Deutsches Institut für Bautechnik

Zulassungsstelle für Bauprodukte und Bauarten
Bautechnisches Prüfamt
Eine vom Bund und den Ländern gemeinsam getragene Anstalt des öffentlichen Rechts
Mitglied der EOTA, der UEAtc und der WFTAO

National technical approval / General construction technique permit

Date: 1 Feb 2021

Reference: I 5-1.9.1-14/20

Number:
Z-9.1-887

Validity
from: **1 February 2021**
to: **18 June 2024**

Applicant:

fischerwerke GmbH & Co. KG
Klaus-Fischer-Straße 1
72178 Waldachtal, Germany

Subject of decision:

fischer termoz 6 H fasteners for fixing external thermal insulation composite systems to external walls made of timber

The subject named above is herewith granted a national technical approval (*allgemeine bauaufsichtliche Zulassung*) / general construction technique permit (*allgemeine Bauartgenehmigung*).
This decision contains eleven pages and five annexes.
This national technical approval / general construction technique permit replaces national technical approval / general construction technique permit No. Z-9.1-887 of 18 June 2019. The subject concerned was granted the first national technical approval on 18 June 2019.

Translation authorised by DIBt

I GENERAL PROVISIONS

1 This decision confirms the fitness for use and application of the subject concerned within the meaning of the Building Codes of the federal states (*Landesbauordnungen*).

2 This decision does not replace the permits, approvals and certificates required by law for carrying out construction projects.

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

4 Notwithstanding further provisions in the 'Special Provisions', copies of this decision shall be made available to the user and installer of the subject concerned. The user and installer of the subject concerned shall also be made aware that this decision must be made available at the place of use or place of application. Upon request, copies of the decision shall be provided to the authorities involved.

5 This decision shall be reproduced in full only. Partial publication requires the consent of DIBt. Texts and drawings in promotional material shall not contradict this decision. In the event of a discrepancy between the German original and this authorised translation, the German version shall prevail.

6 This decision may be revoked. The provisions contained herein may subsequently be supplemented and amended, in particular if this is required by new technical findings.

7 This decision is based on the information and documents provided by the applicant. Alterations to this basis are not covered by this decision and shall be notified to DIBt without delay.

8 The general construction technique permit included in this decision also serves as a national technical approval for the construction technique.

II SPECIAL PROVISIONS

1 Subject concerned and field of use and application

1.1 Subject of approval and field of use

The approval covers fischer termoz 6 H fasteners consisting of a partially threaded screw with an outer thread diameter d = 6 mm and a plate element (support disc) with a diameter of 60 mm made of glass fibre reinforced plastic (hereinafter referred to as screw anchor). The special screws for the fischer termoz 6 H fasteners are made of galvanised steel or stainless steel.

Fischer termoz 6 H fasteners shall only be used under static or quasi-static actions. Fatigue-relevant loads shall be excluded.

For the field of use of the screw anchors, depending on the environmental conditions,

DIN EN 1993-1-4 in conjunction with DIN EN 1993-1-4/NA and decision No. Z-30.3-6 shall apply to screws made of stainless steel.

For the field of use of the screws made of galvanised carbon steel, depending on the environmental conditions, DIN EN 1995-1-1 in conjunction with DIN EN 1995-1-1/NA shall apply.

1.2 Subject of permit and field of application

The subject of the permit is the planning, design and execution of the fastening system used to fix external thermal insulation composite systems (ETICS) to external walls made of timber using fischer termoz 6 H fasteners.

2 Provisions for the construction products

2.1 Properties and composition

The fischer termoz 6 H fastener shall comply with the annexes and the information deposited with DIBt.

The partially threaded screws of the fischer termoz 6 H fasteners made of galvanised steel shall be made of steel in accordance with the material specification deposited with DIBt. The thickness of the galvanisation of the screws shall be at least 5 µm.

The partially threaded screws of the fischer termoz 6 H fasteners made of stainless steel shall be manufactured from stainless steels with material numbers 1.4301, 1.4401, 1.4529, 1.4539, 1.4567 or 1.4571 in accordance with DIN EN 10263-5.

The fischer termoz 6 H fasteners shall have at least the characteristic load-bearing capacity values given in Table 1.

Table 1 Characteristic load-bearing capacity values of the screws of the fischer termoz 6 H fasteners

Variant of the screw	Galvanised steel	Stainless steel
Characteristic tensile strength $f_{tens,k}$ in kN	13	7.4
Characteristic torsional strength $f_{tor,k}$ in Nm	10	6.5

It shall be possible to bend the screws of the fischer termoz 6 H fasteners by an angle of $\alpha = (45/d^{0.7}+10)$ degrees (d = outer thread diameter in mm) without visible bending cracks.

The plate element shall meet the requirements given in Table 2.

