowing out drill holes with diameters $d_0 \leq 20$ mm and drill hole depths $h_0 \leq 10 \cdot d$.



Compressed air cleaning (CAC):

Air nozzle with an orifice opening of minimum 3,5 mm in diameter.



Automatic Cleaning (AC):

Cleaning is performed during drilling with Hilti TE-CD and TE-YD drilling system including vacuum cleaner.



Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Intended Use

Parameters of drilling, cleaning and setting tools
Cleaning alternatives

Annex B9

Table B8: Hilti roughening tool TE-YRT – tool parameters




Associated components			
Diamond coring		Roughening tool TE-YRT	Wear gauge RTG...
			
d ₀ [mm]		d ₀ [mm]	size
nominal	measured		
18	17,9 to 18,2	18	18
20	19,9 to 20,2	20	20
22	21,9 to 22,2	22	22
25	24,9 to 25,2	25	25
28	27,9 to 28,2	28	28
30	29,9 to 30,2	30	30
32	31,9 to 32,2	32	32
35	34,9 to 35,2	35	35

Table B9: Hilti roughening tool TE-YRT – roughening and blowing times

	Roughening time t _{roughen}	Minimum blowing time t _{blowing}
h _{ef} [mm]	t _{roughen} [sec] = h _{ef} [mm] / 10	t _{blowing} [sec] = t _{roughen} [sec] + 20
0 to 100	10	30
101 to 200	20	40
201 to 300	30	50
301 to 400	40	60
401 to 500	50	70
501 to 600	60	80

Hilti roughening tool TE-YRT and wear gauge RTG

Hilti roughening tool TE-YRT	
Wear gauge RTG	

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Intended Use

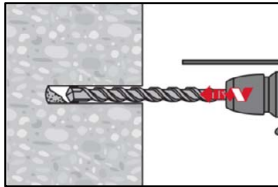
Parameters for use of the Hilti Roughening tool TE-YRT

Annex B10

Installation instruction

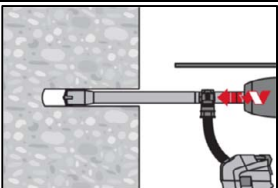
Hole drilling

a) Hammer drilling



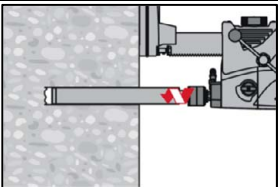
Drill hole to the required embedment depth with a hammer drill set in rotation-hammer mode using an appropriately sized carbide drill bit.

b) Hammer drilling with Hilti hollow drill bit

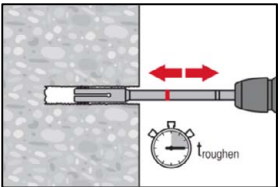


Drill hole to the required embedment depth with an appropriately sized Hilti TE-CD or TE-YD hollow drill bit with vacuum attachment following the requirements given in Table B7. This drilling system removes the dust and cleans the drill hole during drilling when used in accordance with the user's manual. 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 B8.



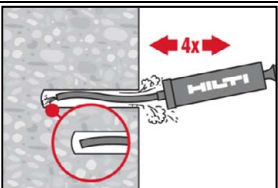
Before roughening water needs to be removed from the drill hole.
Check usability of the roughening tool with the wear gauge RTG.
Roughen the drill hole over the whole length to the required h_{ef} .
Roughening time $t_{roughen}$ see Table B9.

Drill hole cleaning

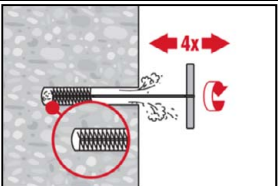
Just before injection of the mortar, the drill hole must be free of dust and debris.
Inadequate hole cleaning = poor load values.

Manual Cleaning (MC)

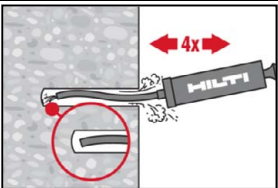
Uncracked concrete only.
For drill hole diameters $d_0 \leq 20$ mm and drill hole depths $h_0 \leq 10 \cdot d$.



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 B7) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it. The brush must produce natural resistance as it enters the drill hole (brush $\varnothing \geq$ drill hole \varnothing) - if not the brush is too small and must be replaced with the proper brush diameter.



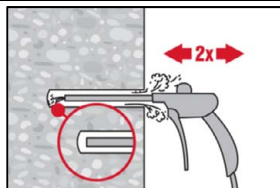
Blow out again with the Hilti hand pump at least 4 times until return air stream is free of noticeable dust.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

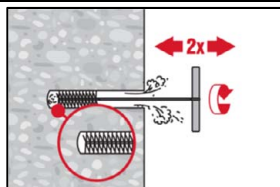
Intended Use
Installation instructions

Annex B11

Compressed air cleaning (CAC) for all drill hole diameters d_0 and all drill hole depths h_0



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 ≥ 32 mm the compressor has to supply a minimum air flow of 140 m³/h.

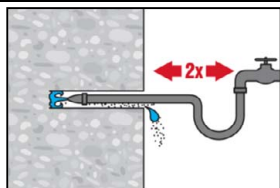


Brush 2 times with the specified brush (see Table B7) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it. The brush must produce natural resistance as it enters the drill hole (brush $\varnothing \geq$ drill hole \varnothing) - if not the brush is too small and must be replaced with the proper brush diameter.

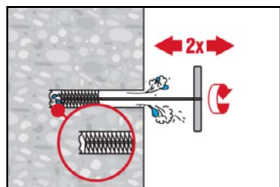


Blow again with compressed air 2 times until return air stream is free of noticeable dust.

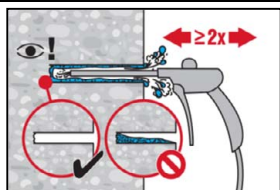
Cleaning of diamond cored holes with roughening with Hilti roughening tool TE-YRT.



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



Brush 2 times with the specified brush (see Table B7) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it. The brush must produce natural resistance as it enters the drill hole (brush $\varnothing \geq$ drill hole \varnothing) - if not the brush is too small and must be replaced with the proper brush diameter.



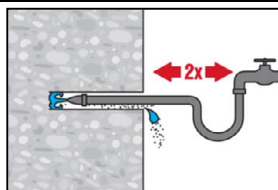
Blow 2 times from the back of the hole (if needed with nozzle extension) over the whole length with oil-free compressed air (min. 6 bar at 6 m³/h) until return air stream is free of noticeable dust and water. Remove all water from the drillhole until drillhole is completely dried before mortar injection (t_{blowing} see Table B9). For drill hole diameters ≥ 32 mm the compressor has to supply a minimum air flow of 140 m³/h.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

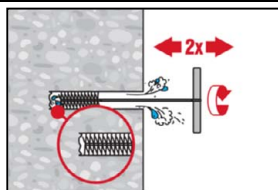
Intended Use
Installation instructions

Annex B12

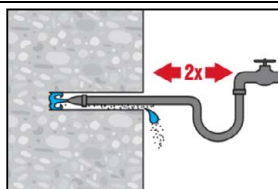
Cleaning and water removal of water-filled drill holes drilled with hammer drilling and hammer drilling with Hilti hollow drill bit: For all drill hole diameters d_0 and all drill hole depths h_0 .



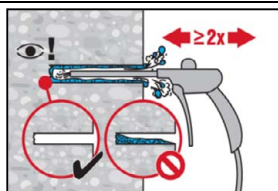
Flush 2 times by inserting a water hose (water-line pressure) to the back of the hole until water runs clear.



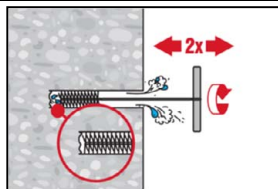
Brush 2 times with the specified brush (see Table B7) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it.
The brush must produce natural resistance as it enters the drill hole (brush $\varnothing \geq$ drill hole \varnothing) - if not the brush is too small and must be replaced with the proper brush diameter.



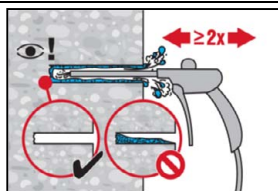
Flush 2 times by inserting a water hose (water-line pressure) to the back of the hole until water runs clear.



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.
For drill hole diameters ≥ 32 mm the compressor has to supply a minimum air flow of 140 m³/h.



Brush 2 times with the specified brush size (see Table B7) by inserting the steel brush Hilti HIT-RB to the back of the hole (if needed with extension) in a twisting motion and removing it.
The brush must produce natural resistance as it enters the drill hole – if not the brush is too small and must be replaced with the proper brush diameter.



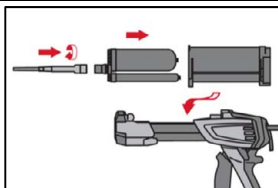
Blow again with compressed air 2 times until return air stream is free of noticeable dust and water.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

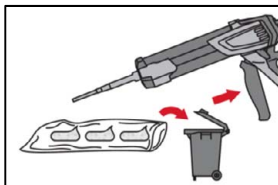
Intended Use
Installation instructions

Annex B13

Injection preparation

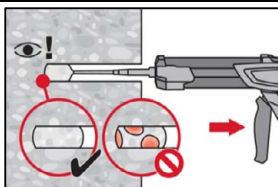


Tightly attach Hilti mixing nozzle HIT-RE-M to foil pack manifold. Do not modify the mixing nozzle.
Observe the instruction for use of the dispenser.
Check foil pack holder for proper function. Insert foil pack into foil pack holder and put holder into dispenser.

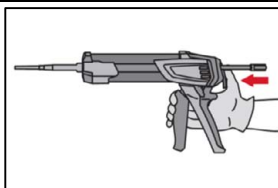


The foil pack opens automatically as dispensing is initiated. Depending on the size of the foil pack, an initial amount of adhesive has to be discarded. Discarded quantities are
2 strokes for 330 ml foil pack,
3 strokes for 500 ml foil pack,
4 strokes for 500 ml foil pack $\leq 5^\circ\text{C}$.
The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

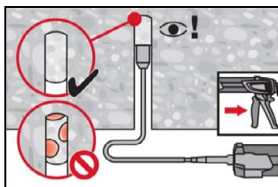
Inject adhesive from the back of the drill hole without forming air voids.



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.



