

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-14/0125
of 26 May 2014

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Deutsches Institut für Bautechnik

Trade name of the construction product

Sika AnchorFix®-3+

Product family
to which the construction product belongs

Bonded Anchor for use in non-cracked concrete

Manufacturer

SIKA SERVICES AG
Tüffenwies 16
8048 ZÜRICH
SCHWEIZ

Manufacturing plant

Sika Schweiz AG
Plant-Number 1001

This European Technical Assessment
contains

13 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

Guideline for European technical approval of "Metal
anchors for use in concrete", ETAG 001 Part 5: "Bonded
anchors", April 2013,
used as European Assessment Document (EAD)
according to Article 66 Paragraph 3 of Regulation (EU)
No 305/2011.

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Specific part

1 Technical description of the product

The Sika AnchorFix®-3+ is a bonded anchor consisting of a mortar cartridge and a threaded rod with hexagon nut and washer of sizes M8, M10, M12, M16, M20 and M24. The anchor rod with nut and washer is made of galvanised steel, hot-dip galvanised steel or stainless steel.

The threaded rod 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 anchor is used in compliance with the specifications and conditions given in Annex B.

The verifications and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchor of at least 50 years. The indications given on the working life cannot be interpreted as a guarantee given by the producer, but are to be regarded only as a means for choosing the right products in relation to the expected economically reasonable working life of the works.

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

3.1 Mechanical resistance and stability (BWR 1)

Essential characteristic	Performance
Characteristic resistance for tension loads	See Annex C 1
Characteristic resistance for shear loads	See Annex C 2
Displacements under tension loads	See Annex C 1
Displacements under shear loads	See Annex C 2

3.2 Safety in case of fire (BWR 2)

Essential characteristic	Performance
Reaction to fire	Anchorage satisfy requirements for Class A1
Resistance to fire	No performance determined (NPD)

3.3 Hygiene, health and the environment (BWR 3)

Regarding dangerous substances there may be requirements (e.g. transposed European legislation and national laws, regulations and administrative provisions) applicable to the products falling within the scope of this European Technical Assessment. In order to meet the provisions of Regulation (EU) No 305/2011, these requirements need also to be complied with, when and where they apply.

3.4 Safety in use (BWR 4)

The essential characteristics regarding Safety in use are included under the Basic Works Requirement Mechanical resistance and stability.

3.5 Protection against noise (BWR 5)

Not applicable.

3.6 Energy economy and heat retention (BWR 6)

Not applicable.

3.7 Sustainable use of natural resources (BWR 7)

The sustainable use of natural resources was not investigated.

3.8 General aspects

The verification of durability is part of testing the essential characteristics. Durability is only ensured if the specifications of intended use according to Annex B are taken into account.

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

According to Decision of the Commission of 24 June 1996 (96/582/EC) (OJ L 254 of 08.10.96 p. 62-65), the system of assessment and verification of constancy of performance (see Annex V and Article 65 Paragraph 2 to Regulation (EU) No 305/2011) given in the following table applies.

Product	Intended use	Level or class	System
Metal anchors for use in concrete (heavy-duty type)	For fixing and/or supporting concrete structural elements or heavy units such as cladding and suspended ceilings	—	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.

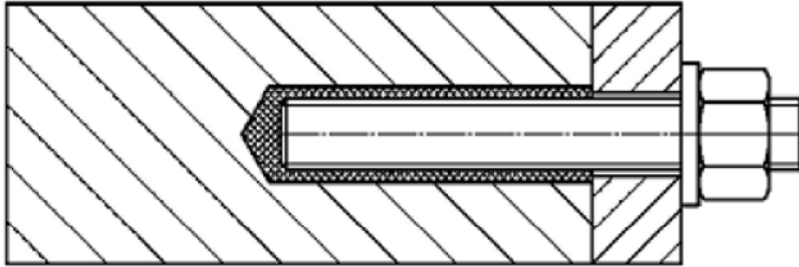
Issued in Berlin on 26 May 2014 by Deutsches Institut für Bautechnik

