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European Technical Assessment

ETA 24/0384 of 06/05/2024

Technical Assessment Body issuing the ETA: Technical and Test Institute for Construction Prague	
Trade name of the construction product	Sika AnchorFix®-3030 for rebar connection
Product family to which the construction product belongs	Product area code: 33 Post-installed reinforcing bar (rebar) connections with improved bond-splitting behaviour under static loading
Manufacturer	Sika Services AG Tueffenwies 16 CH-8048 Zuerich Switzerland
Manufacturing plant	Sika Plant No. 503 44 08 (1138)
This European Technical Assessment contains	14 pages including 11 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 332402-00-0601-v01

1. Technical description of the product

The Sika AnchorFix®-3030 injection system is used for the connection, by anchoring or overlap joint, of reinforcing bars (rebars) in existing structures made of normal weight concrete. The design of the post-installed rebar connections is done in accordance with the regulations for reinforced concrete constructions.

Reinforcing bars made of steel with a diameter d from 8 to 25 mm and Sika AnchorFix®-3030 chemical mortar are used for rebar connections. The steel element is placed into a drilled hole filled with injection mortar and is anchored via the bond between embedded element, injection mortar and concrete.

The illustration and the description of the product are given in Annex A.

2. Specification of the intended use in accordance with the applicable EAD

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

The provisions made in this European Technical Assessment are based on an assumed working life of the anchor of 50 years and 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 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)	
Resistance to combined pull-out and concrete failure in uncracked concrete	See Annex C 1
Resistance to concrete cone failure	See Annex C 1
Robustness	See Annex C 1
Resistance to bond-splitting failure	See Annex C 1
Influence of cracked concrete on resistance to combined pull-out and concrete failure	See Annex C 1

3.2 General aspects relating to fitness for use

Durability and serviceability are only ensured if the specifications of intended use according to Annex B 1 are kept.

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

According to the Decision 96/582/EC of the European Commission[1] the system of assessment verification of constancy of performance (see Annex V to Regulation (EU) No 305/2011) given in the following table apply.

Product	Intended use	Level or class	System
Metal anchors for use in concrete	For fixing and/or supporting concrete structural elements or heavy units	-	1

[1] Official Journal of the European Communities L 254 of 08.10.1996

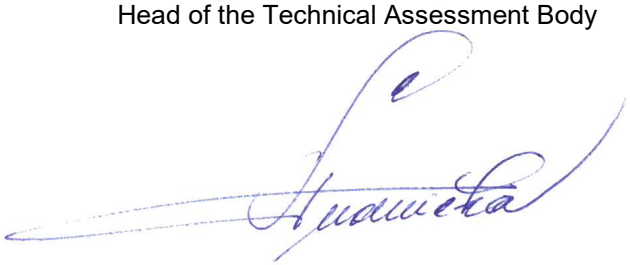
5. Technical details necessary for the implementation of the AVCP system, as provided in the applicable EAD

The factory production control shall be in accordance with the control plan which is a part of the technical documentation of this European Technical Assessment. The control plan is laid down in the context of the factory production control system operated by the manufacturer and deposited at Technical and Test Institute for Construction Prague.[2] The results of factory production control shall be recorded and evaluated in accordance with the provisions of the control plan.

Issued in Prague on 06.05.2024

By

Ing. Jiří Studnička, Ph.D.
Head of the Technical Assessment Body



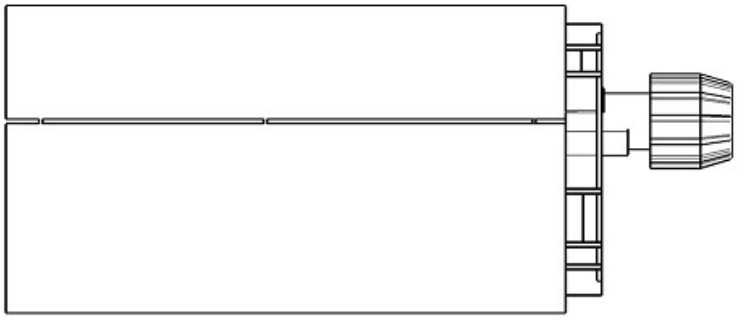
[2] The control plan is a confidential part of the documentation of the European Technical Assessment, but not published together with the ETA and only handed over to the approved body involved in the procedure of AVCP.