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



Overhead installation and/or installation with embedment depth $h_{ef} > 250\text{mm}$.
For overhead installation the injection is only possible with the aid of extensions and piston plugs. Assemble HIT-RE-M mixer, extension(s) and appropriately sized piston plug (see Table B7). 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.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Intended Use
Installation instructions

Annex B14

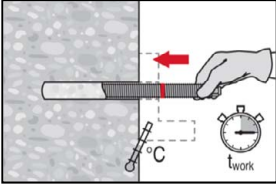
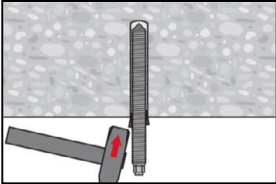
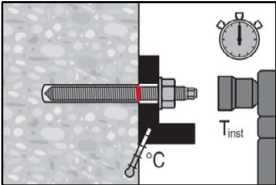
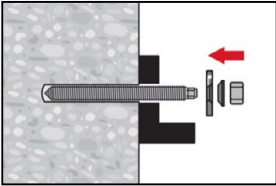
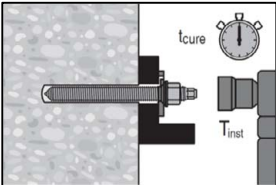
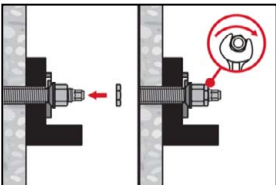
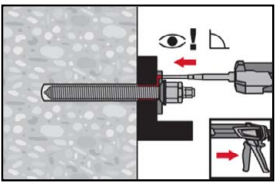
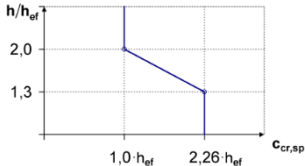
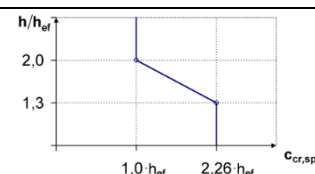
Setting the steel element	
	Before use, verify that the element is dry and free of oil and other contaminants. Mark and set steel element to the required embedment depth before working time t_{work} has elapsed. The working time t_{work} is given in Table B6.
	For overhead installation use piston plugs and fix embedded parts with e.g. wedges (Hilti HIT-OHW).
	Loading: After required curing time t_{cure} (see Table B6) the fastening can be loaded. The applied installation torque shall not exceed the values max T_{inst} given in Table B2 to Table B4.
Installation of Hilti Filling Set	
	Use Hilti Filling Set with standard nut. Observe the correct orientation of filling washer and spherical washer.
	The applied installation torque shall not exceed the values max T_{inst} given in Table B2 to Table B4.
	Optional: Installation of lock nut. Tighten with a $\frac{1}{4}$ to $\frac{1}{2}$ turn. (Not for size M24.)
	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 t_{cure} the fastening can be loaded.
Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	
Intended Use Installation instructions	Annex B15

Table C1: Essential characteristics for threaded rods according to Annex A under tension load in concrete

Threaded rods according to Annex A				M8	M10	M12	M16	M20	M24	M27	M30	
For a working life of 50 and 100 years												
Installation factor for installation in dry or wet (water saturated) concrete												
Hammer drilling (HD)	γ_{inst}	[-]	1,0									
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD (HDB)	γ_{inst}	[-]	1)	1,0								
Diamond coring with roughening with Hilti roughening tool TE-YRT (DD+RT)	γ_{inst}	[-]	1)					1,0				
Installation factor for installation in water-filled drill holes (not sea water)												
Hammer drilling (HD)	γ_{inst}	[-]	1,4									
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD (HDB)	γ_{inst}	[-]	1)	1,4								
Steel failure												
Characteristic resistance	$N_{Rk,s}$	[kN]	$A_s \cdot f_{uk}$									
Partial factor grade 5.8, 6.8 and 8.8 (Table A1)	$\gamma_{Ms,N^{(2)}}$	[-]	1,5									
Partial factor HAS A4, HAS-U A4, HIT-V-R, Threaded rod: CRC II and 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		
Concrete cone failure												
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]	$3,0 \cdot h_{ef}$									
Splitting failure												
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-A V3 and HIT-HY 200-R V3

Performances
Essential characteristics under tension load in concrete

Annex C1

Table C1: continued

Threaded rods according to Annex A				M8	M10	M12	M16	M20	M24	M27	M30	
Combined pullout and concrete cone failure for a working life of 50 years												
Characteristic bond resistance in uncracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)												
Temperature range I:	24°C/40°C	$\tau_{Rk,ucr}$	[N/mm²]	18								
Temperature range II:	50°C/80°C	$\tau_{Rk,ucr}$	[N/mm²]	15								
Temperature range III:	72°C/120°C	$\tau_{Rk,ucr}$	[N/mm²]	13								
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)												
Temperature range I:	24°C/40°C	$\tau_{Rk,cr}$	[N/mm²]	7,5	9,4	9,5						
Temperature range II:	50°C/80°C	$\tau_{Rk,cr}$	[N/mm²]	6,4	8,0							
Temperature range III:	72°C/120°C	$\tau_{Rk,cr}$	[N/mm²]	5,5	6,8	6,9						
Characteristic bond resistance in uncracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB												
Temperature range I:	24°C/40°C	$\tau_{Rk,ucr}$	[N/mm²]	14,0	13,8	13,5	13,0	12,5	11,9	11,4	10,9	
Temperature range II:	50°C/80°C	$\tau_{Rk,ucr}$	[N/mm²]	11,9	11,7	11,5	11,1	10,6	10,1	9,7	9,3	
Temperature range III:	72°C/120°C	$\tau_{Rk,ucr}$	[N/mm²]	10,2	10,1	9,9	9,5	9,1	8,7	8,3	8,0	
Characteristic bond resistance in cracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB												
Temperature range I:	24°C/40°C	$\tau_{Rk,cr}$	[N/mm²]	6,1	7,4	7,2	6,7	6,4	6,1	6,1	6,0	
Temperature range II:	50°C/80°C	$\tau_{Rk,cr}$	[N/mm²]	5,2	6,3	6,1	5,7	5,5	5,2	5,2	5,1	
Temperature range III:	72°C/120°C	$\tau_{Rk,cr}$	[N/mm²]	4,5	5,4	5,2	4,9	4,7	4,5	4,5	4,4	
Influence factors ψ on bond resistance τ_{Rk} in cracked and uncracked concrete												
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$												
Temperature range I to III :				ψ_c	[-]							$(f_{ck}/20)^{0,1}$
Influence of sustanined load												
Temperature range I:	24°C/40°C	ψ_{sus}^0	[-]	0,80								
Temperature range II:	50°C/80°C	ψ_{sus}^0	[-]	0,89								
Temperature range III:	72°C/120°C	ψ_{sus}^0	[-]	0,72								

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under tension load in concrete

Annex C2

Table C1: continued

Threaded rods according to Annex A				M8	M10	M12	M16	M20	M24	M27	M30
Combined pullout and concrete cone failure for a working life of 100 years											
Characteristic bond resistance in uncracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)											
Temperature range I: 24°C/40°C $\tau_{Rk,ucr,100}$ [N/mm ²]				17							
Temperature range II: 50°C/80°C $\tau_{Rk,ucr,100}$ [N/mm ²]				14							
Temperature range III: 72°C/120°C $\tau_{Rk,ucr,100}$ [N/mm ²]				12							
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)											
Temperature range I: 24°C/40°C $\tau_{Rk,cr,100}$ [N/mm ²]				6,5	6,7	8,1					
Temperature range II: 50°C/80°C $\tau_{Rk,cr,100}$ [N/mm ²]				5,5	5,7	7,0					
Temperature range III: 72°C/120°C $\tau_{Rk,cr,100}$ [N/mm ²]				5,0		6,0					
Characteristic bond resistance in uncracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB											
Temperature range I: 24°C/40°C $\tau_{Rk,ucr,100}$ [N/mm ²]				14,0	13,8	13,5	13,0	12,5	11,9	11,4	10,9
Temperature range II: 50°C/80°C $\tau_{Rk,ucr,100}$ [N/mm ²]				11,9	11,7	11,5	11,1	10,6	10,1	9,7	9,3
Temperature range III: 72°C/120°C $\tau_{Rk,ucr,100}$ [N/mm ²]				10,2	10,1	9,9	9,5	9,1	8,7	8,3	8,0
Characteristic bond resistance in cracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB											
Temperature range I: 24°C/40°C $\tau_{Rk,cr,100}$ [N/mm ²]				5,5	5,3	6,1	5,8	5,5	5,3	5,1	4,8
Temperature range II: 50°C/80°C $\tau_{Rk,cr,100}$ [N/mm ²]				4,5	4,5	5,2	4,9	4,7	4,5	4,3	4,1
Temperature range III: 72°C/120°C $\tau_{Rk,cr,100}$ [N/mm ²]				3,9	3,8	4,5	4,2	4,0	3,8	3,7	3,5
Influence factors ψ on bond resistance $\tau_{Rk,100}$ in cracked and uncracked concrete											
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$											
Temperature range I to III :											

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under tension load in concrete

Annex C3

Table C2: Essential characteristics for threaded rods according to Annex A under shear load in concrete

Threaded rods according to Annex A			M8	M10	M12	M16	M20	M24	M27	M30	
For a working life of 50 and 100 years											
Steel failure without lever arm											
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 6.8 and 8.8	k_6	[-]	0,5								
Factor HAS A4, HAS-U A4, HIT-V-R, Threaded rod: CRC II and 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, 6.8, 8.8	$\gamma_{Ms,V}^{1)}$	[-]	1,25								
Partial factor HAS A4, HAS-U A4, HIT-V-R, Threaded rod CRC II and 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								
Steel failure with lever arm											
Characteristic resistance	$M_{Rk,s}^0$	[Nm]	$1,2 \cdot W_{el} \cdot f_{uk}$								
Ductility factor	k_7	[-]	1,0								
Concrete pry-out failure											
Pry-out factor	k_8	[-]	2,0								
Concrete edge failure											
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	

¹⁾ In absence of national regulations.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

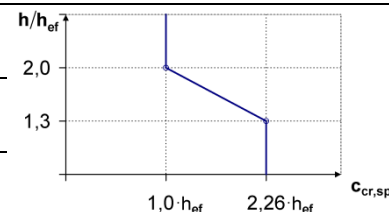
Performances

Essential characteristics under shear load in concrete

Annex C4

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

HIS-(R)N			M8	M10	M12	M16	M20
For a working life of 50 years							
Installation factor							
Hammer drilling	γ_{inst}	[-]	1,0				
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD	γ_{inst}	[-]	1,0				
Diamond coring with roughening with Hilti roughening tool TE-YRT	γ_{inst}	[-]	1)	1,0			
Steel failure							
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
Concrete cone failure							
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]	$3,0 \cdot h_{ef}$				
Splitting failure							
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-A V3 and HIT-HY 200-R V3

Performances
Essential characteristics under tension load in concrete

Annex C5

Table C3: continued

HIS-(R)N			M8	M10	M12	M16	M20
Combined pullout and concrete cone failure for a working life of 50 years							
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 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)							
Temperature range I:	24°C/40°C	$\tau_{Rk,ucr}$	[N/mm²]	13			
Temperature range II:	50°C/80°C	$\tau_{Rk,ucr}$	[N/mm²]	11			
Temperature range III:	72°C/120°C	$\tau_{Rk,ucr}$	[N/mm²]	9,5			
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)							
Temperature range I:	24°C/40°C	$\tau_{Rk,cr}$	[N/mm²]	7			
Temperature range II:	50°C/80°C	$\tau_{Rk,cr}$	[N/mm²]	5,5			
Temperature range III:	72°C/120°C	$\tau_{Rk,cr}$	[N/mm²]	5			
Influence factors ψ on bond resistance τ_{Rk} in cracked and uncracked concrete							
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$							
Temperature range I to III :	ψ_c	[-]	$(f_{ck}/20)^{0,1}$				
Influence of sustained load							
Temperature range I:	24°C/40°C	ψ^0_{sus}	[-]	0,80			
Temperature range II:	50°C/80°C	ψ^0_{sus}	[-]	0,89			
Temperature range III:	72°C/120°C	ψ^0_{sus}	[-]	0,72			

