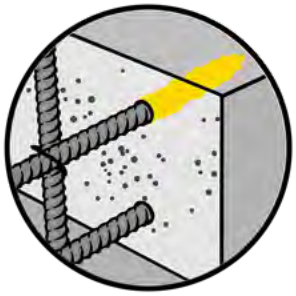
CF920

2K Reaction resin mortar, vinylester-based, styrene-free

CHARACTERISTICS

- Fast setting
- High bending- and compressive strength
- Free of expansion forces
- High chemical resistance
- For internal and external use
- Downward, horizontal and upwards installation
- High temperature resistant
- Styrene-free
- Easy application even in flooded holes



SCOPE OF USE

CF920 is a two-component, fast-setting injection mortar for anchoring based on reactive resins, styrene free. It is characterized by high load carrying capacity. The material is suitable for internal and external use also for permanently damp substrates. Extrusion of material is easy and possible with using an ordinary cartridge gun or special one depending on cartridge type.

For static and quasi-static loads, as well as where vibration may occur. Can be used **for fixation of: rods and threaded anchors, gates and fences, mounting machines and devices** (e.g. fans, air conditioners), **handrails, railings, balustrades and masts, attaching handles, brackets and gratings, facades and wall coverings, installations** (e.g. cabinets, boxes and wires), **sanitary devices** (e.g. sinks, urinal), **cable trays, piping, etc.** For **heavy duty fixings** that include varied weight loads where life and dead loads must be considered. This includes applications such as **I-beams, balconies and railings.** Also for **professional post-installed connection,** by anchoring or overlap connection joint, of reinforcing bars (rebars) in existing structures made of normal weight concrete. High chemical resistance make it suitable **in aggressive environments.** Suitable for building substrates such as: **non-cracked and cracked concrete, light-concrete, porous-concrete, solid masonry, hollow brick and natural stone** (need to be checked for discoloration effect in advance) since chemical anchoring is free of expansion forces. For anchors of different types like: threaded rods (zinc plated or hot dip, stainless steel and high corrosion resistance steel), reinforcing bars, internal threaded rods, profiled rod, etc.

SUBSTRATE PREPARATION / MATERIAL REQUIREMENTS

Substrates should comply with the requirements of comparable national standards. In particular they must be level, load-bearing, free from structural defects, clean, dry and free of dust and substances which impair adhesion. In addition requirements must comply with relevant ETA 08/0381 or ETA 13/0428.

For installation in concrete, specified in ETA-08/0381, threaded rod M8-M30:

Anchores subject to:
- Static and quasi static loads: M8 to M30, Rebar Ø8 to Ø32
- Seismic action for Performance Category C1: M2 to M30, rebar Ø12 to Ø32

Base materials:
- Reinforced or unreinforced normal weight concrete according to EN 206-1:2000
- Strength classes C20/25 to C50/60 according to EN 206-1:2000
- Non-cracked concrete: M8 to M30, rebar Ø8 to Ø32
- Cracked concrete: M12 to M30, rebar Ø12 to Ø32

Temperature range:
- From -40°C, up to max long term +72°C and max short term +120°C

Use conditions (environmental):
- Structures subject to dry internal conditions, subject to external atmospheric exposure (including industrial and marine environment) and permanently dump internal condition even if other particular aggressive conditions exist.

Design:
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Anchorages under static or quasi-static actions are designed in accordance with:
  – EOTA Technical Report TR 029 "Design of bonded anchors", Edition September 2010 or
  – CEN/TS 1992-4:2009
- Anchorages under seismic actions (cracked concrete) are design in accordance with:
  – EOTA Technical Report TR 045 "Designing of metal Anchors under Seismic Action" Edition February 2013.
  – Anchorages shall be positioned outside of critical regions (e.g. plastic hinges) of the concrete Structure.
  – Fastenings in stand-off installation or with a grout layer are not allowed.

Installation:
- Dry or wet concrete: M8 to M30 rebar Ø8 to Ø32
- Flooded holes (not see water): M8 to M16, rebar Ø8 to Ø16
- Hole drilling by hammer or compressed air drill mode
- Overhead installation allowed
- Anchor installation carried out by appropriately qualified personnel and under the supervision of responsible for technical matters on the site.

For installation in concrete specified in ETA-13/0428: for post install rebar connection with concrete, reinforcing bars made of steel with a diameter ϕ from 8 to 32 mm or the tension anchor ZA from sizes M12 to M24:

Anchorages subject to:
- Static and quasi-static loads
- Fire exposure

Base materials:
- Reinforced or unreinforced normal weight concrete according EN 206:2013+A1:2016
- Strength classes C12/15 to C50/C60 according EN 206:2013+A1:2016
- Maximum chloride concrete of 0,40% (CL 0,40) related to the cement content according to EN 206:2013+A1:2016
- Non carbonated concrete

Temperature range:
- From -40°C up to max long term +50°C and max short term +80°C

Use conditions (environmental):
- Structurers subject to dry internal conditions or (all materials) or for all other conditions according EN 1993-1 4:2006+A1:2015 corresponding to corrosion resistance class of steel anchor.

Design:
- Anchorages are design under the responsibility of an engineer experienced in anchorages and concrete work
- Verifiable calculation notes and drawings are prepared taking into account of the forces to be transmitted
- Design according to EN 1992-1-1:2004+AC:2010, EN 1992-1-2:2004+AC:2008 and Annex B2 and B3
- The actual position of the reinforcement in the existing structure shall be determined on the basis of the construction documentation and taken into account when designing.

Installation:
- Dry or wet concrete. It must not be installed in a flooded holes
- Overhead installation allowed
- Hole drilling by hammer drill (HD), hollow drill (HDB) or compressed air drill mode (CD)
- The installation of post-installed rebar resp. tension anchors shall be done only be suitable trained installer and under supervision on site: the conditions under which an installer may be considered as suitable trained and the conditions for supervision on site are up to the Member States in which the installation is done.
- Check the position of the existing rebars (if the position of existing rebars is not known, it shall be determined using rebar detector suitable for this purpose as well as on the basis of the construction documentation and then marked on the building component for the overlap joint).

Installation of bonded fasteners for reinforcement of prefabricated concrete and reinforced concrete sandwich type walls in "large panel" buildings:
Specified in National Technical Assessment: ITB nr AT-15-8510/2016 +Aneks1 CERESIT CF920 bonded fasteners for the reinforcement of prefabricated concrete and reinforced concrete sandwich type walls.

CERESIT CF920 bonded fasteners are intended for the reinforcement of prefabricated concrete and reinforced concrete sandwich walls in large-panel buildings where the load-bearing layer is at least:
- 80 mm - it is made of non-cracked normal concrete, class not lower than C12 / 15 according to PN-EN 206 + A1: 2016,
- 140 mm - it is made of non-cracked lightweight concrete, class not lower than LC12 / 13 according to the PN-EN 206 + A1: 2016 standard.