Table 2 Requirements for the plate element

Material	Diameter in mm	Plate stiffness in accordance with EOTA Technical Report TR 026:2016-05 [kN/mm]	Characteristic load-bearing capacity of the plate element in accordance with EOTA Technical Report TR 026:2016-05 [kN]
Polyamide PA6 GF 30 in accordance with deposited material specification	60	1.3	3.8

2.2 Marking

The packaging and/or delivery note for the fasteners shall be marked by the manufacturer with the national conformity mark (*Ü-Zeichen*) in accordance with the Conformity Marking Ordinances (*Übereinstimmungszeichen-Verordnungen*) of the federal states. The mark shall only be applied if the requirements given in Section 2.3 are met.

Furthermore, the packaging or the delivery note shall contain the following information:

- name of the subject of approval: "fischer termoz 6 H",
- length of the fastener,
- material of the screw (galvanised carbon steel or stainless steel with specification of the steel grade, e.g. A2 in accordance with Z-30.3-6 or the corrosion resistance class, e.g. CRC II in accordance with DIN EN 1993-1-4).

2.3 Confirmation of conformity

2.3.1 General

The manufacturer shall confirm for each manufacturing plant that the fischer termoz 6 H fastener complies with the provisions of the national technical approval included in this decision by way of a declaration of conformity based on factory production control and a certificate of conformity issued by a recognised certification body as well as on regular external surveillance, including initial type-testing of the fasteners, carried out in accordance with the following provisions.

To issue the certificate of conformity and for external surveillance, including the associated product testing, the manufacturer of the fasteners shall use a certification body and an inspection body recognised for these purposes.

The declaration of conformity shall be submitted by the manufacturer through marking of the construction products with the national conformity mark including a statement of the intended use.

The certification body shall send a copy of the certificate of conformity issued by it to DIBt.

2.3.2 Factory production control

A factory production control system shall be set up and implemented in each manufacturing plant. Factory production control shall be understood to be continuous surveillance of production by the manufacturer to ensure that the manufactured construction products satisfy the provisions of the national technical approval included in this decision.

The factory production control shall at least include the following measures:

Special screws:

- The wire rod used shall at least have a DIN EN 10204 "inspection certificate type 3.1"; this inspection document shall be used to verify compliance with the requirements given in Section 2.1.
- An inspection certificate "type 3.2" in accordance with DIN EN 10204 shall be supplied for the composition and layer thickness of the galvanisation of the screw; this certificate shall be used to verify compliance with the requirement given in Section 2.1.
- Testing of the torsional strength of the screw. The required value given in Section 2.1 of this decision shall be met.
- Bending test with a bend angle of $\alpha \geq (45/d^{0.7}+10)$ degrees (d in mm). It shall be possible to bend the screws to this angle without visible bending cracks.
- Verification of the dimensions of the screws.

Plate element:

- The raw material shall at least have a DIN EN 10204 inspection certificate "type 3.1"; this certificate shall be used to verify compliance with the requirements given in Section 2.1.
- The following characteristics of the raw material shall be determined twice a year:
  - Density (injection-moulded part) in accordance with DIN EN ISO 1183,
  - Melt volume-flow rate (MVR) in accordance with DIN EN ISO 1133 under measurement conditions in accordance with DIN EN ISO 16396-2,
  - DSC curve in accordance with DIN EN ISO 3146, method C with a heating rate of 20°C/min at the 2nd heating.
- Checks and tests to be carried out during the manufacture of the plate elements:
  - Documentation of the most important machine settings; the injection-moulding process shall be inspected visually each time an inspection is due, i.e. several times a day.
  - Verification of the main dimensions of the tool (inner/outer diameter, total/slot length and core shape) each time the tool is inserted into the injection-moulding machine.
  - Verification of all drawing dimensions with every change or new production of a tool.

Further checks and details of the factory production control shall be specified in the surveillance contract; at least the following test shall be carried out at appropriate intervals:

- Determination of the plate stiffness and the load-bearing capacity of the plate element in accordance with Technical Report TR 026

  Three samples shall be tested for 10,000 fasteners or once per production week. The values given in Table 2 shall be met.

The results of factory production control shall be recorded and evaluated. The records shall at least include the following information:

- designation of the construction product or the starting material or the components,
- type of check or test,
- date of manufacture and testing of the construction product or the starting material or the components,

- results of the checks and tests as well as, if applicable, comparison with requirements,
- signature of the person responsible for factory production control.

The records shall be kept for at least five years and submitted to the inspection body used for external surveillance. They shall be submitted to DIBt and the competent supreme building authority upon request.

If the test result is unsatisfactory, the manufacturer shall immediately take the necessary measures to resolve the defect. Construction products which do not meet the requirements shall be handled in such a way that they cannot be confused with compliant products. After the defect has been remedied, the relevant test shall be repeated immediately - where technically feasible and necessary to show that the defect has been eliminated.

2.3.3 External surveillance

The factory production control system shall be inspected regularly, i.e. at least once a year, by means of external surveillance at each manufacturing plant.

Initial type-testing of the fasteners including a verification of the pull-through resistance in accordance with TR 026 shall be carried out within the scope of external surveillance. Samples for random testing shall also be taken. Sampling and testing shall be the responsibility of the recognised inspection body. At least the torsional strength, the tensile strength, the bending angle and the dimensions of the fasteners shall be verified.

The results of certification and external surveillance shall be kept for at least five years. They shall be presented by the certification or inspection body to DIBt and the competent supreme building authority upon request.