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under tension load in concrete

Annex C6

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

HIS-(R)N			M8	M10	M12	M16	M20
For a working life of 50 years							
Steel failure without lever arm							
Characteristic resistance HIS-N with screw or threaded rod grade 8.8	$V^0_{Rk,s}$	[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	$V^0_{Rk,s}$	[kN]	13	20	30	55	83
Partial factor	$\gamma_{Ms,V^{(1)}}$	[-]	1,56				2,0
Ductility factor	k_7	[-]	1,0				
Steel failure with lever arm							
Characteristic resistance HIS-N with screw or threaded rod grade 8.8	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519
Characteristic resistance HIS-RN with screw or threaded rod grade 70	$M^0_{Rk,s}$	[Nm]	26	52	92	233	454
Ductility factor	k_7	[-]	1,0				
Concrete pry-out failure							
Pry-out factor	k_8	[-]	2,0				
Concrete edge failure							
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

¹⁾ In absence of national regulations.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under shear load in concrete

Annex C7

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
For a working life of 50 and 100 years								
Installation factor for installation in dry or wet (water saturated) concrete								
Hammer drilling	γ_{inst}	[-]				1,0		
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD	γ_{inst}	[-]				1,0		
Diamond coring with roughening with Hilti roughening tool TE-YRT	γ_{inst}	[-]		1)		1,0		
Installation factor for installation in water-filled drill holes (not sea water)								
Hammer drilling	γ_{inst}	[-]				1,4		
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD	γ_{inst}	[-]				1,4		
Steel failure								
Characteristic resistance HZA	$N_{Rk,s}$	[kN]		46	86	135	194	253
Characteristic resistance HZA-R	$N_{Rk,s}$	[kN]		62	111	173	248	1)
Partial factor	$\gamma_{Ms,N^{2)}$	[-]				1,4		
Concrete cone failure								
Effective anchorage depth	HZA	h_{ef}	[mm]			h_{nom}		
	HZA-R	h_{ef}	[mm]			h_{nom}		
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]				$3,0 \cdot h_{ef}$		
Splitting failure relevant for uncracked concrete								
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-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under tension load in concrete

Annex C8

Table C5: continued

Hilti tension anchor HZA, HZA-R				M12	M16	M20	M24	M27
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]	$h_{nom} - 100$ 1)				
Combined pull-out and concrete cone failure for a working life of 50 years								
Characteristic bond resistance in uncracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)								
Temperature range I:		24°C/40°C	$\tau_{Rk,ucr}$	[N/mm²]	12			
Temperature range II:		50°C/80°C	$\tau_{Rk,ucr}$	[N/mm²]	10			
Temperature range III:		72°C/120°C	$\tau_{Rk,ucr}$	[N/mm²]	8,5			
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)								
Temperature range I:		24°C/40°C	$\tau_{Rk,cr}$	[N/mm²]	7			
Temperature range II:		50°C/80°C	$\tau_{Rk,cr}$	[N/mm²]	5,5			
Temperature range III:		72°C/120°C	$\tau_{Rk,cr}$	[N/mm²]	5			
Characteristic bond resistance in uncracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB								
Temperature range I:		24°C/40°C	$\tau_{Rk,ucr}$	[N/mm²]	11,4			
Temperature range II:		50°C/80°C	$\tau_{Rk,ucr}$	[N/mm²]	9,3			
Temperature range III:		72°C/120°C	$\tau_{Rk,ucr}$	[N/mm²]	8,1			
Characteristic bond resistance in cracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB								
Temperature range I:		24°C/40°C	$\tau_{Rk,cr}$	[N/mm²]	6,5			
Temperature range II:		50°C/80°C	$\tau_{Rk,cr}$	[N/mm²]	5,2			
Temperature range III:		72°C/120°C	$\tau_{Rk,cr}$	[N/mm²]	4,5			
Influence factors ψ on bond resistance τ_{Rk} in cracked and uncracked concrete								
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$								
Temperature range I to III :		ψ_c	[-]	$(f_{ck}/20)^{0,1}$				
Influence of sustained load								
Temperature range I:		24°C/40°C	ψ_{sus}^0	[-]	0,80			
Temperature range II:		50°C/80°C	ψ_{sus}^0	[-]	0,89			
Temperature range III:		72°C/120°C	ψ_{sus}^0	[-]	0,72			

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under tension load in concrete

Annex C9

Table C5: continued

Hilti tension anchor HZA, HZA-R				M12	M16	M20	M24	M27
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]	$h_{nom} - 100$				
Combined pull-out and concrete cone failure for a working life 100 years								
Characteristic bond resistance in uncracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)								
Temperature range I:	24°C/40°C	$\tau_{Rk,ucr,100}$	[N/mm²]	12				
Temperature range II:	50°C/80°C	$\tau_{Rk,ucr,100}$	[N/mm²]	10				
Temperature range III:	72°C/120°C	$\tau_{Rk,ucr,100}$	[N/mm²]	8,5				
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)								
Temperature range I:	24°C/40°C	$\tau_{Rk,cr,100}$	[N/mm²]	7				
Temperature range II:	50°C/80°C	$\tau_{Rk,cr,100}$	[N/mm²]	5,5				
Temperature range III:	72°C/120°C	$\tau_{Rk,cr,100}$	[N/mm²]	5				
Characteristic bond resistance in uncracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB								
Temperature range I:	24°C/40°C	$\tau_{Rk,ucr,100}$	[N/mm²]	11,4				
Temperature range II:	50°C/80°C	$\tau_{Rk,ucr,100}$	[N/mm²]	9,3				
Temperature range III:	72°C/120°C	$\tau_{Rk,ucr,100}$	[N/mm²]	8,1				
Characteristic bond resistance in cracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB								
Temperature range I:	24°C/40°C	$\tau_{Rk,cr,100}$	[N/mm²]	6,5				
Temperature range II:	50°C/80°C	$\tau_{Rk,cr,100}$	[N/mm²]	5,2				
Temperature range III:	72°C/120°C	$\tau_{Rk,cr,100}$	[N/mm²]	4,5				
Influence factors ψ on bond resistance τ_{Rk} in cracked and uncracked concrete								
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$								
Temperature range I to III :		ψ_c	[-]	$(f_{ck}/20)^{0,1}$				
Influence of sustained load								
Temperature range I:	24°C/40°C	$\psi_{sus,100}^0$	[-]	0,80				
Temperature range II:	50°C/80°C	$\psi_{sus,100}^0$	[-]	0,89				
Temperature range III:	72°C/120°C	$\psi_{sus,100}^0$	[-]	0,72				

¹⁾ No performance assessed

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under tension load in concrete

Annex C10

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

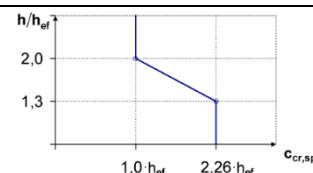
Hilti tension anchor HZA, HZA-R			M12	M16	M20	M24	M27
For a working life of 50 and 100 years							
Steel failure without lever arm							
Characteristic resistance HZA	$V^0_{Rk,s}$	[kN]	23	43	67	97	126
Characteristic resistance HZA-R	$V^0_{Rk,s}$	[kN]	31	55	86	124	1)
Partial factor	$\gamma_{Ms,V}^{2)}$	[-]	1,5				
Ductility factor	k7	[-]	1,0				
Steel failure with lever arm							
Characteristic resistance HZA	$M^0_{Rk,s}$	[Nm]	72	183	357	617	915
Characteristic resistance HZA-R	$M^0_{Rk,s}$	[Nm]	97	234	457	790	1)
Ductility factor	k7	[-]	1,0				
Concrete pry-out failure							
Pry-out factor	k8	[-]	2,0				
Concrete edge failure							
Effective length of fastener	lf	[mm]	min (h _{nom} ; 12 · d _{nom})				min (h _{nom} ; 8 · d _{nom} ; 300)
Outside diameter of fastener	d _{nom}	[mm]	12	16	20	24	27

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

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3	Annex C11
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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
For a working life of 50 and 100 years													
Installation factor for installation in dry or wet (water saturated) concrete													
Hammer drilling	γ_{inst}	[-]	1,0										
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD	γ_{inst}	[-]	1,0										
Diamond coring with roughening with Hilti roughening tool TE-YRT	γ_{inst}	[-]	1)				1,0						
Installation factor for installation in water-filled drill holes (not sea water)													
Hammer drilling	γ_{inst}	[-]	1,4										
Hammer drilling with Hilti hollow drill bit TE-CD or TE-YD	γ_{inst}	[-]	1,4										
Steel failure													
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										
Concrete cone failure													
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]	$3,0 \cdot h_{ef}$										
Splitting failure relevant for uncracked concrete													
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-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under tension load in concrete

Annex C12

Table C7: continued

Rebar	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 26	Ø 28	Ø 30	Ø 32
Diameter of rebar d [mm]	8	10	12	14	16	20	25	26	28	30	32
Combined pull-out and concrete cone failure for a working life of 50 years											
Characteristic bond resistance in uncracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)											
Temperature range I: 24°C/40°C τ _{Rk,ucr} [N/mm²]	12										
Temperature range II: 50°C/80°C τ _{Rk,ucr} [N/mm²]	10										
Temperature range III: 72°C/120°C τ _{Rk,ucr} [N/mm²]	8,5										
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)											
Temperature range I: 24°C/40°C τ _{Rk,cr} [N/mm²]	1)	5,0	7,0								
Temperature range II: 50°C/80°C τ _{Rk,cr} [N/mm²]	1)	4,0	5,5								
Temperature range III: 72°C/120°C τ _{Rk,cr} [N/mm²]	1)	3,5	5,0								
Characteristic bond resistance in uncracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB											
Temperature range I: 24°C/40°C τ _{Rk,ucr} [N/mm²]	1)	11,4									
Temperature range II: 50°C/80°C τ _{Rk,ucr} [N/mm²]	1)	9,3									
Temperature range III: 72°C/120°C τ _{Rk,ucr} [N/mm²]	1)	8,1									
Characteristic bond resistance in cracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB											
Temperature range I: 24°C/40°C τ _{Rk,cr} [N/mm²]	1)	4,6	6,5								
Temperature range II: 50°C/80°C τ _{Rk,cr} [N/mm²]	1)	3,7	5,2								
Temperature range III: 72°C/120°C τ _{Rk,cr} [N/mm²]	1)	3,2	4,5								
Influence factors ψ on bond resistance τ _{Rk} in cracked and uncracked concrete											
Influence of concrete strength class: τ _{Rk} = τ _{Rk,(C20/25)} · ψ _c											
Temperature range I to III :	ψ _c	(f _{ck} /20) ^{0,1}									
Influence of sustained load											
Temperature range I: 24°C/40°C ψ ⁰ _{sus}	[-]	0,80									
Temperature range II: 50°C/80°C ψ ⁰ _{sus}	[-]	0,89									
Temperature range III: 72°C/120°C ψ ⁰ _{sus}	[-]	0,72									