Use conditions:
- Ambient temperature: from -10°C up to +40°C
- Cartridge temperature: +5°C up to +35°C – protect from overheating and freezing
- Fasteners made of threaded rods M20-A4, nuts and washers are made of corrosion-resistant steel (stainless steel), grade 1.4401 according to PN-EN 10088-1: 2014, mechanical properties class A4-70 according to PN-EN ISO 3506-1:2009
- Due to the corrosive aggressiveness of the environment, fasteners made of corrosion-resistant (stainless) steel, grade 1.4401 according to the PN-EN standard 10088-1: 2014, should be used in accordance with the requirements specified in PN-H-86020: 1971 for steel OH17N14M2 grade
- The polypropylene or steel mesh sleeves have a diameter of 24 mm

Design:
CERESIT CF920 bonded fasteners should be used in accordance with the technical design, developed taking into account standards and construction regulations, the provisions of this National Technical Assessment, and in accordance with the manufacturer's instructions regarding the conditions of fastening with the use of the above-mentioned bonded fasteners.

Installation in masonry:
- Autoclaved Aerated Concrete
- Solid brick masonry
- Hollow brick masonry
- Mortar strength class of the masonry M2,5 at minimum according to EN 998-2:2010
- Joints of the masonry must be visible and filled with mortar and:
- Characteristic resistance of the anchor must be determined by job site tests according to EOTA Technical Report TR 053 under consideration of the β-factor to Annex C1, Table C1. Steel element in case of chemical anchoring in masonry can be used with a plastic sleeve, accordingly to case.

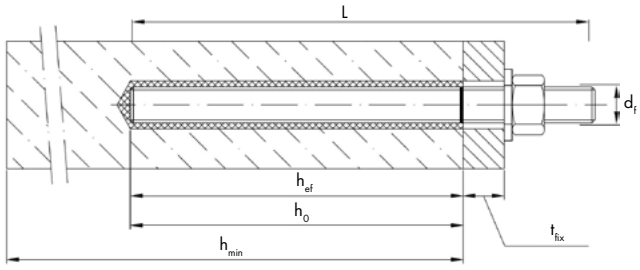
Use conditions in respect of installation and use:
- Installation and use in dry and wet masonry
- Anchors M8-M16 made of material suitable for specific structure exposure.

APPLICATION IN CONCRETE

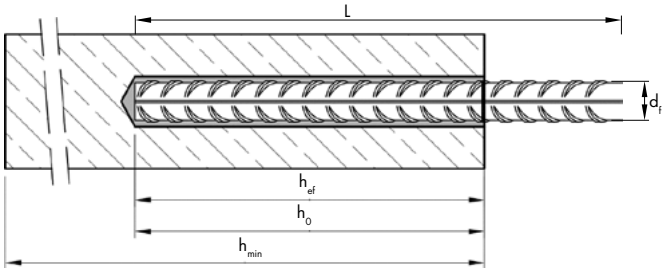
Refer to: ETA-08/0381

Anchoring by composite form-fitting between injection mortar, anchor threaded rod or reinforcing bar and anchoring surface. Prior resin injection mortar application, preparation steps must be done accordingly to substrate and fixing type given accordingly in:

- Annex A1: **Installation threaded rod**



Installation reinforcing bar



d_f = diameter of clearance hole in the fixture
h_{ef} = effective embedment depth
h_0 = depth of drill hole
h_{min} = minimum thickness of member

- Annex A2: cartridges types
- Annex A4, Table A1: Anchor threaded rods types: galvanized steel, stainless steel, highly corrosion-resistant steel and reinforcing bars
- Annex B1: Specifications of intended use
- Annex B2, Table B1: Installation parameters for threaded rods

Table B1: Installation parameters for threaded rod

Anchor size		M8	M10	M12	M16	M20	M24	M27	M30
Nominal drill hole diameter	d_0 [mm] =	10	12	14	18	24	28	32	35
Effective anchorage depth	$h_{ef,min}$ [mm] =	60	60	70	80	90	96	108	120
	$h_{ef,max}$ [mm] =	160	200	240	320	400	480	540	600
Diameter of clearance hole in the fixture	d_f [mm] ≤	9	12	14	18	22	26	30	33
Diameter of steel brush	d_b [mm] ≥	12	14	16	20	26	30	34	37
Torque moment	T_{inst} [Nm] ≤	10	20	40	80	120	160	180	200
Thickness of fixture	$t_{fix,min}$ [mm] >	0							
	$t_{fix,max}$ [mm] <	1500							
Minimum thickness of member	h_{min} [mm]	h_{ef} + 30 mm ≥ 100 mm			$h_{ef} + 2d_0$				
Minimum spacing	s_{min} [mm]	40	50	60	80	100	120	135	150
Minimum edge distance	c_{min} [mm]	40	50	60	80	100	120	135	150

- Annex B2, Table B2: installation parameters for rebar

Table B2: Installation parameters for rebar

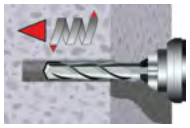
Rebar size		Ø8	Ø10	Ø12	Ø14	Ø16	Ø20	Ø25	Ø28	Ø32
Nominal drill hole diameter	d_0 [mm] =	12	14	16	18	20	24	32	35	40
Effective anchorage depth	$h_{ef,min}$ [mm] =	60	60	70	75	80	90	100	112	128
	$h_{ef,max}$ [mm] =	160	200	240	280	320	400	480	540	640
Diameter of steel brush	d_b [mm] ≤	14	16	18	20	22	26	34	37	41,5
Minimum thickness of member	h_{min} [mm]	h_{ef} + 30 mm ≥ 100 mm			$h_{ef} + 2d_0$					
Minimum spacing	s_{min} [mm]	40	50	60	70	80	100	125	140	160
Minimum edge distance	c_{min} [mm]	40	50	60	70	80	100	125	140	160

- Annex B3, Table B3: Parameter cleaning and setting tools
- Annex 5, Table B4 and technical data in TDS – Working and curing times with cartridge temp range given

Prior resin mortar application drilling must be done accordingly to substrate and fixing type.

For heavy load-carrying attachments in non-cracked concrete, cracked concrete, light-concrete, porous-concrete and solid stone following steps are recommended:

Installation instructions



1. Drill with hammer drill a hole into the base material to the size and embedment depth required by the selected anchor (Table B1 or Table B2). In case of aborted drill hole: the drill hole shall be filled with mortar.

or

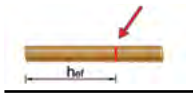
Attention! Standing water in the bore hole must be removed before cleaning.
2a. Starting from the bottom or back of the bore hole, blow the hole clean with compressed air (min. 6 bar) or a hand pump (Annex B3) a minimum of four times. If the bore hole ground is not reached an extension shall be used.
The hand-pump can be used for anchor sizes up to bore hole diameter 20 mm. For bore holes larger then 20 mm or deeper 240 mm, compressed air (min. 6 bar) **must** be used.

or

2b. Check brush diameter (Table B3) and attach the brush to a drilling machine or a battery screwdriver. Brush the hole with an appropriate sized wire brush > db, $_{min}$ (Table B3) a minimum of four times.
If the bore hole ground is not reached with the brush, a brush extension shall be used (Table B3).
2c. Finally blow the hole clean again with compressed air (min. 6 bar) or a hand pump a minimum of four times. If the bore hole ground is not reached an extension shall be used.
The hand-pump can be used for anchor sizes up to bore hole diameter 20 mm. For bore holes larger than 20 mm or deeper 240 mm, compressed air (min. 6 bar) **must** be used.

