Deutsches Institut für Bautechnik

Eine vom Bund und den Ländern gemeinsam getragene Anstalt des öffentlichen Rechts

Zulassungs- und Genehmigungsstelle für Bauprodukte und Bauarten

Allgemeine bauaufsichtliche Zulassung / Allgemeine Bauartgenehmigung

Datum: 6 October 2026 | Geschäftszeichen: 28-1.21.8-50/26

Nummer:
Z-21.8-2180

Geltungsdauer
vom: **6 October 2026**
bis: **24 March 2031**

Antragsteller:
fischerwerke GmbH & Co. KG
Klaus-Fischer-Straße 1
72178 Waldachtal

Gegenstand dieses Bescheides:
fischer TherMax II for use as distance fixing systems in concrete and masonry

The product described above is hereby generally approved.
This decision comprises 13 pages and 21 annexes.
This general building authority approval/general type approval replaces the general general building approval/general type approval No. Z-21.8-2180 dated 24 March 2026. The subject was first granted general building authority approval on 30 January 2026.

Translation of the original German version not verified by the German Institute for Building Technology, DIBt. Translated by fischer.

I GENERAL PROVISIONS

1 This decision certifies the suitability and applicability of the subject matter of the regulations within the meaning of the State Building Regulations.

2 This decision does not replace the permits, consents and certificates required by law for the implementation of building projects.

3 This decision is issued without prejudice to the rights of third parties, in particular private property rights.

4 The user of the subject matter of the regulations must be provided with copies of this decision, without prejudice to any further provisions in the ‘Special Provisions’. Furthermore, the user of the subject matter of the regulations must be informed that this decision must be available at the place of use. Copies must also be made available to the relevant authorities upon request.

5 This notice may only be reproduced in its entirety. Publication of extracts requires the consent of the German Institute for Building Technology. Texts and drawings in promotional material must not contradict this notice; translations must include the statement ‘Translation of the original German version not verified by the German Institute for Building Technology’.

6 This decision is granted on a revocable basis. The provisions may be supplemented or amended at a later date, in particular if new technical findings so require.

7 This decision is based on the information provided and the documents submitted by the applicant. Any change to these details is not covered by this decision and must be disclosed to the German Institute for Building Technology without delay.

II SPECIAL PROVISIONS

1 Subject matter and scope of application

1.1 Subject matter

The subject of this approval is the fischer TherMax II.

The fischer TherMax II consists of the Anti-Cold Cone (hereinafter referred to as 'AKK') in sizes 12-M12 and 16-M12, a cover cap made of glass-fibre-reinforced polyamide, a sealing ring made of EPDM material, an anchor rod made of galvanised or stainless steel in sizes M12 or M16, the FIS H K injection anchor sleeve and a threaded pin, threaded rod or threaded screw in size M12 (with corresponding washer and hexagon nut) made of galvanised or stainless steel.

The fischer TherMax II is anchored to the structure on the substrate side using the anchor rod and a composite mortar (injection) in accordance with section 1.2. The installation of the fixture component is carried out on the fixture side using, for example, a threaded pin.

The AKK is a conical thermal break with a serrated surface and milled ribs. At its tapered end (substrate side), the AKK has an M12 (Type 12-M12) or M16 (Type 16-M12) at its tapered end (substrate side) to accommodate the anchor rod, and an M12 internal thread at the other end (fixture side) to accommodate the threaded pin, the stepped threaded pins M12/M10 or M12/M8, the threaded rod or the fixing screw.

When installed, the AKK is located within the thermal insulation; on the fixture side, a cover cap and a sealing ring are fitted before the fixing screw is installed.

The subject of this approval is the design, dimensioning and installation of anchorages using fischer TherMax II.

1.2 Scope of use and application

The fischer TherMax II may be used for anchoring spacer systems on insulated or uninsulated substrates (e.g. external walls with a composite thermal insulation system) made of concrete or various types of masonry under static and quasi-static loads, provided that no fire resistance requirements are imposed on the overall structure, including the fischer TherMax II.

The permissible substrates for the fischer TherMax II are set out in the following European Technical Assessments:

- ETA-12/0258 dated 24 October 2023: **fischer Superbond** for use in concrete
- ETA-12/0554 dated 18 October 2019: **FIS HT II** for use in masonry
- ETA-12/0556 dated 7 June 2021: **FIS HT II** for use in concrete
- ETA-17/0979 dated 12 February 2025: **FIS EM Plus** for use in concrete
- ETA-17/0350 dated 29 July 2022: **FIS AB** for use in concrete
- ETA-17/0352 dated 18 August 2022: **FIS AB** for use in masonry
- ETA-17/0435 dated 21 March 2025: **T-Bond PRO 1. – FIS C700 HP PRO.1** for use in concrete
- ETA-17/0429 dated 4 December 2025: **T-Bond PRO 1. or FIS C700 HP PRO.1** for use in masonry
- ETA-20/0603 dated 29 January 2026: **FIS V Plus** for use in concrete
- ETA-20/0729 dated 3 February 2025: **FIS V Plus** for use in masonry
- ETA-20/0572 dated 28 April 2021: **FIS V Zero** for use in concrete
- ETA-21/0267 dated 14 November 2024: **FIS V Zero** for use in masonry

Steel components on the substrate side

The anchor rod made of galvanised steel may be used in dry indoor environments.
The anchor rod made of stainless steel, as specified in Annexes 3 and 4, may be used in accordance with its corrosion resistance class CRC (see Annex 4, Table 4.1) in accordance with DIN EN 1993-1-4 in conjunction with DIN EN 1993-1-4/NA.
The TherMax II, with its galvanised steel anchor rod on the substrate side, may only be used for structures in corrosion resistance class CRC III in accordance with DIN EN 1993-1-4 in conjunction with DIN EN 1993-1-4/NA, provided that the anchor with sealing ring is installed with a maximum displacement of 3 mm under transverse load, a maximum distance of 5 mm from the render surface, and a maximum grain size of K3 for the render. Where the distance between the mounting plate and the plaster surface exceeds 5 mm, the insulated substrate (e.g. the external thermal insulation composite system) must also be protected against ingress of precipitation by suitable means (e.g. with a sheet metal cover or a hybrid sealant).

Steel components on the mounting plate side

The materials of the threaded pin (optional: the fixing screw or threaded rod) and the corresponding washer and hexagon nut – in terms of steel grade and strength values – must comply with Annex 4, Table 4.1.

2 Requirements for the construction product(s)

2.1 Properties and composition

The fischer TherMax II must comply with the specifications set out in Annexes 3 and 4 in terms of its dimensions and material specifications.

Any material properties, dimensions and tolerances not specified in the Annexes must comply with the details on file with the German Institute for Building Technology, the certification body and the third-party monitoring body.

2.2 Packaging, storage and labelling

2.2.1 Packaging and storage

The fischer TherMax II must only be packed and supplied as a fixing unit (AKK, cover cap, sealing ring, metal parts and, where applicable, injection anchor sleeve). The injection mortar specified in the relevant ETA is supplied separately.

The AKK, the cover cap and the sealing ring must be stored under normal climatic conditions. They must not be excessively dry or frozen prior to installation.

2.2.2 Marking

The packaging, package insert or delivery note for the fischer TherMax II must be marked by the manufacturer with the conformity mark (Ü mark) in accordance with the conformity mark regulations of the federal states. In addition, the manufacturer's mark, the approval number and the full designation of the fischer TherMax II must be stated. Marking may only be carried out if the requirements set out in section 2.3 are met.

The fischer TherMax II is designated by the product name and the two internal thread sizes of the AKK, e.g. TherMax II 16 M12.

In accordance with Annex 3, each AKK is stamped with the product name 'fischer TherMax II' on the front face (on the side with the mounting part) and with the diameter of the internal thread on the substrate side on the outer surface.

2.3 Confirmation of Conformity

2.3.1 General

Confirmation of the conformity of the fischer TherMax II with the provisions of the general building approval covered by the decision must be provided for each manufacturing plant by means of a manufacturer's declaration of conformity based on in-house production control and a certificate of conformity issued by a recognised certification body, as well as regular third-party surveillance by a recognised surveillance body in accordance with the following provisions: For the issue of the certificate of conformity and the third-party surveillance, including the product tests to be carried out in this context, the manufacturer of the fischer TherMax II must engage a recognised surveillance body for this purpose.

The manufacturer must issue the declaration of conformity by marking the construction products with the conformity mark (Ü mark), indicating the intended use.

The certification body must provide the German Institute for Building Technology with a copy of the certificate of conformity it has issued.

2.3.2 In-house production control

A factory production control system must be established and operated at every manufacturing plant. In-house production control refers to the continuous monitoring of production to be carried out by the manufacturer, by means of which the manufacturer ensures that the construction products manufactured by them comply with the provisions of the general building approval covered by this decision. The in-house production control shall include at least the measures listed in the test plan.

The test plan filed with the German Institute for Building Technology and the external supervisory body shall be decisive for the scope, nature and frequency of the in-house production control.

The results of the in-house production control must be recorded and evaluated. The records must contain at least the following information:

- Description of the construction product or the raw material and its components
- Type of inspection or test
- Date of manufacture and testing of the construction product, raw material or components
- Results of the checks and tests and, where applicable, a comparison with the requirements
- Signature of the person responsible for the in-house production control.

The records must be kept for at least five years and submitted to the inspection body engaged to carry out third-party supervision. They must be submitted to the German Institute for Building Technology and the competent supreme building control authority upon request.

In the event of unsatisfactory test results, the manufacturer must immediately take the necessary measures to rectify the defect. Construction products that do not meet the requirements must be handled in such a way as to prevent any confusion with compliant products. Once the defect has been rectified the existing test must be repeated immediately insofar as this is technically possible and necessary to provide evidence that the defect has been rectified.

2.3.3 External monitoring

At each manufacturing plant, the in-house production control system must be regularly verified by an external inspection body, at least once a year.

As part of the third-party monitoring, an initial inspection of the fischer TherMax II must be carried out and samples must also be taken for random testing. Sampling and testing are the responsibility of the recognised monitoring body.

The scope, nature and frequency of third-party supervision are governed by the test plan filed with the German Institute for Building Technology and the third-party supervisory body.

The results of the certification and third-party supervision must be retained for at least five years. They must be submitted by the certification body or the supervisory body to the German Institute for Building Technology and the competent supreme building control authority upon request.

3 Provisions for design, calculation and execution

3.1 General

Anchors using fischer TherMax II must be designed, dimensioned and installed in accordance with the Technical Building Regulations, unless otherwise specified below.

3.2 Planning

Anchoring using fischer TherMax II must be planned in accordance with engineering principles. Verifiable calculations and construction drawings must be prepared, taking into account the loads to be anchored. The construction drawings must show the exact location and number of anchoring points.

With regard to the anchoring substrate, temperature range, dry or wet borehole, borehole cleaning, minimum component dimensions and maximum torques, the specifications of the relevant ETA as set out in section 1.2 must be observed.

The installation specifications for the TherMax II are set out in Appendices 7, 8 and 9.

3.3 Design

3.3.1 General

Fastening using fischer TherMax II must be designed in accordance with engineering principles. Verification of the direct local transfer of forces into the anchoring substrate is provided by the following analyses. The transfer of the loads to be anchored within the structural element must be verified.

Additional stresses that may arise in the fischer TherMax II, in the connected structural element or in the structural element in which the fischer TherMax II is grouted, due to restricted deformation (e.g. during temperature changes), must be taken into account.

Plaster, gravel, cladding or levelling layers are considered non-load-bearing and must not be taken into account when determining the anchoring depth.

The threaded pin or, optionally, the fixing screw or threaded rod (for fixing the attached component) must, unless supplied by the manufacturer for the specific application, be specified by the design engineer with regard to the scope of application (corrosion resistance factors), the minimum length L_s in accordance with Annex 6, Table 6.1, taking into account the thickness of the component to be connected, the required adjustment lengths and the possible tolerances. Verification of the material and the mechanical properties of the fastening bolt, threaded pin or threaded rod by means of an acceptance test certificate 3.1 in accordance with DIN EN 10204; the verification documents must be retained.

3.3.2 Verification of the anchoring of the anchor rod in the base material

The design of the anchorage in concrete and masonry shall be carried out in accordance with the design methods specified in the ETAs referred to in section 1.2.

The characteristic values of the load-bearing capacity are specified in the relevant ETAs. Notwithstanding this, the characteristic load-bearing capacities in Annex 10 shall be used for the verification against steel failure.

