# Stand-off installation TherMax 12/16

The approved stand-off installation with thermal barrier in external thermal insulation composite systems



Awnings

Satellite dishes and air conditioning units

## Applications

For the thermally separated fixing of:
- Awnings
- Canopies
- French balcony railings
- Air conditioning units
- Satellite dishes

## Advantages

- When combined with the injection mortars FIS EM Plus, FIS V Plus, FIS SB and FIS GREEN, the stand-off installation is approved for high loads in a range of materials. This allows for a secure fixing.
- Usable lengths of 62 to 290 mm can be covered with just one TherMax.
- The plastic cone creates a thermal barrier between the fixture and the inner fixture, and offers an energy-optimised fixing.
- The glass-fibre-reinforced plastic cone cuts its own way through the ETICS with a positive fit, and allows for a simple, fast and adjustable installation without the need for any special tools.

## Certificates


## Building materials

Approved for:
- Concrete, cracked and non-cracked
- Vertically perforated brick
- Hollow blocks made from lightweight concrete
- Perforated sand-lime brick
- Solid sand-lime brick
- Solid brick
- Aerated concrete

## Versions

- Zinc-plated steel
- Stainless steel

## Functioning

- The TherMax 12 and 16 systems are suitable for pre-positioned installation.
- The self-tapping, glass-fibre-reinforced cone cuts its own way through the plaster into the insulation during installation.
- The anti-cold cone uses a thermal barrier to minimise heat losses.
- In the case of resistant plaster (e.g. thick cement plaster), it is recommended that the TherMax cutting blade included is used for grinding out the plaster.
- The sealing of the annular gap with sealing adhesive Multi MS seals the facade at plaster level.

**See also**

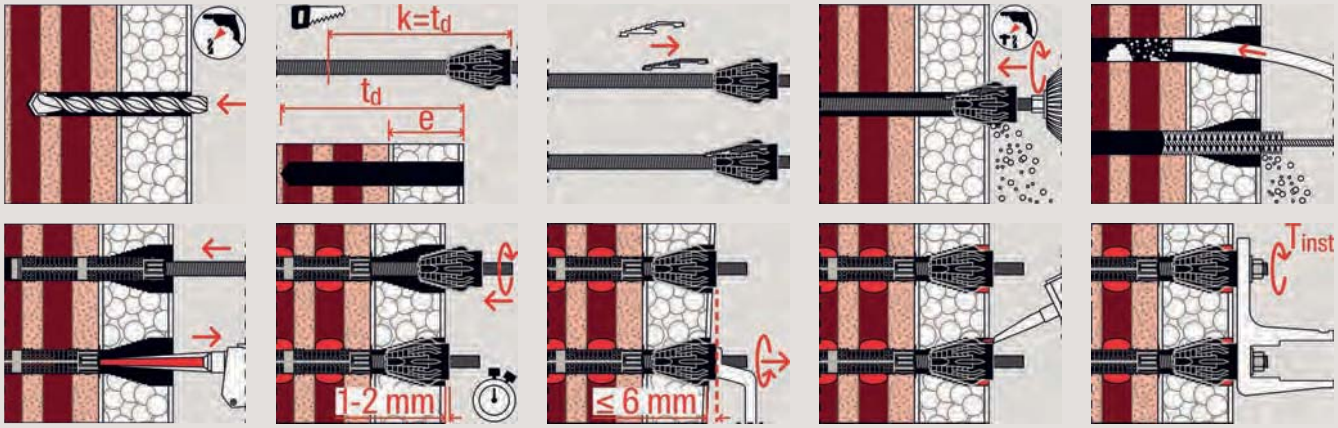
FIS EM Plus mortar page 

FIS V Plus mortar page 

FIS SB mortar 67 

FIS Green mortar 114 

## Installation TherMax 12/16






## Technical data

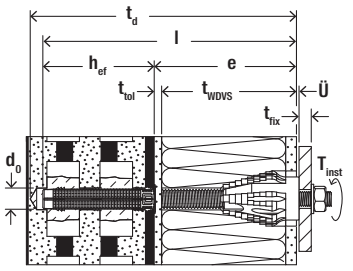
**Stand-off installation TherMax 12/16**