Mortar cartridges

Side by side cartridge

Sika AnchorFix®-3030

385 ml
585 ml



Marking of the mortar cartridges

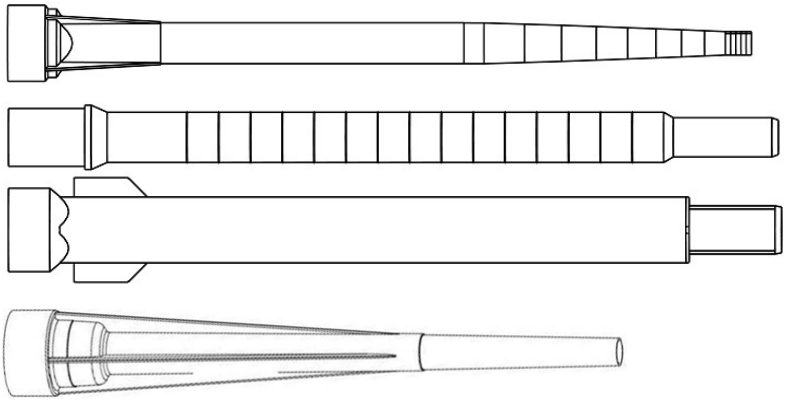
Identifying mark of the producer, Trade name, Charge code number, Storage life, Curing and processing time

Mixing nozzle

Q mixing nozzle

QH mixing nozzle

EZ-Flow mixing nozzle



Sika AnchorFix®-3030 for rebar connection	**Annex A 2**
Product description Injection system	

Rebar Ø8, Ø10, Ø12, Ø16, Ø20, Ø25

Figure A6: Reinforcing bar

Minimum value of related rib area $f_{R,min}$ according to EN 1992-1-1:2004+AC:2010

- The maximum outer rebar diameter over the ribs shall be:
  Nominal diameter of the rib d + 2 • h (h≤0,07 • d)
  (d: nominal diameter of the bar; h: rib height of the bar)

Table A1: Materials

Designation	Material
Rebar EN 1992-1-1:2004	Bars and de-coiled rods class B or C with f_{yk} and k according to NDP or NCL of EN 1992-1-1 $f_{uk} = f_{tk} = k \cdot f_{yk}$

Sika AnchorFix®-3030 for rebar connection	**Annex A 3**
Product description Rebar and materials	

Specifications of intended use

Anchorages subject to:

- Static and quasi-static loading: rebar Ø 8 to Ø 25

Base materials

- Reinforced or unreinforced normal weight concrete without fibres according to EN 206:2013+A1:2016
- Strength classes C12/15 to C50/60 according to 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.
  Note: In case of a carbonated surface of the existing concrete structure the carbonated layer shall be removed in the area of the post installed rebar connection (with a diameter d_s + 60 mm) prior to the installation of the new rebar. The depth of concrete to be removed shall correspond to at least minimum concrete cover in accordance with EN 1992-1-1:2004+AC:2010.
  The foregoing may be neglected if building components are new and not carbonated.

Temperature range:

- -40°C to +70°C (max. short. term temperature +70°C and max. long term temperature +50°C)

Design:

- The anchorages are designed under the responsibility of an engineer experienced in anchorages and concrete work.
- Verifiable calculation notes and drawings are prepared taking account of the forces to be transmitted.
- Design under static and quasi-static loading in accordance with EOTA Technical Report TR 069, Edition June 2021.
- The 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 and flooded holes
- Hole drilling by hammer drill, dustless drill or compressed air drill mode.
- The installation of post-installed rebars shall be done only by 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 is not known, it shall be determined using a rebar detector suitable for this purpose).