In the case of compressive loading, the following verifications must also be provided:

a) Anchoring substrate: concrete, solid bricks and aerated concrete

The verification shall be carried out in the same way as specified in the relevant ETA in accordance with section 1.2. The characteristic load-bearing capacities for centric tension specified in the relevant ETAs also apply to compressive loading.

b) Anchoring substrate: perforated blocks

The verification for tensile loading shall be carried out in accordance with the provisions of the relevant ETA as set out in section 1.2.

For compressive loading, it must be demonstrated that the following condition is satisfied:

$$P_{Ed} \leq \alpha_{pressure} \cdot N_{Rk,b}/\gamma_{Mm} \quad \text{(Eq. 1)}$$

$$P_{Ed}^{g} \leq \alpha_{pressure} \cdot N_{Rk}^{g} / \gamma_{Mm} \quad \text{(Eq. 2)}$$

where:

P_{Ed} = Design value of the load resulting from a centric compressive load on a single anchor

P_{Ed}^{g} = Design value of the load resulting from a centric compressive load on a group of anchors

$\alpha_{pressure}$ = Reduction factor for compressive load-bearing capacities depending on the number of webs engaged, in accordance with Annex 11, Table 11.3

$N_{Rk,b}$ = Characteristic resistance of an anchor in the event of failure due to spalling of the masonry under tensile stress in accordance with the specifications in the relevant ETA as per section 1.2

N_{Rk}^{g} = Characteristic resistance of a group of anchors in the event of failure due to masonry spalling under tensile stress, in accordance with the information in the relevant ETA as set out in section 1.2

γ_{Mm} = 2.5 = Partial safety factor in the event of failure of the anchor or anchor group in the masonry

If suitable measures ensure that the compressive load is transferred to the anchoring substrate via a suitable mechanical means, $\alpha_{pressure} = 1{,}0$ may be applied.

c) Combined compressive and shear stresses

The design of the anchorage under combined compressive and shear stresses in concrete and masonry is carried out in accordance with the design procedures specified in the ETAs under section 1.2. The respective interaction equations for tensile and shear stresses apply mutatis mutandis to compressive and shear stresses.

3.3.3 Verification of the anti-cold-cone

It must be verified that the design value of the action does not exceed the design value of the resistance:

Tensile stress: $N_{Ed} \leq N_{Rk,tk}/\gamma_{Mtk}$ (Eq. 2)

Compressive stress: $P_{Ed} \leq P_{Rk,tk}/\gamma_{Mtk}$ (Eq. 3)

Shear stress: $V_{Ed} \leq V_{Rk,tk}/\gamma_{Mtk}$ (Eq. 4)

Combined tensile and shear stress: $\left(\frac{N_{Ed}}{\frac{N_{Rk,tk}}{\gamma_{Mtk}}}\right) + \left(\frac{V_{Ed}}{\frac{V_{Rk,tk}}{\gamma_{Mtk}}}\right) \leq 1{,}0$ (Eq. 5)

Combined compressive and shear stress: $\left(\frac{P_{Ed}}{\frac{P_{Rk,tk}}{\gamma_{Mtk}}}\right) + \left(\frac{V_{Ed}}{\frac{V_{Rk,tk}}{\gamma_{Mtk}}}\right) \leq 1{,}0$ (Eq. 6)

where:

N_{Ed} = design value of the action resulting from tensile loading

P_{Ed} = Design value of the action resulting from a centric compressive load

V_{Ed} = Design value of the action resulting from transverse loading

$N_{Rk,tk}$ = Characteristic resistance of the anti-freeze cone under tensile stress in accordance with Annex 11, Table 11.1

$P_{Rk,tk}$ = Characteristic resistance of the anti-freeze cone under compressive stress in accordance with Annex 11, Table 11.2

$V_{Rk,tk}$ = Characteristic transverse load-bearing capacity of the Anti-Cold Cone under transverse loading in accordance with Annex 12, Tables 12.1 and 12.2

γ_{Mtk} = 1.7 = Partial safety factor in the event of failure of the Anti-Cold Cone

A separate bending verification under transverse load with a lever arm is not required.

3.3.4 Verification of the fischer TherMax II outside the anchorage base (buckling of the lever arm)

It must be verified that the design value of the load does not exceed the design value of the resistance:

$$P_{Ed} \leq P_{Rk,ca}/\gamma_{Mca} \quad \text{(Eq. 7)}$$

$$P_{Ed}\,(\delta_v) \leq P_{Rk,ca}\,(\delta_v)\,/\gamma_{Mca} \quad \text{(Eq. 8)}$$

where:

P_{Ed} = Design value of the action resulting from centric compressive loading

$P_{Ed}\,(\delta_v)$ = Design value of the action resulting from a centric compressive load with an existing displacement under transverse load

$P_{Rk,ca}$ = Characteristic buckling resistance of the cantilever under centric compressive loading in accordance with Annex 13, Table 13.1

$P_{Rk,ca}\,(\delta_v)$ = Characteristic buckling resistance of the cantilever under compressive loading with a defined transverse displacement in accordance with Annex 14, Tables 14.1 and 14.2, and Annex 15, Tables 15.1 and 15.2

γ_{Mca} = 1.3 = partial safety factor for buckling

In the case of combined compressive and shear stresses and pre-deformation of the entire system (e.g. due to imperfections), a more precise verification in accordance with Second-Order Theory is required. In this context, deformations caused by shear stress and pre-deformation at the lever arm must be taken into account. It must be verified that the following interaction equation is satisfied:

$$\left(\frac{P_{Ed}\,(\delta_v)}{\frac{P_{Rk,ca}}{\gamma_{Mca}}}\right) + \left(\frac{V_{Ed} + \frac{P_{Ed}\cdot e_k}{L_r}}{\frac{V_{Rk,ca}}{\gamma_{Mca}}}\right) \leq 1.0 \quad \text{(Eq. 9)}$$

where:

$P_{Ed}\,(\delta_v)$ = design value of the action resulting from centric compressive loading with an existing displacement under transverse load

V_{Ed} = Design value of the action resulting from transverse loading

P_{Ed} = Design value of the action resulting from a centric compressive load

L_r = Buckling length, see Annex 13

$P_{Rk,ca}$ = Characteristic buckling resistance of the cantilever under centric compressive loading in accordance with Annex 13, Table 13.1

$V_{Rk,ca}$ = Characteristic buckling resistance of the cantilever under transverse loading in accordance with Annex 15, Table 15.3

γ_{Mca} = 1.3 = partial safety factor for buckling

e_k = Total deflection due to imperfection resulting from transverse loading and second-order theory.

$$e_k = e_{imp,T2.0} + e_v \quad \text{(Eq. 10)}$$

where:

e_V = Assumed deformation due to the transverse force according to the displacement tables; see Appendices 16 to 19

The deflection , using calculated be approximated using the following equationsecond-order theory, can :

$$e_{imp,T2.0} = \frac{e_0}{1-\frac{P_{Ed}}{P_{crit}}} \quad \text{(Eq. 11)}$$

$e_{imp,T2.0}$ = Deflection according to second-order theory

e_0 = Assumed deflection due to imperfections according to DIN EN 1993-1-1, section 5.3.2

$$e_0 = \frac{L_r}{200} \quad \text{(Eq. 12)}$$

P_{crit} = Critical buckling load according to Euler

$$P_{crit} = \frac{\pi^2 \times E \times I}{{s_k}^2} \quad \text{(Eq. 13)}$$

where

E = modulus of elasticity, see Table 10.1

I = moment of inertia, see Table 10.1

s_k = effective buckling length

$$s_k = \beta \times L_r \quad \text{(Eq. 14)}$$

β = buckling length coefficient, see Annex 13

When determining the critical buckling load, the assumed with regard to the buckling length static system as set out in Annex 13 must be taken into account .

3.3.5 Displacement behaviour

The displacements of the Anti-Cold Cone under tensile and compressive loads are given in Annex 11, Tables 11.1 and 11.2.

The maximum short-term displacements $\delta_{v,ca,0}$and the maximum long-term displacements $\delta_{v,ca,\infty}$at maximum transverse load at the end of the maximum lever arm (max. V = $V_{Rk,ca}$/ ($\gamma_F \cdot \gamma_M$) are given in Annex 15, Table 15.3.

The maximum possible transverse loads V (characteristic action at the end of the lever arm), depending on the respective lever arm and on defined displacements, are given in Appendices 16 to 19.

3.3.6 Thermal bridges

The effect of mechanical fasteners in the thermal insulation layer must be taken into account when determining the heat transfer coefficient U in accordance with DIN EN ISO 6946. The corrected heat transfer coefficient U_c is given by the following equation:

$$U_c = U + \Delta U_f + \Delta U_g \quad \text{(Eq. 11)}$$

where: U: heat transfer coefficient of the undisturbed component

ΔU_f : Correction term for mechanical fastening

ΔU_g : Correction term for the air gap in accordance with DIN EN ISO 6946, section F.2

The correction to the heat transfer coefficient for mechanical fixing components is calculated in accordance with DIN EN ISO 6946, section F.3.1, as follows:

$$\Delta U_f = n_f \cdot \chi \quad \text{(Eq. 12)}$$

where: n_f : number of fasteners per m^2

χ: in accordance with Annex 21

The point-specific heat transfer coefficientχ can also be calculated using a 3D model in accordance with DIN EN ISO 10211. For the TherMax II, the equivalent thermal conductivityλ_{eq} as specified in Annex 21 must be used.

If the total correction (ΔU_f+ ΔU_g) is less than 3 per cent of U, no correction is required.

3.4 Implementation

3.4.1 General

The contractor must submit a declaration of conformity in accordance with sections 16a(5) in conjunction with 21(2) of the MBO to confirm that the design conforms to the general type approval covered by this decision.

The fischer TherMax II must only be used as a fixing unit. Individual parts must not be replaced, with the exception of the threaded pin. This may optionally be replaced with a reduced-diameter threaded pin, a fixing screw or a threaded rod in accordance with Annex 4, Table 4.1.

The fischer TherMax II to be anchored must be installed in accordance with the design drawings produced in accordance with section 3.2 and the applicant's installation instructions.

Before installing the fischer TherMax II, the type of anchoring substrate and the thickness of the non-load-bearing layer must be determined.

When anchoring the fischer TherMax II anchor rod in the relevant anchoring substrate (substrate side), the provisions for carrying out the corresponding assessments specified in section 1.2 for the relevant fischer injection mortar must be adhered to.

The threaded pin (optional: the fixing screw or threaded rod) and the associated washer and hexagon nut, made of galvanised steel or stainless steel, must correspond in terms of steel grade and strength class.

3.4.2 Drilling the hole

In the case of reinforced substrates, the position of the fischer TherMax II must be coordinated with the reinforcement in such a way as to avoid damage to the reinforcement.

The borehole must be drilled at right angles to the surface of the anchoring substrate in accordance with the drilling procedure specified in the installation instructions. The nominal drill bit diameter and borehole depth as specified in Annex 5, Tables 5.1 and 5.2 must be adhered to.

Before inserting the anchor rod or the injection anchor sleeve, the drill hole must be cleaned in accordance with the specifications for the relevant fischer composite anchor as set out in section 1.2.

In the event of a failed drill hole, a new drill hole must be positioned at a distance of at least 1 times the depth of the failed drill hole, whereby a minimum distance of 5 times the outer diameter of the anchor is sufficient. Tolerances in the anchoring substrate must be compensated for in such a way that no unintended stresses arise during the installation of the anchor due to the multiple fixings.

3.4.3 Installation of the fischer TherMax II

The fischer TherMax II is installed in accordance with the installation instructions shown in Appendices 7 to 9.

Each AKK may only be used once for milling the thermal insulation. When milling using a milling blade, this may be reused (Figure 3 of the installation instructions).

After milling the insulation using the fischer TherMax II (anchor rod, AKK and, where applicable, a threaded pin screwed in), the fixture part may optionally be secured using a threaded pin, a threaded rod or a fixing screw.

The installation instructions and setting time for the injection mortar, as specified in section 1.2, must be observed.

If the total drilling depth $t_d$is ≥ 250 mm, the static mixer with extension hose must be used for injecting the mortar (Figure 6 of the installation instructions). The movement joint is sealed by fitting the cover cap in accordance with the installation instructions (Figure 9).

3.4.4 Inspection of the work

When installing anchors, the contractor responsible for anchoring the dowels, or the site manager appointed by them, or a competent representative of the site manager, must be present on site. They must ensure that the work is carried out correctly.

During the installation of the anchorage, records must be kept by the site manager or their representative to document the anchorage substrate (type of masonry, strength class and mortar group), the temperature in the anchorage substrate and the correct installation. The records must be available on site throughout the construction period and must be presented to the persons responsible for construction supervision upon request. Like the delivery notes, they must be retained by the contractor for at least 5 years after completion of the works.