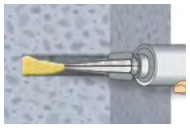
After cleaning, the bore hole has to be protected against re-contamination in an appropriate way, until dispensing the mortar in the bore hole.
If necessary, the cleaning repeated has to be directly before dispensing the mortar. In-flowing water must not contaminate the bore hole again.

3. Attach a supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. Cut off the foil tube clip before use. For every working interruption longer than the recommended working time (Table B4) as well as for new cartridges, a new static-mixer shall be used.



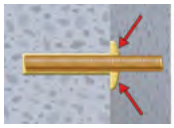
4. Prior to inserting the anchor rod into the filled bore hole, the position of the embedment depth shall be marked on the anchor rods.

5. Prior to dispensing into the drill hole, squeeze out separately a minimum of three full strokes and discard non-uniformly mixed adhesive components until the mortar shows a consistent grey colour. For foil tube cartridges is must be discarded a minimum of six full strokes.

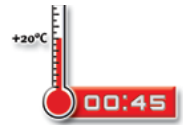


6. Starting from the bottom or back of the cleaned anchor hole fill the hole up to approximately two-thirds with adhesive. Slowly withdraw the static mixing nozzle as the hole is filled to avoid creating air pockets. For embedment larger than 190 mm an extension nozzle shall be used. For overhead and horizontal installation a piston plug (Annex B3) an extension nozze shall be used. Observe the gel-/ working times given in Table B4.

7. Push the threaded rod or reinforcing bar into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor should be free of dirt, grease, oil or other foreign material.



8. Be sure that the anchor is fully seated at the bottom of the hole and that excess mortar is visible at the top of the hole. If these requirements are not maintained, the application has to be renewed. For overhead application the anchor rod should be fixed (e.g. wedges).



9. Allow the adhesive to cure to the specified time prior to applying any load or torque. Do not move or load the anchor until it is fully cured (attend table B4).

10. After full curing, the add-on part can be installed with the max. torque (Table B2) by using a calibrated torque wrench.

POST INSTALLED REBAR CONNECTION (IN CONCRETE)

Refer to: ETA-13/0428

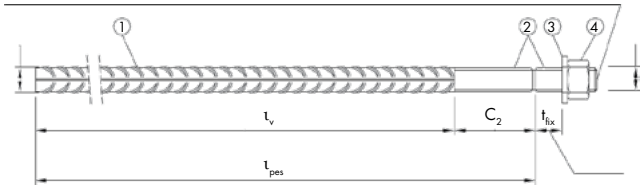
Anchoring by composite form-fitting between injection mortar, anchor threaded rod or reinforcing bar and anchoring surface. Prior resin injection mortar application, preparation steps must be done accordingly to substrate and fixing type given accordingly in:

- Annex 4, Table A1: Reinforcing bar

Reinforcing bar (rebar): Ø8 to Ø32

- Minimum value of related rip area $f_{R,min}$ according to EN 1992-1-1:2004+AC:2010
- Rib height of the bar shall be in the range $0{,}05\phi \leq h_{rib} \leq 0{,}07\phi$ (ϕ: Nominal diameter of the bar; h_{rib}: Rip height of the bar)
- Annex 5, Table A2: Tension anchors materials
  Installation in solid brick; threaded rod with sleeve

Tension Anchor: ZA-M12 up to ZA-M24
Marketing: e.g. ◇ ZA 12 A4



◇ Mark of the producer
ZA Trade name
12 Rod diameter/thread
A4 for stainless steel A4
HCR for high corrosion resistance steel

- Annex 5, Table A3: Dimensions and installation parameters

Table A3: Dimensions and installation parameters

Size				ZA-M12	ZA-M16	ZA-M20	ZA-M24
Diemeter of threaded rod		d_s	[mm]	12	16	20	24
Diemeter of reinforcement bar		ϕ	[mm]	12	16	20	25
Drill gole diameter		d_0	[mm]	16	20	25	32
Diameter of clearance hole in fixture		d_f	[mm]	14	18	22	26
With across nut flats		SW	[mm]	19	24	30	36
Stress area		A_s	[mm]	84	157	245	353
Effective embedment depth		l_v	[mm]	according to static calculation			
Length of bonded thread	plated	l_e	[mm]	≥ 20	≥ 20	≥ 20	≥ 20
	A4/HCR			≥ 100	≥ 100	≥ 100	≥ 100

Size			ZA-M12	ZA-M16	ZA-M20	ZA-M24
Minimum thickness of fixture	min t_{fix}	[mm]	5	5	5	5
Maximum thickness of fixture	max t_{fix}	[mm]	3000	3000	3000	3000
Maximum installation torgue	max T_{inst}	[Nm]	50	100	150	150

- Annex B2, Figure B1: General Construction rules for post-installed rebars
- Annex B3, Figure B2: General Construction rules for tension anchors ZA
- Annex B4, Table B1: Minimum concrete cover of post-installed rebar and tie rod ZA depending on drilling method
- Annex B4, Table B2: Dispensing tools
- Annex B5, Table B3: Brushes, piston plugs, max anchorage depth and drill bitt systems
- Annex B6, Table B4: Working time and curing time

Table B3: Brushes, piston plugs, max anchorage depth and mixer extension, hollow drill bit system (HDB), hammer (HD) and compressed air (CD) drilling

Bar size -ϕ	Tension Anchor -ϕ	Drill bit -Ø HD HDB	Drill bit -Ø CD	d_b Brush -Ø		$d_{b,min}$ min. Brush -Ø	Piston plug	Cartridge: All sizes – Hand or battery tool $l_{v,max}$	Cartridge: All sizes – Hand or battery tool Mixer extension	Cartridge: All sizes – Pneumatic tool $l_{v,max}$	Cartridge: All sizes – Pneumatic tool Mixer extension	Cartridge: 825 ml – Pneumatic tool $l_{v,max}$	Cartridge: 825 ml – Pneumatic tool Mixer extension
[mm]	[mm]	[mm]			[mm]	[mm]		[mm]		[mm]		[mm]	
8	–	10	–	RBT 10	12	10,5	–	250		250		250	
	–			RBT 12	14	12,5	–	700		800		800	VL 10/0,75 or VL 16/1,8
10	–	12	–					250		250		250	
	–			RBT 14	16	14,5	VS14	700		1000		1000	
12	ZA M12	14	–					250		250		250	
		16		RBT 16	18	16,5	VS16	700	VL 10/0,75 or VL 16/1,8	1000	VL 10/0,75 or VL 16/1,8	1200	VL 16/1,8
14	–	18		RBT 18	20	18,5	VS18					1400	
16	ZA M16	20		RBT 20	22	20,5	VS20					1600	
20	ZA M20	25	–	RBT 25	27	25,5	VS25	500		700		2000	
		–	26	RBT 26	28	26,5	VS25						
22	–	28		RBT 28	30	28,5	VS28						
24/25	ZA M24	32		RBT 32	34	32,5	VS32			500		1000	
28	–	35		RBT 35	37	35,5	VS35						
32	–	40		RBT 40	41,5	40,5	VS40						