Sika AnchorFix®-3030 for rebar connection	**Annex B 1**
Intended use Specifications	

Table B1: Minimum concrete cover c_{min} depending on drilling method

Drilling method	Bar diameter ϕ	Without drilling aid c_{min}	With drilling aid c_{min}
Hammer drilling or dustless drilling	< 25 mm	30 mm + 0,06 $\ell_v \geq 2\ \phi$	30 mm + 0,02 $\ell_v \geq 2\ \phi$
	≥ 25 mm	40 mm + 0,06 $\ell_v \geq 2\ \phi$	40 mm + 0,02 $\ell_v \geq 2\ \phi$
Compressed air drilling	< 25 mm	50 mm + 0,08 ℓ_v	50 mm + 0,02 ℓ_v
	≥ 25 mm	60 mm + 0,08 $\ell_v \geq 2\ \phi$	60 mm + 0,02 $\ell_v \geq 2\ \phi$

The minimum concrete cover according to EN 1992-1-1 shall be observed.
The minimum clear spacing is a = max (40 mm; 4 Ø)

Figure B1: Example of drilling aid

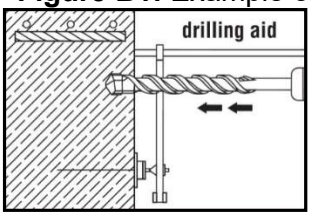


Table B2: Drilling diameter and maximum anchorage depth

Rebar diameter d_{nom}	Nominal drilling diameter d_{cut}	Max permissible embedment depth $l_{b,max}$
[mm]	[mm]	[mm]
8	12	400
10	14	500
12	16	600
16	20	800
20	25	1000
25	32	1000

Table B3: Processing and Cure time

Base Material Temperature °C	Cartridge Temperature °C	T Gel (mins)	T load (hrs)
+5°C	Minimum +10°C	300	24
+5°C to +10°C		150	
+10°C to +15°C	+10°C to +15°C	40	18
+15°C to +20°C	+15°C to +20°C	25	12
+20°C to +25°C	+20°C to +25°C	18	8
+25°C to +30°C	+25°C to +30°C	12	6
+30°C to +35°C	+30°C to +35°C	8	4
+35°C to +40°C	+35°C to +40°C	6	2
Ensure cartridge is > 10°C			

Sika AnchorFix®-3030 for rebar connection

Intended use
Minimum concrete cover and maximum embedment length
Processing and Load time

Annex B 3

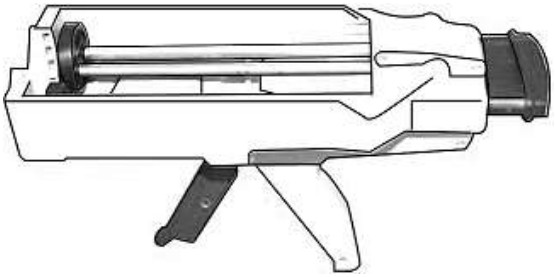
Table B4: Applicator gun

A

B

C

D



E

Applicator gun	A	B	C	D
Cartridge	Side by side 385 ml	Side by side 385 ml	Side by side 385 ml	Side by side 585 ml

Sika AnchorFix®-3030 for rebar connection	**Annex B 4**
Intended use Applicator gun	

Table B5: Brush

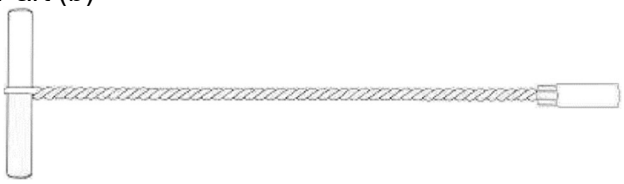
Sizes		Ø8	Ø10	Ø12	Ø16	Ø20	Ø25
Drill hole diameter d_0	[mm]	12	14	16	20	25	32
Steel brush diameter	[mm]	S12HF S13HF	S14HF S15HF	S18HF	S22HF	S27HF	S35HF
Brushes head length	[mm]	75					

If required use additional accessories and extension for air nozzle and brush to reach back of hole.