Dr.-Ing- Karsten Kathage
Vice President

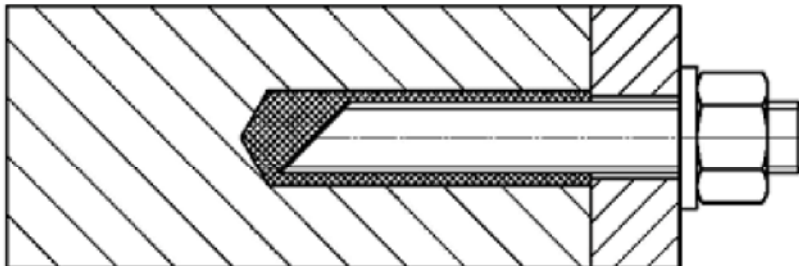
Beglaubigt:
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Installation Anchor

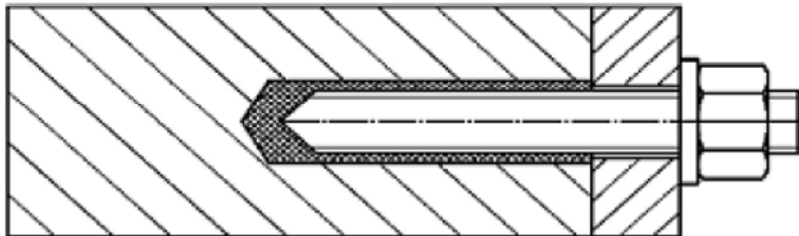
Standard threaded rod with flat tip end



Standard threaded rod with one side 45° chamfer



Standard threaded rod with two side 45° chamfer



Sika AnchorFix®-3+

Product description
Installed condition

Annex A 1

Cartridges

Universal cartridge (two chamber system within a single component cartridge)

Sika AnchorFix-3+

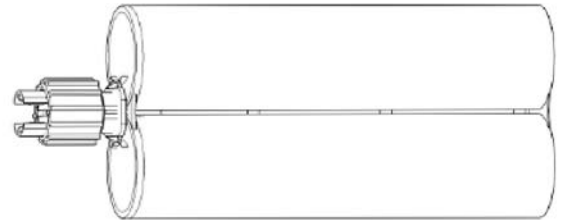
250 ml



Side by side cartridges:

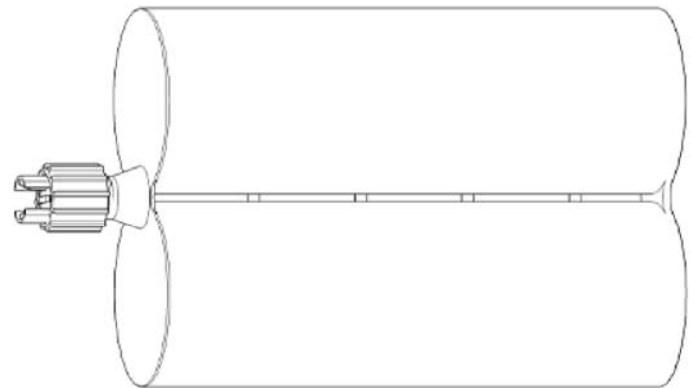
Sika AnchorFix-3+

400ml



Sika AnchorFix-3+

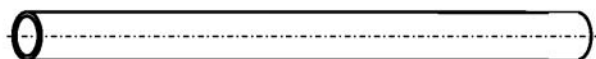
1'500ml



Marking of the mortar cartridges

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

Mixing nozzle & Extension tubes:

