

Approval body for construction products
and types of construction

Bautechnisches Prüfamt

An institution established by the Federal and
Laender Governments



European Technical Assessment

ETA-11/0144
of 4 April 2014

General Part

Technical Assessment Body issuing the
European Technical Assessment:

Trade name of the construction product

Product family
to which the construction product belongs

Manufacturer

Manufacturing plant

This European Technical Assessment
contains

This European Technical Assessment is
issued in accordance with Regulation (EU)
No 305/2011, on the basis of

Deutsches Institut für Bautechnik

Insulation anchors Koelner TFIX-8S and TFIX-8ST

Screwed-in anchor for fixing of external thermal
insulation composite systems with rendering in concrete
and masonry

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15 pages including 11 annexes which form an integral
part of this assessment

Guideline for European technical approval of "Plastic
anchors for fixing of external thermal insulation
composite systems with rendering", ETAG 014, Edition
February 2011, 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 screwed-in anchors Koelner TFIX-8S and TFIX-8ST consist of an anchor sleeve with an enlarged shaft, an insulation plate made of polypropylene and a special screw made of galvanised steel with a special plastic cap out of glass fibre reinforced polyamide as an expansion element. The expanding part of the anchor sleeve is slotted.

For mounting on the surface the anchor type TFIX-8S may in addition be combined with the anchor plates KWL 90, KWL 110 and KWL 140.

For deep mounting of the anchor in the insulating material an insulation layer made of closed cell polyethylene foam is put on the insulation plate of the anchor type TFIX-8ST. A setting device is fixed to the anchor plate for deep mounting of the anchor.

The Illustration and the description of the product are 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 anchors are used in compliance with the specifications and conditions given in Annex B.

The verification and assessment methods on which this European Technical Assessment is based lead to the assumption of a working life of the anchors of at least 25 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)

Requirements with respect to the mechanical resistance and stability of non load bearing parts of the works are not included in this Essential requirement but are under the Essential Requirement safety in use.

3.2 Safety in case of fire (BWR 2)

Not applicable.

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 the 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)

Essential characteristic	Performance
Characteristic resistance	See Annex C 1
Edge distances and spacing	See Annex B 3
Point thermal transmittance	See Annex C 2
Plate stiffness	See Annex C 2
Displacements	See Annex C 3

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)

For the sustainable use of natural resources no performance was investigated for this product.

3.8 General aspects

The verification of durability is part of testing of 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 27 June 1997 (97/463/EC) (Official Journal of the European Communities L 198 of 25.07.1997, p. 31-32), 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
Plastic anchors for use in concrete and masonry	For use in systems, such as façade systems, for fixing or supporting elements which contribute to the stability of the systems	—	2+

5 Technical details necessary for the implementation of the AVCP system, as provided in the applicable European Assessment Document

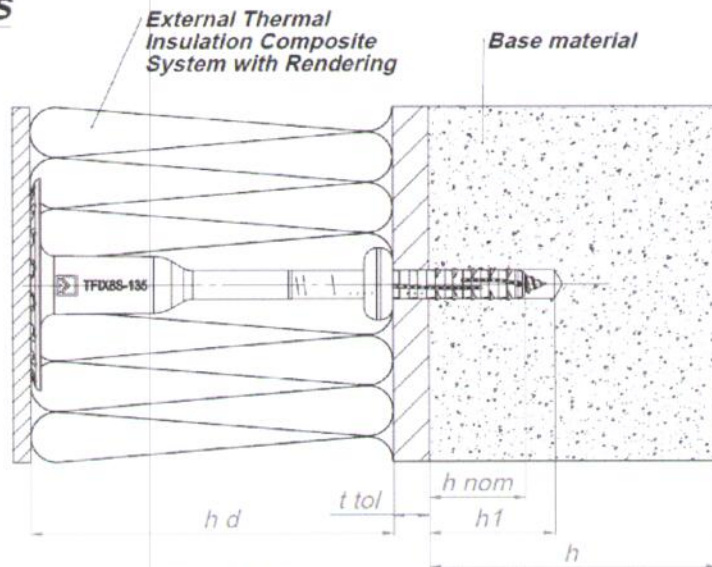
Technical details necessary for the implementation of the AVCP system are laid down in the control plan deposited at Deutsches Institut für Bautechnik.