Max. hole depth	Brush / extension configuration	Part
375 mm	Brush head unit + handle unit	(a)+(b)
675 mm	Brush head unit + extension piece + handle unit	(a)+(c)+(b)
975 mm	Brush head unit + 2x extension piece + handle unit	(a)+(c)+(c)+(b)

Part (a)

Part (b)



Part (c)

Table B6: Extension hose for deep holes

Sizes		Ø8	Ø10	Ø12	Ø16	Ø20	Ø25
Hole diameter	[mm]	12	14	16	20	25	32
Extension hose	[mm]	9	9	14	14	14	14
Resin stopper	[mm]	-	-	-	18	22	30

Sika AnchorFix®-3030 for rebar connection

Intended use
Brush
Extension hose for deep holes

Annex B 6

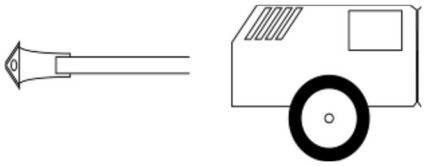
Drilling the hole

Drill hole to the require embedment depth using one of the following:

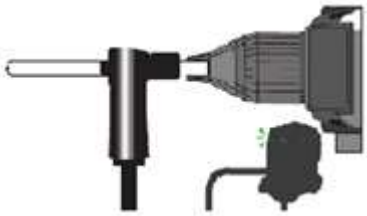
- Hammer drill (HD) with a carbide drill bit set in rotation hammer mode
- Hammer drill with the specified hollow drill bit (HDB) set in hammer mode
- Compressed air drilling (CA)

Before drilling remove carbonized concrete.
In case of aborted drill hole the drill hole shall be filled with mortar.

Rotary hammer drilling



Compressed air drill

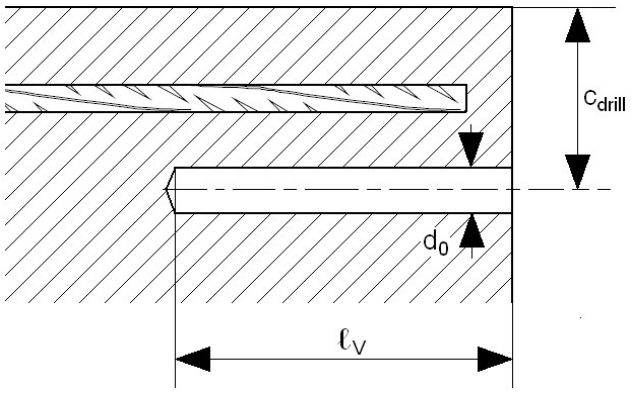


Hollow drill bit (Dustless drilling)

HDB – Hollow Drill Bit System

Heller Duster Expert hollow drill bit
SDS-Plus ≤ 16mm
SDS-Max ≥ 16mm

Class M vacuum
Minimum flow rate 266 m^3/h (74 l/s)



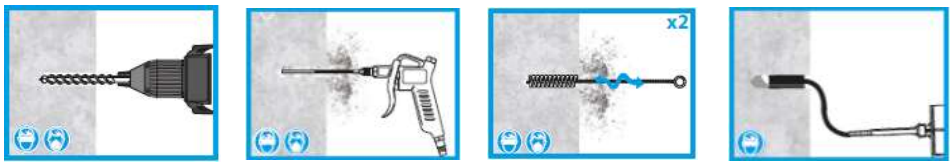
- Observe concrete coverage c, as per setting plan and Table B1
- Drill parallel to the edge and to existing rebar

Sika AnchorFix®-3030 for rebar connection	**Annex B 7**
Intended use Installation instructions I	

Cleaning the hole

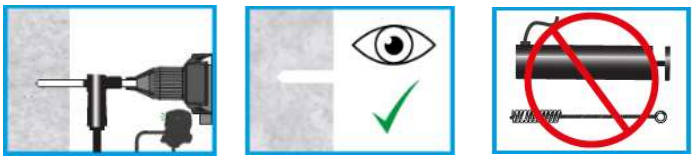
The borehole must be free of dust, debris, water, ice, oil, grease and other contaminants prior to mortar injection.

