



# HIT-RE 500 V4 injection mortar

Technical data not covered by ETA-20/0541

## Injection mortar system



## Information covered

HIT-RE 500 V4 and Threaded Rods	oversized drill hole (max. $d_0 = 1,5 \times d$ )
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## Hilti Technical data HIT-RE 500 V4

### Scope and Specification of intended use

- The technical data in this document are not covered by ETA-20/0541 (issued 04.09.2021).
- The technical data in this document are intended for use in **special cases** of application and an **application consulting** is recommended.
- Applicability of the technical data provided by this document is limited to an expected service life of maximum 50 years. This information is intended to provide an indication to choose the right product in relation to the expected economically reasonable working life of the works however, this cannot be interpreted as a guarantee (given by Hilti) of a service life of 50 years.
- Durability and serviceability of the Hilti product are ensured only, if the specifications of intended use according to Annex B of ETA-20/0541 (issued 04.09.2021) are considered and the installation instructions, supplied with the Hilti injection mortar, are obeyed unless deviating directives are provided in this document.
- Application is valid for static and quasi-static loading, only.
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work. Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the fastener is indicated on the design drawings. The anchorages are designed in accordance with EN 1992-4.
- Fastener installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

### Special note:

It is especially needed that **borehole cleaning** is performed following the installation instructions supplied with the Hilti injection mortar. Special interest shall be put on blowing out with compressed air **until the borehole is completely dried and the mortar must be injected immediately after drill hole cleaning**. Furthermore, the **additional installation instructions** given in this document must be considered.

Reference: ARA 20-003

Release: 26.01.2022




Validity: 26.01.2024 or new version released

Version	Date	Comment
1.0	26.01.2022	First release

## Application Scope

Anchorage subject to static and quasi static loading	
Base material	<ul style="list-style-type: none"> <li>Concrete strength C20/25 to C50/60</li> <li>Compacted reinforced or unreinforced normal weight concrete without fibers according to EN 206:2013+A1:2016</li> <li>Uncracked concrete, only</li> </ul>
Concrete condition	dry or wet concrete (not in water-filled drill holes)
Embedment depth	see Installation parameters
Installation direction	acc. ETA-20/0541 (issued 04.09.2021)
Temperature in base material at installation	acc. ETA-20/0541 (issued 04.09.2021)
Temperature in base material in-service	Temperature range I only (max. long term 20°C, max. short term 40°C)
Drilling technique	Diamond coring
Cleaning	acc. ETA-20/0541 (issued 04.09.2021) and Installation instructions supplied with the Hilti injection mortar
Setting	acc. ETA-20/0541 (issued 04.09.2021) and Installation instructions supplied with the Hilti injection mortar and Installation instruction in this document

## Parameters of drilling, cleaning and setting tools

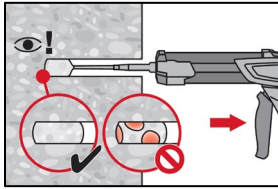
Steel element	Drill and clean		Installation
Threaded rod	Diamond coring ("large drill hole")	Brush	Piston plug
			
Size	$d_0$ [mm]	HIT-RB	HIT-SZ
M8	12	12	12
M10	15	15	15
M12	18	18	18
M16	24	24	24
M20	30	30	30
M24	36	36	36
M27	40	40	40
M30	45	45	45

## Installation parameters

Threaded rod	M8	M10	M12	M16	M20	M24	M27	M30
min. $h_{ef}$ [mm]	60	60	70	80	90	96	108	120
max. $h_{ef}$ [mm]	160	200	240	320	400	480	540	600
Minimum base material thickness $h_{min}$ [mm]	$h_{ef} + 30 \geq 100$ mm			$h_{ef} + 2 d_0$				
Diameter of clearance hole in the fixture $d_f$ [mm]	9	12	14	18	22	26	30	33
Minimum spacing $s_{min}$ [mm]	50	60	75	100	120	145	160	180
Minimum edge distance $c_{min}$ [mm]	40	45	45	50	60	75	80	90
Installation torque max. $T_{inst}$ [Nm]	10	20	40	80	150	200	270	300

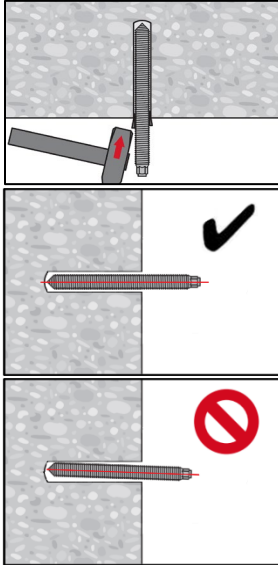
## Installation instruction

### 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 **100%** of the drill hole to ensure that **the annular gap between the anchor and the concrete is completely filled** with adhesive along the embedment length.

### Setting the element: Just before setting an anchor, the drill hole must be free of dust and debris.



For overhead and horizontal installation use piston plugs and **fix embedded parts with e.g. wedges**, so that the anchor is centered in the borehole.

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1.0	26.01.2022	First release



## Essential characteristics

TENSION LOAD											
Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30	
Steel failure			acc. EN 1992-4								
Installation factor											
Diamond coring (dry and wet concrete)	$\gamma_{inst}$	[-]	1,2				1,4				
Concrete cone failure			acc. EN 1992-4								
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]	$2 \cdot c_{cr,sp}$								
Combined pullout and concrete cone failure for a working life of 50 years											
Characteristic resistance in uncracked concrete C20/25 in diamond cored holes											
Temperature range I:	40°C / 24°C	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	12	12	12	12	12	11	11	11
Temperature range II:	55°C / 43°C	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	no performance assessed							
Temperature range III:	75°C / 55°C	$\tau_{Rk,ucr}$	[N/mm <sup>2</sup> ]	no performance assessed							
Influence factors $\psi$ on bond resistance $\tau_{Rk}$ in uncracked concrete in diamond cored holes											
Influence of concrete strength	$\psi_c$	[-]	$(f_{ck}/20)^{0,1}$								
Influence of sustained load	$\psi_{sus}^0$	[-]	no performance assessed								
Displacements			no performance assessed								

SHEAR LOAD										
Threaded rod			M8	M10	M12	M16	M20	M24	M27	M30
Steel failure without lever arm										
Characteristic resistance	$V_{Rk,s}^0$	[kN]	$k_6 \cdot A_s \cdot f_{uk}$ with $k_6$ acc. EN 1992-4							
Partial factor	$\gamma_{Ms,V}$	[kN]	acc. EN 1992-4							
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 and concrete edge failure			acc. EN 1992-4 with $k_8 = 2,0$							
Displacements			no performance assessed							

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