3 Provisions for planning, design and execution

3.1 Planning

3.1.1 General

Unless otherwise specified below, the fixation of ETICS using fischer termoz 6 H fasteners shall be planned in compliance with the Technical Building Rules (*Technische Baubestimmungen*).

ETICS may be fixed to external walls made of timber using fischer termoz 6 H fasteners. The provisions of the national technical approvals / general construction technique permits for ETICS concerning the application on external walls made of timber shall be observed.

The external walls made of timber may be made of spruce, pine and fir:

- Solid timber made of softwood at least of grading class S 10 or strength class C24 in accordance with DIN EN 14081-1 in conjunction with DIN 20000-5,
- Glued laminated timber in accordance with DIN EN 14080 in conjunction with DIN 20000-3,
- Glued solid timber in accordance with DIN EN 14080 in conjunction with DIN 20000-3 or a national technical approval. The glued lamellae (planks or squared timber) shall be made from solid timber (softwood) of at least strength class C24 in accordance with DIN EN 14081-1.

- Cross-laminated timber in accordance with a national technical approval or European Technical Assessment. The layers in which the fischer termoz 6 H fasteners are anchored shall be made from solid timber (softwood) of at least strength class C24 in accordance with DIN EN 14081-1. The width of gaps between the layers of the cross-laminated timber shall not exceed 4 mm.

Fixing ETICS by means of fischer termoz 6 H fasteners to timber elements made of spruce, pine or fir in accordance with the national technical approvals or European Technical Assessments is permitted provided that self-drilling screw connections are permitted in accordance with the approval/ETA for the timber element.

In addition, fischer termoz 6 H fasteners may be used to fix ETICS to the following external panels used for external walls made of timber:

- Oriented strand boards (OSB) of type OSB/3 or OSB/4 in accordance with DIN EN 13986 (DIN EN 300) and DIN 20000-1 or OSB in accordance with a national technical approval; the density of the OSB shall be at least 550 kg/m³.
- Resin-bonded particleboards in accordance with DIN EN 13986 (DIN EN 312) and DIN 20000-1 at least of type P5 or in accordance with a national technical approval; the density of the synthetic resin bonded particleboards shall be at least 600 kg/m³.

The fitness for application of the fastening system of ETICS by means of fischer termoz 6 H fasteners has been verified with regard to resistance to wind loads.

Fixations by means of fischer termoz 6 H fasteners with special screws made of galvanised steel shall be used only in ETICS with insulation products made of wood fibres.

The fasteners shall only be screwed into cross-laminated timber if the gaps between the layers are not wider than 4 mm.

When fastening the fischer termoz 6 H fasteners in solid timber boards or in wood-based panels, the screw anchors shall be screwed through in such a way that the tip protrudes at least 10 mm outside the boards or wood-based panels (see Annexes 1 and 2).

When fastening the fischer termoz 6 H fasteners exclusively in wood-based panels in accordance with Section 3.1.1, it shall be ensured that the wood-based panels are connected to the ribs of the wall panels in such a way that the loads introduced by the fasteners are transferred to the substructure.

3.1.2 Additional provisions for use with recessed installation

When fixing ETICS, recessed installation is possible when fischer termoz 6 H fasteners with special screws made of stainless steel are used. This application is basically suitable for the fixation of ETICS with mineral wool insulation materials in accordance with DIN EN 13162.

The fitness for application of fixing ETICS by means of fischer termoz 6 H fasteners with special screws made of stainless steel using recessed installation has been verified for a minimum thickness of the insulation boards h_D = 100 mm.

The specific requirements for insulation products can be found in the respective national technical approval / general construction technique permits of the ETICS.

3.2 Design

3.2.1 General

Unless otherwise specified below, the fixation of ETICS using fischer termoz 6 H fasteners shall be designed in accordance with the Technical Building Rules (*Technische Baubestimmungen*).

For fixing the ETICS using fischer termoz 6 H fasteners, it shall be verified in the ultimate limit state that the design value of the actions is $E_d \leq$ the design resistance value R_d.

Section 3.2.2 shall apply to the design resistance of the load-bearing capacity of the fischer termoz 6 H fastener in the timber element.

For designing with regard to the load-bearing capacity of the fischer termoz 6 H fastener in the insulation material, the provisions of the respective national technical approval/general construction technique permit of the ETICS shall be observed.

For the timber elements, the relevant national technical approvals, general construction technique permits or European Technical Assessments of the timber elements shall be observed, where necessary.

3.2.2 Axially loaded fasteners

The design pull-out resistance of the fischer termoz 6 H fasteners for short-term loading shall be taken from Table 3 depending on the minimum embedment depth of the threaded part of the screw.