Dr.-Ing. Karsten Kathage
Vice-President

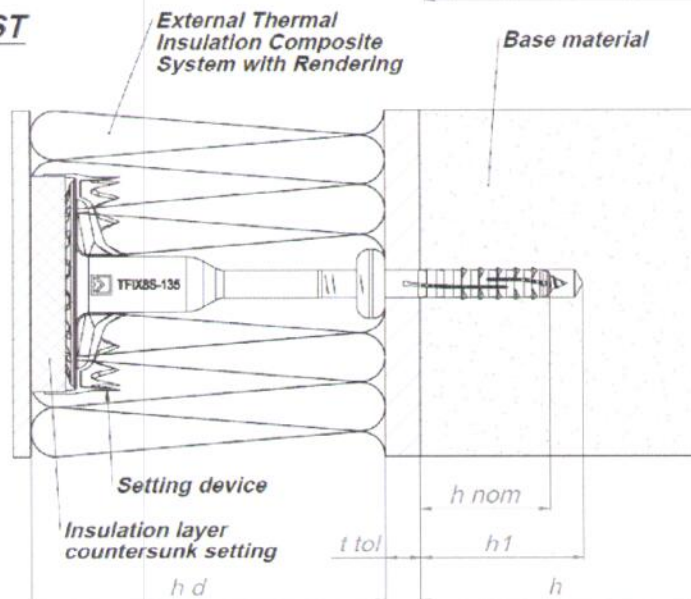
beglaubigt:
E. Aksünger

Fixing of ETICS in concrete and masonry

TFIX-8S



TFIX-8ST



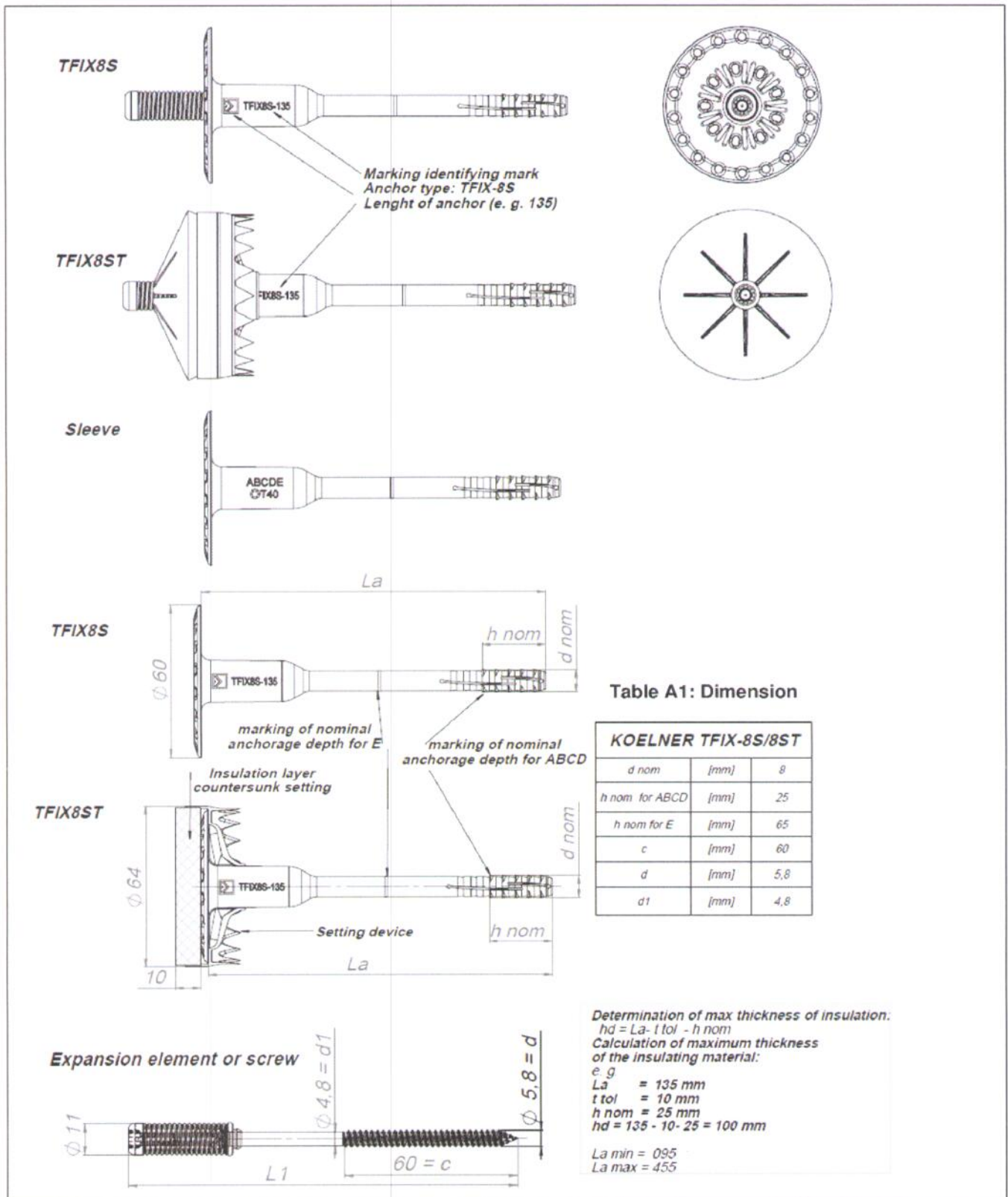
Legend

- h_{nom} = overall plastic anchor embedment depth in the base material
- h = thickness of member (wall)
- h_1 = depth of drilled hole to deepest point
- h_d = thickness of insulation material
- t_{tol} = thickness of equalizing layer or non-load-bearing coating

Insulation anchor Koelner TFIX-8S and TFIX-8ST

Product description
Installed condition

Annex A1



Insulation anchor Koelner TFIX-8S and TFIX-8T

Product description
 Marking and dimension of the anchor sleeve
 Expansion element

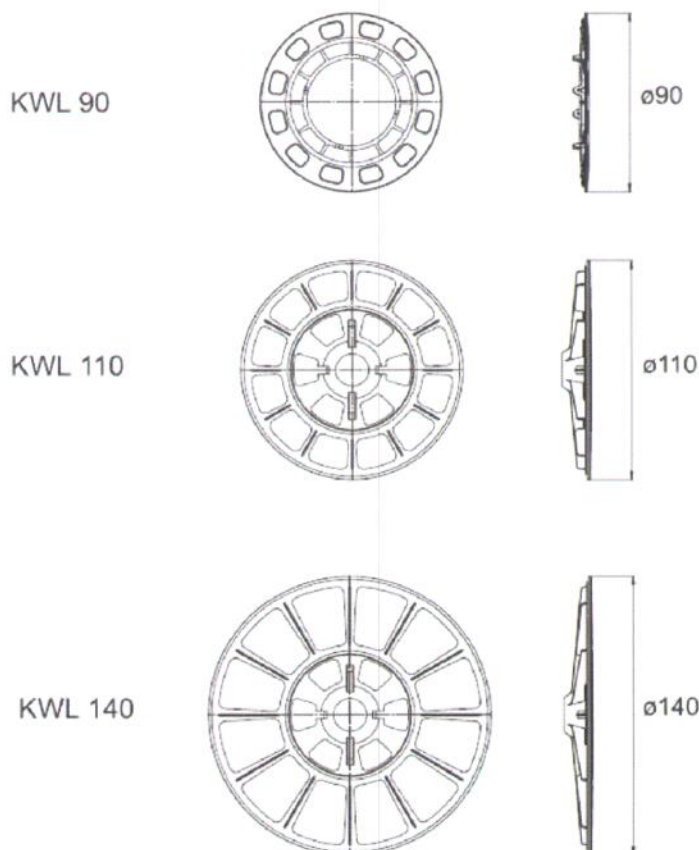
Annex A2

Table A2: Materials

Designation	Material
Anchor sleeve	Polypropylene, colour natural
Expansion screw	Steel, electro galvanized $\geq 5\mu\text{m}$ according to EN ISO 4042:2001-01 $f_{yk} \geq 420 \text{ N/mm}^2$; $f_{uk} \geq 520 \text{ N/mm}^2$
Expansion screw head	Glass fibre reinforced polyamide
Insulation layer TFIX-8ST	Polyethylene closed cell foam

Table A3: Additional plates, diameter and materials

Plate	Diameter	Colour	Materials
KWL 90	90	nature	PA6+GF, PP
KWL 110	110		
KWL 140	140		



Insulation anchor Koelner TFIX-8S and TFIX-8ST

Product description

Materials,
Slip on plates combined with Koelner TFIX-8S

Annex A3

Specifications of intended use

Anchorage subject to:

- The anchor may only be used for transmission of wind suction loads and shall not be used for the transmission of dead loads of the thermal insulation composite system.