This decision refers to the following technical specifications:

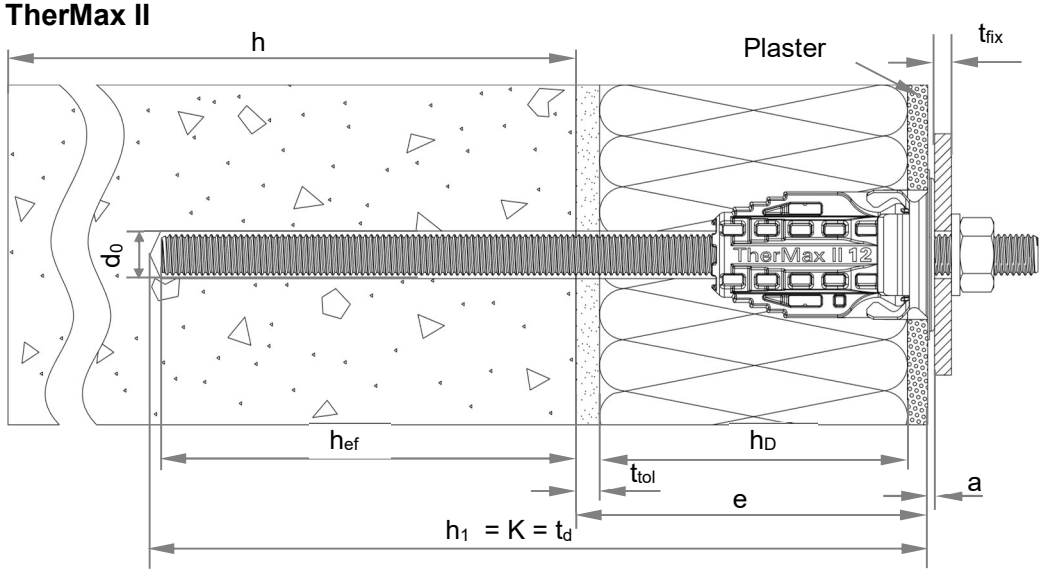
– DIN EN 1993-1-4:2015-10	Eurocode 3: Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels; German version EN 1993-1-4:2006 + A1:2015
– DIN EN 1993-1-4/NA:2020-11	National Annex - Nationally determined parameters - Eurocode 3: Design of steel structures - Part 1-4: General rules - Supplementary rules for stainless steels
– DIN EN 10204:2005-01	Metallic products - Types of inspection documents; German version EN 10204:2004
– DIN EN ISO 898-1:2013	Mechanical properties of fasteners made of carbon steel and alloy steel - Part 1: Bolts, screws and studs with specified property classes - Coarse thread and fine pitch thread (ISO 898-1:2013); German version EN ISO 898-1:2013
– DIN EN ISO 4042:2022-11	Fasteners - Electroplated coating systems (ISO 4042:2022); German version EN ISO 4042:2022
– DIN EN ISO 3506-1:2020-08	Fasteners - Mechanical properties of corrosion-resistant stainless steel fasteners - Part 1: Bolts, screws and studs with specified grades and property classes (ISO 3506-1:2020); German version EN ISO 3506-1:2020
– DIN EN ISO 7089:2000-11	Plain washers - Normal series, Product grade A (ISO 7089:2000); German version EN ISO 7089:2000
– DIN EN ISO 4026:2004-05	Hexagon socket set screws with flat point (ISO 4026:2003); German version EN ISO 4026:2003
– DIN EN ISO 4014:2022-10	Fasteners – Hexagon head bolts – Product classes A and B (ISO 4014:2022); German version: EN ISO 4014:2022
– DIN EN ISO 4032:2023-12	Fasteners - Hexagon head bolts - Product grades A and B (ISO 4014:2022); German version EN ISO 4014:2022
– DIN EN ISO 6946: 2018-03	Building components and building elements - Thermal resistance and thermal transmittance - Calculation methods (ISO 6946:2017); German version EN ISO 6946:2017
– DIN EN ISO 10211:2018-03	Thermal bridges in building construction - Heat flows and surface temperatures - Detailed calculations (ISO 10211:2017); German version EN ISO 10211:2017
– DIN EN 1993-1-1:2010-12	Eurocode 3: Design of steel structures - Part 1-2: General rules - Structural fire design; German version EN 1993-1-2:2005 + AC:2009

Beatrix Wittstock, Dipl.-Ing.
Head of Division

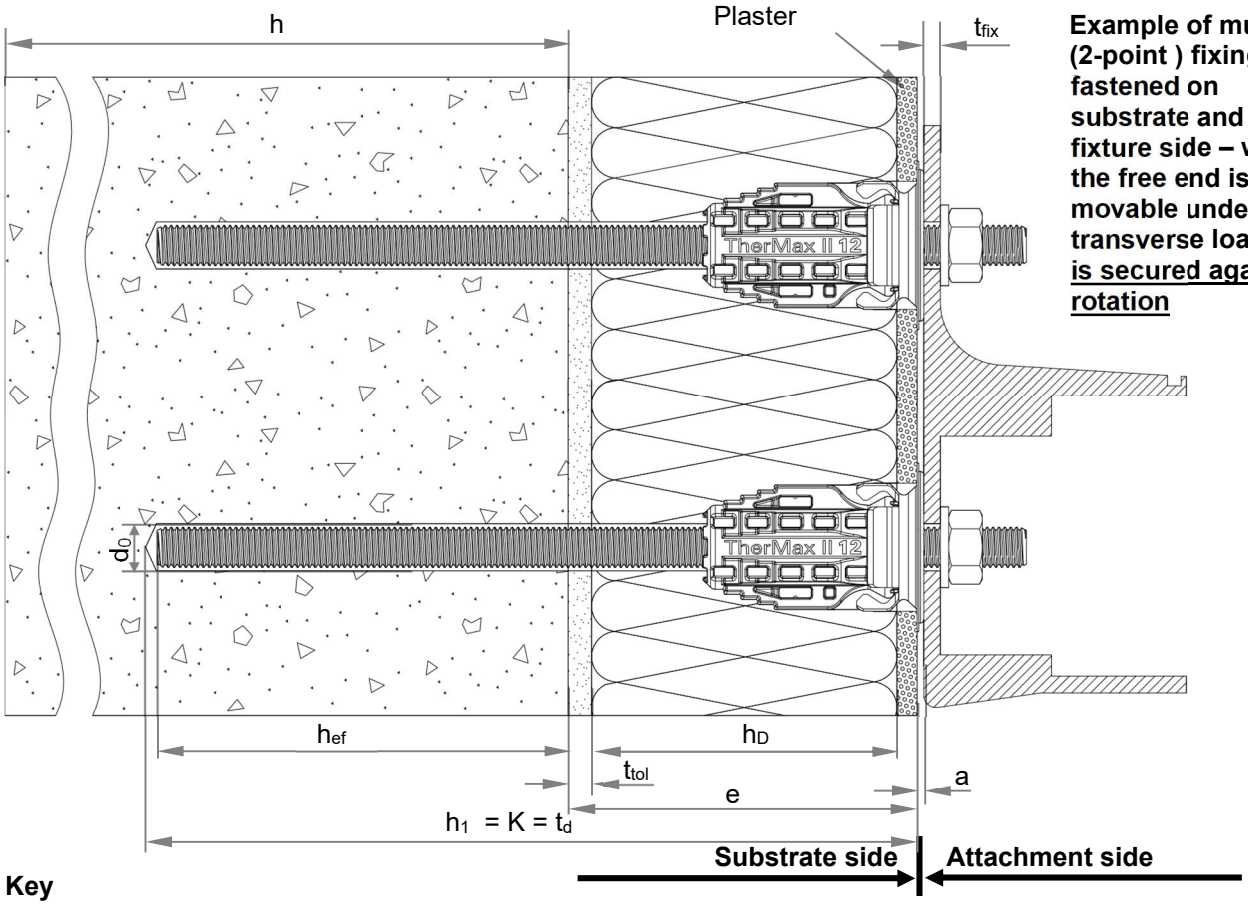
Certified
Aksünger

Deutsches Institut für Bautechnik DIBt

TherMax II



Example of a single fixing at the substrate end – the free end is movable and rotatable under an applied transverse load



Example of multiple (2-point) fixing, fastened on substrate and fixture side – where the free end is movable under a transverse load but is secured against rotation

Key

d_0 = drill hole diameter
h = thickness of member (wall)
h_{ef} = effective anchorage depth
h_D = thickness of insulation material
h_1 = Total drill hole depth of the system (corresponds to K=t_d)
e = distance between surface of base material and ETICS (h_D+t_{tol} + plaster)
a = distance between plaster surface and fixture
t_{tol} = thickness of existing plaster and / or adhesive ETICS
t_{fix} = thickness of fixture

Figures not to scale

fischer TherMax II for anchoring spacer structures in concrete and masonry

Product installation

Annex 1

Deutsches Institut für Bautechnik DIBt

Intended use

Thermal bridge-reduced element for connecting and transferring loads from fixture side to substrate. The system is used for distance installations in insulated or non-insulated base materials, e.g. concrete or various types of masonry.

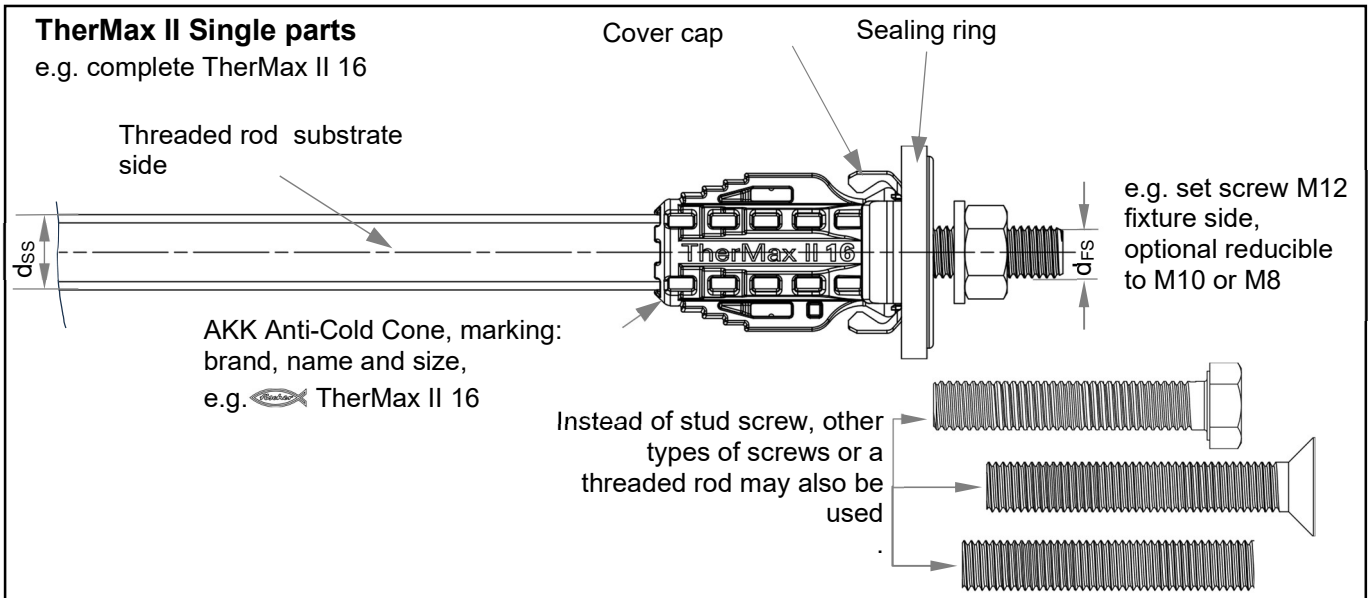
Table 2.1 Substrate-side anchoring of the system in accordance with the following ETA

ETA number	Date	Title and base material
ETA-12/0258	24 October 2023	fischer Superbond for use in concrete
ETA-12/0554	18 October 2019	FIS HT II for use in masonry
ETA-12/0556	7 June 2021	FIS HT II for use in concrete
ETA-17/0979	12 February 2026	FIS EM Plus for use in concrete
ETA-17/0350	29 July 2022	FIS AB for use in concrete
ETA-17/0352	18 August 2022	FIS AB for use in masonry
ETA-17/0435	21 March 2025	T-Bond PRO.1 – FIS C700 HP PRO.1 for use in concrete
ETA-17/0429	4 December 2025	T-Bond PRO.1 – FIS C700 HP PRO.1 for use in masonry
ETA-20/0603	29 April 2026	FIS V Plus for use in concrete
ETA-20/0729	3 February 2025	FIS V Plus for use in masonry
ETA-20/0572	28 April 2021	FIS V Zero for use in concrete
ETA-21/0267	14 November 2024	FIS V Zero for use in masonry