Table 3 Design pull-out resistance of fischer termoz 6 H fasteners at an angle of 90° to grain

Timber products or wood-based panels	Maximum embedment depths of the threaded part of the screws in timber products or wood-based panels $l_{ef,max}$ [mm]	Minimum embedment depths of the threaded part of the screws in timber products or wood-based panels $l_{ef,min}$ [mm]	Design pull-out resistance $F_{ax,90,Rd}$ [N]
Solid timber boards made of softwood[a]	-	24	1260
Solid timber, glued laminated timber, glued solid timber or cross-laminated timber made of softwood	100	30	50 N/mm · l_{ef}
OSB[a]	60[b]/ 30[c]	12	560
		15	560
		18	700
Resin-bonded particleboard[a]	52[b]/ 30[c]	13	460
		16	630
		19	770

[a] Screw-through required
[b] For screws made of galvanised steel
[c] For screws made of stainless steel
l_{ef} Effective embedment depth of the threaded part of the screws in timber products [mm]

3.2.3 Point thermal transmittance

When determining the transmission heat loss of the external components, the point thermal transmittance χ in accordance with Table 4 may be used for the fasteners when fastening external thermal insulation composite systems to timber substrates. The specified thermal transmittance coefficients shall apply in conjunction with thermal insulation materials with a design thermal conductivity value $\lambda_B \geq 0.035$ W/(m · K).

Table 4 Thermal transmittance χ

Designation of the fastener	Type of installation / Thickness of insulation layer	Point thermal transmittance χ in W/K
fischer termoz 6 H with screws made of galvanised steel	Installation flush with the surface / insulation layer thickness of 40 mm (with EPS sealing plug)	0
	Installation flush with the surface / insulation layer thickness of 40 mm < d ≤ 280 mm (with EPS sealing plug)	0.001
	Recessed installation / insulation layer thickness of 100 mm ≤ d ≤ 280 mm (with EPS sealing plug)	0.001
fischer termoz 6 H with screws made of stainless steel	Installation flush with the surface / insulation layer thickness of 40 mm (with EPS sealing plug)	0
	Installation flush with the surface / insulation layer thickness of 40 mm < d ≤ 280 mm (with EPS sealing plug)	0.001
	Recessed installation / insulation layer thickness of 100 mm ≤ d ≤ 280 mm (with EPS sealing plug)	0

3.2.4. Minimum thicknesses

The minimum thicknesses of the timber products and wood-based panels resulting from the minimum embedment depths of the threaded part of the screws in accordance with Table 3 of this decision shall be observed.

For the minimum thicknesses of timber elements in accordance with national technical approvals/construction technique permits and/or European Technical Assessments, the provisions contained therein shall also apply.

3.2.5 Minimum spacings and distances

For fischer termoz 6 H fasteners screwed into softwood and wood-based panels, the minimum spacing and distances in accordance with DIN EN 1995-1-1 in conjunction with

DIN EN 1995-1-1/NA given there for nails without predrilled holes shall be observed; the external thread diameter d in accordance with Annex 2 shall be the screw diameter. The distance of the screws from the loaded or unloaded end $a_{3,t}$ or $a_{3,c}$ parallel to grain shall be at least 15 · d.

With regard to the minimum distances for timber elements in accordance with national technical approvals/construction technique permits or in accordance with European Technical Assessments, the provisions contained therein shall apply.

3.3 Execution

3.3.1 General

Unless otherwise specified below, the Technical Building Rules shall apply to the fixation of ETICS using fischer termoz 6 H fasteners.

The fischer termoz 6 H fasteners shall be installed in accordance with Annexes 1 and 3.

The provisions of the respective national technical approvals/general construction technique permits of the ETICS shall be observed.

For the timber elements, the relevant national technical approvals, construction technique permits or European Technical Assessments shall be observed, where necessary.

The executing company shall provide a declaration of conformity in accordance with Section 16a (5) in conjunction with Section 21 (2) of the Model Building Code to confirm the conformity of the construction technique with the general construction technique permit.

3.3.2 Installation

Only the setting tools recommended by the manufacturer shall be used for screwing in the fasteners.

When installing the fischer termoz 6 H fasteners, the provisions of the national technical approval/general construction technique permit for the ETICS shall be observed.

Surface-flush installation of the screw anchors

Surface-flush installation of termoz 6 H fasteners shall be performed in accordance with Annex 4. The setting tool for surface-flush installation in accordance with Annex 4 shall be used.

Recessed installation of screw anchors

For recessed installation of fischer termoz 6 H fasteners with screws made of stainless steel for fixing ETICS with mineral wool insulation boards in accordance with Section 3.1.2, the provisions of the national technical approval/construction technique permit for the ETICS shall also be observed with regard to recessing.

The recessed installation of fischer termoz 6 H fasteners with stainless steel screws shall be carried out in accordance with Annex 5. The setting tool for recessed installation in accordance with Annex 5 shall be used.

The minimum thickness of the insulation boards h_D for recessed installation is 100 mm.

The depth of incision Δh_D for recessed installation is 15 mm.