TherMax 12/110 M12

TherMax 16/170 M12

| | Zinc-plated steel<br>Item No. | Stainless steel<br>Item No. | Approval | Contents | Sales unit<br>[pcs] |
|---|---|---|---|---|---|
| **Item** | **gvz** | **R** | **DIBt** | | |
| **TherMax 12/110 M12** | **051291** | **–** | ● | 20 TherMax M12, 20 perforated sleeves 20 x 130, 5 bits, 5 cutting blades, 5 user manuals | 20 |
| **TherMax 12/110 M12 R** | **–** | **051537** | ● | 10 TherMax M12 R, 10 perforated sleeves 20 x 130, 3 bits, 3 cutting blades, 3 user manuals | 10 |
| **TherMax 12/110 M12 (2)** | **051290** | **–** | ● | 2 TherMax M12, 2 perforated sleeves 20 x 130, 1 bit, 1 cutting blade, 1 user manual | 1 |
| **TherMax 16/170 M12** | **051293** | **–** | ● | 20 TherMax M16, 20 perforated sleeves 20 x 200, 5 bits, 5 cutting blades, 5 applicator tip extension hoses, 5 user manuals | 20 |
| **TherMax 16/170 M12 R** | **–** | **051543** | ● | 10 TherMax M16 R, 10 perforated sleeves 20 x 200, 3 bits, 3 cutting blades, 3 applicator tip extension hoses, 3 user manuals | 10 |
| **TherMax 16/170 M12 (2)** | **051292** | **–** | ● | 2 TherMax M16, 2 perforated sleeves 20 x 200, 1 bit, 1 cutting blade, 1 applicator tip extension hose, 1 user manual | 1 |

## Installation data




| Type | Length of TherMax incl. anti-cold cone l [mm] | Building material + insulation: Threaded rod in building material | Building material | Suitable injection anchor sleeve | Drill hole diameter $d_0$ [mm] | Min. anchorage depth $h_{ef}$ [mm] | Drill hole depth $t_d$ [mm] | Thickness of non-bearing layer e [mm] | Fixture: Max. fixture thickness $t_{fix}$ [mm] | Connection thread | Max. installation torque $T_{inst}$ [Nm] | Required resin quantity [Scale unit] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **TherMax M 12** | **240** | **M 12** | **Concrete** | - | 14 | 70 | $h_{ef}$ + e | 62 - 170 | 16[1)] | M 12 | 20 | 5 |
| | **240** | **M 12** | **Solid brick** | - | 14 | 80 | $h_{ef}$ + e | 62 - 160 | 16[1)] | M 12 | 20 | 6 |
| | **240** | **M 12** | **Perforated brick** | FIS H 20x130 K | 20 | 130 | $h_{ef}$ + e + 10 mm | 62 - 110 | 16[1)] | M 12 | 20 | 26 |
| | **240** | **M 12** | **Aerated concrete** | - | 14 | 100 | $h_{ef}$ + e | 62 - 140 | 16[1)] | M 12 | 20 | 8 |
| **TherMax M 16** | **370** | **M 16** | **Concrete** | - | 18 | 80 | $h_{ef}$ + e | 62 - 290 | 16[1)] | M 12 | 20 | 7 |
| | **370** | **M 16** | **Solid brick** | - | 18 | 80 | $h_{ef}$ + e | 62 - 290 | 16[1)] | M 12 | 20 | 7 |
| | **370** | **M 16** | **Perforated brick** | FIS H 20x200 K | 20 | 200 | $h_{ef}$ + e + 10 mm | 62 - 170 | 16[1)] | M 12 | 20 | 40 |
| | **370** | **M 16** | **Aerated concrete** | - | 18 | 100 | $h_{ef}$ + e | 62 - 270 | 16[1)] | M 12 | 20 | 9 |

[1)] The setscrews may be replaced by a setscrew / fixing screw up to a length 200 mm.