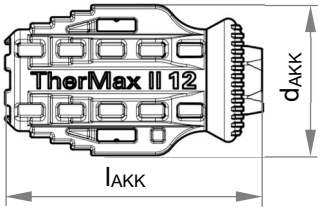
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TherMax II Single parts

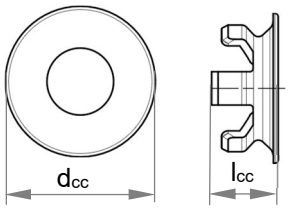
e.g. complete TherMax II 16



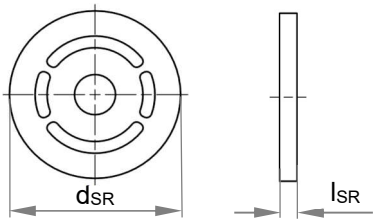
Anti-Cold Cone (AKK)



Cover cap (CC)

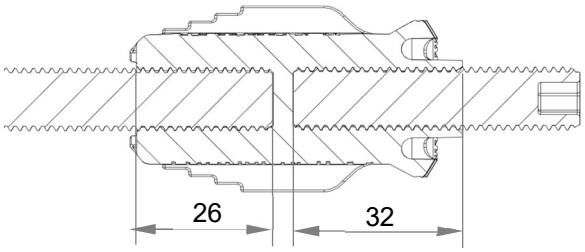


Sealing ring (SR)



Mounting options for threaded rods

e.g. maximum screwed-in



e.g. minimum screwed-in

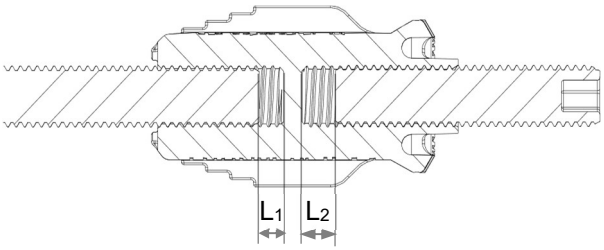


Table 3.1: Dimensions

	d_{SS}	d_{AKK} [mm]	l_{AKK} [mm]	d_{FS}[1)] [mm]	d_{CC} [mm]	l_{CC} [mm]	d_{SR} [mm]	l_{SR} [mm]	Adjustment length L_1 [mm]	Adjustment length L_2 [mm]
TherMax II 12	M12	37	64	M12	45	≥ 20	50	10	≤ 5	≤ 7
TherMax II 16	M16	37	64	M12	45	≥ 20	50	10	≤ 5	≤ 7

[1)] Set screw M12, optional reduced to M10 or M8.

Figures not to scale

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Single parts and dimensions

Annex 3

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Table 4.1: Materials

Designation	Materials	
Anti-Cold Cone (AKK)	Polyamide PA6 GF, colour: black	
Sealing ring (SR)	EPDM	
Cover cap (CC)	Polyamide PA6 GF, colour: black	
fischer injection mortar	See the information in the specified ETAs as per Section 1.2	
FIS H K injection anchor sleeve	See the information in the specified ETAs as per Section 1.2	
Steel parts substrate side		
	Steel galvanised min. 5,µ m	Stainless steel of corrosion resistance class (CRC) in accordance with DIN EN 1993-1-4
Anchor rod M12 or M16	Material in accordance with DIN EN ISO 898-1 M12 f_{uk} ≥ 500 N/mm² f_{yk} ≥ 400 N/mm² M16 f_{uk} ≥ 400 N/mm² f_{yk} ≥ 320 N/mm² Steel galvanised with Zn5/Ag or Zn5/An in accordance with DIN EN ISO 4042	at least CRC III Material in accordance with DIN EN ISO 3506-1 f_{uk} ≥ 700 N/mm² f_{yk} ≥ 450 N/mm²
Steel parts fixture side		
Washer DIN EN ISO 7089	Material in accordance with DIN EN ISO 898-1 f_{uk} ≥ 500 N/mm² f_{yk} ≥ 400 N/mm² Steel galvanised with Zn5/Ag or Zn5/An in accordance with DIN EN ISO 4042	CRC III
Threaded pin M12 or graduated set screw M12/M10 or M12/M8 according to DIN EN ISO 4026 Optional: • Screw M12 in accordance with DIN EN ISO 4014 • Threaded rod (AS) M12 to DIN EN ISO 898-1		CRC III Material in accordance with DIN EN ISO 3506-1 f_{uk} ≥ 500 N/mm² f_{yk} ≥ 210 N/mm²
Hexagon nut DIN EN ISO 4032		

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Materials

Annex 4

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Table 5.1: Installation data for concrete, solid brick and autoclaved aerated concrete

Anchor type				TherMax II 12	TherMax II 16
Nominal drill hole diameter	d_0	=	[mm]	14	18
Member thickness	h	≥	[mm]	See corresponding ETA according to section 1.2	
Effective anchorage depth	h_{ef}	≥	[mm]	See corresponding ETA according to section 1.2	
Total borehole depth of the system (K=t_d)	h_1	≥	[mm]	h_{ef} + e	
Minimum length of the TherMax II	K=t_d	≥	[mm]	See Annex 7, installation step No. 2	
Thickness between the surface of the substrate and the surface of the plaster layer (h_D + t_{tol} + plaster)	e	=	[mm]	65 – 300[1)]	65 – 300[1)]
Distance between the plaster surface and fixture	a	=	[mm]	2 – 7[2)]	2 – 7[2)]
Thickness of fixture	t_{fix}	=	[mm]	2 – 300[3)]	2 – 300[3)]
Installation moment (fixture side)	T_{inst}	=	[Nm]	20	20

[1)] For pure tensile load, the following applies: 60–400 [mm].
[2)] Please note: resistance to driving rain only up to 5 mm; additional sealing required up to 7 mm (see Annex 9, No. 10)
[3)] Bending moments on the plastic cone need not be taken into account if, for example, a wooden component rests directly rests directly against the surface (and the cone). For an M12x55 threaded pin or a threaded pin reduced to M12/M10 or M12/M8, t_{fix} = 2–16 [mm].

Table 5.2: Installation data for hollow or perforated blocks

Anchor type				TherMax II 12	TherMax II 16
Nominal drill hole diameter	d_0	=	[mm]	20	20
Member thickness	h	≥	[mm]	See corresponding ETA according to section 1.2	
Effective anchorage depth	h_{ef}	=	[mm]	See corresponding ETA according to section 1.2	
Total borehole depth of the system (K=t_d)	h_1	≥	[mm]	h_{ef} + e + 10 mm	
Minimum length of the TherMax II	K=t_d	≥	[mm]	See Annex 7, installation step No. 2	
Thickness between the surface of the substrate and the surface of the plaster layer (h_D + t_{tol} + plaster)	e	=	[mm]	65 – 300[1)]	65 – 300[1)]
Distance between the plaster surface and fitting	a	=	[mm]	2 – 7[2)]	2 – 7[2)]
Thickness of fixture	t_{fix}	=	[mm]	2 – 300[3)]	2 – 300[3)]
Installation moment (fixture side)	T_{inst}	=	[Nm]	20	20
Injection anchor sleeve		=	[mm]	See corresponding ETA according to section 1.2	

[1)] For pure tensile load, the following applies: 60–400 [mm].
[2)] Please note: resistance to driving rain only up to 5 mm; additional sealing required up to 7 mm (see Annex 9, No. 10)
[3)] Bending moments on the plastic cone need not be taken into account if, for example, a wooden component rests directly rests directly against the surface (and the cone). For an M12x55 threaded pin or a threaded pin reduced to M12/M10 or M12/M8 , t_{fix} = 2–16 [mm].

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Installation parameters in concrete, solid bricks, autoclaved aerated concrete, hollow or perforated masonry

Annex 5

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Table 6.1: Determining the length of the threaded pin, or optionally the length of the bolt or threaded rod

Thickness of the mounting part t_{fix} [mm]	Minimum length L_S [mm]		
	M12 threaded pin or reduced threaded pin M12/M10 or M12/M8	Anchor rod M12	Fastening screw M12 with washer
2 – 300	$L_S \geq t_{fix} + 47$ mm[1)]	$L_S \geq t_{fix} + 47$ mm[1)]	$L_S \geq t_{fix} + 29$ mm and $L_S \leq t_{fix} + 36$ mm

[1)] Minimum length of L_S for maximum screwing-in depth, see Table 6.2.

Table 6.2: Possible installation data of screw-in length of anchor rods into the plastic part (AKK)

Anchor type	Possible screw-in length[1)] with adjusting length L_1 and L_2			
	$26 - L_1$ [mm]	L_1 [mm]	$32 - L_2$ [mm]	L_2 [mm]
TherMax II 12	21	5	25	7
	26	0	32	0
	21	5	32	0
	26	0	25	7
TherMax II 16	21	5	25	7
	26	0	32	0
	21	5	32	0
	26	0	25	7

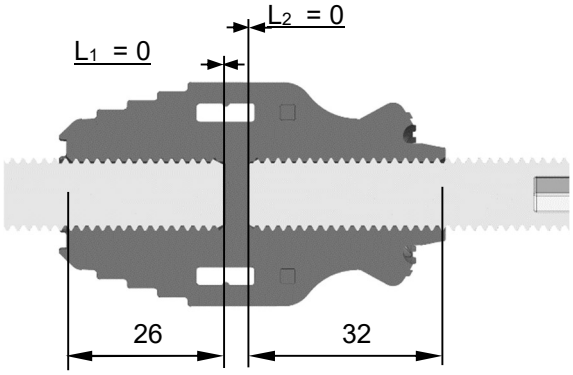
[1)] See illustrations of the various screw-in depths.

Different adjustment illustrations with various screw-in length into the plastic part (AKK)

maximum screwed-in with adjustment length:

L_1 = Substrate side = 0 mm

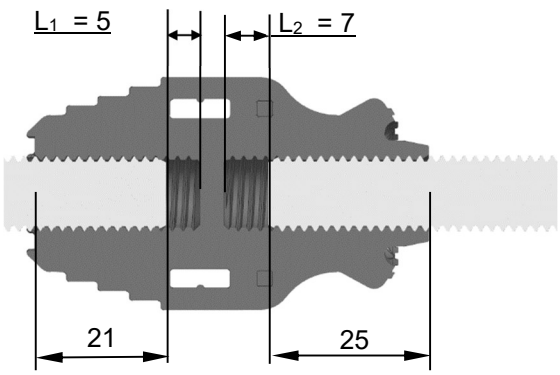
L_2 = Fixture side = 0 mm



minimum screwed-in with adjustment length:

L_1 = Substrate side = 5 mm

L_2 = Fixture side = 7 mm



Figures not to scale
all sizes in [mm]

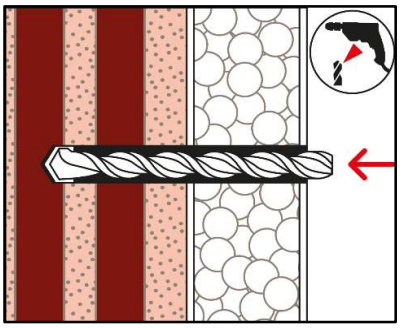
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Minimum screw-lengths
Possible screw-in length – illustrations

Annex 6

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Installation instructions

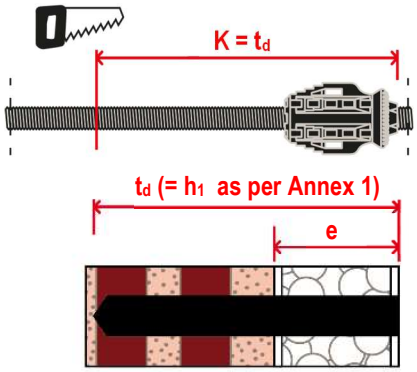


1. Drilling the borehole

- Marking out the boreholes.
- Drill diameter and drilling depth: see Tables 5.1 and 5.2 'Installation data'.
- Drill at right angles to the anchoring surface.

Drilling method:

- see the ETA for the fischer injection mortar.