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under tension load in concrete

Annex C13

Table C7: continued

Rebar	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 20	Ø 25	Ø 26	Ø 28	Ø 30	Ø 32
Diameter of rebar d [mm]	8	10	12	14	16	20	25	26	28	30	32
Combined pull-out and concrete cone failure for a working life of 100 years											
Characteristic bond resistance in uncracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)											
Temperature range I: 24°C/40°C τ _{Rk,ucr,100} [N/mm²]	12										
Temperature range II: 50°C/80°C τ _{Rk,ucr,100} [N/mm²]	10										
Temperature range III: 72°C/120°C τ _{Rk,ucr,100} [N/mm²]	8,5										
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete, all drilling methods (HD, HDB, DD + RT)											
Temperature range I: 24°C/40°C τ _{Rk,cr,100} [N/mm²]	1)	5,0	7,0								
Temperature range II: 50°C/80°C τ _{Rk,cr,100} [N/mm²]	1)	4,0	5,5								
Temperature range III: 72°C/120°C τ _{Rk,cr,100} [N/mm²]	1)	3,5	5,0								
Characteristic bond resistance in uncracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB											
Temperature range I: 24°C/40°C τ _{Rk,ucr,100} [N/mm²]	1)	11,4									
Temperature range II: 50°C/80°C τ _{Rk,ucr,100} [N/mm²]	1)	9,3									
Temperature range III: 72°C/120°C τ _{Rk,ucr,100} [N/mm²]	1)	8,1									
Characteristic bond resistance in cracked concrete C20/25 for installation in water-filled drill holes (not sea water), HD and HDB											
Temperature range I: 24°C/40°C τ _{Rk,cr,100} [N/mm²]	1)	4,6	6,5								
Temperature range II: 50°C/80°C τ _{Rk,cr,100} [N/mm²]	1)	3,7	5,2								
Temperature range III: 72°C/120°C τ _{Rk,cr,100} [N/mm²]	1)	3,2	4,5								
Influence factors ψ on bond resistance τ _{Rk} in cracked and uncracked concrete											
Influence of concrete strength class: τ _{Rk} = τ _{Rk,(C20/25)} · ψ _c											
Temperature range I to III : ψ _c [-]	(f _{ck} /20) ^{0,1}										
Influence of sustained load											
Temperature range I: 24°C/40°C ψ ⁰ _{sus,100} [-]	0,80										
Temperature range II: 50°C/80°C ψ ⁰ _{sus,100} [-]	0,89										
Temperature range III: 72°C/120°C ψ ⁰ _{sus,100} [-]	0,72										

1) No performance assessed.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances
Essential characteristics under tension load in concrete

Annex C14

Table C8: Essential characteristics for rebar under shear 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
For a working life of 50 and 100 years											
Steel failure without lever arm											
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										
Steel failure with lever arm											
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										
Concrete pry-out failure											
Pry-out factor k_8 [-]	2,0										
Concrete edge failure											
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

¹⁾ f_{uk} according to rebar specification

²⁾ In absence of national regulations.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Essential characteristics under shear load in concrete

Annex C15

Table C9: Displacements under tension load

Threaded rods according to Annex A			M8	M10	M12	M16	M20	M24	M27	M30
Uncracked concrete temperature range I: 24°C / 40°C										
Displacement	δ_{N0}	[mm/(N/mm²)]	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,04	0,05	0,06	0,08	0,10	0,13	0,14	0,16
Uncracked concrete temperature range II: 50°C / 80°C										
Displacement	δ_{N0}	[mm/(N/mm²)]	0,03	0,04	0,05	0,06	0,08	0,09	0,10	0,12
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,04	0,05	0,06	0,09	0,11	0,13	0,15	0,16
Uncracked concrete temperature range III: 72°C / 120°C										
Displacement	δ_{N0}	[mm/(N/mm²)]	0,04	0,05	0,06	0,08	0,10	0,12	0,13	0,16
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,04	0,05	0,07	0,09	0,11	0,13	0,15	0,17
Cracked concrete temperature range I: 24°C / 40°C										
Displacement	δ_{N0}	[mm/(N/mm²)]	0,07							
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,16							
Cracked concrete temperature range II: 50°C / 80°C										
Displacement	δ_{N0}	[mm/(N/mm²)]	0,10							
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,22							
Cracked concrete temperature range III: 72°C / 120°C										
Displacement	δ_{N0}	[mm/(N/mm²)]	0,13							
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,29							

Table C10: Displacements under shear load

Threaded rods according to Annex A			M8	M10	M12	M16	M20	M24	M27	M30
Displacement	δ_{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-A V3 and HIT-HY 200-R V3

Performances

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

Annex C16

Table C11: Displacements under tension load

HIS-(R)N			M8	M10	M12	M16	M20
Uncracked concrete temperature range I: 24°C / 40°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,03	0,05	0,06	0,07	0,08
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,06	0,09	0,11	0,13	0,14
Uncracked concrete temperature range II: 50°C / 80°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,05	0,06	0,08	0,10	0,11
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,07	0,09	0,11	0,13	0,15
Uncracked concrete temperature range III: 72°C / 120°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,06	0,08	0,10	0,13	0,14
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,07	0,09	0,11	0,14	0,15
Cracked concrete temperature range I: 24°C / 40°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,11				
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,16				
Cracked concrete temperature range II: 50°C / 80°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,15				
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,22				
Cracked concrete temperature range III: 72°C / 120°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,20				
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,29				

Table C12: Displacements under shear load

HIS-(R)N			M8	M10	M12	M16	M20
Displacement	δ_{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-A V3 and HIT-HY 200-R V3

Performances
Displacements with HIS-(R)N

Annex C17

Table C13: Displacements under tension load

Hilti tension anchor HZA, HZA-R			M12	M16	M20	M24	M27
Uncracked concrete temperature range I: 24°C / 40°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,03	0,04	0,06	0,07	0,08
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,06	0,08	0,13	0,13	0,15
Uncracked concrete temperature range II: 50°C / 80°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,05	0,06	0,08	0,10	0,11
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,06	0,09	0,14	0,14	0,15
Uncracked concrete temperature range III: 72°C / 120°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,06	0,08	0,10	0,12	0,14
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,07	0,09	0,14	0,14	0,16
Cracked concrete temperature range I: 24°C / 40°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,11				
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,16				
Cracked concrete temperature range II: 50°C / 80°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,15				
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,22				
Cracked concrete temperature range III: 72°C / 120°C							
Displacement	δ_{N0}	[mm/(N/mm²)]	0,20				
	$\delta_{N\infty}$	[mm/(N/mm²)]	0,29				

Table C14: Displacements under shear load

Hilti tension anchor HZA, HZA-R			M12	M16	M20	M24	M27
Displacement	δ_{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-A V3 and HIT-HY 200-R V3

Performances
Displacements with HZA and HZA-R

Annex C18

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: 24°C / 40°C													
Displacement	δ _{N0}	[mm/(N/mm²)]	0,02	0,03	0,03	0,04	0,04	0,06	0,07	0,08	0,08	0,09	0,09
	δ _{N∞}	[mm/(N/mm²)]	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: 50°C / 80°C													
	δ _{N0}	[mm/(N/mm²)]	0,03	0,04	0,05	0,05	0,06	0,08	0,10	0,11	0,11	0,12	0,12
	δ _{N∞}	[mm/(N/mm²)]	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: 72°C / 120°C													
Displacement	δ _{N0}	[mm/(N/mm²)]	0,04	0,05	0,06	0,07	0,08	0,10	0,12	0,13	0,14	0,15	0,16
	δ _{N∞}	[mm/(N/mm²)]	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: 24°C / 40°C													
Displacement	δ _{N0}	[mm/(N/mm²)]	0,11										
	δ _{N∞}	[mm/(N/mm²)]	0,16										
Cracked concrete temperature range II: 50°C / 80°C													
Displacement	δ _{N0}	[mm/(N/mm²)]	0,15										
	δ _{N∞}	[mm/(N/mm²)]	0,22										
Cracked concrete temperature range III: 72°C / 120°C													
Displacement	δ _{N0}	[mm/(N/mm²)]	0,20										
	δ _{N∞}	[mm/(N/mm²)]	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	δ_{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-A V3 and HIT-HY 200-R V3

Performances
Displacements with rebar

Annex C19

Table C17: Essential characteristics for threaded rods according to Annex A under tension load for seismic performance category C1

Threaded rods according to Annex A				M10	M12	M16	M20	M24	M27	M30
For a working life of 50 and 100 years										
Steel failure										
Characteristic resistance				$N_{Rk,s,C1}$	[kN]	$A_s \cdot f_{uk}$				
Combined pullout and concrete cone failure for a working life of 50 years										
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete all drilling methods (HD, HDB, DD + RT)										
Temperature range I:		24°C/40°C	$\tau_{Rk,C1}$	[N/mm ²]	5,2	7,0				
Temperature range II:		50°C/80°C	$\tau_{Rk,C1}$	[N/mm ²]	3,9	5,7				
Temperature range III:		72°C/120°C	$\tau_{Rk,C1}$	[N/mm ²]	3,5	4,8				
Combined pullout and concrete cone failure for a working life of 100 years										
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete all drilling methods (HD, HDB, DD + RT)										
Temperature range I:		24°C/40°C	$\tau_{Rk,100,C1}$	[N/mm ²]	4,5	6,3				
Temperature range II:		50°C/80°C	$\tau_{Rk,100,C1}$	[N/mm ²]	3,7	5,2				
Temperature range III:		72°C/120°C	$\tau_{Rk,100,C1}$	[N/mm ²]	3,1	4,4				
Influence factors ψ on bond resistance $\tau_{Rk,C1}$ and $\tau_{Rk,100,C1}$ in cracked concrete										
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$										
Temperature range I to III :				ψ_c	[-]	1,0				

Table C18: Essential characteristics for threaded rods according to Annex A under shear load for seismic performance category C1

Threaded rods according to Annex A			M10	M12	M16	M20	M24	M27	M30
For a working life of 50 and 100 years									
Annular gap factor without Hilti filling set	α_{gap}	[-]	0,5						
Annular gap factor with Hilti filling set	α_{gap}	[-]	1,0						1)
Steel failure without lever arm									
Characteristic resistance HAS 5.8, HAS-U 5.8, HIT-V 5.8	$V_{Rk,s,C1}$	[kN]	$0,60 \cdot A_s \cdot f_{uk}$						
Characteristic resistance HAS 8.8, HAS-U 8.8, HIT-V 8.8, AM 8.8	$V_{Rk,s,C1}$	[kN]	$0,50 \cdot A_s \cdot f_{uk}$						
Characteristic resistance HAS A4, HAS-U A4, HIT-V-R HAS-U HCR, HIT-V-HCR	$V_{Rk,s,C1}$	[kN]	$0,50 \cdot A_s \cdot f_{uk}$						
Characteristic resistance Commercial standard threaded rod	$V_{Rk,s,C1}$	[kN]	$0,35 \cdot A_s \cdot f_{uk}$						

1) No performance assessed.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

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

Annex C20

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
For a working life of 50 and 100 years							
Steel failure							
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	¹⁾
Partial factor	$\gamma_{Ms,N,C1}$ ²⁾	[-]	1,4				
Combined pull-out and concrete cone failure							
Diameter of rebar	d	[mm]	12	16	20	25	28
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete all drilling methods (HD, HDB, DD + RT)							
Temperature range I:	24°C/40°C	$\tau_{Rk,C1} = \tau_{Rk,100,C1}$ [N/mm²]	6,1				
Temperature range II:	50°C/80°C	$\tau_{Rk,C1} = \tau_{Rk,100,C1}$ [N/mm²]	4,8				
Temperature range III:	72°C/120°C	$\tau_{Rk,C1} = \tau_{Rk,100,C1}$ [N/mm²]	4,4				
Influence factors ψ on bond resistance $\tau_{Rk,C1}$ and $\tau_{Rk,100,C1}$ in cracked concrete							
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$							
Temperature range I to III :	ψ_c	[-]	1,0				

¹⁾ No performance assessed.