## Accessories installation

**Injection mortar**


FIS EM Plus 390 S


FIS V Plus 360 S


FIS Green 300 T


FIS SB 390 S


Multi MS white

| Item | Item No. | Approval DIBt | Approval ETA | Languages on the cartridge | Contents | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **FIS EM Plus 390 S** | **544154** [1)] | ● | ● | DE, EN, FR, NL, ES, PT | 1 cartridge 390 ml, 2 x FIS MR Plus | 6 |
| **FIS EM Plus 390 S** | **544155** [1)] | ● | ● | EN, ZH, EL, KO, HU, PL | 1 cartridge 390 ml, 2 x FIS MR Plus | 6 |
| **FIS V Plus 360 S** | **558752** | ● | ● | DE, FR, NL | 1 cartridge 360 ml, 2 x FIS MR Plus | 6 |
| **FIS V Plus 360 S (EN,ES,PT)** | **558746** | ● | ● | EN, ES, PT | 1 cartridge 360 ml, 2 x FIS MR Plus | 6 |
| **FIS SB 390 S** | **519451** | – | ● | DE, FR, NL | 1 cartridge 390 ml, 2 x FIS MR Plus | 6 |
| **FIS SB 390 S** | **518831** | – | ● | EN, ES, PT | 1 cartridge 390 ml, 2 x FIS MR Plus | 6 |
| **FIS Green 300 T** | **522989** | – | ● | FR | 1 cartridge 300 ml, 2 x FIS MR Plus with transparent Clip | 4 |
| **FIS Green 300 T** | **523245** | – | ● | IT | 1 cartridge 300 ml, 2 x FIS MR Plus with transparent Clip | 12 |
| **FIS Green 300 T** | **538219** | – | ● | CS, SK | 1 cartridge 300 ml, 2 x FIS MR Plus | 12 |
| **FIS Green 300 T** | **532972** | – | ● | DA, SV, NO, FI | 1 cartridge 300 ml, 2 x FIS MR Plus with transparent Clip | 12 |
| **KD white 290ML** | **059389** | – | – | DE, EN | 1 cartridge 290 ml | 12 |

1) Dangerous goods - no express shipping possible.

## Accessories for drill hole cleaning

**Brushes**

BS

| | Item No. | Length $L_1$ [mm] | Length $L_2$ [mm] | Brush diameter [mm] | For drill diameter [mm] | Sales unit [pcs] |
|---|---|---|---|---|---|---|
| **Item** | | | | | | |
| **BS ø 14** | **078180** | 250 | 80 | 16 | 14 | 1 |
| **BS ø 16/18** | **078181** | 250 | 80 | 20 | 16/18 | 1 |
| **BS ø 20/22** | **052277** | 180 | 80 | 25 | 20/22 | 1 |



## Accessories for drill hole cleaning

**Blow-out pump**

AB G

| | Item No. | Sales unit [pcs] |
|---|---|---|
| **Item** | | |
| **Blow-out pump AB G** | **089300** | 1 |

## Accessories

**Accessories**

TherMax cutting blade

TherMax thread reducing pin

| | Item No. | Description | Sales unit [pcs] |
|---|---|---|---|
| **Item** | | | |
| **TherMax cutting blade, 25 pcs** | **547723** | for milling the thermal insulation with a resistant plaster | 1 |
| **TherMax thread reducing pin M12/M10 A4** | **553834** | enables a connection thread M10 | 10 |

# Loads

**Stand-off installation TherMax 12 and 16 with load-bearing anchor rod made of zinc-plated steel 8.8 and a displacement of 1 mm**

The below load table is valid for short-term loading (e.g. wind load). If the sealing of the annular gap between TherMax and plaster is assured by fischer all-round sealing KD, the TherMax version with an anchor rod on base substrate side made of zinc-plated steel may be used.
Highest permissible loads[1)5)7)] of a TherMax within an anchor group[2)] in concrete with the injection mortars FIS V Plus or FIS SB and in masonry with the injection mortar FIS V Plus.