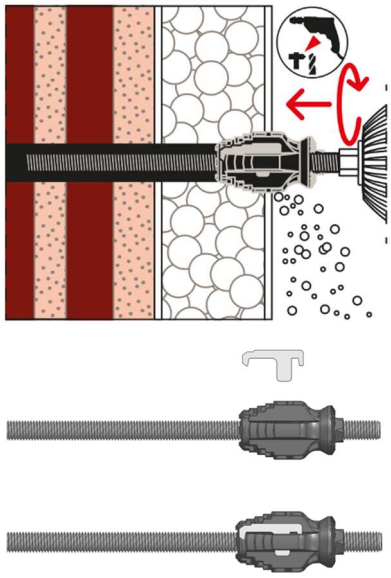


2. Cutting the TherMax II 12 or TherMax II 16 to length

- The threaded rod must be screwed fully into the anti-freeze cone.
- Determine the minimum length K (= t_d = h_{ef} + e) according to the table below and cut the threaded rod to the required length.

				
TherMax II 12	K [mm] = e + 70	K [mm] = e + 80	K [mm] = e + 130[1)]	K [mm] = e + 100
TherMax II 16	K [mm] = e + 80	K [mm] = e + 80	K [mm] = e + 130[1)]	K [mm] = e + 100

[1)] For hollow and perforated blocks, the dimension K must be determined according to the sieve sleeve to be used; see Table 5.2.



3. Milling out the ETICS

- Milling with the complete TherMax II using the hexagonal bit.
- The threaded rod serves as a guide during the milling process.
- **Milling depth**: the upper edge of the anti-cold cone (AKK) should be flush with the plaster surface.
- Mill using the 'impact or hammer drilling' setting on the drill. Clean the threaded rod after milling by brushing it down. Each anti-cold cone (AKK) may only be milled in once.
- **Tip:** For tough plaster, we recommend using the TherMax II milling blade for milling. To do this, insert the milling blade into the anti-cold cone using pliers, as shown. Remove after use.

Figures not to scale

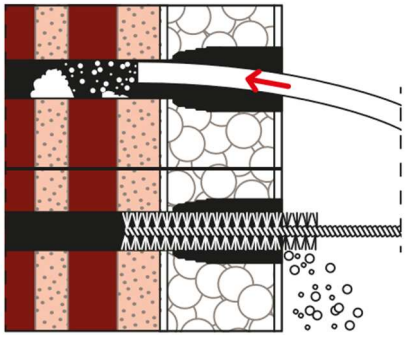
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Installation instructions 1 – 3

Annex 7

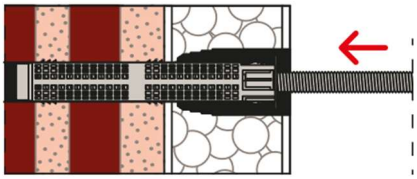
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Assembly instructions



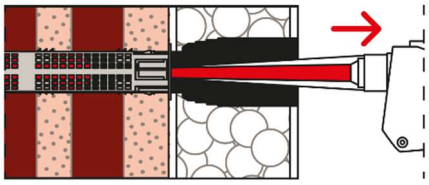
4. Cleaning the drill hole

- Thoroughly clean the drill hole in accordance with the ETA for fischer injection mortar.
- For hollow and perforated building materials, cleaning the drill hole is not necessary.



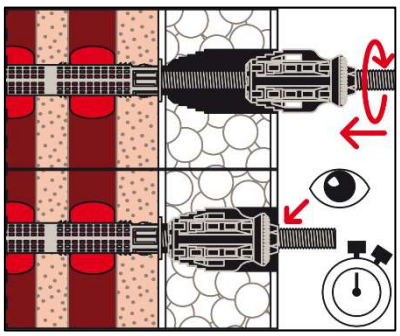
5. Inserting the injection anchor sleeve

- Solid brick / concrete / autoclaved aerated concrete: The injection anchor sleeve is generally not required; see the ETA for fischer injection mortar. Perforated brick: Insert the injection anchor sleeve using the cut-to-length complete TherMax II until the anti-cold cone (AKK) is flush with the render surface. Then pull out the TherMax II.



6. Injection

- Fill the borehole or injection anchor sleeve from the bottom of the borehole with injection mortar, ensuring there are no air bubbles, whilst withdrawing the static mixer a little further out of the borehole after each stroke.
- If the total borehole depth t_d (h_1) is ≥ 250 mm, the static mixer must be used with an extension hose.
- **Important:** Observe the installation steps, mortar quantity and working time in accordance with the ETA and the installation instructions for the fischer injection mortar.



7. Insertion of the TherMax II within the working time of the injection mortar

- Gently rotate the entire TherMax II as you insert it: the anti-cold cone sits centrally in the drill hole without coming into contact with the render, and the outer edge must be flush with the render surface.
- Allow the injection mortar to cure in accordance with the curing times (see the ETA for the fischer injection mortar).

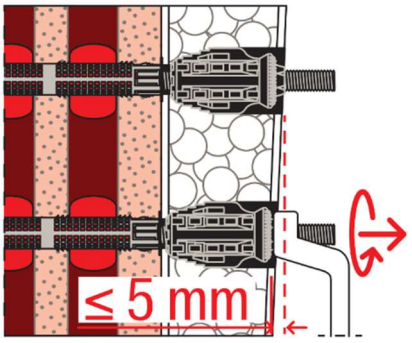
Figures not to scale

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Installation instructions 4 – 7

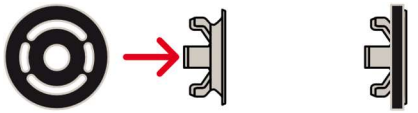
Annex 8

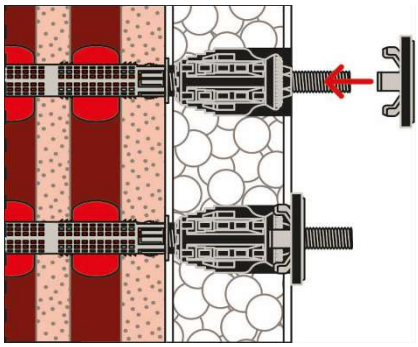
Installation instructions



8. Adjusting the TherMax II

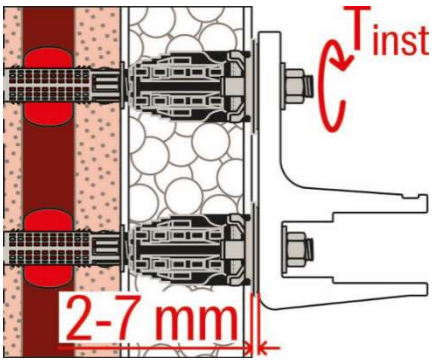
- Any unevenness in the substrate can be compensated for by unscrewing the anti-cold cone (AKK) by a maximum of 5 mm (max. 2.5 turns). Use an offset ring spanner (SW 15) to unscrew the AKK.
- If necessary, unscrew the **threaded pin from the AKK** using the hex bit by a maximum of 7 mm (max. 4 turns) from the AKK. Whilst doing so, prevent the AKK from turning by holding it in place with a cranked ring spanner (SW 15).
- **Important:** Water resistance against driving rain is guaranteed as long as the AKK protrudes no more than 3 mm above the plaster surface. If the AKK protrudes more than 3 mm above the plaster surface, additional sealing is required (see **10**.)





9. Fitting the cover cap

- Fit the EPDM sealing ring onto the cover cap
- Fit the cover cap, together with the EPDM sealing ring, onto the anti-cold cone (AKK).



10. Installation of the fixture

- After tightening the hexagon nut with a torque spanner (installation torque T_{inst}= 20 Nm), the mounting bracket must not rest on the plaster surface. To prevent this, secure the threaded pin with an Allen key to stop the AKK from turning.
- In the case of slotted holes in the transverse load direction (e.g. in an awning mounting profile), the open sections of the slotted holes must be completely filled with injection mortar.
- The gap between the fitted component and the plaster surface must not exceed 5 mm in order to ensure protection against driving rain. For larger gaps of up to 7 mm, suitable additional waterproofing (e.g. a sheet metal cover or a hybrid sealant) is required.

Figures not to scale

fischer TherMax II for anchoring spacer structures in concrete and masonry

Installation instructions 8–10

Annex 9

Table 10.1: Characteristic tension load resistance $N_{Rk,s}$ of the anchor rods on substrate side

Anchor type			TherMax II 12				TherMax II 16			
			Galvanised steel (gvz)		Stainless steel (CRC III)		Galvanised steel (gvz)		Stainless steel (CRC III)	
Nominal tensile strength of anchor rod	f_{uk}	[N/mm²]	500	800[1)]	700	800[1)]	400	800[1)]	700	800[1)]
Characteristic tension resistance	$N_{Rk,s}$	[kN]	42.1	67.4[1)]	59.0	67.4[1)]	62.8	125.6[1)]	109.9	125.6[1)]
Tension diameter	d_S	[mm]	10.36				14.14			
Cross section of thread	A_s	[mm²]	84.3				157.0			
Moment of inertia moment	I	[mm⁴]	565.5				1961.5			
Modulus of elasticity	E	[N/mm²]	210,000		200,000		210,000		200,000	
Partial safety factor	γ_{Ms}	[-]	**1.50**	**1.50**[1)]	**1.87**	**1.60**[1)]	**1.50**	**1.50**[1)]	**1.87**	**1.60**[1)]

[1)] On request, high-load version available.

Table 10.2: Characteristic shear load resistance $V_{Rk,s}$ without lever arm and characteristic bending resistance $M_{Rk,s}$ of the anchor rods on substrate side

Anchor type			TherMax II 12				TherMax II 16			
			Galvanised steel (gvz)		Stainless steel (CRC III)		Galvanised steel (gvz)		Stainless steel (CRC III)	
Nominal tensile strength of anchor rod	f_{uk}	[N/mm²]	500	800[1)]	700	800[1)]	400	800[1)]	700	800[1)]
Characteristic shear load resistance	$V_{Rk,s}$	[kN]	25.3	33.7[1)]	29.5	33.7[1)]	37.7	62.8[1)]	55.0	62.8[1)]
Characteristic bending moment	$M_{Rk,s}$	[Nm]	65.5	104.8[1)]	91.7	104.8[1)]	133.1	266.4[1)]	233.1	266.4[1)]
Partial safety factor	γ_{Ms}	[-]	**1.25**	**1.25**[1)]	**1.56**	**1.33**[1)]	**1.25**	**1.25**[1)]	**1.56**	**1.33**[1)]

[1)] On request, high-load version available.

Table 10.3: Characteristic tension load resistance $N_{Rk,s}$, characteristic shear load resistance $V_{Rk,s}$ without lever arm and characteristic bending resistance $M_{Rk,s}$ of the stud screws M12-M10 and M12-M8, M12 screws and M12 anchor rods on fixture side

Steel components, attached part side			Threaded pin M12 – M8		Threaded pin M12 – M10		Screw M12		Threaded rod M12	
			gvz[1)]	CRC III	gvz[1)]	CRC III	gvz[1)]	CRC III	gvz[1)]	CRC III
Tensile strength	f_{uk}	[N/mm²]	500	500	500	500	500	500	500	500
Char. load-bearing capacity	$N_{Rk,s}$	[kN]	18.3	18.3	29.0	29.0	42.1	42.1	42.1	42.1
Cross section of thread	A_s	[mm²]	36.6	36.6	58.0	58.0	84.3	84.3	84.3	84.3
Partial safety factor	γ_{Ms}	[-]	**1.50**	**2.86**	**1.50**	**2.86**	**1.50**	**2.86**	**1.50**	**2.86**
Characteristic transverse load-carrying capacity	$V_{Rk,s}$	[kN]	11.0	11.0	17.4	17.4	25.3	25.3	25.3	25.3
Partial safety factor	γ_{Ms}	[-]	**1.25**	**2.38**	**1.25**	**2.38**	**1.25**	**2.38**	**1.25**	**2.38**

[1)] Variant available on request.

fischer TherMax II for anchoring spacer assemblies in concrete and masonry

Characteristic tension load resistance of the metal parts and shear load resistance of the threaded rods

Annex 10

Table 11.1: Characteristic resistance $N_{Rk,tk}$ of the plastic part (AKK) and displacement under tension load for the fischer TherMax II

Anchor type			TherMax II 12	TherMax II 16	TherMax II 12	TherMax II 16
			Maximum screw-in depth		Minimum screw-in depth	
			L_1 = 0 mm / L_2 = 0 mm		L_1 = 5 mm / L_2 = 7 mm	
Temperature range 24 °C / 40 °C and 50 °C / 80 °C	$N_{Rk,tk}$	[kN]	**12.20**	**12.20**	**10.50**	**10.50**
	$\delta_{N,ca,0}$ [1]	[mm/kN]	**0.058**	**0.073**	**0.058**	**0.073**
	$\delta_{N,ca,\infty}$ [1]	[mm/kN]	**0.116**	**0.145**	**0.116**	**0.145**
Partial safety factor	$\gamma_{M,tk}$ [2]	[-]	**1.70**			

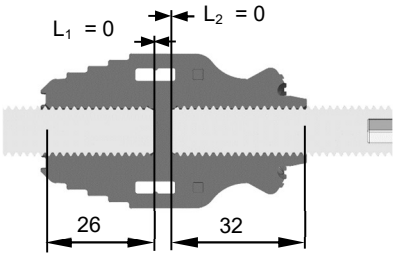
[1] The displacement of the anti-cold cone must be added to the displacement specified in the relevant ETA.
[2] $\gamma_{M,tk}$ for the anti-cold cone.