This decision refers to the following standards and references:

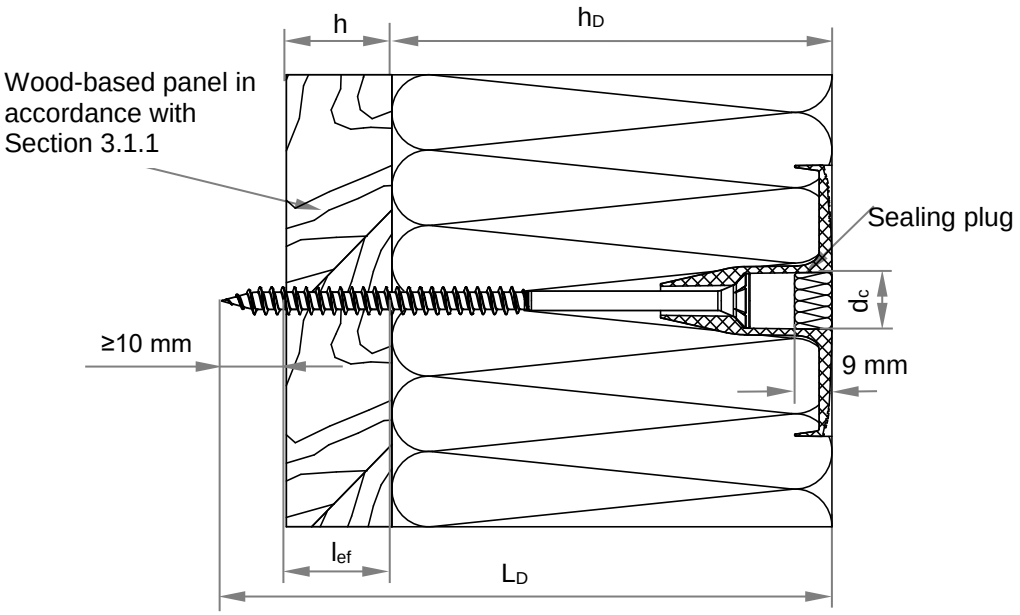
DIN EN 1993-1-4:2015-10	Eurocode 3: Design of steel structures – Part 1-4: General rules - Supplementary rules for stainless steels
DIN EN 1993 1 4/NA:2017-01	National Annex - Nationally determined parameters – Eurocode 3: Design of steel structures – Part 1-4: General design rules – Supplementary rules for the application of stainless steels
Z-30.3-6	Products, structural components and fasteners made of stainless steels
DIN EN 1995 1 1:2010-12+A2:2014-07	Eurocode 5: Design and construction of timber structures – Part 1 1: General – Common rules and rules for building constructions

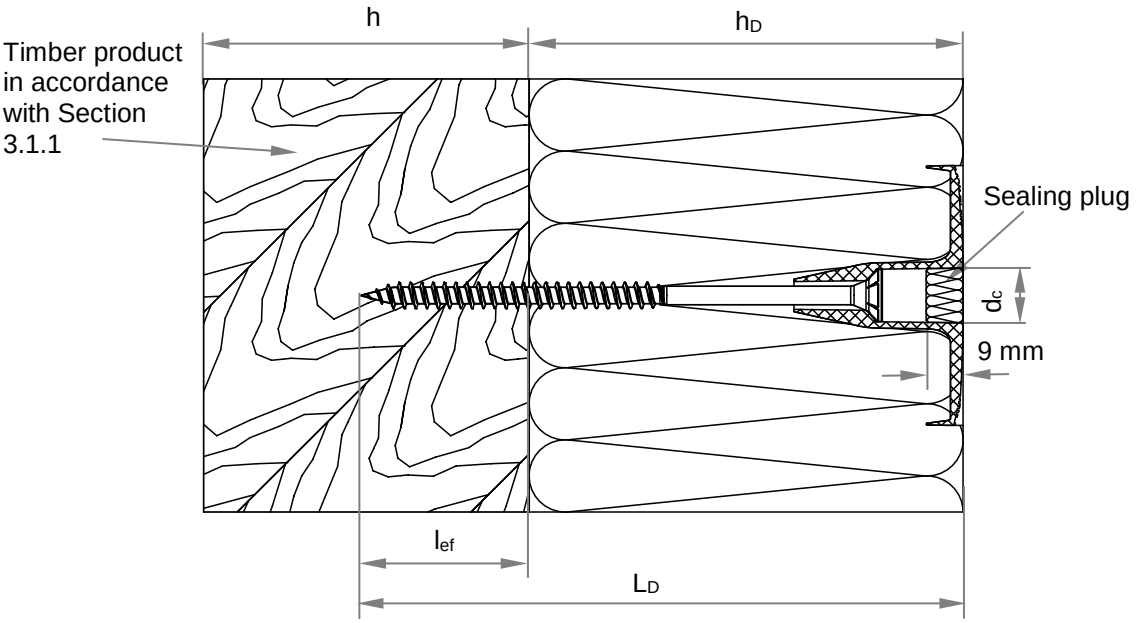
DIN EN 1995-1-1/NA:2013-08	National Annex – Nationally determined parameters – Eurocode 5: Design and construction of timber structures – Part 1-1: General – Common rules and rules for buildings
DIN EN 10263-5:2018-02	Steel rod, bars and wire for cold heading and cold extrusion – Part 5: Technical delivery conditions for stainless steels
DIN EN 10204:2005 01	Metallic products – Types of inspection documents
DIN EN 14081 1:2011 05	Timber structures – Strength graded structural timber with rectangular cross section – Part 1: General requirements
DIN 20000 5:2012 03	Application of construction products in structures – Part 5: Strength graded structural timber with rectangular cross section
DIN EN 14080: 2013-09	Timber structures – Glued laminated timber and glued solid timber – Requirements
DIN 20000-3:2015-02	Application of construction products in structures, Part 3: Glued laminated timber and glued solid timber in accordance with DIN EN 14080
DIN EN 13986:2015 06	Wood-based panels for use in construction – Characteristics, evaluation of conformity and marking
DIN EN 300:2006 09	Oriented Strand Boards (OSB) – Definitions, classification and specifications
DIN 20000 1:2017 06	Application of construction products in structures – Part 1: Wood-based panels
DIN EN 312:2010 12	Particleboards – Specifications
DIN EN 13162:2015-04	Thermal insulation products for buildings – Factory made mineral wool (MW) products – Specification
EOTA TR 026:2016-05	Plate stiffness of plastic anchors for ETICS