| Type | Minimum effective anchorage depth $h_{ef}$ [4)8)] [mm] | Permissible tensile load $N_{perm}$ [3)] [kN] | Permissible shear load at e = 62 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 100 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 120 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 140 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 160 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 180 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 200 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 250 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 300 mm $V_{perm}$ [3)] [kN] | Minimum member thickness $h_{min}$ [mm] | Minimum spacing $s_{min\parallel}$ / $s_{min\perp}$ [9)] [mm] | Minimum edge distance $c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Concrete, cracked and non-cracked, strength class ≥ C20/25** | | | | | | | | | | | | | | |
| **TherMax 12**[8)] | 70 | 3,40[6)] | 1,22 | 0,75 | 0,63 | 0,54 | 0,4 | 0,29 | 0,22 | 0,10 | 0,05 | 100 | 55 | 55 |
| **TherMax 16**[8)] | 80 | 3,40[6)] | 1,59 | 0,99 | 0,82 | 0,70 | 0,62 | 0,55 | 0,46 | 0,22 | 0,10 | 116 | 65 | 65 |
| **Solid brick, Mz, EN 771-1; $f_b$ ≥ 12 N/mm²; ρ ≥ 1,8 kg/dm³; LxWxH ≥ 240x115x71 mm, NF** | | | | | | | | | | | | | | |
| **TherMax 12**[8)] | 200 | 2,71 | 0,85 | 0,75 | 0,63 | 0,54 | 0,36 | 0,29 | 0,22 | 0,10 | 0,05 | 240 | 80/80 | 60 |
| **TherMax 16**[8)] | 200 | 2,71 | 1,29 | 0,99 | 0,82 | 0,70 | 0,62 | 0,55 | 0,46 | 0,22 | 0,10 | 240 | 80/80 | 60 |
| **Solid sand-lime brick, KS, EN 771; $f_b$ ≥ 20 N/mm²; ρ ≥ 2,0 kg/dm³; LxWxH ≥ 250x240x240 mm, 8DF** | | | | | | | | | | | | | | |
| **TherMax 12**[8)] | 50 | 2,86 | 1,22 | 0,75 | 0,63 | 0,54 | 0,40 | 0,29 | 0,22 | 0,10 | 0,05 | 240 | 80/80 | 60 |
| **TherMax 16**[8)] | 50 | 2,14 | 1,59 | 0,99 | 0,82 | 0,7 | 0,62 | 0,55 | 0,46 | 0,22 | 0,10 | 240 | 80/80 | 60 |
| **Vertically perforated brick type B, HLz, EN 771-1; $f_b$ ≥ 12 N/mm²; ρ ≥ 1,0 kg/dm³; LxWxH = 370x240x237 mm resp. 500x175x237 mm** | | | | | | | | | | | | | | |
| **TherMax 12**[4)] | 110 | 1,14 | 0,57 | 0,57 | 0,57 | 0,54 | 0,40 | 0,29 | 0,22 | 0,10 | 0,05 | 175 | 100/100 | 100 |
| **TherMax 16**[4)] | 110 | 1,14 | 0,57 | 0,57 | 0,57 | 0,57 | 0,57 | 0,55 | 0,46 | 0,22 | 0,10 | 175 | 100/100 | 100 |
| **Perforated sand-lime brick, KSL, EN 771-2; $f_b$ ≥ 12 N/mm²; ρ ≥ 1,4 kg/dm³; LxWxH = 240x175x113 mm, 3DF** | | | | | | | | | | | | | | |
| **TherMax 12**[4)] | 85 | 1,00 | 1,22 | 0,75 | 0,63 | 0,54 | 0,40 | 0,29 | 0,22 | 0,10 | 0,05 | 175 | 100/115 | 80 |
| **TherMax 16**[4)] | 85 | 1,00 | 1,14 | 0,99 | 0,82 | 0,7 | 0,62 | 0,55 | 0,46 | 0,22 | 0,10 | 175 | 100/115 | 80 |
| **Hollow block made of light weight concrete, Hbl, EN 771-3; $f_b$ ≥ 2 N/mm²; ρ ≥ 1,0 kg/dm³; LxWxH = 362x240x240 mm** | | | | | | | | | | | | | | |
| **TherMax 12**[4)] | 110 | 0,43 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,22 | 0,10 | 0,05 | 240 | 100/240 | 60 |
| **TherMax 16**[4)] | 180 | 0,71 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,22 | 0,10 | 240 | 100/240 | 60 |
| **Aerated concrete (cylindrical drill hole), EN 771-4; $f_b$ ≥ 2 N/mm²; ρ ≥ 0,35 kg/dm³; LxWxH ≥ 599x240x249 mm** | | | | | | | | | | | | | | |
| **TherMax 12**[8)] | 200 | 1,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,40 | 0,29 | 0,22 | 0,10 | 0,05 | 240 | 80/80 | 100 |
| **TherMax 16**[8)] | 200 | 1,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,22 | 0,10 | 240 | 80/80 | 100 |