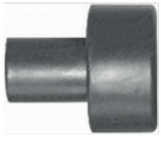
Cleaning and installation tools

Hand pump
(Volume 750 ml, $h_0 \geq 10\ d_s$, $d_0 \leq 20$mm)

Manual slide valve
(min 6 bar)

Brush RBT

Piston Plug VS



Brush extension RBL

Prior resin mortar application drilling must be done accordingly to substrate and fixing type.
For heavy load-carrying attachments in dry or wet concrete following steps are recommended:

Installation instructions

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

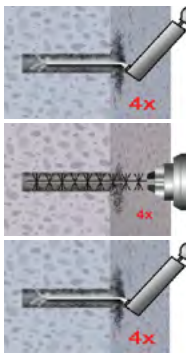
Drilling of the bore hole

1a. **Hammer drilling (HD) / Compressed air drilling (CD)**
Drill a hole to the required embedment depth. Drill bit diameter according to Table B3. Proceed with Step 2 (MAC or CAC).

1b. **Hollow drill bit system (HDB)**
Drill a hole to the required embedment depth. Drill bit diameter according to Table B3. Proceed with Step 2 (MAC or CAC).

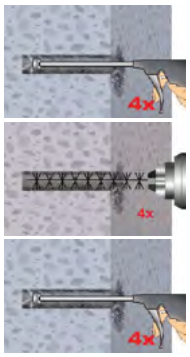
Cleaning the bore hole

Manual Air Cleaning (MAC) for drill hole diameter $d_0 \leq 20$ mm and drill hole depth $h_0 \leq 10\Phi$ with drilling method HD, HDB and CD.



Attention! Standing water in the bore hole must be removed before cleaning.
2a. Blow the bore hole clean minimum 4x from the bottom or back by hand pump (Annex B 5).
2b. Brush the bore hole minimum 4x with brush RBT according to Table B3 over the entire embedment depth in a twisting motion (if necessary, a brush extension RBL shall be used).
2c. Finally blow the bore hole clean minimum 4x from the bottom or back by hand pump (Annex B 5).

Compressed Air Cleaning (CAC): All diameter with drilling method HD, HDB and CD

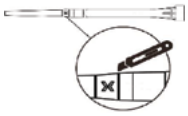


Attention! Standing water in the bore hole must be removed before cleaning.
2a. Blow the bore hole clean minimum 4x with compressed air (min. 6 bar) (Annex B 5) over the entire embedment depth until return air stream is free of noticeable dust. (If necessary, an extension shall be used).
2b. Brush the bore hole minimum 4x with brush RBT according to Table B3 over the entire embedment depth in a twisting motion (if necessary, a brush extension RBL shall be used).
2c. Finally blow the bore hole clean minimum 4x with compressed air (min. 6 bar) (Annex B 5) over the entire embedment depth until return air stream is free of noticeable dust (if necessary, an extension shall be used).

Protect cleaned bore hole against re-contamination in an appropriate way. If necessary, repeat cleaning process directly before dispensing the mortar. In-flowing water must not contaminate the bore hole again.

Material preparation for injection

3. Screw on static-mixing nozzle SM-14W or PM-19E, and load the cartridge into an appropriate dispensing tool. Cut off the foil tube clip before use. For every working interruption longer than the maximum working time t_{work} (Annex B 6) as well as for new cartridges, a new static-mixer shall be used.

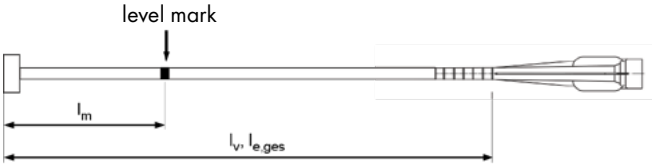


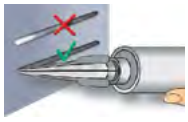
3a. In case of using the mixer extension VL16/1,8 cut off the tip of the mixer nozzle PM-19E at position „X".

4. Mark embedment depth on the reinforcing bar. The reinforcing bar shall be free of dirt, grease, oil or other foreign material.

5. Mark mixer nozzle and extension with mortar level mark l_m and anchorage depth l_v resp. $l_{e,ges}$
Quick estimation: $l_m = 1/3 \cdot l_v$
Optimum mortar volume:

$$l_m = l_v \text{ bzw. } l_{e,ges} \cdot (1{,}2 \cdot \frac{\Phi^2}{d_0^2} - 0{,}2)$$

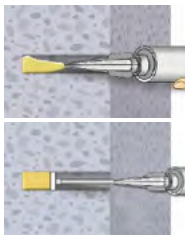




6. Not proper mixed mortar is not sufficient for fastening. Dispense and discard mortar until an uniform grey colour is shown, at least 3 full strokes. For foil tube cartridges it must be discarded a minimum of 6 full strokes.

7. Piston plugs VS and mixer nozzle extensions VL shall be used according to Table B3. Assemble mixing nozzle, mixer extension and piston plug before injecting mortar.

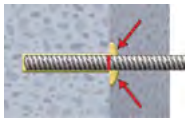
Filling the bore hole



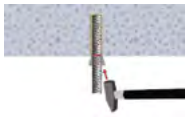
8a. **Injecting mortar without piston plug VS:**
Starting at bottom of the hole and fill the hole with adhesive until the mortar level mark l_m is visible (if necessary, a mixer nozzle extension shall be used). Slowly withdraw of the static mixing nozzle avoid creating air pockets Observe the temperature related working time t_{work} (Annex B 6).
8b. **Injecting mortar with piston plug VS:**
Insert piston plug to bottom of the hole and fill the hole with mortar until mortar level mark l_m is visible (if necessary, a mixer nozzle extension shall be used). During injection the piston plug is pushed out of the bore hole by the back pressure of the mortar. Observe the temperature related working time t_{work} (Annex B 6).

9. Insert the reinforcing bar while turning slightly up to the embedment mark.

Inserting the rebar



10. Annular gap between reinforcing bar and base material must be completely filled with mortar. Otherwise, the installation must be repeated starting from step 8 before the maximum working time t_{work} has expired.