LBD Dipl.-Ing. Andreas Kummerow
Head of Department

Drawn up by
Dewitt

termoz 6 H fastener installed flush with the surface





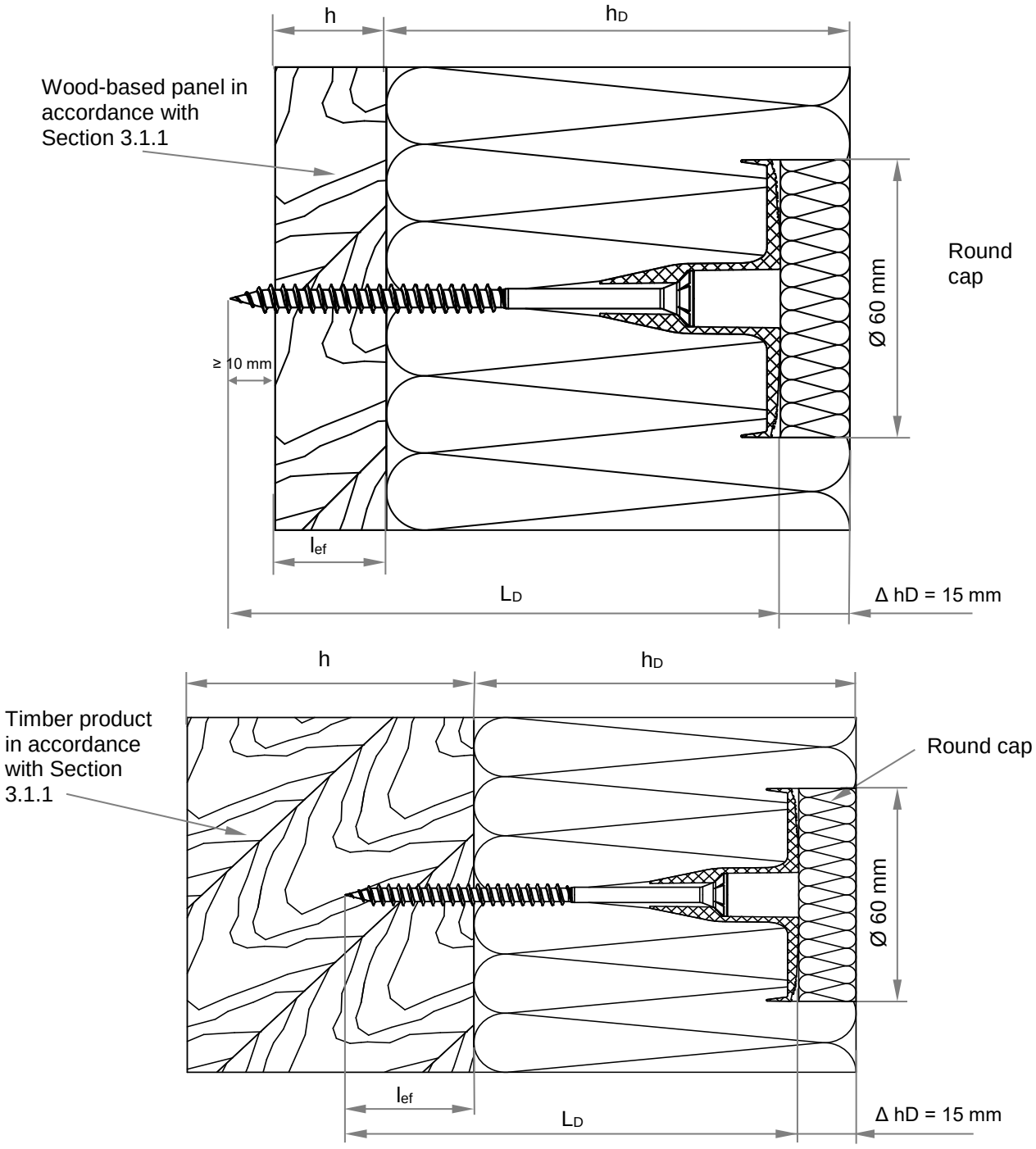
Legend

h_D = insulation thickness 40 mm ≤ h_D ≤ 280 mm
l_{ef} = embedment depth of the threaded part of the screws in the timber products/wood-based panels
L_D = total fastener length, complete
h = thickness of the timber product or wood-based panel
d_c = 13 mm sealing plug