Base materials:

- Normal weight concrete (use category A) according to Annex C1.
- Solid masonry (use category B), according to Annex C 1.
- Hollow or perforated masonry (use category C), according to Annex C 1
- Lightweight aggregate concrete (use category D), according to Annex C 1 and Annex B 2
- Autoclaved aerated concrete (use category E), according to Annex C 1
- For other base materials of the use categories A, B, C, D or E the characteristic resistance of the anchor may be determined by job site tests according to ETAG 014 Edition February 2011, Annex D.

Temperature Range:

- 0°C to +40°C (max. short term temperature +40°C and max. long term temperature +24°C)

Design:

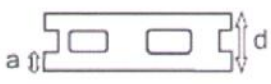

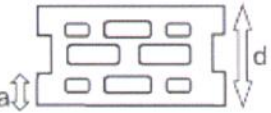
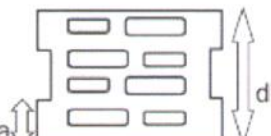
- The anchorages are designed in accordance with the ETAG 014 Edition February 2011 under the responsibility of an engineer experienced in anchorages and masonry work.
- Verifiable calculation notes and drawings are prepared taking account of the loads to be anchored. The position of the anchor is indicated on the design drawings.
- Fasteners are only to be used for multiple fixings for non-structural application, according to ETAG 014 Edition February 2011

Installation:

- Hole drilling by the drill modes according to Annex C1.
- Anchor installation carried out by appropriately qualified personnel and under the supervision of the person responsible for technical matters of the site.
- Installation temperature from 0°C to +40°C
- Exposure to UV due to solar radiation of the anchor not protected by rendering ≤ 6 weeks

Insulation anchor Koelner TFIX-8S and TFIX-8ST	Annex B1
Intended Use Specifications	

Table B1: Assignment type of anchor and geometry of bricks for lightweight-concrete hollow blocks according to DIN V 18151-100:2005-10

Geometry	Thickness of Brick d [mm]	Outer web in longitudinal direction a [mm]	Anchor type TFIX-8S TFIX-8ST
	175	50	•
	240 300	50	•
	365	35	•
	240 300 365	35	•
	240 300 365	35	•

The anchor shall be placed in the brick in such way, that the spreading part of the expansion sleeve is located in the outer web

Insulation anchor Koelner TFIX-8S and TFIX-8ST

Intended Use

Assignment type of anchor for lightweight concrete hollow blocks

Annex B2

Table B2: Installation parameters

Anchor Type			Koelner TFIX- 8S / 8ST	
			A, B, C, D	E
Use category			A, B, C, D	E
Drill hole diameter	d_o	= [mm]	8	8
Cutting diameter of drill bit	d_{cut}	≤ [mm]	8,45	8,45
Depth of drilled hole to deepest point	h_1	≥ [mm]	45	85
Overall plastic anchor embedment depth in the base material	h_{nom}	≥ [mm]	25	65

Setting device for TFIX-8ST

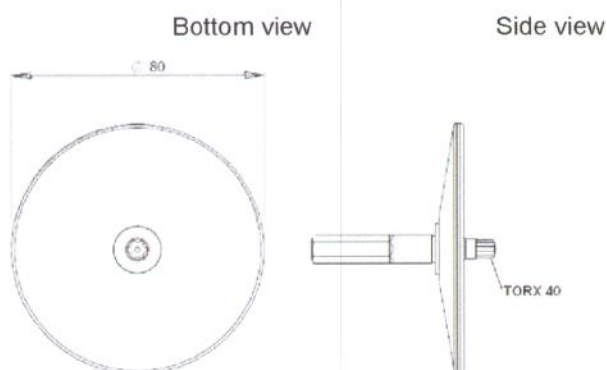
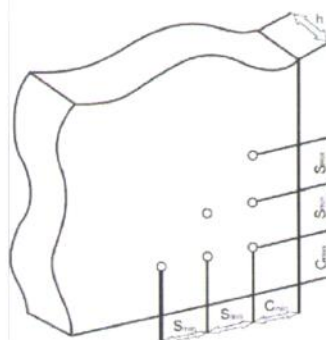