Hammer drilling (HD) or Compressed air drilling (CA)



1. After drilling the hole, Blow 2 times from the back of the hole with oil-free compressed air (min. 6 bar) until return air stream is free of noticed dust. Repeat this action twice.
2. Selecting the appropriate brush and extension if necessary, insert the brush to the bottom of the hole and firmly withdraw with a twisting motion. There should be positive interaction between the bristles of the brush and the side of the hole otherwise a new brush should be chosen. Repeat this action twice.
3. Repeat operation 1 and 2.
4. Perform the blowing operation 1 time again with compressed air until return air stream is free of noticeable dust.

Hammer drilling with hollow drill bit (HDB)

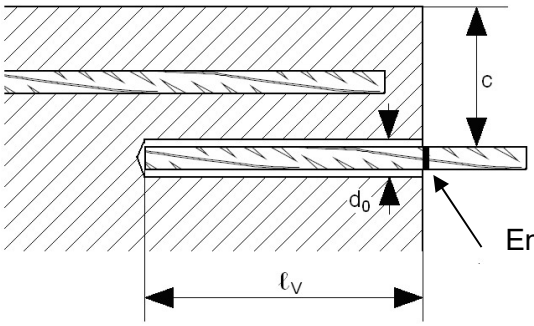


1. Use the specified hollow drill bit and follow the manufacturers instruction. Ensure the vacuum system is on.
2. After drilling the hole, perform a visual inspection to ensure the system has worked correctly and that no debris remains.
3. No further cleaning process is necessary.

Sika AnchorFix®-3030 for rebar connection	
Intended use Installation instructions II	**Annex B 8**

Mortar injection

If the hole collects water after initial cleaning,
this water must be removed before injecting the resin.



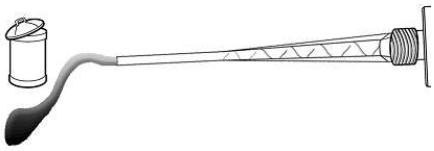
Before use, make sure the rebar is dry and free of oil or other residue.

Mark embedment depth on the rebar (e.g. with tape) ℓ_v

Insert rebar in borehole, to verify hole and setting depth ℓ_v

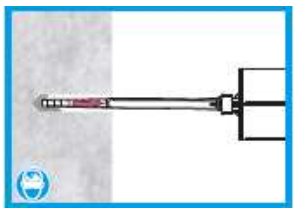
- Check expiration date: See imprint on cartridge. Do not use an expired product
- Base material temperature at time of installation:
  Must be between +5°C and +40°C
- Instructions for transport and storage:
  Keep in a cool, dry and dark place at +5°C to +20°C achieve maximum shelf life

Select the appropriate static mixer nozzle for the installation, open the cartridge and screw onto the mouth of the cartridge. Insert the cartridge into the correct applicator gun.



Extrude the first part of the cartridge to waste until an even colour has been achieved without streaking in the resin

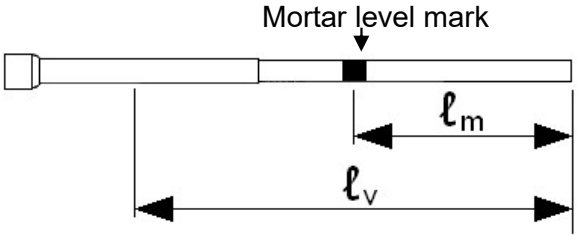
If necessary, cut the extension tube to the depth of the hole and push onto the end of the mixer nozzle, and (for rebars 16 mm dia. or more) fit the correct resin stopper to the other end. Attach extension tubing and resin stopper.



Insert the mixer nozzle (resin stopper / extension tube if applicable) to the bottom of the hole. Begin to extrude the resin and slowly withdraw the mixer nozzle from the hole ensuring that there are no air voids as the mixer nozzle is withdrawn. Fill the hole to approximately ½ to ¾ full and remove the mixer nozzle completely.