Figures not to scale

fischer termoz 6 H fasteners for fixing external thermal insulation composite systems to external walls made of timber	Annex 1
Fastener installed flush with the surface	

termoz 6 H recessed installation



Thickness of insulating material 100 mm ≤ h_D ≤ 280 mm

Figures not to scale

fischer termoz 6 H fasteners for fixing external thermal insulation composite systems to external walls made of timber	Annex 2
Recessed installation	

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Assembled fastener

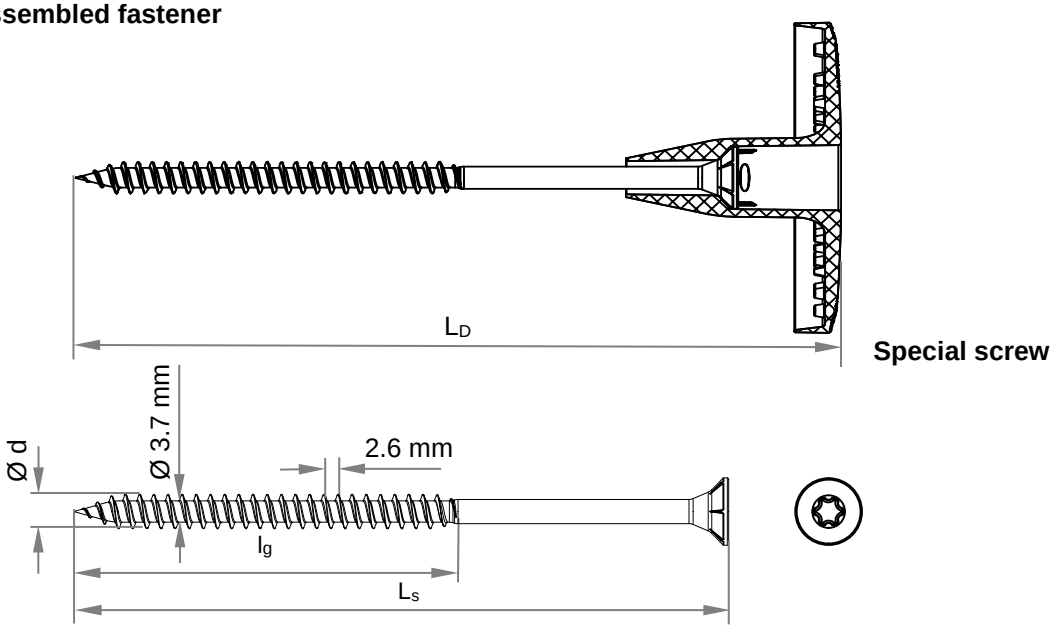
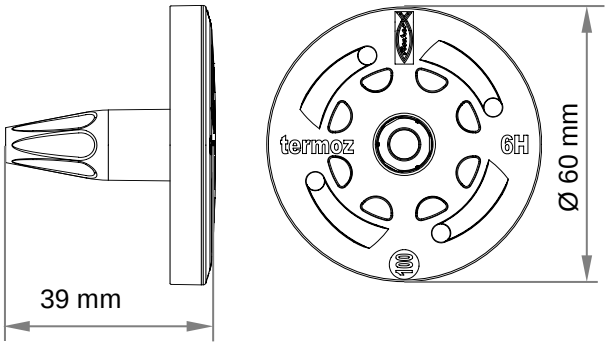
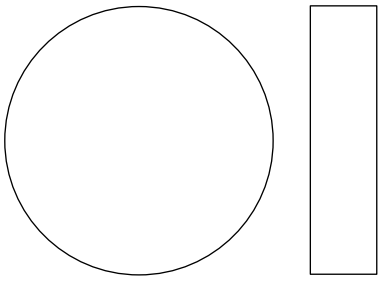


Plate element





EPS round cap Ø 60 mm x 15

Table A.3.1: Dimensions [mm]

termoz 6 H	Plate element			Special screw		
L_D	Colour	Plate-Ø	Plate height	d	L_s	l_g
60	grey, red, orange, blue, yellow, green, mocha-latte	60	39	6.0	40	24
80					60	36
100					80	48
120					100	60
140 – 320					120 – 300	70

Table A.3.2: Materials

Designation	Materials
Plate element	PA 6 GF
Sealing plug/round cap	e.g. polystyrene EPS or mineral wool MW or wood fibre material
Special screw	made of galvanised carbon steel or stainless steel in accordance with Section 2.1

Figures not to scale

fischer termoz 6 H fasteners for fixing external thermal insulation composite systems to external walls made of timber	Annex 3
Dimensions and materials	