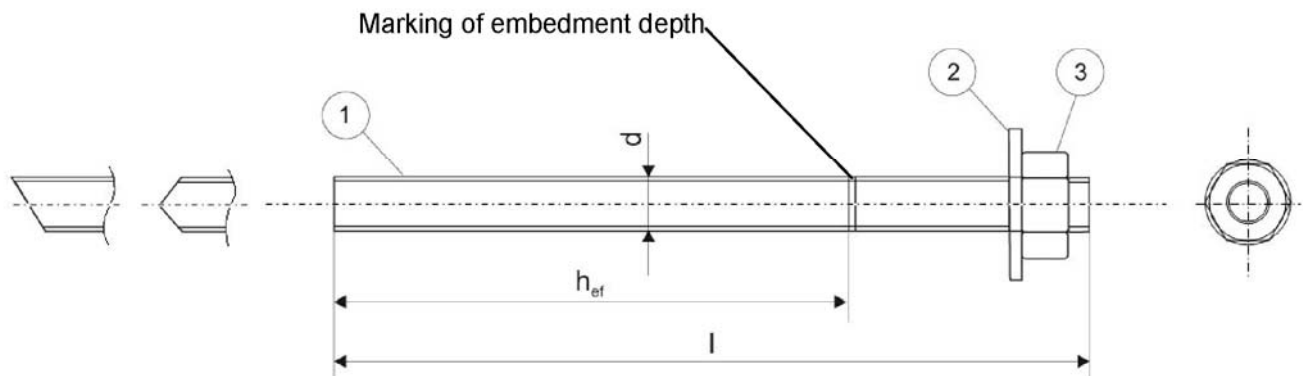


Sika AnchorFix®-3+

Product description
Cartridges

Annex A 2

Threaded rod with washer and hexagon nut M8, M10, M12, M16, M20, M24



Commercial standard threaded rod M8, M10, M12, M16, M20, M24 with

- Material and mechanical properties acc. to Table A1
- Confirmation of material and mechanical properties by inspection certificate 3.1 acc. to EN 10204:2004
- Marking of the threaded rod with embedment depth

Table A1: Materials

Part	Designation	Material
Steel, zinc plated $\geq 5 \mu\text{m}$ acc. to EN ISO 4042 or Steel, hot-dip galvanised $\geq 40 \mu\text{m}$ acc. to EN ISO 1461:2009 and EN ISO 10684:2004+AC:2009		
1	Threaded rod	Steel acc. to EN 10087:1998 or EN 10263:2001 Property class 5.8 or 8.8 acc. to EN 1993-1-8:2005+AC:2009
2	Washer EN ISO 7089:2000,	Steel, zinc plated or hot-dip galvanised
3	Hexagon nut EN ISO 4032:2012	Steel acc. to EN 10087:1998 or EN 10263:2001 Property class 5.8 or 8.8 acc. to EN ISO 898-2:2012
Steel elements made of stainless steel		
1	Threaded rod	Stainless steel 1.4401, 1.4404 or 1.4571 acc. to EN 10088:2005 Property class 70 or 80 acc. to EN ISO 3506-1:2009
2	Washer EN ISO 7089:2000,	Stainless steel 1.4401, 1.4404 or 1.4571 acc. to EN 10088:2005
3	Hexagon nut EN ISO 4032:2012	Stainless steel 1.4401, 1.4404 or 1.4571 acc. to EN 10088:2005 Property class 70 or 80 acc. to EN ISO 3506-2:2009

Sika AnchorFix®-3+

Product description
Threaded rod
Materials

Annex A 3

Specifications of intended use

Anchorage subject to:

- Static and quasi-static loads: all sizes.

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.

Temperature Range:

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

Use conditions (Environmental conditions):

- Structures subject to dry internal conditions (zinc coated steel or stainless steel).
- Structures subject to external atmospheric exposure (including industrial and marine environment) and to permanently damp internal condition, if no particular aggressive conditions exist (stainless steel).

Note: Particular aggressive conditions are e.g. permanent, alternating immersion in seawater or the splash zone of seawater, chloride atmosphere of indoor swimming pools or atmosphere with extreme chemical pollution (e.g. in desulphurization plants or road tunnels where de-icing materials are used).

Design:

- 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 anchor is indicated on the design drawings (e. g. position of the anchor relative to reinforcement or to supports, etc.).
- Anchorages are designed in accordance with EOTA Technical Report TR 029, Edition September 2010.

Installation:

- Dry or wet concrete: all sizes.
- The anchor must not be installed in water filled bore holes.
- Hole drilling by hammer drilling only.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.