²⁾ 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
For a working life of 50 and 100 years							
Annular gap factor without Hilti filling set	α_{gap}	[-]	0,5				
Annular gap factor with Hilti filling set	α_{gap}	[-]	1,0 ¹⁾				
Steel failure without lever arm							
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	¹⁾
Partial factor	$\gamma_{Ms,V,C1}$ ²⁾	[-]	1,5				

¹⁾ No performance assessed.

²⁾ In absence of national regulations.

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

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

Annex C21

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		
For a working life of 50 and 100 years												
Steel failure												
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
Combined pull-out and concrete cone failure												
Diameter of rebar	d	[mm]	10	12	14	16	20	25	26	28	30	32
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete all drilling methods (HD, HDB, DD + RT)												
Temperature range I: 24°C/40°C	$\tau_{Rk,C1} = \tau_{Rk,100,C1}$	[N/mm²]	4,4	6,1								
Temperature range II: 50°C/80°C	$\tau_{Rk,C1} = \tau_{Rk,100,C1}$	[N/mm²]	3,5	4,8								
Temperature range III: 72°C/120°C	$\tau_{Rk,C1} = \tau_{Rk,100,C1}$	[N/mm²]	3	4,4								
Influence factors ψ on bond resistance $\tau_{Rk,C1}$ and $\tau_{Rk,100,C1}$ in cracked concrete												
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$												
Temperature range I to III :	ψ_c	[-]	1,0									

¹⁾ 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
For a working life of 50 and 100 years										
Annular gap factor without Hilti filling set α_{gap}	[-]									
0,5										
Steel failure without lever arm										
Characteristic resistance $V_{Rk,s,C1}$	[kN]									
0,35 · A _s · 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										

¹⁾ f_{uk} according to rebar specification

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

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

Annex C22

Table C23: Essential characteristics for threaded rods according to Annex A under tension load for seismic performance category C2

Threaded rods according to Annex A	M12	M16	M20	M24
For a working life of 50 and 100 years				
Steel failure				
Characteristic resistance HAS (8.8, 8.8 HDG, A4), 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 (8.8, CRC II, CRC III and CRC V, see Table A1)	$N_{Rk,s,C2} \quad [kN]$ $A_s \cdot f_{uk}$			
Combined pullout and concrete cone failure				
Characteristic bond resistance in cracked concrete C20/25 for installation in dry or wet (water saturated) concrete, in hammer drilled holes and hammer drilled holes with Hilti hollow drill bit TE-CD or TE-YD				
Temperature range I: 24°C/40°C $\tau_{Rk,C2} = \tau_{Rk,100,C2} \quad [N/mm^2]$	2,7	4,6	4,6	3,5
Temperature range II: 50°C/80°C $\tau_{Rk,C2} = \tau_{Rk,100,C2} \quad [N/mm^2]$	2,3	3,9	3,9	2,9
Temperature range III: 72°C/120°C $\tau_{Rk,C2} = \tau_{Rk,100,C2} \quad [N/mm^2]$	2,0	3,3	3,3	2,5
Influence factors ψ on bond resistance $\tau_{Rk,C2}$ and $\tau_{Rk,100,C2}$ in cracked concrete				
Influence of concrete strength class: $\tau_{Rk} = \tau_{Rk,(C20/25)} \cdot \psi_c$				
Temperature range I to III : ψ_c [-]	1,0			

Table C24: Essential characteristics for threaded rods according to Annex A under shear load for seismic performance category C2

Threaded rods according to Annex A	M12	M16	M20	M24		
For a working life of 50 and 100 years						
Annular gap factor without Hilti filling set	α_{gap}	[-]	0,5			
Annular gap factor with Hilti filling set	α_{gap}	[-]	1,0			
Steel failure without lever arm with Hilti Filling Set						
Characteristic resistance						
HAS 8.8, HAS-U 8.8, HIT-V 8.8, AM 8.8	$V_{Rk,s,C2}$	[kN]	28	46	77	103
Steel failure without lever arm without Hilti Filling Set						
Characteristic resistance						
HAS 8.8, HAS-U 8.8, HIT-V 8.8, AM 8.8	$V_{Rk,s,C2}$	[kN]	24	40	71	90
HAS A4, HAS-U A4, HIT-V-R	$V_{Rk,s,C2}$	[kN]	21	35	62	79
HAS-U-HCR, HIT-V-HCR	$V_{Rk,s,C2}$	[kN]	24	40	71	79
HAS 8.8 HDG, HAS-U 8.8 HDG, HIT-V-F 8.8, AM-HDG 8.8	$V_{Rk,s,C2}$	[kN]	18	30	46	66
Threaded rod, hot dip galvanized 8.8	$V_{Rk,s,C2}$	[kN]	13	21	32	46
Threaded rod, electroplated zinc coated 8.8	$V_{Rk,s,C2}$	[kN]	17	28	50	63
Threaded rod CRC II and CRC III (Table A1)	$V_{Rk,s,C2}$	[kN]	15	25	43	55
Threaded rod CRC V (Table A1)	$V_{Rk,s,C2}$	[kN]	17	28	50	55

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

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

Annex C23

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

Threaded rods according to Annex A	M12	M16	M20	M24
Displacement DLS, HAS (8.8, 8.8 HDG, A4), 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 (8.8, CRC II, CRC III and CRC V, see Table A1)	$\delta_{N,C2(DLS)}$ [mm] 0,3	0,4	0,5	0,4
Displacement ULS, HAS (8.8, 8.8 HDG, A4), 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 (8.8, CRC II, CRC III and CRC V, see Table A1)	$\delta_{N,C2(ULS)}$ [mm] 1,2	1,1	0,7	0,9

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

Threaded rods according to Annex A		M12	M16	M20	M24
Installation with Hilti Filling Set					
Displacement DLS, HAS 8.8, HAS-U 8.8, HIT-V 8.8, AM 8.8	$\delta_{V,C2(DLS)}$ [mm]	0,6	1,2	1,4	1,1
Displacement ULS, HAS 8.8, HAS-U 8.8, HIT-V 8.8, AM 8.8	$\delta_{V,C2(ULS)}$ [mm]	3,1	3,2	3,8	2,6
Installation without Hilti Filling Set					
Displacement DLS, HAS (8.8, A4), HAS-U (-8.8, A4, HCR), HIT-V (-8.8, -R, HCR), AM 8.8, Threaded rod (electroplated zinc coated 8.8, CRC II, CRC III and CRC V, see Table A1)	$\delta_{V,C2(DLS)}$ [mm]	1,9	3,2	2,5	3,5
Displacement DLS, HAS 8.8 HDG, HAS-U 8.8 HDG, HIT-V-F 8.8, AM HDG 8.8, Threaded rods 8.8 HDG	$\delta_{V,C2(DLS)}$ [mm]	2,2	2,3	3,8	3,7
Displacement ULS, HAS (-8.8, A4), HAS-U (-8.8, A4, HCR), HIT-V (-8.8, -R, HCR), AM 8.8, Threaded rod (electroplated zinc coated 8.8, CRC II, CRC III and CRC V, see Table A1)	$\delta_{V,C2(ULS)}$ [mm]	4,4	9,2	7,1	10,2
Displacement ULS, HAS 8.8 HDG, HAS-U 8.8 HDG, HIT-V-F 8.8, AM HDG 8.8, Threaded rods 8.8 HDG	$\delta_{V,C2(ULS)}$ [mm]	4,1	4,3	9,1	8,4

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Displacements under tension and shear load
for seismic performance category C2

Annex C24

Characteristic resistance to combined pull-out and concrete failure under fire for concrete strength classes C20/25 to C50/60 for threaded rods and rebars for all drilling methods

The characteristic bond resistance $\tau_{Rk,fi}(\theta)$ under fire shall be calculated by using the following equations:

$$\tau_{Rk,fi}(\theta) = k_{fi,p}(\theta) \cdot \tau_{Rk,cr,C20/25}$$
$$\tau_{Rk,fi}(\theta) = k_{fi,p}(\theta) \cdot \tau_{Rk,cr,100,C20/25}$$

Temperature reduction factor for threaded rods

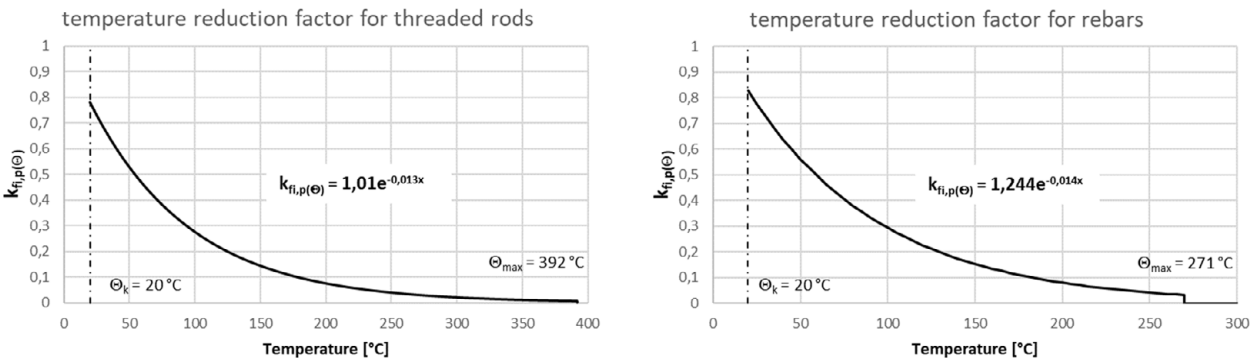
with: $\theta \leq 392\text{ °C}$: $k_{fi,p}(\theta) = 1,01 \cdot e^{(-0,013 \cdot \theta)} \leq 1,0$
and $\theta > \theta_{max}$: $k_{fi,p}(\theta) = 0,0$
 $\theta_{max} = 392\text{ °C}$