Table B3: Minimum distances and dimensions

Anchor Type			Koelner TFIX- 8S / 8ST	
			A, B, C, D	E
Use category			A, B, C, D	E
Minimum allowable spacing	S_{min}	= [mm]	100	100
Minimum allowable distance	C_{min}	= [mm]	100	100
Minimum thickness of member	h_{min}	= [mm]	100	110

Scheme of distance and spacing



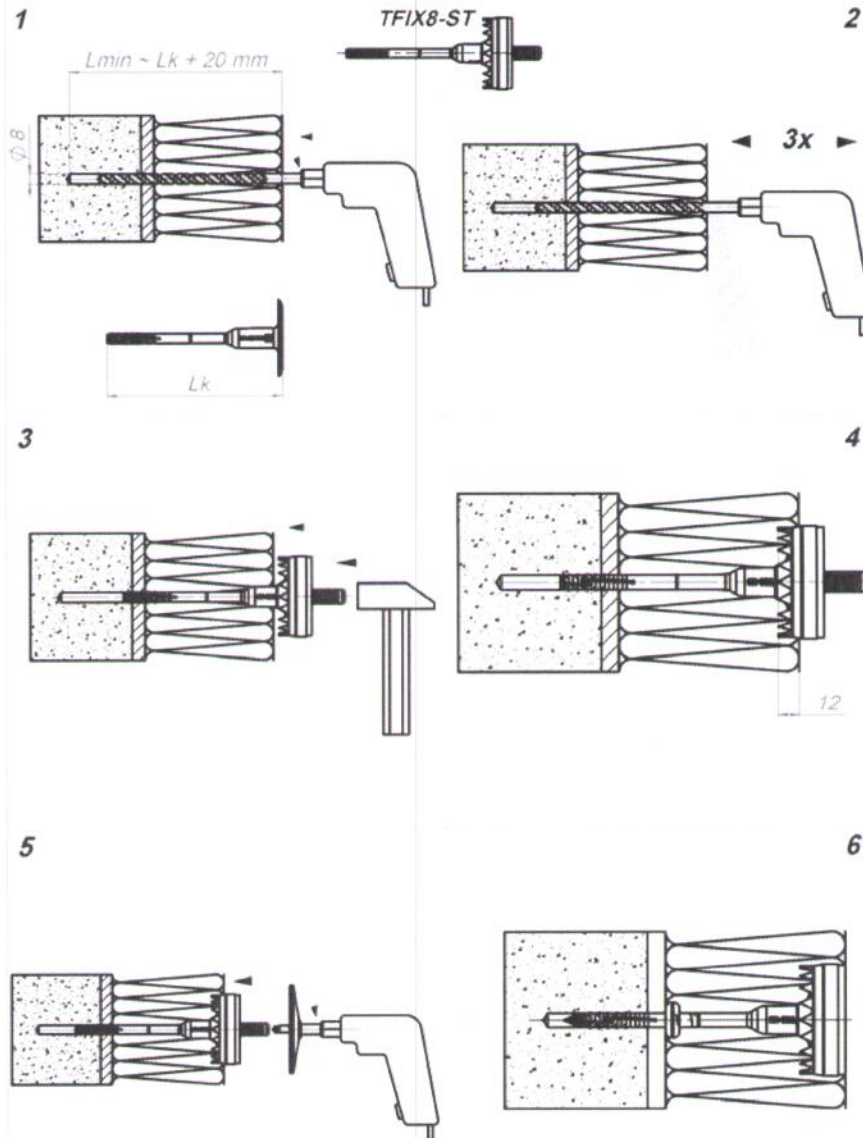
Insulation anchor Koelner TFIX-8S and TFIX-8ST