Sika AnchorFix®-3+

Intended Use
Specifications

Annex B 1

Table B1: Installation Parameter

Anchor size			M 8	M 10	M 12	M 16	M 20	M 24
Nominal drill hole diameter	d_0	= [mm]	10	12	14	18	22	26
Effective anchorage depth	$h_{ef,min}$	= [mm]	48	60	96	128	160	192
	$h_{ef,max}$	= [mm]	64	80	96	128	160	192
Diameter of clearance hole in the fixture	d_f	≤ [mm]	9	12	14	18	22	24
Diameter of steel brush	d_b	≤ [mm]	12	14	16	22	27	31
Torque moment	T_{inst}	= [Nm]	10	20	40	80	150	200
Minimum thickness of member	h_{min}	= [mm]	240	400				
Minimum spacing	s_{min}	= [mm]	144	180	288	384	480	576
Minimum edge distance	c_{min}	= [mm]	72	90	144	192	240	288

Table B2: Curing time

Temperature [°C]	Open Time T_{gel} [min]	Curing Time ¹⁾ T_{cure} [h]
+5°C to +9°C	75	45
+10°C to +19°C	35	30
+20°C to +34°C	15	14
+35°C to +40°C	10	7

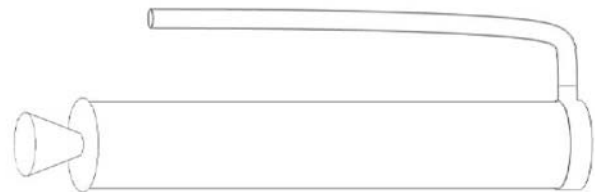
¹⁾ In wet concrete the the curing time must be doubled

Cleaning Tools

Steel Brush



Hand Pump



Sika AnchorFix®-3+

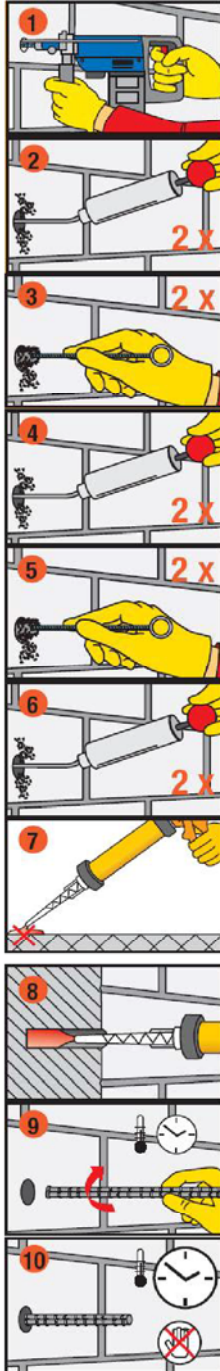
Intended Use

Installation parameters, Curing time
Cleaning Tools

Annex B 2

Applicator guns:	Manual	pneumatic
250 ml		
400 ml		
1'500 ml		
Sika AnchorFix®-3+		Annex B 3
Intended Use Applicator Guns		

Installation instructions



Drilling of hole with an electric drill to the diameter and depth required. Drill hole diameter must be in accordance with anchor size. In case of aborted drill hole: the drill hole shall be filled with mortar

The drill hole must be cleaned with a blow pump or by compressed air, starting from the bottom of the hole. (at least twice)
oil-free compressors shall be used

The drill hole must be thoroughly cleaned with the special steel brush (brush at least twice).
The diameter of the brush must be larger than the diameter of the drill hole.

The drill hole must be cleaned with a blow pump or by compressed air, starting from the bottom of the hole. (at least twice)
oil-free compressors shall be used

The drill hole must be thoroughly cleaned with the special steel brush (brush at least twice).
The diameter of the brush must be larger than the diameter of the drill hole.

The drill hole must be cleaned with a blow pump or by compressed air, starting from the bottom of the hole. (at least twice)
oil-free compressors shall be used

Pump approx. twice until both parts come out uniformly. Do not use this material. Release the gun pressure and clean the cartridge opening with a cloth.