Temperature reduction factor for rebars

with: $\theta \leq 271\text{ °C}$: $k_{fi,p}(\theta) = 1,244 \cdot e^{(-0,014 \cdot \theta)} \leq 1,0$
and $\theta > \theta_{max}$: $k_{fi,p}(\theta) = 0,0$
 $\theta_{max} = 271\text{ °C}$

- $\tau_{Rk,fi}(\theta)$ = characteristic bond resistance for cracked concrete under fire exposure for a given temperature
- $k_{fi,p}(\theta)$ = reduction factor for bond resistance under fire conditions
- $\tau_{Rk,cr,C20/25}$ = characteristic bond resistance for cracked concrete C20/25 for a working life of 50 years given in Table C1
- $\tau_{Rk,cr,100,C20/25}$ = characteristic bond resistance for cracked concrete C20/25 for a working life of 100 years given in Table C1

Figure C1 Reduction factor $k_{fi,p}(\theta)$



Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances
Characteristic bond resistance under fire conditions

Annex C25

Table C27: Characteristic resistance to steel failure under tension loading for threaded rods in case of fire

Threaded rods according to Annex A		M8	M10	M12	M16	M20	M24	M27	M30
HAS 5.8, HAS-U 5.8, HIT-V 5.8, AM 8.8 HAS 5.8 HDG, HAS-U 5.8 HDG, HIT-V-F 5.8, AM-HDG 5.8 HAS 8.8, HAS-U 8.8, HIT-V 8.8, AM 8.8 HAS 8.8 HDG, HAS-U 8.8 HDG, HIT-V-F 8.8, AM-HDG 8.8	$N_{Rk,s,fi(30)}$	1,04	1,80	2,80	5,22	8,15	11,74	15,27	18,67
	$N_{Rk,s,fi(60)}$	0,81	1,36	2,05	3,83	5,98	8,62	11,21	13,70
	$N_{Rk,s,fi(90)}$	0,58	0,91	1,31	2,44	3,81	5,49	7,14	8,73
	$N_{Rk,s,fi(120)}$	0,47	0,69	0,93	1,74	2,72	3,92	5,10	6,24
HAS A4, HAS-U A4, HIT-V-R HAS-U-HCR, HIT-V-HCR Threaded rod CRC III and Threaded rod CRC V (Table A1)	$N_{Rk,s,fi(30)}$	2,70	4,93	7,93	14,77	23,06	33,23	43,20	52,81
	$N_{Rk,s,fi(60)}$	1,93	3,49	5,56	10,37	16,18	23,31	30,31	37,05
	$N_{Rk,s,fi(90)}$	1,17	2,04	3,20	5,96	9,30	13,40	17,42	21,29
	$N_{Rk,s,fi(120)}$	0,79	1,32	2,01	3,75	5,86	8,44	10,98	13,42

Table C28: Characteristic resistance to steel failure under tension loading for rebar in case of fire

Rebars according to Annex A		φ 8	φ 10	φ 12	φ 14	φ 16	φ 20	φ 25	φ 26	φ 28	φ 30	φ 32
Rebar	$N_{Rk,s,fi(30)}$	0,5	1,2	2,3	3,1	4,0	6,3	9,8	10,6	12,3	14,1	16,1
	$N_{Rk,s,fi(60)}$	0,5	1,0	1,7	2,3	3,0	4,7	7,4	8,0	9,2	10,6	12,1
	$N_{Rk,s,fi(90)}$	0,4	0,8	1,5	2,0	2,6	4,1	6,4	6,9	8,0	9,2	10,5
	$N_{Rk,s,fi(120)}$	0,3	0,6	1,1	1,5	2,0	3,1	4,9	5,3	6,2	7,1	8,0

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Fire resistance to steel failure under tension loading

Annex C26

Table C29: Characteristic resistance under tension load for concrete cone failure in case of fire

Elements according to Annex A		M8	M10	M12	M16	M20	M24	M27	M30
HAS 5.8, HAS-U 5.8, HIT-V 5.8, AM 8.8	$N_{Rk,c,fi(30)}^0$	$h_{ef}/200 \cdot N_{Rk,c}^0 \leq N_{Rk,c}^0$							
HAS 5.8 HDG, HAS-U 5.8 HDG, HIT-V-F 5.8, AM-HDG 5.8									
HAS 8.8, HAS-U 8.8, HIT-V 8.8, AM 8.8									
HAS 8.8 HDG, HAS-U 8.8 HDG, HIT-V-F 8.8, AM-HDG 8.8	$N_{Rk,c,fi(60)}^0$								
HAS A4, HAS-U A4, HIT-V-R									
HAS-U-HCR, HIT-V-HCR	$N_{Rk,c,fi(90)}^0$								
Threaded rod CRC III and Threaded rod CRC V (Table A1)									
Rebar	$N_{Rk,c,fi(120)}^0$								
Characteristic spacing	$S_{cr,N,fi}$	$4 \cdot h_{ef}$							
Characteristic edge distance	$C_{cr,N,fi}$	$2 \cdot h_{ef}$							

Table C30: Characteristic resistance to steel failure under shear loading without lever arm for threaded rods in case of fire

Threaded rods according to Annex A		M8	M10	M12	M16	M20	M24	M27	M30
HAS 5.8, HAS-U 5.8, HIT-V 5.8, AM 8.8	$V_{Rk,s,fi(30)}$	1,04	1,80	2,80	5,22	8,15	11,74	15,27	18,67
HAS 5.8 HDG, HAS-U 5.8 HDG, HIT-V-F 5.8, AM-HDG 5.8		0,81	1,36	2,05	3,83	5,98	8,62	11,21	13,70
HAS 8.8, HAS-U 8.8, HIT-V 8.8, AM 8.8		0,58	0,91	1,31	2,44	3,81	5,49	7,14	8,73
HAS 8.8 HDG, HAS-U 8.8 HDG, HIT-V-F 8.8, AM-HDG 8.8		0,47	0,69	0,93	1,74	2,72	3,92	5,10	6,24
HAS A4, HAS-U A4, HIT-V-R	$V_{Rk,s,fi(60)}$	2,70	4,93	7,93	14,77	23,06	33,23	43,20	52,81
HAS-U-HCR, HIT-V-HCR		1,93	3,49	5,56	10,37	16,18	23,31	30,31	37,05
Threaded rod CRC III and Threaded rod CRC V (Table A1)		1,17	2,04	3,20	5,96	9,30	13,40	17,42	21,29
		0,79	1,32	2,01	3,75	5,86	8,44	10,98	13,42

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Fire resistance to steel failure under tension and shear loading

Annex C27

Table C31: Characteristic resistance to steel failure under shear loading without lever arm for rebars in case of fire

Rebars according to Annex A		φ 8	φ 10	φ 12	φ 14	φ 16	φ 20	φ 25	φ 26	φ 28	φ 30	φ 32
Rebar	$V_{Rk,s,fi(30)}$	0,5	1,2	2,3	3,1	4,0	6,3	9,8	10,6	12,3	14,1	16,1
	$V_{Rk,s,fi(60)}$	0,5	1,0	1,7	2,3	3,0	4,7	7,4	8,0	9,2	10,6	12,1
	$V_{Rk,s,fi(90)}$	0,4	0,8	1,5	2,0	2,6	4,1	6,4	6,9	8,0	9,2	10,5
	$V_{Rk,s,fi(120)}$	0,3	0,6	1,1	1,5	2,0	3,1	4,9	5,3	6,2	7,1	8,0

Table C32: Characteristic resistance to steel failure under shear loading with lever arm for threaded rods in case of fire

Threaded rods according to Annex A		M8	M10	M12	M16	M20	M24	M27	M30
HAS 5.8, HAS-U 5.8, HIT-V 5.8, AM 8.8	$M^0_{Rk,s,fi(30)}$	1,07	2,33	4,36	11,08	21,60	37,36	55,40	74,85
HAS 5.8 HDG, HAS-U 5.8 HDG, HIT-V-F 5.8, AM-HDG 5.8	$M^0_{Rk,s,fi(60)}$	0,83	1,75	3,19	8,13	15,85	27,41	40,65	54,92
HAS 8.8, HAS-U 8.8, HIT-V 8.8, AM 8.8	$M^0_{Rk,s,fi(90)}$	0,60	1,18	2,03	5,18	10,10	17,46	25,90	34,99
HAS 8.8 HDG, HAS-U 8.8 HDG, HIT-V-F 8.8, AM-HDG 8.8	$M^0_{Rk,s,fi(120)}$	0,48	0,89	1,45	3,70	7,22	12,49	18,52	25,03
HAS A4, HAS-U A4, HIT-V-R HAS-U-HCR, HIT-V-HCR Threaded rod CRC III and Threaded rod CRC V (Table A1)	$M^0_{Rk,s,fi(30)}$	2,76	6,35	12,33	31,34	61,10	105,6	156,6	211,7
	$M^0_{Rk,s,fi(60)}$	1,98	4,49	8,65	21,99	42,87	74,14	109,9	148,5
	$M^0_{Rk,s,fi(90)}$	1,20	2,64	4,97	12,64	24,64	42,61	63,19	85,38
	$M^0_{Rk,s,fi(120)}$	0,80	1,71	3,13	7,96	15,52	26,85	39,81	53,80

Table C33: Characteristic resistance to steel failure under shear loading with lever arm for rebars in case of fire

Rebars according to Annex A		φ 8	φ 10	φ 12	φ 14	φ 16	φ 20	φ 25	φ 26	φ 28	φ 30	φ 32
Rebar	$M^0_{Rk,s,fi(30)}$	0,5	1,8	4,1	6,5	9,7	18,8	36,8	41,4	51,7	63,6	77,2
	$M^0_{Rk,s,fi(60)}$	0,5	1,5	3,1	4,8	7,2	14,1	27,6	31,1	38,8	47,7	57,9
	$M^0_{Rk,s,fi(90)}$	0,4	1,2	2,6	4,2	6,3	12,3	23,9	26,9	33,6	41,4	50,2
	$M^0_{Rk,s,fi(120)}$	0,3	0,9	2,0	3,2	4,8	9,4	18,4	20,7	25,9	31,8	38,6

Injection System Hilti HIT-HY 200-A V3 and HIT-HY 200-R V3

Performances

Fire resistance to steel failure under shear loading

Annex C28

Attestation

AgBB

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

HIT-HY 200-R V3

supplied by

Hilti Entwicklungsgesellschaft mbH

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

Evaluation of the emission test result according to AgBB:

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

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

14 June 2023



Laura Hartung Sørensen
Analytical Service Manager



Rasmus Verdier
Analytical Service Manager



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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

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

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

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

To whom it may concern,

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

Please refer to the below table for more details:

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

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

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

Yours faithfully,



Dennis Yeung
Head of Product Leadership Strategy, F&P

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

Attn. : To whom it may concern

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

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

Dear Sir / Madam,

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

Brand Name : Hilti

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

Manufacturer : Hilti Corporation

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

Manufacturer Contact Person : Spencer Cheung

Supplier : Hilti (Hong Kong) Ltd

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

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

Country of Origin : Germany

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

Yours faithfully,



Spencer Cheung
Head of Product Leadership Strategy

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HIT-HY 200-R V3

Safety information for 2-Component-products

Issue date: 09/07/2021

Revision date: 09/07/2021

Version: 1.0

SECTION 1: Kit identification

1.1 Product identifier

Product name

HIT-HY 200-R V3



Product code

BU Anchor

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

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

SECTION 2: General information

Storage

Storage temperature : 5 - 25 °C

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

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

SECTION 3: Kit contents

Classification of the Product

GHS-US classification

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

Label elements

GHS US labelling

Hazard pictograms (GHS US)



GHS07

Signal word (GHS US)

Warning

Hazardous ingredients

methacrylates, dibenzoyl peroxide

Hazard statements (GHS US)

May cause an allergic skin reaction.
Causes serious eye irritation.