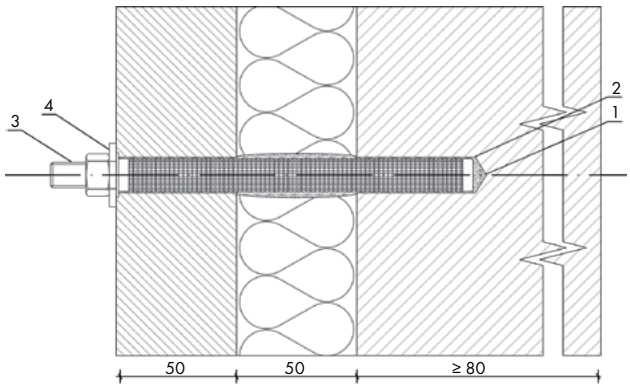
11. For application in vertical upwards direction the reinforcing bar shall be fixed (e.g. wedges).

12. Temperature related curing time t_{cure} (Annex B 6) must be observed. The full load to the reinforcing bar may be applied after the full curing time tcure has elapsed.

APPLICATION IN PREFABRICATED CONCRETE AND REINFORCED CONCRETE SANDWICH TYPE WALLS IN "LARGE PANEL" BUILDINGS

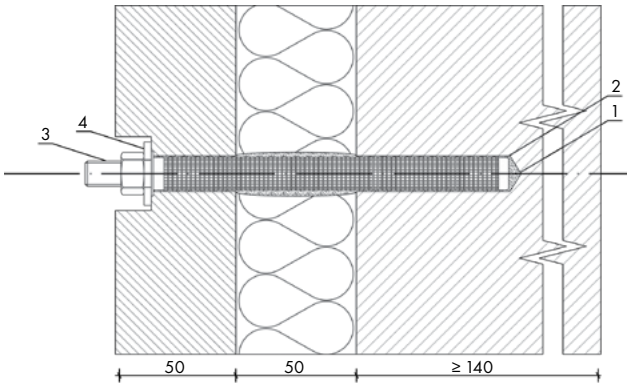
Step by step

1.	Drill with hammer drill a horizontal holes with a Ø24 mm, passing through the façade layer, the insulating layer and through the load bearing layer (over a certain section of it thickness).
2.	Starting from the bottom of the bore hole blow the hole clean with a hand pump a minimum of four times.
3.	Use a 30 mm diameter steel brush. Brush the hole minimum of four times in a twisting motion. If the bore hole ground is not reached with the brush, a brush extension shall be used.
4.	Finally blow the hole clean again with a hand pump a minimum four times.
5.	Prepare the chemical anchor accordingly: • Remove the cap and attach the supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. For every working interruption longer than the recommended working time, as well as for new cartridges, a new static-mixer shall be used. • Prior to dispensing into the anchor hole, squeeze out separately a minimum of three fullstrokes, and discard non-uniformly mixed adhesive components until the mortar shows a consistent grey colour. • For holes deeper than 240 mm a piston plug and the appropriate mixer extension must be used.
6.	Insert relevant sleeve flush with the surface of panel or panel's socket. Only use sleeves that have the right length.
7.	Starting from the bottom or back fill the sleeve with adhesive. For quantity of mortar attend cartridges label or installation instructions. Observe the gel-/ working times given in Minimum timing table.
8.	The position of the embedment depth shall be marked on the threaded rod. Push the threaded rod into the drill hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor shall be free of dirt, grease, oil or other foreign material.
9.	Allow the adhesive to cure to the specified time prior to applying any load or torque. Do not move or load the anchor until it is fully cured (attend Minimum timing table).
10.	After full curing, the fixture can be installed with up to the max. torque (value given for specific material type) by using a calibrated torque wrench.



1 – Ceresit CF920
2 – Sleeve diameter 24 mm
3 – Stainless steel anchor M20-A4
4 – Nut and washer
h_{min} = 65 mm

Reinforcement of a concrete sandwich wall and elements of a glued-in reinforced anchor with CERESIT CF920, anchored in a load-bearing layer of normal concrete of at least C12 / 15 class



1 – Ceresit CF920
2 – Sleeve diameter 24 mm
3 – Stainless steel anchor M24-A4
4 – Washer and nut
h_{min} = 85 mm

Reinforcement of a concrete sandwich wall and elements of a glued-in anchor with CERESIT CF920 anchored in the load-bearing layer of lightweight concrete of at least LC12 / 13 class

Installation parameters of CERESIT CF920 bonded anchors

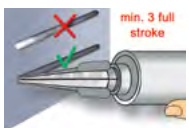
Anchor designation	Hole diameter (mm) - d_{cut}	Minimum depth of anchoring (mm) - h_{min}	Minimum depth of bore hole (mm) - h1	Maximal torque (Nm) - T_{inst}
Applies to sandwich walls with a load-bearing layer (ordinary concrete, class C12 / 15) with a thickness of at least 80 mm				
M20-A4	24	65	70	120
Applies to sandwich walls with a load-bearing layer (LC 12/13 lightweight concrete) with a minimum thickness of 140 mm				
M20-A4	24	85	90	80

APPLICATION IN SOLID AND HOLLOW MASONRY

No ETA to refer, however process is pending.
Prior resin mortar application drilling must be done accordingly to substrate and fixing type.
For medium load applications in solid masonry: e.g. calcium solid silica bricks, concrete solid bricks, clay solid bricks, etc., following steps are recommended:

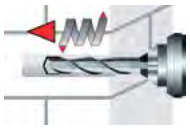
Installation instructions

Preparation of cartridge
1. Remove the cap and attach the supplied static-mixing nozzle to the cartridge and load the cartridge into the correct dispensing tool. In case of foil tube cartridge, cut off the clip before use. For every working interruption longer than the recommended working time as well as for new cartridges, a new static-mixer shall be used.

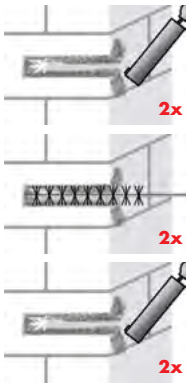


2. Prior to dispensing into the anchor hole, squeeze out separately a minimum of three full strokes (a minimum of six full strokes in case of foil tube cartridges), and discard non-uniformly mixed adhesive components until the mortar shows a consistent grey colour.

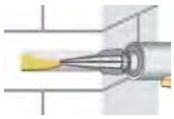
Installation in solid masonry (without sleeve)



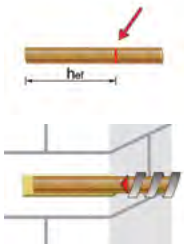
3. Holes to be drilled perpendicular to the surface of the base material by using a hard-metaltipped hammer drill bit. Drill a hole, with drill method according to brick type into the base material, with nominal drill hole diameter and bore hole depth acc. to the sizeand embedment depth required by the selected anchor. In case of aborted drill hole the drill hole shall be filled with mortar.