For the design the complete approval Z-21.8-1837 as well as the European Technical Assessments ETA-20/0603, ETA-20/0729 or ETA-12/0258 have to be considered.

1) The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L$ = 1,4 are considered.

2) Set-up of one or more TherMax in a row in direction of shear, for which the clamping of the attachment prevents a torsion on attachment side due to a sufficient stiffness of the attachment or connecting construction. For a clamping on base substrate side only, see approval.

3) For combinations of tensile and shear loads as well as reduced edge distances or spacings (anchor groups) see approval. The values for tensile loads in masonry are valid only, if the joints of the masonry is completely filled with masonry mortar. If the joints are not filled with masonry mortar are not filled with masonry mortar and the edge distance towards the joints is less than $c_{min}$, the loads have to be reduced by the factor $a_j$ = 0.75. The values for shear loads are valid only, if the joints are filled with masonry mortar. For not completely filled joints they have to be handled like a free edge and a minimum edge distance $c_{min}$ of the anchors to the joints has to be observed. For compression loads and perforated bricks or hollow blocks see approval. Calculative assumed thickness of the attachment $tf_{ix}$ = 6 mm.

4) In vertically perforated bricks HLz, perforated sand-lime bricks KSL as well as hollow blocks made of light weight concrete Hbl the TherMax 12 (standard version) can bridge non-load bearing layers up to 110 mm and the TherMax 16 can bridge them up to 170 mm. Larger usable lengths up to 300 mm are possible, if other perforated sleeves and where required longer anchor rods are used and again the anchorage depth gets reduced - see approval.

5) The stated permissible loads are valid for anchorages in dry base substrates - use category d/d - and for temperatures up to +50 °C (resp. short-term up to +80 °C) in the area of the injection mortar and during drill hole cleaning in accordance with the approval. The load values apply to anchor rods on base substrate side made of zinc-plated steel grade 8.8 - for other steel grades or stainless steel see approval.

6) Complies with the permissible tensile load of the TherMax cone.

7) Intermediate values of the shear load may be linearly interpolated in dependence of "e", if nothing else is mentioned in the approval.

8) In solid bricks Mz and solid sand-lime bricks KS the TherMax 12 (standard version) can bridge non-load bearing layers up to 190 mm (140 mm in aerated concrete) and the TherMax 16 can bridge them up to 300 mm (270 mm in aerated concrete) - but in solid brick Mz and aerated concrete the above load values have to be reduced. In concrete the TherMax 12 (standard version) can bridge non-loadbearing layers up to 170 mm and the TherMax 16 can bridge them up to 290 mm. Larger usable lengths up to 300 mm are possible, if longer anchor rods are used and again in solid bricks Mz if the anchorage depth (compared to above values) gets reduced where required - see approval.

9) Minimum spacings for at the same time reduced permissible loads, where required.