Precautionary statements (GHS US)

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

HIT-HY 200-R V3

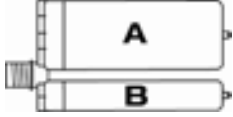
Safety information for 2-Component-products

Additional information

2-Component-foilpack, contains:

Component A: Urethane methacrylate resin, inorganic filler

Component B: Dibenzoyl peroxide, phlegmatized



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

SECTION 4: General advice

General advice

For professional users only

SECTION 5: Safe handling advice

General measures

Spilled material may present a slipping hazard

Environmental precautions

Prevent entry to sewers and public waters

Notify authorities if liquid enters sewers or public waters

Storage conditions

Keep cool. Protect from sunlight.

Precautions for safe handling

Wear personal protective equipment

Avoid contact with skin and eyes

Wash hands and other exposed areas with mild soap and water before eating, drinking or

smoking and when leaving work

Provide good ventilation in process area to prevent formation of vapour

Methods for cleaning up

This material and its container must be disposed of in a safe way, and as per local legislation

Mechanically recover the product

Store away from other materials.

For containment

Collect spillage.

Incompatible materials

Sources of ignition

Direct sunlight

Incompatible products

Strong bases

Strong acids

SECTION 6: First aid measures

First-aid measures after eye contact

Rinse immediately with plenty of water

Remove contact lenses, if present and easy to do. Continue rinsing.

Obtain medical attention if pain, blinking or redness persists

First-aid measures after ingestion

Rinse mouth

Get medical advice/attention.

Do not induce vomiting

Obtain emergency medical attention

First-aid measures after inhalation

Remove person to fresh air and keep comfortable for breathing.

Allow affected person to breathe fresh air

Allow the victim to rest

First-aid measures after skin contact

Wash contaminated clothing before reuse.

Wash with plenty of water/...

If skin irritation or rash occurs: Get medical advice/attention.

First-aid measures general

Take off immediately all contaminated clothing.

HIT-HY 200-R V3

Safety information for 2-Component-products

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

SECTION 7: Fire fighting measures

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

SECTION 8: Other information

No data available

HIT-HY 200-R V3, A

Safety Data Sheet

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

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

Version: 1.0

SECTION 1: Identification

1.1. Identification

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

1.2. Recommended use and restrictions on use

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

1.3. Supplier

Supplier	Department issuing data specification sheet
Hilti, Inc. Legacy Tower, Suite 1000 7250 Dallas Parkway Plano, TX 75024 - USA T +1 9724035800 1-800-879-8000 toll free - F +1 918 254 0522	Hilti Entwicklungsgesellschaft mbH Hiltistraße 6 Kaufering, 86916 - Deutschland T +49 8191 906876 anchor.hse@hilti.com

1.4. Emergency telephone number

Emergency number	Chem-Trec Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada) Tel.: 703 527 3887 (Other countries) +1 918 8723000 1-800-879-8000 toll free
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SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Skin sensitisation, Category 1	H317	May cause an allergic skin reaction.
Full text of H-statements: see section 16		

2.2. GHS Label elements, including precautionary statements

GHS US labelling

Hazard pictograms (GHS US)



Signal word (GHS US)

Warning

Hazard statements (GHS US)

H317 - May cause an allergic skin reaction.

Precautionary statements (GHS US)

P280 - Wear eye protection, protective clothing, protective gloves.
P262 - Do not get in eyes, on skin, or on clothing.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P302+P352 - If on skin: Wash with plenty of water.

2.3. Other hazards which do not result in classification

No additional information available

HIT-HY 200-R V3, A

Safety Data Sheet

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

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

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

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

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general

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

First-aid measures after inhalation

Remove person to fresh air and keep comfortable for breathing. Allow affected person to breathe fresh air. Allow the victim to rest.

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

Potential adverse human health effects and symptoms

No additional information available.

Symptoms/effects after skin contact

May cause an allergic skin reaction.

Symptoms/effects after eye contact

May cause severe irritation.

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media

Water spray. Carbon dioxide. Dry powder. Foam. Sand.

Unsuitable extinguishing media

Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Hazardous decomposition products in case of fire

Thermal decomposition generates : Carbon dioxide. Carbon monoxide.

5.3. Special protective equipment and precautions for fire-fighters

Firefighting instructions

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

Protection during firefighting

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

HIT-HY 200-R V3, A

Safety Data Sheet

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

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures Spilled material may present a slipping hazard.

6.1.1. For non-emergency personnel

Emergency procedures Evacuate unnecessary personnel.

6.1.2. For emergency responders

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

Emergency procedures Ventilate area.

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

For containment Collect spillage.

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

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

6.4. Reference to other sections

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

SECTION 7: Handling and storage

7.1. Precautions for safe handling

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

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

7.2. Conditions for safe storage, including any incompatibilities

Storage conditions Keep cool. Protect from sunlight.

Incompatible products Strong bases. Strong acids.

Incompatible materials Sources of ignition. Direct sunlight.

Storage temperature 5 – 25 °C

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

HIT-HY 200-R V3, A	
No additional information available	
Quartz (SiO₂) (14808-60-7)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Silica crystalline - quartz
ACGIH OEL TWA	0.025 mg/m ³ (Respirable fraction)
Remark (ACGIH)	TLV® Basis: Pulm fibrosis; lung cancer. Notations: A2 (Suspected Human Carcinogen)
Regulatory reference	ACGIH 2021
USA - OSHA - Occupational Exposure Limits	
Local name	Silica, crystalline quartz, respirable dust

HIT-HY 200-R V3, A

Safety Data Sheet

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

Remark (OSHA)	(3) See Table Z-3.
2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)	
No additional information available	
2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
No additional information available	

Additional information

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

8.2. Appropriate engineering controls

Appropriate engineering controls

Ensure good ventilation of the work station.

Environmental exposure controls

Not applicable.

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

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

Hand protection:

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

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

Eye protection:

Wear security glasses which protect from splashes

Type	Field of application	Characteristics
Safety glasses	Droplet	clear

Skin and body protection:

Wear suitable protective clothing

Personal protective equipment symbol(s):



Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

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

HIT-HY 200-R V3, A

Safety Data Sheet

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

Relative evaporation rate (butylacetate=1)	No data available
Flammability (solid, gas)	Non flammable.
Vapour pressure	No data available
Relative vapour density at 20 °C	No data available
Relative density	No data available
Density	1.8 g/ml AW 4.3.23
Solubility	Water: % Not miscible
Partition coefficient n-octanol/water (Log Pow)	No data available
Auto-ignition temperature	Not self-igniting
Decomposition temperature	No data available
Viscosity, kinematic	27777.778 mm ² /s
Viscosity, dynamic	50 Pa·s HN-0333
Explosive limits	No data available
Explosive properties	Product is not explosive.
Oxidising properties	No data available

9.2. Other information

No additional information available

SECTION 10: Stability and reactivity

10.1. Reactivity

No additional information available

10.2. Chemical stability

Stable under normal conditions.

10.3. Possibility of hazardous reactions

No additional information available.

10.4. Conditions to avoid

Direct sunlight. Extremely high or low temperatures.

10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

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

SECTION 11: Toxicological information

11.1. Information on toxicological effects

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

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

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
LD50 oral rat	> 5000 mg/kg (Rat; OECD 401: Acute Oral Toxicity; Literature study; \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

HIT-HY 200-R V3, A

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

Quartz (SiO ₂) (14808-60-7)	
IARC group	1 - Carcinogenic to humans

Reproductive toxicity	Not classified
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STOT-single exposure	Not classified
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STOT-repeated exposure	Not classified
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Aspiration hazard	Not classified
Viscosity, kinematic	27777.778 mm ² /s

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

SECTION 12: Ecological information

12.1. Toxicity

2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)	
LC50 - Other aquatic organisms [1]	9.79 mg/l
NOEC (acute)	7.51 mg/l
NOEC (chronic)	20 mg/l
2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
LC50 - Fish [1]	493 mg/l (48 h; Leuciscus idus; GLP)
EC50 - Crustacea [1]	> 143 mg/l (48 h; Daphnia magna; GLP)
ErC50 algae	97.2 mg/l (OECD 201: Alga, Growth Inhibition Test, 72 h, Pseudokirchneriella subcapitata, Static system, Fresh water, Experimental value, GLP)
Threshold limit - Algae [1]	> 97.2 mg/l (72 h; Pseudokirchneriella subcapitata; GLP)
Threshold limit - Algae [2]	> 97.2 mg/l (72 h; Pseudokirchneriella subcapitata; GLP)

12.2. Persistence and degradability

HIT-HY 200-R V3, A	
Persistence and degradability	Not established.
Quartz (SiO ₂) (14808-60-7)	
Persistence and degradability	Biodegradability: not applicable.
Chemical oxygen demand (COD)	Not applicable (inorganic)
ThOD	Not applicable (inorganic)
2-Propenoic acid, 2-methyl-, 1,4-butanediyl ester (2082-81-7)	
Biodegradation	84 %
2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
Persistence and degradability	Readily biodegradable in water.

12.3. Bioaccumulative potential

HIT-HY 200-R V3, A	
Bioaccumulative potential	Not established.
Quartz (SiO ₂) (14808-60-7)	
Bioaccumulative potential	No bioaccumulation data available.

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

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

12.4. Mobility in soil

Quartz (SiO ₂) (14808-60-7)	
Surface tension	No data available in the literature
Ecology - soil	Low potential for mobility in soil.
2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)	
Partition coefficient n-octanol/water (Log Koc)	1.9 (log Koc, Calculated value)
Ecology - soil	Highly mobile in soil.

12.5. Other adverse effects

Other information

Avoid release to the environment.

SECTION 13: Disposal considerations

13.1. Disposal methods

Regional legislation (waste)	Disposal must be done according to official regulations.
Product/Packaging disposal recommendations	After curing, the product can be disposed of with household waste. . Full or only partially emptied cartridges must be disposed of as special waste in accordance with official regulations. Packaging contaminated by the product : Dispose in a safe manner in accordance with local/national regulations.
Ecology - waste materials	Avoid release to the environment.