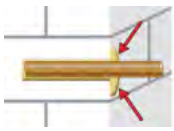
4. Blow out from the bottom of the drill hole two times. Attach the appropriate sized brush (>$d_{b,min,}$ acc. table) to a drilling machine or a battery screwdriver, brush the hole clean two times, and finally blow out the hole again two times.



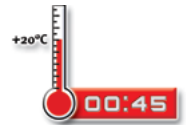
5. Starting from the bottom or back of the cleaned anchor hole fill the hole up to approximately two-thirds with adhesive. Slowly withdraw the static mixing nozzle as the hole fills to avoid creating air pockets. Observe the gel-/ working times given in Minimum timing.



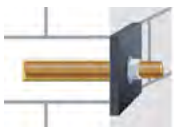
6. The position of the embedment depth shall be marked on the threaded rod. Push the threaded rod into the drill hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor shall be free of dirt, grease, oil or other foreign material.



7. Be sure that the annular gap is fully filled with mortar. If no excess mortar is visible at the top of the hole, the application has to be renewed.

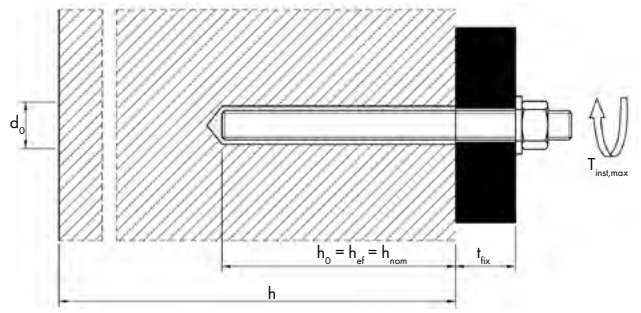


8. Allow the adhesive to cure to the specified time prior to applying any load or torque. Do not move or load the anchor until it is fully cured (attend Minimum timing table).



9. After full curing, the fixture can be installed with up to the max. torque (value given for specific brick type) by calibrated torque wrench.

Installation in solid brick; Threaded rod without sleeve



d_0 = nominal drill hole diameter
t_{fix} = thickness of fixture
$T_{inst,max}$ = max installation torque moment
h = thickness of member
h_0 = depth of drill hole at shoulder
h_{ef} = effective anchorage depth
h_{nom} = overall embedment depth

Table B2: Installation parameters in Autoclaved Aerated Concrete AAC and solid masonry (without sleeve)

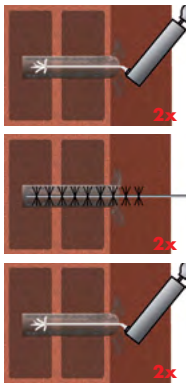
Threaded rod			M8	M10	M12	M16
Nominal drill hole diameter	d_0	[mm]	10	12	14	18
Drill hole depth	h_0	[mm]	80	90	100	100
Effective anchorage depth	$h_{ef} = h_{nom}$	[mm]	80	90	100	100
Minimum wall thickness	h_{min}	[mm]	h_{ef} + 30			
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	9	12	14	18
Diameter of steel brush	$d_b \geq$	[mm]	12	14	16	20
Minimum diameter of steel brush	$d_{b,min}$	[mm]	10,5	12,5	14,5	18,5
Max torque moment	T_{inst}	[Nm]	refer to specific brick parameters			

For medium load applications in solid and hollow masonry with sleeves: e.g. solid or hollow calcium silica bricks, solid or hollow concrete bricks, solid or hollow clay bricks, etc., following steps are recommended:

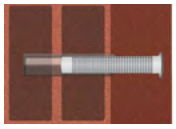
Installation instructions (after cartridge preparation)

Installation in solid and hollow masonry (with sleeve)

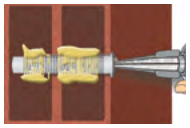
3. Holes to be drilled perpendicular to the surface of the base material by using a hard-metal tipped hammer drill bit. Drill a hole, with drill method according to material type, into the base material, with nominal drill hole diameter and drill hole depth acc. to the size and embedment depth required by the selected anchor. In case of aborted drill hole the drill hole shall be filled with mortar.



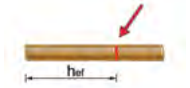
4. Blow out from the bottom of the drill hole two times. Attach the appropriate sized brush (> $d_{b,min,}$ acc. table) to a drilling machine or a battery screwdriver, brush the hole clean two times, and finally blow out the hole again two times.



5. Insert the sleeve flush with the surface of the masonry. Only use sleeves that have the right length.

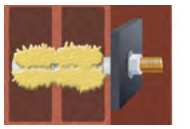


6. Starting from the bottom or back fill the sleeve with adhesive. For quantity of mortar attend cartridges label or installation instructions. Observe the gel-/ working times given in Minimum timing.



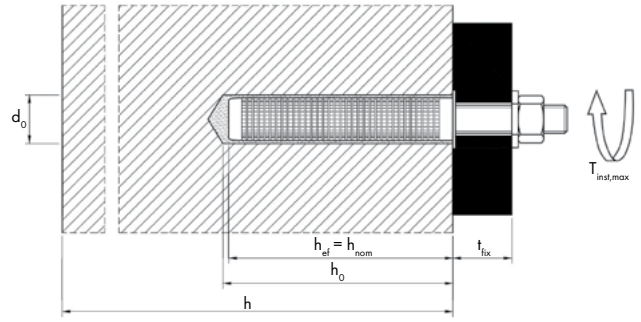
7. The position of the embedment depth shall be marked on the threaded rod. Push the threaded rod into the anchor hole while turning slightly to ensure positive distribution of the adhesive until the embedment depth is reached. The anchor shall be free of dirt, grease, oil or other foreign material.

8. Allow the adhesive to cure to the specified curing time prior to applying any load or torque. Do not move or load the anchor until it is fully cured (attend Minimum timing Table.

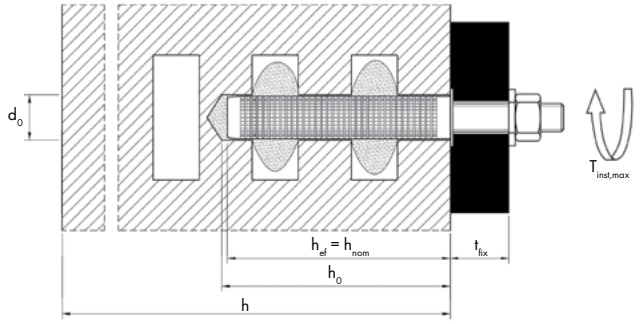


9. After full curing, the fixture can be installed with up to the max. torque (value given for specific material type) by using a calibrated torque wrench.