Table 11.2: Characteristic resistance $P_{Rk,tk}$ of the plastic part (AKK) under pressure load and displacement for the fischer TherMax II

Anchor type			TherMax II 12	TherMax II 16	TherMax II 12	TherMax II 16
			Maximum screw-in depth		Minimum screw-in depth	
			L_1 = 0 mm / L_2 = 0 mm		L_1 = 5 mm / L_2 = 7 mm	
Temperature range 24 °C / 40 °C and 50 °C / 80 °C	$P_{Rk,tk}$	[kN]	**12.10**	**12.10**	**11.60**	**11.60**
	$\delta_{P,ca,0}$ [1]	[mm/kN]	**0.038**	**0.039**	**0.038**	**0.039**
	$\delta_{P,ca,\infty}$ [1]	[mm/kN]	**0.075**	**0.078**	**0.075**	**0.078**
Partial safety factor	$\gamma_{M,tk}$ [2]	[-]	**1.70**			

[1] The displacement of the anti-cold cone must be added to the displacement specified in the relevant ETA.
[2] $\gamma_{M,tk}$ for the anti-cold cone.

maximum screwed-in with adjustment length:
L_1 = Substrate side = 0 mm
L_2 = Fixture side = 0 mm



minimum screwed-in with adjustment length:
L_1 = Substrate side = 5 mm
L_2 = Fixture side = 7 mm

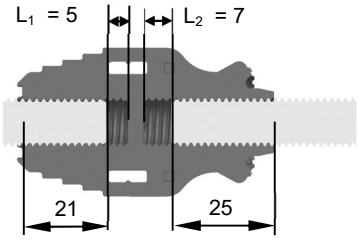


Table 11.3: Characteristic resistance to push-through breakout failure of a single anchor under pressure load

Reduction factor $\alpha_{pressure}$ for compressive load-bearing capacities depending on the number of webs engaged in the hollow or perforated block

Number of webs	$\alpha_{pressure}$
[-]	[-]
1	0.09
2	0.31
3	0.62
≥ 4	1.00

Figures not to scale

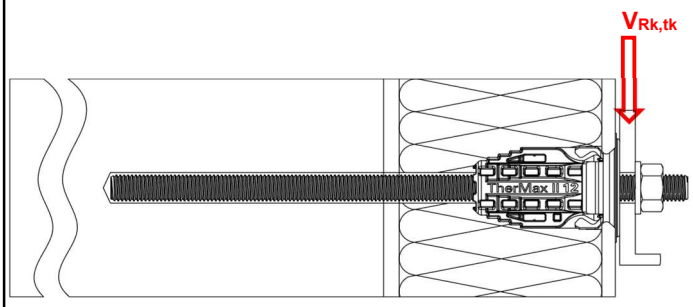
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Characteristic tension and pressure resistance of the plastic part (AKK) at minimum and maximum screw-in length

Annex 11

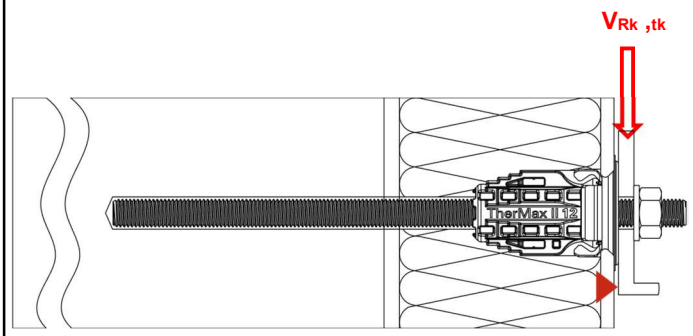
Deutsches Institut für Bautechnik DIBt

Table 12.1: Characteristic lateral load-bearing capacity of the anti-cold cone for TherMax II – simply supported with a freely movable end

Anchor type, e.g. TherMax II 12 – fixed on one side, free edge movable	Screw-in depth [mm]		Temperature range			
			24 °C / 40 °C		50 °C / 80 °C	
			TherMax II			
			12	16	12	16
			$V_{Rk,tk}$ [kN]			
	maximum 0 / 0		5.50	6.30	2.90	3.30
	minimum 5 / 7		4.80	5.00	2.50	2.70
Partial safety factor	$\gamma_{M,tk}$[1)]	[-]	1.70			

[1)] $\gamma_{M,tk}$ for the anti-cold cone.

Table 12.2: Characteristic lateral load-carrying capacity of the anti-cold cone for TherMax II – fixed at both ends with a rotation-secured end

Anchor type e.g. TherMax II 12 – fixed on both sides, free edge not rotatable	Screw-in depth [mm]		Temperature range			
			24 °C / 40 °C		50 °C / 80 °C	
			TherMax II			
			12	16	12	16
			$V_{Rk,tk}$ [kN]			
	maximum 0 / 0		5.50	6.30	2.90	3.30
	minimum 5 / 7		4.80	5.00	2.50	2.70
Partial safety factor	$\gamma_{M,tk}$[1)]	[-]	1.70			

[1)] $\gamma_{M,tk}$ for the anti-cold cone.

Figures not to scale

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Characteristic load-bearing capacity $V_{Rk,tk}$ – simply supported, movable free end
Characteristic load-bearing capacity $V_{Rk,tk}$ – fixed at both ends, free end secured against rotation

Annex 12

Table 13.1: Characteristic resistance $P_{Rk,ca}$ under compressive loading – (buckling of the cantilever) and displacement for TherMax II

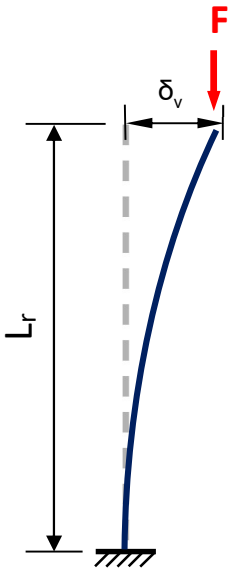
TherMax II 12 maximum screwed-in 0 / 0 mm and minimum screwed-in 5 / 7 mm		
Cantilever / buckling length L_r $e + a + 0.5 \times d_n$[1] $+ 0.5 \times t_{fix}$	**Compressive load $P_{Rk,ca}$**	**Displacement under compressive load**
[mm]	[kN]	[mm]
313	**12.40**	**1.42**
TherMax II 16 maximum screwed-in 0 / 0 mm and minimum screwed-in 5 / 7 mm		
Cantilever / buckling length L_r $e + a + 0.5 \times d_n$[1] $+ 0.5 \times t_{fix}$	**Compressive load $P_{Rk,ca}$**	**Displacement under compressive load**
[mm]	[kN]	[mm]
315	**19.50**	**0.34**

[1] d_n = nominal diameter = d_{SS} .

Representation of buckling according to the characteristic buckling resistance $P_{Rk,ca}$
where:
$L_r = e + a + 0.5 \times d_n + 0.5 \times t_{fix}$

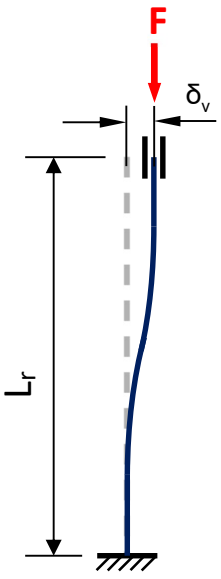
simply supported with a freely movable end

Buckling length coefficient β = 2.0



fixed at both ends with a free end secured against rotation

Buckling length coefficient β = 0.7



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Characteristic resistance under compression (buckling of the cantilever)

Annex 13

Table 14.1: Characteristic buckling resistance $P_{Rk,ca}$ for transverse load displacement δ_V = 1 mm

Anchor type	Thickness of insulation layer + plaster + t_{tol} +a	Maximum shear load displacement	Cantilever arm	Free end, movable[2)]	Free end, not rotatable	Partial safety factor
	e+a	δ_V	l_r	$P_{Rk,ca}$	$P_{Rk,ca}$	γ_{Mca}[1)]
	[mm]	[mm]	[mm]	[kN]	[kN]	[-]
TherMax II 12	65	1	79.50	31.32	31.32	1.30
	120	1	134.50	29.15[3)]		
	160	1	174.50	17.32[3)]		
	220	1	234.50	9.59[3)]		
	300	1	314.50	5.33[3)]		
TherMax II 16	65	1	79.50	59.00	59.00	
	120	1	134.50	59.00		
	160	1	174.50	54.74[3)]		
	220	1	234.50	30.31[3)]		
	300	1	314.50	16.85[3)]	43.53[2)]	

1) $\gamma_{Mca.}$ for buckling failure.
2) Intermediate values may be interpolated.
3) The values calculated in accordance with the Euler cases were decisive for determining the capacity.

Table 14.2: Characteristic buckling resistance $P_{Rk,ca}$ for transverse load displacement δ_V = 2 mm

Anchor type	Thickness of insulation layer + plaster + t_{tol} +a	Maximum shear load displacement	Cantilever arm	Free end, movable[2)]	Free end, not rotatable	Partial safety factor
	e+a	δ_V	l_r	$P_{Rk,ca}$	$P_{Rk,ca}$	γ_{Mca}[1)]
	[mm]	[mm]	[mm]	[kN]	[kN]	[-]
TherMax II 12	65	2	79.50	21.51	21.51	1.30
	120	2	134.50	21.51		
	160	2	174.50	17.32[3)]		
	220	2	234.50	9.59[3)]		
	300	2	314.50	5.33[3)]		
TherMax II 16	65	2	79.50	42.16	42.16	
	120	2	134.50	42.16		
	160	2	174.50	42.16		
	220	2	234.50	30.31[3)]		
	300	2	314.50	16.85[3)]		

1) $\gamma_{Mca.}$ for buckling failure.
2) Intermediate values may be interpolated.
3) The values calculated in accordance with the Euler cases were decisive for determining the performance.

Table 15.1: Characteristic buckling resistance $P_{Rk,ca}$ for transverse load displacement δ_V = 3 mm

Anchor type	Thickness of insulation layer + plaster + t_{tol} +a	Maximum shear load displacement	Cantilever arm	Free end, movable[2]	Free end, not rotatable	Partial safety factor
	e+a	δ_V	l_r	$P_{Rk,ca}$	$P_{Rk,ca}$	γ_{Mca}[1]
	[mm]	[mm]	[mm]	[kN]	[kN]	[-]
TherMax II 12	65	3	79.50	17.27	17.27	1.30
	120	3	134.50	17.27		
	160	3	174.50	17.27		
	220	3	234.50	9.59[3]		
	300	3	314.50	5.33[3]		
TherMax II 16	65	3	79.50	34.63	34.63	
	120	3	134.50	34.63		
	160	3	174.50	34.63		
	220	3	234.50	30.31[3]		
	300	3	314.50	16.85[3]		

[1] γ_{Mca} for buckling failure. [2] Intermediate values may be interpolated.
[3] The values calculated in accordance with the Euler cases were decisive for determining the performance.

Table 15.2: Characteristic buckling resistance $P_{Rk,ca}$ for transverse load displacement δ_V = 5 mm

Anchor type	Thickness of insulation layer + plaster + t_{tol} +a	Maximum shear load displacement	Cantilever arm	Free end, movable[2]	Free end, not rotatable	Partial safety factor
	e+a	δ_V	l_r	$P_{Rk,ca}$	$P_{Rk,ca}$	γ_{Mca}[1]
	[mm]	[mm]	[mm]	[kN]	[kN]	[-]
TherMax II 12	65	5	79.50	13.09	13.09	1.30
	120	5	134.50	13.09		
	160	5	174.50	13.09		
	220	5	234.50	9.59[3]		
	300	5	314.50	5.33[3]		
TherMax II 16	65	5	79.50	27.03	27.03	
	120	5	134.50	27.03		
	160	5	174.50	27.03		
	220	5	234.50	27.03		
	300	5	314.50	16.85[3]		

[1] γ_{Mca} for buckling failure. [2] Intermediate values may be interpolated.
[3] The values calculated in accordance with the Euler cases were decisive for determining the performance.