## Loads

**Stand-off installation TherMax 12 and 16 with load-bearing anchor rod made of stainless steel R-70 and a displacement of 3 mm**

The below load table is valid for short-term loading (e.g. wind load). Measures for sealing see approval, section 3.2.4.
Highest permissible loads[1)5)7)] of a TherMax within an anchor group[2)] in concrete with the injection mortars FIS V Plus or FIS SB and in masonry with the injection mortar FIS V Plus.

| Type | Minimum effective anchorage depth $h_{ef}$ [4)8)] [mm] | Permissible tensile load $N_{perm}$ [3)] [kN] | Permissible shear load at e = 62 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 100 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 120 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 140 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 160 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 180 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 200 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 250 mm $V_{perm}$ [3)] [kN] | Permissible shear load at e = 300 mm $V_{perm}$ [3)] [kN] | Minimum member thickness $h_{min}$ [mm] | Minimum spacing $s_{min\parallel}$ / $s_{min\perp}$ [9)] [mm] | Minimum edge distance $c_{min}$ [mm] |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Concrete, cracked and non-cracked, strength class ≥ C20/25** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 70 | 3,40[6)] | 1,22 | 0,75 | 0,63 | 0,54 | 0,4 | 0,29 | 0,22 | 0,10 | 0,05 | 100 | 55 | 55 |
| **TherMax 16[8)]** | 80 | 3,40[6)] | 1,59 | 0,99 | 0,82 | 0,70 | 0,62 | 0,55 | 0,46 | 0,22 | 0,10 | 116 | 65 | 65 |
| **Solid brick, Mz, EN 771-1; $f_b$ ≥ 12 N/mm²; ρ ≥ 1,8 kg/dm³; LxWxH ≥ 240x115x71 mm, NF** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 200 | 2,71 | 0,85 | 0,75 | 0,63 | 0,54 | 0,36 | 0,29 | 0,22 | 0,10 | 0,05 | 240 | 80/80 | 60 |
| **TherMax 16[8)]** | 200 | 2,71 | 1,29 | 0,99 | 0,82 | 0,70 | 0,62 | 0,55 | 0,46 | 0,22 | 0,10 | 240 | 80/80 | 60 |
| **Solid sand-lime brick, KS, EN 771; $f_b$ ≥ 20 N/mm²; ρ ≥ 2,0 kg/dm³; LxWxH ≥ 250x240x240 mm, 8DF** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 50 | 2,86 | 1,22 | 0,75 | 0,63 | 0,54 | 0,40 | 0,29 | 0,22 | 0,10 | 0,05 | 240 | 80/80 | 60 |
| **TherMax 16[8)]** | 50 | 2,14 | 1,59 | 0,99 | 0,82 | 0,7 | 0,62 | 0,55 | 0,46 | 0,22 | 0,10 | 240 | 80/80 | 60 |
| **Vertically perforated brick type B, HLz, EN 771-1; $f_b$ ≥ 12 N/mm²; ρ ≥ 1,0 kg/dm³; LxWxH = 370x240x237 mm resp. 500x175x237 mm** | | | | | | | | | | | | | | |
| **TherMax 12[4)]** | 110 | 1,14 | 0,57 | 0,57 | 0,57 | 0,54 | 0,40 | 0,29 | 0,22 | 0,10 | 0,05 | 175 | 100/100 | 100 |
| **TherMax 16[4)]** | 110 | 1,14 | 0,57 | 0,57 | 0,57 | 0,57 | 0,57 | 0,55 | 0,46 | 0,22 | 0,10 | 175 | 100/100 | 100 |
| **Perforated sand-lime brick, KSL, EN 771-2; $f_b$ ≥ 12 N/mm²; ρ ≥ 1,4 kg/dm³; LxWxH = 240x175x113 mm, 3DF** | | | | | | | | | | | | | | |
| **TherMax 12[4)]** | 85 | 1,00 | 1,22 | 0,75 | 0,63 | 0,54 | 0,40 | 0,29 | 0,22 | 0,10 | 0,05 | 175 | 100/115 | 80 |
| **TherMax 16[4)]** | 85 | 1,00 | 1,14 | 0,99 | 0,82 | 0,7 | 0,62 | 0,55 | 0,46 | 0,22 | 0,10 | 175 | 100/115 | 80 |
| **Hollow block made of light weight concrete, Hbl, EN 771-3; $f_b$ ≥ 2 N/mm²; ρ ≥ 1,0 kg/dm³; LxWxH = 362x240x240 mm** | | | | | | | | | | | | | | |
| **TherMax 12[4)]** | 110 | 0,43 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,22 | 0,10 | 0,05 | 240 | 100/240 | 60 |
| **TherMax 16[4)]** | 180 | 0,71 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,26 | 0,22 | 0,10 | 240 | 100/240 | 60 |
| **Aerated concrete (cylindrical drill hole), EN 771-4; $f_b$ ≥ 2 N/mm²; ρ ≥ 0,35 kg/dm³; LxWxH ≥ 599x240x249 mm** | | | | | | | | | | | | | | |
| **TherMax 12[8)]** | 200 | 1,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,40 | 0,29 | 0,22 | 0,10 | 0,05 | 240 | 80/80 | 100 |
| **TherMax 16[8)]** | 200 | 1,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,43 | 0,22 | 0,10 | 240 | 80/80 | 100 |