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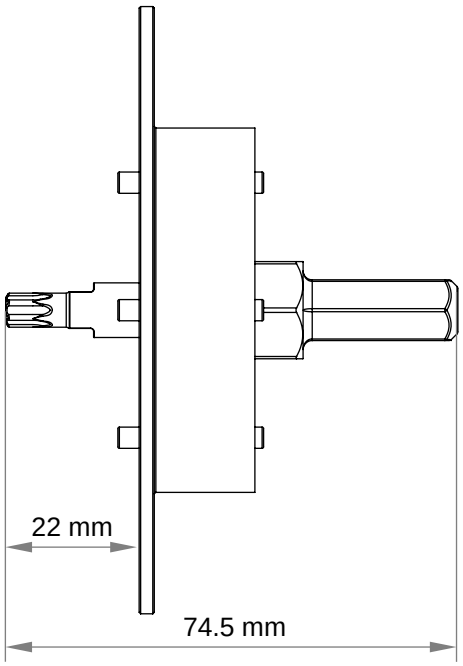
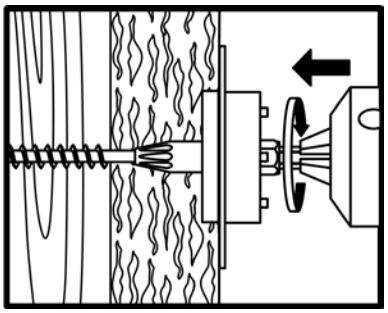
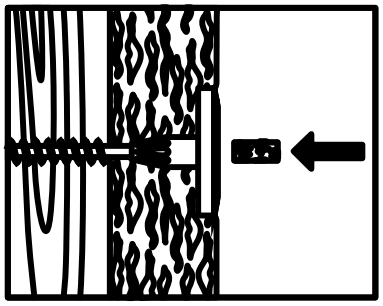
Setting tool for surface-flush installation



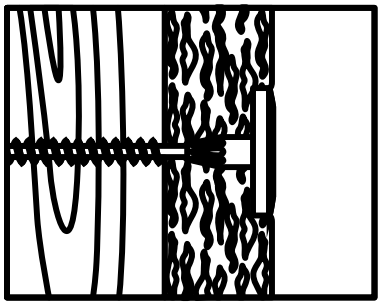
Surface-flush installation of the termoz 6 H fastener



Place the setting tool on the fastener, then screw in the fastener until the setting tool is flush with the surface of the insulation as shown here.



Seal the plate element flush with the surface using the EPS plug.



Correctly set fastener flush with the surface.

fischer termoz 6 H fasteners for fixing external thermal insulation composite systems to external walls made of timber	Annex 4
Fasteners installed flush with the surface	

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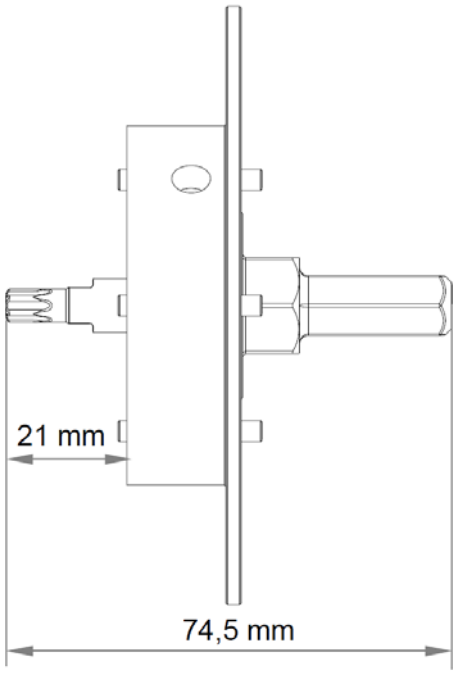
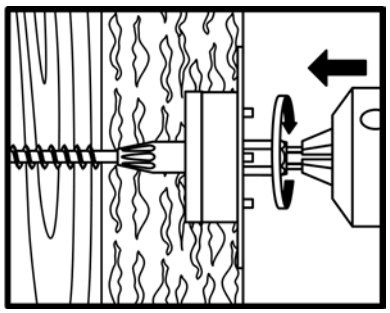
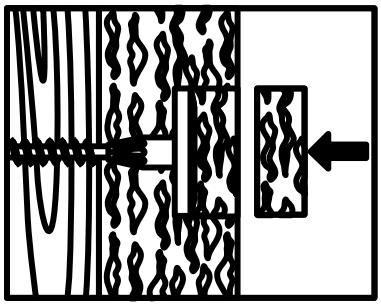
Setting tool, converted for recessed installation



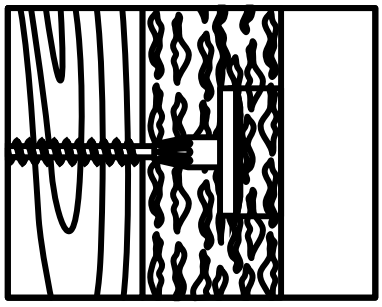
Recessed installation of the termoz 6 H fastener



Place the setting tool on the fastener, then screw in the fastener until the setting tool with the stop disc, as shown here, is flush with the surface of the insulation.



Seal the plate element using the EPS round cap which is flush with the surface.



Properly recessed fastener, near-surface.

fischer termoz 6 H fasteners for fixing external thermal insulation composite systems to external walls made of timber	Annex 5
Recessed installation	