Intended Use

Installation parameters, setting devices,
Edge distances and spacing

Annex B3

Installation instructions



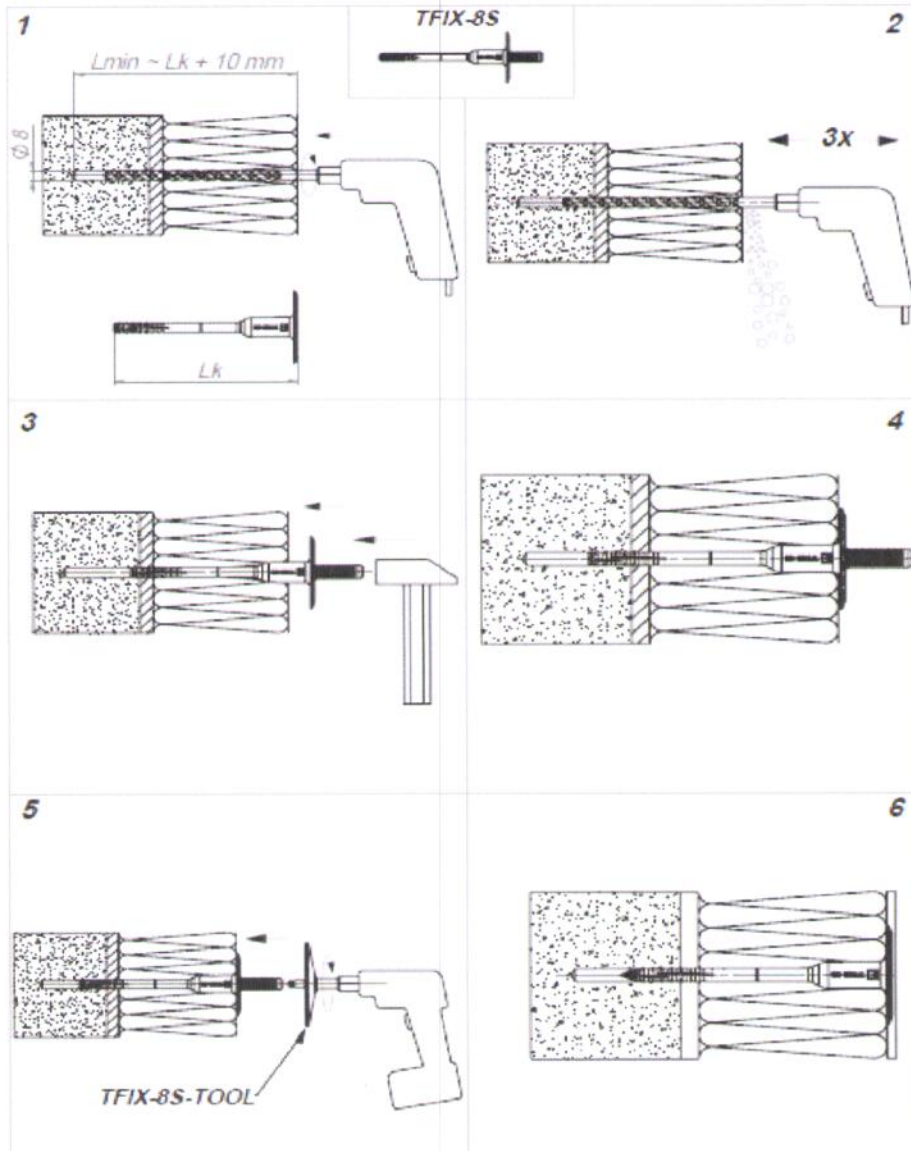
- 1) Drill hole perpendicular to substrate surface
- 2) Clean the drill hole 3x
- 3) Drive in the anchor with the hammer.
- 4) The bottom side of the plate must be flush with the ETICS
- 5) Use the setting device for countersunk installation
- 6) Installed condition of TFIX-8ST

Insulation anchor Koelner TFIX-8S and TFIX-8ST

Intended Use
Installation instructions for TFIX-8ST

Annex B4

Installation instructions



- 1) Drill hole perpendicular to substrate surface
- 2) Clean the drill hole 3x
- 3) Drive in the anchor with the hammer.
- 4) The bottom side of the plate must be flush with the ETICS
- 5) Use the setting device
- 6) Installed condition of TFIX-8S

Insulation anchor Koelner TFIX-8S and TFIX-8ST

Intended Use
Installation instructions for TFIX-8S

Annex B5

Table C1: Characteristic resistance N_{RK} in [kN] to tension loads for single anchor