For the design the complete approval Z-21.8-1837 as well as the European Technical Assessments ETA-20/0603, ETA-20/0729 or ETA-12/0258 have to be considered.

1) The required partial safety factors for material resistance as well as a partial safety factor for load actions of $\gamma_L$ = 1,4 are considered.

2) Set-up of one or more TherMax in a row in direction of shear, for which the clamping of the attachment prevents a torsion on attachment side due to a sufficient stiffness of the attachment or connecting construction. For a clamping on base substrate side only, see approval.

3) For combinations of tensile and shear loads as well as reduced edge distances or spacings (anchor groups) see approval. The values for tensile loads in masonry are valid only, if the joints of the masonry is completely filled with masonry mortar. If the joints are not filled with masonry mortar are not filled with masonry mortar and the edge distance towards the joints is less than $c_{min}$, the loads have to be reduced by the factor $a_j$ = 0.75. The values for shear loads are valid only, if the joints are filled with masonry mortar. For not completely filled joints they have to be handled like a free edge and a minimum edge distance $c_{min}$ of the anchors to the joints has to be observed. For compression loads and perforated bricks or hollow blocks see approval. Calculative assumed thickness of the attachment $t_{fix}$ = 6 mm.

4) In vertically perforated bricks HLz, perforated sand-lime bricks KSL as well as hollow blocks made of light weight concrete Hbl the TherMax 12 (standard version) can bridge non-load bearing layers up to 110 mm and the TherMax 16 can bridge them up to 170 mm. Larger usable lengths up to 300 mm are possible, if other perforated sleeves and where required longer anchor rods are used and again the anchorage depth gets reduced - see approval.

5) The stated permissible loads are valid for anchorages in dry base substrates - use category d/d - and for temperatures up to +50 °C (resp. short-term up to +80 °C) in the area of the injection mortar and during drill hole cleaning in accordance with the approval. The load values apply to anchor rods on base substrate side made of stainless steel of the grade A4-70.

6) Complies with the permissible tensile load of the TherMax cone.

7) Intermediate values of the shear load may be linearly interpolated in dependence of "e", if nothing else is mentioned in the approval.

8) In solid bricks Mz and solid sand-lime bricks KS the TherMax 12 (standard version) can bridge non-load bearing layers up to 190 mm (140 mm in aerated concrete) and the TherMax 16 can bridge them up to 300 mm (270 mm in aerated concrete) - but in solid brick Mz and aerated concrete the above load values have to be reduced. In concrete the TherMax 12 (standard version) can bridge non-loadbearing layers up to 170 mm and the TherMax 16 can bridge them up to 290 mm. Larger usable lengths up to 300 mm are possible, if longer anchor rods are used and again in solid bricks Mz if the anchorage depth (compared to above values) gets reduced where required - see approval.

9) Minimum spacings for at the same time reduced permissible loads, where required.