Table 15.3: Characteristic resistance of the plastic part transferring load to failure under shear load on the cantilever arm – screw-in length -5 / -7 mm

	Shear load resistance				Displacement			
Temperature range	24 °C / 40 °C		50 °C / 80 °C		24 °C / 40 °C	50 °C / 80 °C	24 °C / 40 °C	50 °C / 80 °C
Type of load [2]	Short-term	Long-term	Short-term	Long-term	Short-term		Long-term	
Anchor type	$V_{Rk,ca}$ [kN]				$\delta_{V,ca,0}$ [mm]		$\delta_{V,ca,\infty}$ [mm]	
TherMax II 12	8.15	4.08	6.30	3.67	8.98	8.98	7.98	7.30
TherMax II 16	8.92	3.12	9.96	3.12	7.90	7.90	3.34	3.34
$\gamma_{M,tk}$[1] [-]	1.70							

[1] $\gamma_{M,tk}$ for the anti-cold cone. [2] Short-term loads, e.g. wind loads; long-term loads, e.g. dead load and snow loads.

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Characteristic buckling resistance for specified displacements under shear load

Annex 15

Table 16.1: Shear load V[1] for a single TherMax II 12 anchor with displacements of w = 1, 2, 3, 4 or 5 mm, with a freely movable end, under short-term loading[2)]

Thickness of non-bearing layer e+a	Anchor type: TherMax II 12									
	Temperature range 24 °C / 40 °C					Temperature range 50 °C / 80 °C				
	Shear load V [kN] at displacement of					Shear load V [kN] at displacement of				
	1 mm	2 mm	3 mm	4 mm	5 mm	1 mm	2 mm	3 mm	4 mm	5 mm
65	0.35	1.07	1.75	2.31	2.78	0.29	0.88	1.51	2.00	2.55
80	0.35	0.84	1.27	1.64	1.96	0.29	0.70	1.10	1.42	1.64
100	0.22	0.48	0.77	1.04	1.28	0.18	0.41	0.67	0.90	1.18
120	0.13	0.21	0.36	0.47	0.58	0.10	0.18	0.31	0.41	0.53
140	0.09	0.19	0.31	0.44	0.57	0.07	0.16	0.27	0.38	0.53
160	0.06	0.10	0.17	0.23	0.28	0.05	0.09	0.15	0.20	0.26
180	0.05	0.08	0.13	0.17	0.21	0.04	0.07	0.11	0.15	0.20
200	0.03	0.06	0.10	0.14	0.18	0.02	0.06	0.09	0.12	0.17
220	0.03	0.05	0.08	0.10	0.13	0.02	0.04	0.07	0.09	0.12
240	0.02	0.04	0.06	0.08	0.11	0.02	0.04	0.06	0.07	0.10
250	0.02	0.03	0.06	0.08	0.10	0.02	0.03	0.05	0.07	0.09
260	0.02	0.03	0.05	0.07	0.09	0.02	0.03	0.05	0.06	0.08
280	0.02	0.03	0.04	0.06	0.07	0.01	0.03	0.04	0.05	0.07
300	0.01	0.02	0.04	0.05	0.06	0.01	0.02	0.03	0.04	0.06

[1)] Intermediate values can be interpolated – shear load data are limited due to ultimate limit state verifications of the performance given in Table. 15.3.
[2)] Short-term loads, e.g. wind loads.

Table 16.2: Shear load V[1)] for a single TherMax II 12 anchor with displacements of w = 1, 2, 3, 4 or 5 mm, with a freely movable end, under long-term loading[2)]

Thickness of non-bearing layer e+a	Anchor type TherMax II 12									
	Temperature range 24 °C / 40 °C					Temperature range 50 °C / 80 °C				
	Shear load V [kN] at displacement of					Shear load V [kN] at displacement of				
	1 mm	2 mm	3 mm	4 mm	5 mm	1 mm	2 mm	3 mm	4 mm	5 mm
65	0.23	0.71	1.17	1.54	1.85	0.19	0.59	1.00	1.33	1.50
80	0.23	0.56	0.85	1.09	1.26	0.19	0.47	0.73	0.93	0.93
100	0.14	0.32	0.52	0.70	0.86	0.12	0.28	0.45	0.61	0.73
120	0.09	0.15	0.25	0.34	0.41	0.07	0.13	0.22	0.29	0.38
140	0.07	0.14	0.23	0.32	0.41	0.05	0.12	0.20	0.28	0.38
160	0.05	0.08	0.13	0.17	0.22	0.04	0.07	0.12	0.15	0.20
180	0.04	0.06	0.11	0.14	0.17	0.03	0.06	0.09	0.12	0.16
200	0.03	0.06	0.09	0.13	0.16	0.02	0.05	0.08	0.11	0.15
220	0.03	0.04	0.07	0.09	0.12	0.02	0.04	0.06	0.08	0.11
240	0.02	0.03	0.06	0.08	0.10	0.02	0.03	0.05	0.07	0.09
250	0.02	0.03	0.05	0.07	0.09	0.02	0.03	0.05	0.06	0.08
260	0.02	0.03	0.05	0.06	0.08	0.01	0.03	0.04	0.06	0.07
280	0.01	0.02	0.04	0.05	0.07	0.01	0.02	0.04	0.05	0.06
300	0.01	0.02	0.03	0.05	0.06	0.01	0.02	0.03	0.04	0.05

[1)] Intermediate values can be interpolated – shear load data are limited due to ultimate limit state verifications of the performance given in Table. 15.3.
[2)] Long-term loads, e.g. dead load and snow loads.

Table 17.1: Shear load V[1)] for a single TherMax II 12 anchor with displacements of w = 1, 2, 3, 4 or 5 mm, clamped at both ends with a movable, anti-rotation end, under short-term loading[2)]

Thickness of non-bearing layer e+a	Anchor type TherMax II 12									
	Temperature range 24 °C / 40 °C					Temperature range 50 °C / 80 °C				
	Shear load V [kN] at displacement of					Shear load V [kN] at displacement of				
	1 mm	2 mm	3 mm	4 mm	5 mm	1 mm	2 mm	3 mm	4 mm	5 mm
65	1.31	2.32	2.97	2.97	2.97	1.07	1.92	2.30	2.30	2.30
80	1.23	2.01	2.01	2.01	2.01	1.01	1.55	1.55	1.55	1.55
100	0.76	1.34	1.58	1.58	1.58	0.62	1.15	1.22	1.22	1.22
120	0.56	1.00	1.36	1.43	1.43	0.46	0.87	1.10	1.10	1.10
140	0.52	0.90	1.21	1.28	1.28	0.43	0.80	0.99	0.99	0.99
160	0.33	0.58	0.89	1.13	1.13	0.27	0.52	0.78	0.87	0.87
180	0.27	0.52	0.73	0.91	0.98	0.22	0.47	0.65	0.76	0.76
200	0.14	0.32	0.49	0.64	0.75	0.12	0.30	0.44	0.56	0.64
220	0.14	0.30	0.44	0.58	0.69	0.12	0.28	0.40	0.51	0.61
240	0.09	0.19	0.30	0.40	0.51	0.07	0.18	0.27	0.36	0.47
250	0.09	0.17	0.26	0.35	0.43	0.07	0.17	0.24	0.31	0.40
260	0.09	0.17	0.26	0.35	0.43	0.07	0.17	0.24	0.31	0.40
280	0.08	0.16	0.24	0.33	0.41	0.07	0.16	0.22	0.29	0.38
300	0.06	0.13	0.20	0.27	0.33	0.05	0.13	0.18	0.24	0.31

[1)] Intermediate values can be interpolated – shear load data are limited due to ultimate limit state verifications of the performance given in Table. 15.3.
[2)] Short-term loads, e.g. wind loads.

Table 17.2: Shear load V[1)] for a single TherMax II 12 anchor with displacements of w = 1, 2, 3, 4 or 5 mm, clamped at both ends with a movable, rotation-locked end, under long-term loading[2)]

Thickness of non-bearing layer e+a	Anchor type TherMax II 12									
	Temperature range 24 °C / 40 °C					Temperature range 50 °C / 80 °C				
	Shear load V [kN] at displacement of					Shear load V [kN] at displacement of				
	1 mm	2 mm	3 mm	4 mm	5 mm	1 mm	2 mm	3 mm	4 mm	5 mm
65	0.87	1.55	1.76	1.76	1.76	0.71	1.28	1.30	1.30	1.30
80	0.82	1.19	1.19	1.19	1.19	0.67	0.88	0.88	0.88	0.88
100	0.51	0.90	0.94	0.94	0.94	0.41	0.69	0.69	0.69	0.69
120	0.40	0.72	0.85	0.85	0.85	0.33	0.62	0.62	0.62	0.62
140	0.39	0.67	0.76	0.76	0.76	0.32	0.56	0.56	0.56	0.56
160	0.25	0.44	0.67	0.67	0.67	0.21	0.40	0.49	0.49	0.49
180	0.22	0.42	0.58	0.58	0.58	0.18	0.39	0.43	0.43	0.43
200	0.13	0.28	0.44	0.49	0.49	0.10	0.26	0.36	0.36	0.36
220	0.13	0.27	0.39	0.47	0.47	0.10	0.25	0.34	0.34	0.34
240	0.08	0.17	0.27	0.36	0.42	0.06	0.16	0.24	0.31	0.31
250	0.08	0.16	0.24	0.32	0.39	0.06	0.15	0.22	0.28	0.29
260	0.08	0.16	0.24	0.32	0.37	0.06	0.15	0.22	0.27	0.27
280	0.07	0.15	0.22	0.30	0.35	0.06	0.14	0.20	0.26	0.26
300	0.06	0.12	0.18	0.24	0.30	0.05	0.12	0.17	0.21	0.26

[1)] Intermediate values can be interpolated – shear load data are limited due to ultimate limit state verifications of the performance given in Table. 15.3.
[2)] Long-term loads, e.g. dead load and snow loads.

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Shear load for a single TherMax II 12 anchor under displacement, clamped at both ends and with a rotation-secured end, under short-term and long-term loads

Annex 17

Table 18.1: Shear load V[1)] for a single TherMax II 16 anchor with displacements of w = 1, 2, 3, 4 or 5 mm, with a freely movable end, under short-term loading[2)]

Thickness of non-bearing layer e+a	Anchor type TherMax II 16									
	Temperature range 24 °C / 40 °C					Temperature range 50 °C / 80 °C				
	Shear load V [kN] at displacement of					Shear load V [kN] at displacement of				
	1 mm	2 mm	3 mm	4 mm	5 mm	1 mm	2 mm	3 mm	4 mm	5 mm
65	0.70	1.62	2.48	3.57	3.75	0.33	1.31	2.42	3.57	3.75
80	0.70	1.62	2.48	2.89	2.89	0.33	1.31	2.32	2.89	2.89
100	0.61	1.29	1.89	2.24	2.24	0.32	1.03	1.74	2.17	2.24
120	0.29	0.65	0.97	1.35	1.62	0.16	0.51	0.87	1.23	1.51
140	0.24	0.55	0.88	1.15	1.15	0.14	0.43	0.78	1.08	1.15
160	0.16	0.34	0.51	0.65	0.79	0.10	0.27	0.44	0.57	0.72
180	0.12	0.27	0.39	0.50	0.61	0.08	0.21	0.33	0.44	0.55
200	0.09	0.20	0.33	0.48	0.61	0.06	0.15	0.28	0.41	0.55
220	0.08	0.17	0.25	0.32	0.40	0.06	0.13	0.21	0.27	0.35
240	0.07	0.14	0.21	0.27	0.33	0.05	0.11	0.17	0.22	0.29
250	0.06	0.13	0.19	0.25	0.30	0.05	0.10	0.15	0.20	0.27
260	0.06	0.12	0.18	0.23	0.28	0.04	0.09	0.14	0.18	0.24
280	0.05	0.10	0.15	0.19	0.24	0.04	0.08	0.12	0.15	0.21
300	0.04	0.09	0.13	0.17	0.21	0.04	0.07	0.10	0.13	0.18

[1)] Intermediate values can be interpolated – shear load data are limited due to ultimate limit state verifications of the performance given in Table. 15.3.
[2)] Short-term loads, e.g. wind loads.