Inject the adhesive into the hole, starting from the bottom, while slowly drawing back the static mixer. In any case avoid entrapping air. For deep holes extension tubing can be used.

Insert the anchor with a rotary motion into the filled drill hole. Some adhesive must come out of the hole.
Important: the anchor must be placed within the open time, according to Table B2.

During the resin hardening time the anchor must not be moved or loaded. Wash tools immediately with Sika® Colma Cleaner. Wash hands and skin thoroughly with warm soap water.

Sika AnchorFix®-3+

Intended Use
Installation instructions

Annex B 4

Table C1: Characteristic values of resistance under tension loads

Anchor size			M 8	M 10	M 12	M 16	M 20	M 24
Steel Failure								
Characteristic resistance, Steel property class 5.8	$N_{Rk,s}$	[kN]	18	29	42	79	123	177
Characteristic resistance, Steel property class 8.8	$N_{Rk,s}$	[kN]	29	46	67	126	196	282
Characteristic resistance, Steel property class 70	$N_{Rk,s}$	[kN]	26	41	59	110	172	247
Characteristic resistance, Steel property class 80	$N_{Rk,s}$	[kN]	29	46	67	126	196	282
Combined pull-out and concrete cone failure								
Characteristic resistance	$\tau_{Rk,p}$	[N/mm ²]	15					
Increasing factors for non-cracked concrete ψ_c	C30/37		1,0					
	C40/50		1,0					
	C50/60		1,0					
Splitting failure								
Spacing	$s_{cr,sp}$	[mm]	144	180	288	384	480	576
Edge distance	$c_{cr,sp}$	[mm]	72	90	144	192	240	288
Installation safety factor	γ_2		1,4			1,2		

Table C2: Displacements under tension loads

Anchor size			M 8	M 10	M 12	M 16	M 20	M 24
Displacement	δ_{N0}	[mm]	0,5	0,5	2,5	1,7	1,5	1,2
Displacement	$\delta_{N\infty}$	[mm]	3,0					

Sika AnchorFix®-3+

Performances

Characteristic values of resistance under tension loads
Displacements under tension loads

Annex C 1

Table C3: Characteristic values of resistance under shear loads

Anchor size			M 8	M 10	M 12	M 16	M 20	M 24
Steel Failure without lever arm								
Characteristic resistance, Property class 5.8	$V_{Rk,s}$	[kN]	9	15	21	39	61	88
Characteristic resistance, Property class 8.8	$V_{Rk,s}$	[kN]	15	23	34	63	98	141
Characteristic resistance, Property class 70	$V_{Rk,s}$	[kN]	13	20	30	55	86	124
Characteristic resistance, Property class 80	$V_{Rk,s}$	[kN]	15	23	34	63	98	141
Steel Failure with lever arm								
Characteristic bending moment, Steel property class 5.8	$M^0_{Rk,s}$	[Nm]	19	37	66	167	325	561
Characteristic bending moment, Steel property class 8.8	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	898
Characteristic bending moment, Steel property class 70	$M^0_{Rk,s}$	[Nm]	26	52	92	233	454	786
Characteristic bending moment, Steel property class 80	$M^0_{Rk,s}$	[Nm]	30	60	105	266	519	898
Concrete pry-out failure								
Factor k in equation (5.7) of Technical Report TR 029			1 ¹⁾	2				
Installation safety factor	γ_2		1,4			1,2		
Concrete edge failure								
See section 5.2.3.4 of Technical Report TR 029								
Installation safety factor	γ_2		1,4			1,2		

¹⁾ for $h_{ef} > 60\text{mm}$ is factor $k = 2$

Table C4: Displacements under shear loads

Anchor size			M 8	M 10	M 12	M 16	M 20	M 24
Displacement	δ_{V0}	[mm]	1,44					
Displacement	$\delta_{V\infty}$	[mm]	2,16					

Sika AnchorFix®-3+

Performances

Characteristic values of resistance under shear loads
Displacements under shear loads

Annex C 2