Installation in solid brick; Threaded rod with sleeve



Installation in hollow brick; Threaded rod with sleeve



d_0 = nominal drill hole diameter
t_{fix} = thickness of fixture
$T_{inst,max}$ = max installation torque moment
h = thickness of member
h_0 = depth of drill hole at shoulder
h_{ef} = effective anchorage depth
h_{nom} = overall embedment depth

Installation parameters in solid and hollow masonry (with sleeve)

Threaded rod			**M8**	**M8/M10**			**M12/M16**		
Sleeve	d_0	[mm]	VM-SH 12x80	VM-SH 16x85	VM-SH 16x130	VM-SH 13x130 /330	VM-SH 20x85	VM-SH 20x130	VM-SH 20x200
Nominal drill hole diameter	d_0	[mm]	12	16	16	16	20	20	20
Drill hole depth	h_0	[mm]	85	90	135	135	90	135	205
Effective anchorage depth	h_{ef}= h_{nom}	[mm]	80	85	130	130	85	130	200
Minimum wall thickness	h_{min}	[mm]	115	115	175	175	115	175	240
Diameter of clearance hole in the fixture	$d_f \leq$	[mm]	9	9 (M8) / 12 (M10)			14 (M12) / 18 (M16)		
Diameter of steel brush	$d_b \geq$	[mm]	14	18			22		
Minimum diameter of steel brush	$d_{b,min}$	[mm]	12,5	16,5			20,5		
Max torque moment	T_{inst}	[Nm]	refer to specific brick parameters						

PLEASE NOTE

- Approval is pending.
- The approvals of approved anchors will specify rotary or hammer drilling.
- The respective approval will describe the cleaning of drill holes (brushed and blown out).
- Approval will determine drilling depth, which will refer to a specific base material thickness. Without an approval, the following can be used as a rule of thumb for general applications: required base material thickness = drilling depth + 50 mm.
- The location of new holes to be drilled after mis drills (such as if iron is struck or if the hole was in the wrong location) will be regulated in the approvals. The distance from a mis drill must usually be two times the drilling depth of the mis drill. A mis drill hole must be sealed.
- Diamond bits are only allowed in exceptional cases:
  - The wall of the drill hole may be too smooth for the anchor.
  - Standing moisture or dampness may drastically reduce the load bearing capacity of the anchor (especially with injection methods).
  - There is a risk of drilling through supporting reinforcing iron.
- Standing water must be removed from the drill hole of shear anchors or injection systems.
- Below freezing temperatures, the anchor should be set immediately after the hole is drilled to avoid the formation of ice crystals in the drill hole.
- The approvals for the respective anchor sizes accurately define the holes of the attachment part. These specifications must be taken into account.
- Note the maximum mounting height, also described as the usable length, in the manufacturer's specifications: tfi x =

attachment part thickness + non-load bearing surfaces up to load-bearing base material.
- A specified torque, which ensures the required pre-tensioning force and correct anchor mounting, is required for tightening many anchors approved by construction authorities. A calibrated torque wrench should be used for this.
- For chemical anchors, observe the required hardening time before applying the tightening torque or actual load.
- Anchors must be installed as standard units. Replacing or removing parts is not allowed.
- The installation of the injection anchor shall be practicable without steel failure, turn-through in the hole or failure of the anchorage.
- There is a tremendous variety of masonry bricks on the market. The different types of bricks (e.g. clay, sand-lime, or concrete bricks) are composed of different materials and are available in various shapes, sizes, bulk densities, and strength classes. They can be either solid or with cavities. As such, this base material is heterogeneous. Performance data often exists only for the shear connector for certain brick styles. In another cases job-side test are required if manufacturer, type and characteristic parameters are unknown.

STORAGE

Up to 18 months from the production date; store in a cold and dark place, storage temperature: from +5°C up to +25°C.

PACKAGING

Foil tube cartridges 300 ml. Coaxial cartridges 420 ml.

PRODUCT SAFETY

For professional users. Safety data sheet available on website https://mysds.henkel.com

May cause an allergic skin reaction. Causes serious eye irritation. Keep out of reach of children. If medical advice is needed, have product container or label at hand. Avoid breathing mist/vapors. Wear protective gloves/eye protection. IF ON SKIN: Wash with plenty of soap and water IF IN EYES: Rinse cautiously with water for several minutes. Remove contact lenses, if present and easy to do. Continue rinsing. If eye irritation persists: Get medical advice/attention.

DISPOSAL

Dispose of waste and residues in accordance with local authority requirements.
Disposal of uncleaned packages: Use packages for recycling only when totally empty.
Waste code: 08040

TECHNICAL DATA

General information regarding material properties

Base:	Vinylester resin, styrene free
Density:	1,77 kg / dm^3
pH-value:	>12
Compressive strength:	100 N / mm^2 acc. EN 196 Part 1
Flexural strength:	15 N / mm^2 acc. EN 196 Part 1
E modulus:	14 kN / mm^{2}acc. EN 196 Part 1
Watertightness:	0 mm acc. DIN EN 12390-8
UV resistance:	Pass
Chemical resistance:	according TDS table
Shrinkage:	< 0,3%
Hardness Shore D:	90
Electrical resistance:	3,6 109 Ω m acc. IEC 93
Thermal conductivity:	0,65 W/mK acc. IEC 60093
Working time:	from 2 min up to 90 minutes depending on ambient conditions (refer Minimum timing table)
Application temperature:	from -10°C up to +40°C
Curing time:	from 20 min up to 12 h depending on ambient conditions (refer Working time table And curing time table)
Thermal resistance (cured mortar):	from -40°C up to +120°C
Fire resistance:	class A1 for rebar connection acc. EAD 330087-01-0601

Consumption 300 ml cartridge – for solid concrete and masonry for given diameter:

Nominal anchor (Ømm)	Nominal drill hole (Ømm)	Depth of drill hole (mm)	Efficiency from one package
M8	10	80	< 56
M10	12	90	< 37
M12	14	110	< 22

Consumption 300 ml cartridge – for hollow masonry with sleeve usage for given diameter:

Nominal anchor (Ømm)	Nominal drill hole (Ømm)	Depth of drill hole (mm)	Sleeve size (Ø x L)	Efficiency from one package
M8	16	135	16x130	< 14
M10	16	135	16x130	< 14
M12	20	135	20x130	< 14

Consumption 420 ml cartridge – for solid concrete and masonary with threaded rod:

Nominal anchor (Ømm)	Nominal drill hole (Ømm)	Depth of drill hole (mm)	Efficiency from one package*
M10	12	90	< 46
M12	14	110	< 27
M16	18	125	< 14

* estimated values

Consumption 420 ml cartridge – for solid concrete and masonry with reinforcing bar:

Nominal anchor (Ømm)	Nominal drill hole (Ømm)	Depth of drill hole (mm)	Efficiency from one package*
Ø16	20	125	< 18
Ø20	24	175	< 10
Ø24	32	240	< 4

* estimated values

Performance: CF920

Working time and curing time

Concrete temperature	Gelling-/working time	Minimum curing time in dry concrete[2)]
≥ -10°C[1)]	90 min	24 h
≥ -5°C	90 min	14 h
≥ 0°C	45 min	7 h
≥ +5°C	25 min	2 h
≥ +10°C	15 min	80 min
≥ +20°C	6 min	45 min
≥ +30°C	4 min	25 min
≥ +35°C	2 min	20 min
≥ +40°C	1,5 min	15 min