Table 18.2: Shear load V[1)] for a single TherMax II 16 anchor with displacements of w = 1, 2, 3, 4 or 5 mm, with a freely movable end, under long-term loading[2)]

Thickness of non-bearing layer e+a	Anchor type TherMax II 16									
	Temperature range 24 °C / 40 °C					Temperature range 50 °C / 80 °C				
	Shear load V [kN] at displacement of					Shear load V [kN] at displacement of				
	1 mm	2 mm	3 mm	4 mm	5 mm	1 mm	2 mm	3 mm	4 mm	5 mm
65	0.47	1.08	1.21	1.96	1.98	0.22	0.88	1.61	1.98	1.98
80	0.47	1.08	1.21	1.53	1.53	0.22	0.87	1.53	1.53	1.53
100	0.41	0.86	1.19	1.19	1.19	0.21	0.69	1.19	1.19	1.19
120	0.20	0.43	0.65	0.90	0.90	0.12	0.37	0.64	0.90	0.90
140	0.16	0.37	0.59	0.61	0.61	0.11	0.32	0.59	0.61	0.61
160	0.11	0.23	0.34	0.43	0.52	0.08	0.20	0.34	0.45	0.57
180	0.08	0.18	0.26	0.33	0.41	0.07	0.17	0.28	0.37	0.47
200	0.06	0.13	0.22	0.32	0.41	0.05	0.13	0.25	0.37	0.47
220	0.05	0.12	0.17	0.22	0.26	0.05	0.12	0.19	0.25	0.32
240	0.05	0.10	0.14	0.18	0.22	0.05	0.10	0.15	0.20	0.27
250	0.04	0.09	0.13	0.16	0.20	0.04	0.09	0.14	0.19	0.24
260	0.04	0.08	0.12	0.15	0.19	0.04	0.08	0.13	0.17	0.22
280	0.03	0.07	0.10	0.13	0.16	0.04	0.07	0.11	0.14	0.19
300	0.03	0.06	0.09	0.11	0.14	0.03	0.06	0.09	0.12	0.16

[1)] Intermediate values can be interpolated – shear load data are limited due to ultimate limit state verifications of the performance given in Table. 15.3.
[2)] Long-term loads, e.g. dead load and snow loads.

Table 19.1: Shear load V[1)] for a single TherMax II 16 anchor with displacements of w = 1.2, 3, 4 or 5 mm, clamped at both ends with a movable, rotation-locked end, under short-term loading[2)]

Thickness of non-bearing layer e+a	Anchor type TherMax II 16									
	Temperature range 24 °C / 40 °C					Temperature range 50 °C / 80 °C				
	Shear load V [kN] at displacement of					Shear load V [kN] at displacement of				
	1 mm	2 mm	3 mm	4 mm	5 mm	1 mm	2 mm	3 mm	4 mm	5 mm
65	1.35	2.61	3.18	3.18	3.18	0.64	2.11	3.18	3.18	3.18
80	1.35	2.61	2.70	2.70	2.70	0.64	2.11	2.70	2.70	2.70
100	1.06	2.14	2.23	2.23	2.23	0.55	1.71	2.23	2.23	2.23
120	0.91	1.77	1.77	1.77	1.77	0.50	1.43	1.77	1.77	1.77
140	0.71	1.38	1.47	1.47	1.47	0.42	1.08	1.47	1.47	1.47
160	0.66	1.18	1.18	1.18	1.18	0.41	0.98	1.18	1.18	1.18
180	0.55	1.02	1.02	1.02	1.02	0.36	0.82	1.02	1.02	1.02
200	0.42	0.79	0.91	0.91	0.91	0.28	0.60	0.91	0.91	0.91
220	0.27	0.56	0.81	0.81	0.81	0.19	0.42	0.68	0.81	0.81
240	0.26	0.50	0.72	0.78	0.78	0.19	0.38	0.58	0.77	0.78
250	0.16	0.34	0.51	0.68	0.72	0.12	0.25	0.40	0.56	0.72
260	0.16	0.31	0.46	0.61	0.66	0.12	0.23	0.36	0.50	0.66
280	0.16	0.31	0.46	0.46	0.62	0.12	0.23	0.35	0.37	0.62
300	0.07	0.18	0.30	0.43	0.56	0.06	0.13	0.22	0.33	0.48

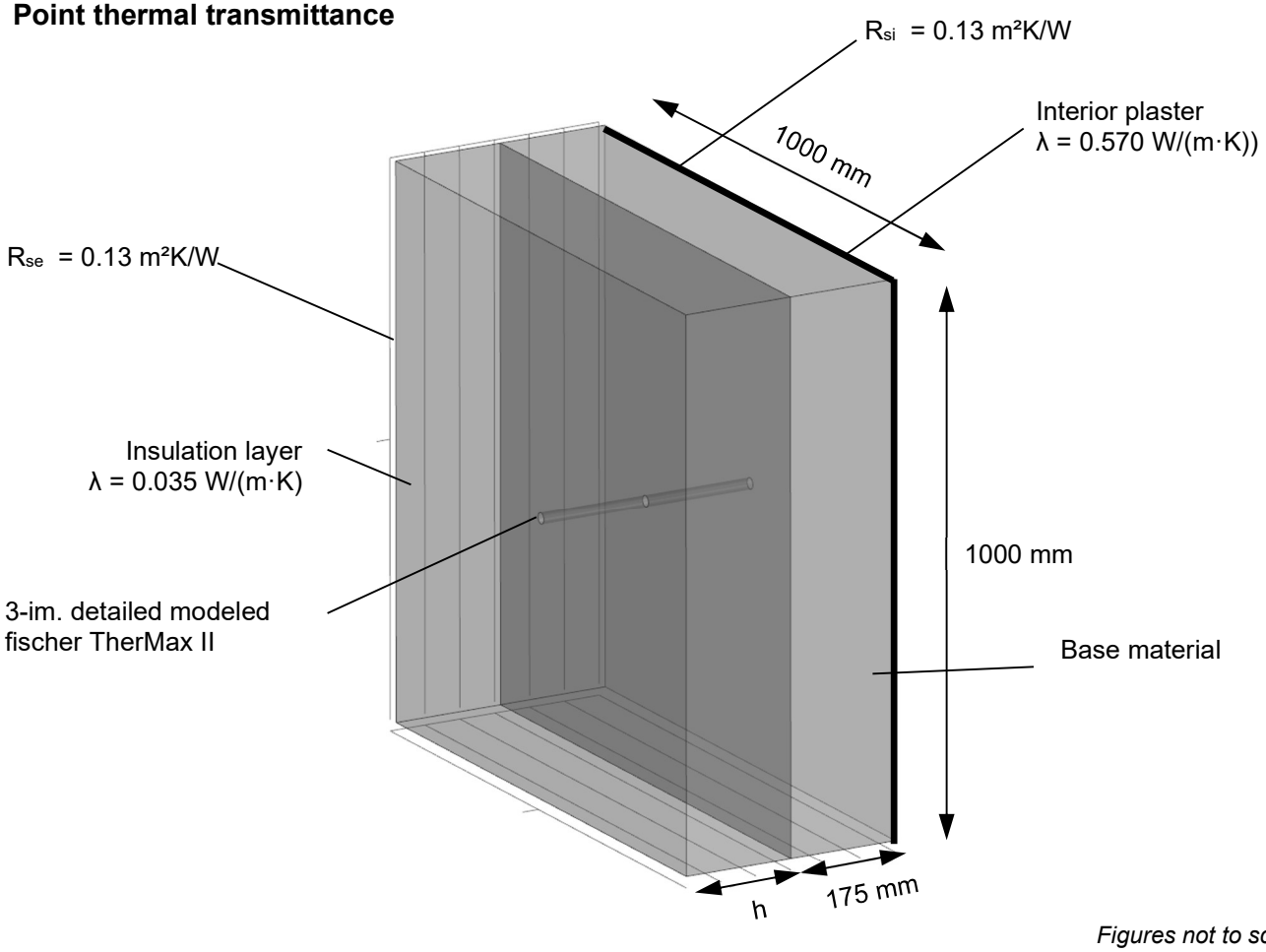
[1)] Intermediate values can be interpolated – shear load data are limited due to ultimate limit state verifications of the performance given in Table. 15.3.
[2)] Short-term loads, e.g. wind loads.

Table 19.2: Shear load V[1)] for a single TherMax II 16 anchor with displacements of w = 1.2, 3, 4 or 5 mm, clamped at both ends with a movable, rotation-locked end, under long-term loading[2)]

Thickness of non-bearing layer e+a	Anchor type TherMax II 16									
	Temperature range 24 °C / 40 °C					Temperature range 50 °C / 80 °C				
	Shear load V [kN] at displacement of					Shear load V [kN] at displacement of				
	1 mm	2 mm	3 mm	4 mm	5 mm	1 mm	2 mm	3 mm	4 mm	5 mm
65	1.03	1.69	1.69	1.69	1.69	0.42	1.41	1.67	1.69	1.69
80	1.03	1.43	1.43	1.43	1.43	0.42	1.41	1.43	1.43	1.43
100	0.71	1.18	1.18	1.18	1.18	0.37	1.15	1.18	1.18	1.18
120	0.65	0.94	0.94	0.94	0.94	0.36	0.94	0.94	0.94	0.94
140	0.53	0.78	0.78	0.78	0.78	0.31	0.78	0.78	0.78	0.78
160	0.50	0.63	0.63	0.63	0.63	0.31	0.63	0.63	0.63	0.63
180	0.45	0.54	0.54	0.54	0.54	0.29	0.54	0.54	0.54	0.54
200	0.37	0.48	0.48	0.48	0.48	0.25	0.48	0.48	0.48	0.48
220	0.24	0.43	0.43	0.43	0.43	0.17	0.38	0.43	0.43	0.43
240	0.23	0.41	0.41	0.41	0.41	0.17	0.34	0.41	0.41	0.41
250	0.14	0.31	0.38	0.38	0.38	0.11	0.23	0.37	0.38	0.38
260	0.14	0.28	0.35	0.35	0.35	0.11	0.21	0.33	0.35	0.35
280	0.14	0.28	0.33	0.33	0.33	0.11	0.21	0.32	0.33	0.33
300	0.07	0.17	0.27	0.33	0.33	0.06	0.12	0.20	0.30	0.33

[1)] Intermediate values can be interpolated – shear load data are limited due to ultimate limit state verifications of the performance given in Table. 15.3.
[2)] Long-term loads, e.g. dead load and snow loads.

Point thermal transmittance



Figures not to scale
all sizes in [mm]

Table 20.1: Thermal conductivity values for determining equivalent thermal conductivity

Name	Material	Equivalent thermal conductivity λ [W/(m·K)]
Anchor rod (substrate side)	Galvanised steel	50
Anchor rod (substrate side)	Stainless steel	17
Stud screw (fixture side)	Stainless steel	17
Plastic part (AKK)	Polyamide PA6 GF	0.574
Plaster	Gypsum	0.570
Base material group	Concrete	2.300
Insulation material	Insulation	0.035

fischer TherMax II for anchoring spacer assemblies in concrete and masonry

Point thermal transmittance scheme of testing and table of equivalent thermal conductivity values

Annex 20

Table 21.1: Point thermal transmittance and equivalent thermal conductivity values for TherMax II, base material concrete, solid- and hollow and perforate masonry and aerated autoclaved concrete

Anchor type	Material of anchor rod	Embedment depth L_N[1] [mm]	Insulation thickness h_D [mm]	Point thermal transmittance χ[2] [W/K]	Equivalent thermal conductivity λ_{eq} [W/(m·K)]
TherMax II 12	Galvanized steel (gvz)	70[3]	60	0.0040	1.7
			100	0.0051	3.5
			150	0.0058	4.9
			200	0.0061	6.0
			250	0.0061	6.7
			300	0.0061	7.3
	Stainless steel (CRC III)		60	0.0036	1.2
			100	0.0041	2.2
			150	0.0041	2.6
			200	0.0039	2.8
			250	0.0036	3.0
			300	0.0033	3.1
TherMax II 16	Galvanized steel (gvz)	80[3]	60	0.0053	5.1
			100	0.0054	4.1
			150	0.0065	6.5
			200	0.0072	8.5
			250	0.0076	10.2
			300	0.0078	11.4
	Stainless steel (CRC III)		60	0.0047	3.3
			100	0.0046	2.8
			150	0.0051	3.8
			200	0.0052	4.5
			250	0.0050	4.9
			300	0.0048	5.1

[1] L_N = nominal length = effective anchorage depth h_{ef} .

[2] Calculation based on A_N derived from the core diameter of the anti-cold cone with a diameter of 25 mm.

[3] Different anchorage depths apply for masonry bricks and aerated concrete blocks; see the relevant ETA for the injection mortar in accordance with section 1.2; values for χ and λ_{eq} are valid up to a maximum anchorage depth of 130 mm.