SECTION 14: Transport information

In accordance with ADR / IMDG / IATA / RID

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

HIT-HY 200-R V3, A

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14.6. Special precautions for user

Overland transport

Not regulated

Transport by sea

Not regulated

Air transport

Not regulated

Rail transport

Not regulated

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

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

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

15.2. International regulations

CANADA

Quartz (SiO₂) (14808-60-7)

Listed on the Canadian DSL (Domestic Substances List)

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

Listed on the Canadian DSL (Domestic Substances List)

2-Propenoic acid, 2-methyl-, monoester with 1,2-propanediol (27813-02-1)

Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

No additional information available

National regulations

Quartz (SiO₂) (14808-60-7)

Listed on IARC (International Agency for Research on Cancer)

15.3. US State regulations

WARNING:

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

SECTION 16: Other information

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

Revision date

07/09/2021

Other information

None.

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

Full text of H-statements:

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

Abbreviations and acronyms:

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

NFPA health hazard

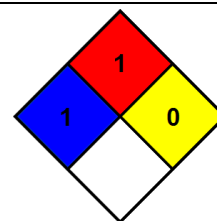
1 - Materials that, under emergency conditions, can cause significant irritation.

NFPA fire hazard

1 - Materials that must be preheated before ignition can occur.

NFPA reactivity

0 - Material that in themselves are normally stable, even under fire conditions.



SDS_US_Hilti

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

HIT-HY 200-R V3, B

Safety Data Sheet

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

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

Version: 1.0

SECTION 1: Identification

1.1. Identification

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

1.2. Recommended use and restrictions on use

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

1.3. Supplier

Supplier	Department issuing data specification sheet
Hilti, Inc. Legacy Tower, Suite 1000 7250 Dallas Parkway Plano, TX 75024 - USA T +1 9724035800 1-800-879-8000 toll free - F +1 918 254 0522	Hilti Entwicklungsgesellschaft mbH Hiltistraße 6 Kaufering, 86916 - Deutschland T +49 8191 906876 anchor.hse@hilti.com

1.4. Emergency telephone number

Emergency number	Chem-Trec Tel.: 1 800 424 9300 (USA, PR, Virgin Islands, Canada) Tel.: 703 527 3887 (Other countries) +1 918 8723000 1-800-879-8000 toll free
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SECTION 2: Hazard(s) identification

2.1. Classification of the substance or mixture

GHS-US classification

Serious eye damage/eye irritation, Category 2	H319	Causes serious eye irritation.
Skin sensitisation, Category 1	H317	May cause an allergic skin reaction.
Full text of H-statements: see section 16		

2.2. GHS Label elements, including precautionary statements

GHS US labelling

Hazard pictograms (GHS US)



Signal word (GHS US)

Warning

Hazard statements (GHS US)

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

Precautionary statements (GHS US)

P280 - Wear eye protection, protective clothing, protective gloves.
P262 - Do not get in eyes, on skin, or on clothing.
P305+P351+P338 - IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing.
P333+P313 - If skin irritation or rash occurs: Get medical advice/attention.
P337+P313 - If eye irritation persists: Get medical advice/attention.
P302+P352 - If on skin: Wash with plenty of water.

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2.3. Other hazards which do not result in classification

No additional information available

2.4. Unknown acute toxicity (GHS US)

Not applicable

SECTION 3: Composition/information on ingredients

3.1. Substances

Not applicable

3.2. Mixtures

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

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

SECTION 4: First-aid measures

4.1. Description of first aid measures

First-aid measures general	Take off immediately all contaminated clothing. Never give anything by mouth to an unconscious person. If you feel unwell, seek medical advice (show the label where possible).
First-aid measures after inhalation	Remove person to fresh air and keep comfortable for breathing. Allow affected person to breathe fresh air. Allow the victim to rest.
First-aid measures after skin contact	Wash contaminated clothing before reuse. Wash with plenty of water/... If skin irritation or rash occurs: Get medical advice/attention.
First-aid measures after eye contact	Rinse immediately with plenty of water. Remove contact lenses, if present and easy to do. Continue rinsing. Obtain medical attention if pain, blinking or redness persists.
First-aid measures after ingestion	Rinse mouth. Get medical advice/attention. Do not induce vomiting. Obtain emergency medical attention.

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

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

4.3. Immediate medical attention and special treatment, if necessary

No additional information available

SECTION 5: Fire-fighting measures

5.1. Suitable (and unsuitable) extinguishing media

Suitable extinguishing media	Water spray. Carbon dioxide. Dry powder. Foam. Sand.
Unsuitable extinguishing media	Do not use a heavy water stream.

5.2. Specific hazards arising from the chemical

Hazardous decomposition products in case of fire	Thermal decomposition generates : Carbon dioxide. Carbon monoxide.
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HIT-HY 200-R V3, B

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5.3. Special protective equipment and precautions for fire-fighters

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

SECTION 6: Accidental release measures

6.1. Personal precautions, protective equipment and emergency procedures

General measures	Spilled material may present a slipping hazard.
6.1.1. For non-emergency personnel	
Emergency procedures	Evacuate unnecessary personnel.
6.1.2. For emergency responders	
Protective equipment	Use personal protective equipment as required. Equip cleanup crew with proper protection.
Emergency procedures	Ventilate area.

6.2. Environmental precautions

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

6.3. Methods and material for containment and cleaning up

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

6.4. Reference to other sections

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

SECTION 7: Handling and storage

7.1. Precautions for safe handling

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

7.2. Conditions for safe storage, including any incompatibilities

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

SECTION 8: Exposure controls/personal protection

8.1. Control parameters

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

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ACGIH OEL TWA	5 mg/m ³
Remark (ACGIH)	TLV® Basis: URT & skin irr. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2021
USA - OSHA - Occupational Exposure Limits	
Local name	Benzoyl peroxide
OSHA PEL TWA [1]	5 mg/m ³
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1
Quartz (SiO₂) (14808-60-7)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Silica crystalline - quartz
ACGIH OEL TWA	0.025 mg/m ³ (Respirable fraction)
Remark (ACGIH)	TLV® Basis: Pulm fibrosis; lung cancer. Notations: A2 (Suspected Human Carcinogen)
Regulatory reference	ACGIH 2021
USA - OSHA - Occupational Exposure Limits	
Local name	Silica, crystalline quartz, respirable dust
Remark (OSHA)	(3) See Table Z-3.
dibenzoyl peroxide (94-36-0)	
USA - ACGIH - Occupational Exposure Limits	
Local name	Benzoyl peroxide
ACGIH OEL TWA	5 mg/m ³
Remark (ACGIH)	TLV® Basis: URT & skin irr. Notations: A4 (Not classifiable as a Human Carcinogen)
Regulatory reference	ACGIH 2020
USA - OSHA - Occupational Exposure Limits	
Local name	Benzoyl peroxide
OSHA PEL TWA [1]	5 mg/m ³
Regulatory reference (US-OSHA)	OSHA Annotated Table Z-1

Additional information

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

8.2. Appropriate engineering controls

Appropriate engineering controls

Ensure good ventilation of the work station.

Environmental exposure controls

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

8.3. Individual protection measures/Personal protective equipment

Personal protective equipment:

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

Hand protection:

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

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

Eye protection:

Wear security glasses which protect from splashes

Type	Field of application	Characteristics
Safety glasses	Droplet	clear

Skin and body protection:

Wear suitable protective clothing

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

Personal protective equipment symbol(s):



Other information:

Do not eat, drink or smoke during use.

SECTION 9: Physical and chemical properties

9.1. Information on basic physical and chemical properties

Physical state	Solid
Appearance	Thixotropic paste.
Colour	white
Odour	characteristic
Odour threshold	Not determined
pH	No data available
Melting point	No data available
Freezing point	No data available
Boiling point	No data available
Flash point	No data available
Relative evaporation rate (butylacetate=1)	No data available
Flammability (solid, gas)	Non flammable.
Vapour pressure	No data available
Relative vapour density at 20 °C	No data available
Relative density	No data available
Density	1.9 g/ml AW 4.3.23
Solubility	Water: % Not miscible
Partition coefficient n-octanol/water (Log Pow)	No data available
Auto-ignition temperature	Not self-igniting
Decomposition temperature	No data available
Viscosity, kinematic	21052.632 mm ² /s
Viscosity, dynamic	40 Pa·s HN-0333
Explosive limits	No data available
Explosive properties	Product is not explosive.
Oxidising properties	No data available

9.2. Other information

SADT	65 °C
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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.

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10.5. Incompatible materials

Strong acids. Strong bases.

10.6. Hazardous decomposition products

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

SECTION 11: Toxicological information

11.1. Information on toxicological effects

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

Quartz (SiO ₂) (14808-60-7)	
IARC group	1 - Carcinogenic to humans
dibenzoyl peroxide (94-36-0)	
IARC group	3 - Not classifiable
Reproductive toxicity	Not classified
STOT-single exposure	Not classified
STOT-repeated exposure	Not classified
Aspiration hazard	Not classified
Viscosity, kinematic	21052.632 mm ² /s
Potential adverse human health effects and symptoms	No additional information available.
Symptoms/effects after skin contact	May cause an allergic skin reaction.
Symptoms/effects after eye contact	May cause severe irritation.

SECTION 12: Ecological information

12.1. Toxicity

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

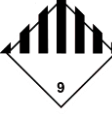
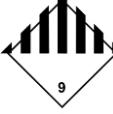
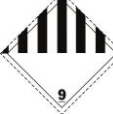

12.2. Persistence and degradability

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

HIT-HY 200-R V3, B

Safety Data Sheet

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

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

14.6. Special precautions for user

Overland transport

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

Transport by sea

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

Air transport

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

Rail transport

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

HIT-HY 200-R V3, B

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Packing instructions (RID)

P002, IBC08, LP02, R001

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

Not applicable

SECTION 15: Regulatory information

15.1. US Federal regulations

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

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

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

CANADA

Quartz (SiO₂) (14808-60-7)

Listed on the Canadian DSL (Domestic Substances List)

dibenzoyl peroxide (94-36-0)

Listed on the Canadian DSL (Domestic Substances List)

EU-Regulations

No additional information available

National regulations

Quartz (SiO₂) (14808-60-7)

Listed on IARC (International Agency for Research on Cancer)

15.3. US State regulations

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

SECTION 16: Other information

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

Revision date

07/09/2021

Other information

None.

Full text of H-statements:

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

Abbreviations and acronyms:

HIT-HY 200-R V3, B

Safety Data Sheet

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

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

NFPA health hazard

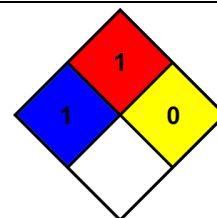
1 - Materials that, under emergency conditions, can cause significant irritation.

NFPA fire hazard

1 - Materials that must be preheated before ignition can occur.

NFPA reactivity

0 - Material that in themselves are normally stable, even under fire conditions.



SDS_US_Hilti

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