1) Cartridge temperature **must** be at min. +15°C
2) In wet concrete the curing time **must** be doubled

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DoP 01713 EAD 330087-01-0601 ETA 13/0428: Systems for post-installed rebar connections with mortar Anchor type/-sizes: threaded rod/M12 – M24 Reinforcing bar/Ø8 – Ø32		DoP 01714 ETAG 001 Part 5 ETA 08/0381: Bonded Anchor with Anchor rod for use in concrete Anchor type/-sizes: threaded rod/M8 – M30 Reinforcing bar/Ø8 – Ø32	
Characteristic resistance under static and quasi-static loading	DoP, Annex: C 1	Characteristic resistance for tension loads in non-cracked concrete	DoP, Annex: C 1, C 4, C 7, C 10
Reaction to fire	Class A1	Characteristic resistance for tension loads in cracked concrete	DoP, Annex: C 2, C 5, C 8, C 11
Resistance to fire	DoP, Annex: C 2 + C 3	Characteristic resistance for shear loads in cracked and non-cracked concrete	DoP, Annex: C 3, C 6, C 9, C 12
		Displacements under tension and shear loads	DoP, Annex: C 13, C 14
		Reaction to fire	Class A1

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Chemical resistance table: for brief/short contact with fully cured injection mortar

Chemical resistance

Chemical Agent	Concentration	Resistant	Not Resistant
Accumulator acid		●	
Acetic acid	40		●
Acetic acid	10	●	
Acetone	10		●
Ammonia, aqueous solution	5	●	
Aniline	100		●
Beer		●	
Benzene (kp 100-140°F)	100	●	
Benzol	100		●
Boric Acid, aqueous solution		●	
Calcium carbonate, suspended in water	all	●	
Calcium chloride, suspended in water		●	
Calcium hydroxide, suspended in water		●	
Carbon tetrachloride	100	●	
Caustic soda solution	10	●	

Chemical resistance

Chemical Agent	Concentration	Resistant	Not Resistant
Citric acid	all	●	
Chlorine water, swimming pool	all	●	
Diesel oil	100	●	
Ethyl alcohol, aqueous solution	50		●
Formic acid	100		●
Formaldehyde, aqueous solution	30	●	
Freon		●	
Fuel Oil		●	
Gasoline (premium grade)	100	●	
Glycol (Ethylene glycol)		●	
Hydraulic fluid	conc.	●	
Hydrochloric acid (Muriatic Acid)	conc.		●
Hydrogen peroxide	30		●
Isopropyi alcohol	100		●
Lactic acid	all	●	
Linseed oil	100	●	
Lubricating oil	100	●	
Magnesium chloride, aqueous solution	all	●	
Methanol	100		●
Motor oil (SAE 20 W-50)	100	●	
Nitric acid	10		●
Oleic acid	100	●	
Perchloroethylene	100	●	
Petroleum	100	●	
Phenol, aqueous solution	8		●
Phosphoric acid	85	●	
Potash lye (Potassium hydroxide)	10	●	
Potassium carbonate, aqueous solution	all	●	
Potassium chlorite, aqueous solution	all	●	
Potassium nitrate, aqueous solution	all	●	
Sea water, salty	all	●	
Sodium carbonate	all	●	
Sodium Chloride, aqueous solution	all	●	
Sodium phosphate, aqueous solution	all	●	
Sodium silicate	all	●	
Standard Benzine	100	●	
Sulfuric acid	10	●	
Sulfuric acid	70		●
Tartaric acid	all	●	
Tetrachloroethylene	100	●	
Toluene			●
Trichloroethylene	100		●
Turpentine	100	●	

Refer to specific information regarding intended applications.

Installation in concrete acc. ETA-08/0381 Henkel Injection System:
- Table C1,Annex C1: Characteristic values of resistance for threaded rods under tension loads in non-cracked concrete (design according TR 029)
- Table C2, Annex C2: Characteristic values of resistance for threaded rods under tension loads in cracked concrete (design according TR 029 or TR 045)
- Table C3, Annex C3: Characteristic values of resistance for threaded rods under shear loads in cracked and non-cracked concrete (design according TR 029 or TR 045)
- Table C4, Annex C4: Characteristic values of resistance for rebar under tension loads in non-cracked concrete (design according TR 029)
- Table C5, Annex C5: Characteristic values of resistance for rebar under tension loads in cracked concrete (design according TR 029 or TR 045)
- Table C6, Annex C6: Characteristic values of resistance for rebar under shear loads in cracked and non-cracked concrete (design according TR 029 or TR 045)
- Table C7, Annex C7: Characteristic values of resistance for threaded rods under tension loads in non-cracked concrete (design according CEN/TS 1992-4)
- Table 8, Annex C8: Characteristic values of resistance for threaded rods under tension loads in cracked concrete (design according CEN/TS 1992-4 or TR 045)
- Table C9, Annex C9: Characteristic values of resistance for threaded rods under shear loads in cracked and non-cracked concrete (design according CEN/TS 1992-4 or TR 045)
- Table C10, Annex C10: Characteristic values of resistance for rebar under tension loads in non-cracked concrete (design according to CEN/TS 1992-4)
- Table C11, Annex C11: Characteristic values of resistance for rebar under tension loads inncracked concrete (design according to CEN/TS 1992-4 or TR 049)
- Table C12, Annex C12: Characteristic values of resistance for rebar under shear loads in cracked and non-cracked concrete (design according to CEN/TS 1992-4 or TR 049)
- Table C13, Annex C13: Displacement under tension load (threaded rod)
- Table C14, Annex C14: Displacement under shear load (threaded rod)
- Table C15, Annex C15: Displacement under tension load (rebar)
- Table C16, Annex C16: Displacement under shear load (rebar)

Refer to specific information regarding Post install rebar connection acc. ETA- 13/0428 Henkel Injection System:

- Annex C1, Table C1: Characteristic tension resistance for tension anchor ZA
- Annex C1, Table C2: Amplification factor related to concrete class and drilling method
- Annex C1, Table C3: Reduction factor for all drilling methods
- Annex C1, Table C4: Design values of the ultimate bond stress for all drilling methods and for good Conditions
- Annex C2: Design value of the ultimate bond stress at increased temperatures for concrete classes C12/C15 to C50/C60, all drilling methods
- Annex C3, Table C5: Characteristic tension resistance for tension anchor ZA under fire exposure

Certificates: ETA-08/0381, ETA-13/0428, VOC French A+, LEED confirmation, Fire resistance report ETA-13/0428 Annex C2, National Technical Assessment: ITB nr AT-15-8510/2016 +Aneks1 CERESIT CF920 bonded fasteners for the reinforcement of prefabricated concrete and reinforced concrete sandwich type walls in a "large panels" building types.

The text above does not replace the original certification. Always refer to the complete certification documentation.