Anchor Type					TFIX-8S TFIX-8ST
Base material	Bulk Density class ρ [kg/dm ³]	Minimum Compressive Strength f_b [N/mm ²]	General remarks	Drill method	N_{RK} [kN]
Concrete C12/15 – C50/60 EN 206-1:2000			-	hammer	1.2
Solid clay bricks, Mz e.g. acc. to DIN 105-100:2012-01/ EN 771-1:2011	$\geq 2,0$	12	cross section reduced up to 15 % by perforation vertically to the resting area	hammer	1.2
Vertically perforated clay bricks, Hlz e.g. acc. to DIN 105-100:2012-01/ EN 771-1:2011	$\geq 1,0$	12	Cross section reduced between 15 % and 50 % by perforation vertically to the resting area. Exterior web thickness ≥ 12 mm	rotary	0.75
Sand-lime solid bricks, KS e.g. acc. to DIN V 106:2005-10 / EN 771-2:2011	$\geq 1,8$	12	cross section reduced up to 15 % by perforation vertically to the resting area	hammer	0.9
Sand-lime perforated bricks, KSL e.g. acc. to DIN V 106:2005-10/ EN 771-2:2011	$\geq 1,4$	12	Cross section reduced more than 15 % by perforation vertically to the resting area. Web thickness ≥ 23 mm	hammer	0.9
Lightweight concrete solid brick, V e.g. acc. to DIN V 18152-100:2005-10 / EN 771-3:2011	$\geq 1,2$	4	Proportion of handle hole to resting area up to 10 %, Maximum size of handle hole: 110x45 mm	rotary	0.5
Lightweight concrete hollow block, Hbl e.g. acc. to DIN V 18151-100:2005-10 / EN 771-3:2011	$\geq 1,2$	6	According to Annex B 2, exterior web thickness ≥ 35 mm	rotary	0.6
		4			0,4
Prefabricated reinforced components of lightweight aggregate concrete, e.g. acc. to EN 1520:2011	$\geq 0,8$	6	-	hammer	0.6
		4			0,4
Autoclaved aerated concrete, AAC e.g. acc. to DIN V 4165-100:2005-10	$\geq 0,6$	6	Overall plastic anchor embedment depth $h_{nom} \geq 65$ mm	rotary	1.2
		4			0,9

Insulation anchor Koelner TFIX-8S and TFIX-8ST

Annex C1

Performances
Characteristic resistance

Table C2: Point thermal transmittance according EOTA Technical Report TR 025:2007-06

anchor type	insulation thickness h_D [mm]	point thermal transmittance χ [W/K]
Koelner TFIX-8S (mounted on the surface)	60 – 420	0.002
Koelner TFIX-8ST (mounted countersunk)	60 – 100	0.001
Koelner TFIX-8ST (mounted countersunk)	120 – 420	0.002

Table C3: Plate stiffness according EOTA Technical Report TR 026:2007-06

anchor type	diameter of the anchor plate [mm]	load resistance of the anchor plate [kN]	plate stiffness [kN/mm]
Koelner TFIX-8S Koelner TFIX-8ST	60	2.04	0.6

Insulation anchor Koelner TFIX-8S and TFIX-8ST

Performances
Point thermal transmittance,
Plate stiffness

Annex C2

Table C4: Displacements

Base material	Bulk density class ρ [kg/dm ³]	Minimum Compressive strength f_b [N/mm ²]	Tension load N [kN]	Displacements $\delta_m(\mathbf{N})$ [mm]
Concrete C12/15 – C50/60 EN 206-1:2000			0.4	0.4
Solid clay bricks, Mz e.g. acc. to DIN 105-100:2012-01/ EN 771-1:2011	≥ 2.0	12	0.4	0.5
Vertically perforated clay bricks, Hz e.g. acc. to DIN 105-100:2012-01/ EN 771-1:2011	≥ 1.0	12	0.25	0.4
Sand-lime solid bricks, KS e.g. acc. to DIN V 106:2005-10 / EN 771-2:2011	≥ 1.8	12	0.3	0.5
Sand-lime perforated bricks, KSL e.g. acc. to DIN V 106:2005-10/ EN 771-2:2011	≥ 1.4	12	0.3	0.6
Lightweight concrete solid brick, V e.g. acc. to DIN V 18152-100:2005-10 / EN 771-3:2011	≥ 1.2	4	0.15	0.2
Lightweight concrete hollow block, Hbl e.g. acc. to DIN V 18151-100:2005-10 / EN 771-3:2011	≥ 1.2	6	0.2	0.3
		4	0.15	
Prefabricated reinforced components of lightweight aggregate concrete EN 1520:2011	≥ 0.8	6	0.2	0.2
		4	0.15	
Autoclaved aerated concrete, AAC e.g. acc. to DIN V 4165-100:2005-10	≥ 0.6	6	0.4	1.8
		4	0.3	

Insulation anchor Koelner TFIX-8S and TFIX-8ST

Performances
Displacements

Annex C3