Sika AnchorFix®-3030 for rebar connection	
Intended use Installation instructions III	**Annex B 9**

Inserting the rebar



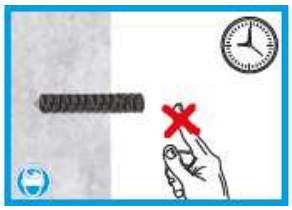
Mark the required mortar level ℓ_m and embedment depth ℓ_v with tape or marker on the injection extension.

Quick estimation: $\ell_m = 1/2 \cdot \ell_v$

Continue injection until the mortar level mark ℓ_m becomes visible.

Insert the rebar, free from oil or other release agents, to the bottom of the hole using a back and forth twisting motion ensuring all the threads are thoroughly coated. Adjust to the correct position within the stated working time.

Any excess resin should be expelled from the hole evenly around the steel element showing that the hole is full.
This excess resin should be removed from around the mouth of the hole before it sets.



Leave the anchor to cure.

Do not disturb the anchor until the appropriate loading/curing time has elapsed depending on the substrate conditions and ambient temperature.

Sika AnchorFix®-3030 for rebar connection	
Intended use Installation instructions IV	**Annex B 10**

Table C1: Characteristic resistance for reinforcing bars under tension load in concrete under static and quasi-static loading

Reinforcing bar			**Ø8**	**Ø10**	**Ø12**	**Ø16**	**Ø20**	**Ø25**
Combined pullout and concrete cone failure in concrete C20/25 for a working life of 50 years and 100 years								
Characteristic bond resistance in uncracked concrete								
Dry and wet concrete, flooded hole	$\tau_{Rk,ucr}$ [1]	[N/mm²]	13	13	13	12	12	12
Installation safety factor								
Hammer drilling - Dry, wet concrete	γ_{inst}	[-]	1,0					
Dustless drilling - Dry, wet concrete	γ_{inst}	[-]	1,2					
Flooded hole	γ_{inst}	[-]	1,2					
Factor for influence of sustained load	ψ^0_{sus} [2]	[-]	0,72					
Factor for concrete: C25/30	ψ_c	[-]	1,02					
Factor for concrete: C30/37	ψ_c	[-]	1,04					
Factor for concrete: C35/45	ψ_c	[-]	1,06					
Factor for concrete: C40/50	ψ_c	[-]	1,07					
Factor for concrete: C45/55	ψ_c	[-]	1,08					
Factor for concrete: C50/60	ψ_c	[-]	1,09					
Influence of cracked concrete on combined pull-out and concrete cone failure								
Factor for influence of cracked concrete	Ω_{cr}	[-]	0,5					
Concrete cone failure								
Factor for concrete cone failure for uncracked concrete	$k_{ucr,N}$	[-]	11,0					
Factor for concrete cone failure for cracked concrete	$k_{cr,N}$	[-]	7,7					
Edge distance	$c_{cr,N}$	[mm]	$1,5 \cdot l_0$					
Spacing	$c_{cr,N}$	[mm]	$3 \cdot l_0$					
Bond-splitting failure for a working life of 50 years and 100 years								
Product basic factor	A_k	[-]	6,38					
Exponent for influence of concrete compressive strength	sp1	[-]	0,19					
Exponent for influence of rebar diameter Ø	sp2	[-]	0,29					
Exponent for influence of concrete cover c_d	sp3	[-]	0,18					
Exponent for influence of side concrete cover (c_{max}/c_d)	sp4	[-]	0,25					
Exponent for influence of anchorage length l_b	lb1	[-]	0,45					

[1] $\tau_{Rk,ucr} = \tau_{Rk,ucr,50} = \tau_{Rk,ucr,100}$

[2] $\psi^0_{sus} = \psi^0_{sus,50} = \psi^0_{sus,100}$

Sika AnchorFix®-3030 for rebar connection

Performances
Characteristic resistance for reinforcing bars under tension load in concrete under static and quasi-static loading

Annex C 1