

# THE INTERIOR INSULATION SYSTEM BACKED BY VALIDATION

The high-quality choice for superior thermal  
insulation and comfortable dwelling



Trades



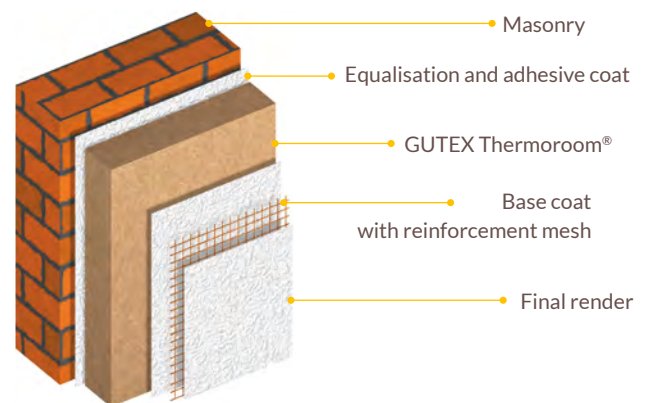


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# 1. THE SYSTEM

Interior insulation is a consideration particularly for buildings for which exterior insulation is not possible or may be ill advised due to the historical significance or listing of the building. Thanks to wood fibre's excellent inherent qualities, GUTEX's ecological interior insulation system creates wholesome living spaces with a comfortable indoor climate.



System details

## 1.1 Main components

### GUTEX Thermoroom®

Specially designed to insulate interior sides of outer walls

**Thickness:** 20, 40, 50, 60, 80, 100 mm

**Dimensions:** 1,200 x 500 mm

**Thermal conductivity  $\lambda$  (W/mK)\*:** 0.041



### GUTEX® Universal-Armierungsgewebe/ fibre reinforcement mesh

**Length:** 50 lm/roll

**Width:** 1.10 m



### GUTEX® Feinspachtel/filler (20-kg bag)

GUTEX Feinspachtel is a finely-grained mineral mortar for the filling of joints and establishment of fine to course substrate surfaces.

### GUTEX® Klebe- und Spachtelputz/ cementitious dry base coat mortar (25-kg bag)

Fibre-reinforced, hydraulic setting mortar in the Mörtelgruppe (mortar class) P II as per DIN 18550.



### GUTEX® Flankendämmkeil/corner insulation wedge

Insulation element that integrates between walls and ceilings in GUTEX interior insulation systems to reduce thermal bridges

**Length:** 1,250 mm

**Width:** 300 mm

**Thickness:** Tapers off from 30 mm to 5 mm





## 1.2 Applications

- › Insulation of the interior sides of exterior walls
- › Under-rafter insulation suitable for interior render
- › As per **4108-10**:
  - › **DI-zg**: Interior insulation of ceilings (underside) or roofs, insulation under rafters/load bearing structures, suspended ceilings, etc; less tensile strength
  - › **WI-zg**: Interior insulation of walls; less tensile strength

## 2. PREPPING

### Original status

- › General information about the building
- › Building material courses, dimensions and surface character
- › General condition of the structure and the entire building
- › Condition of building element with regard to moisture (driving rain exposure and protection, other types of pressure on structure and substance, such as capillary rise, etc.)
- › Other negative influences on interior climate
- › Thermal bridges

### Establishment of insulation requirements

- › Level of thermal insulation to achieve healthy indoor climate
- › Thermal insulation properties
- › Compliance with applicable energy-efficiency standards or customer requirements

### Plan details

- › Guidelines for substrate preparation
- › Consideration of surface temperatures in critical areas
- › Plan the joint details considering potential thermal bridges

### NOTE

EnEV no longer requires maximum U-values. Only minimum levels of thermal insulation as per DIN 4108 are mandatory. In most cases, a 40-mm thick course of GUTEX Thermoroom® suffices.

## 3. INSTALLATION STEPS

### 3.1 Prepping substrate

The wall substrate must be sound, uniform, dry and free of oily substances or dust. Depending on the type or condition of the substrate, proceed as follows:

- › Check surface and substance for suitability
- › Remove wallpaper and repair plaster where necessary
- › Remove coverings that retard or fully prevent diffusion, or prep them with a nail float
- › Remove gypsum plaster and replace with lime or cement plaster
- › Smooth the wall surfaces out, eliminating any buckles or hollows
- › If the the capillary-active course is less than 2 cm, apply a 20-mm coat of suitable material
- › Sandy substrates: Apply an adhesive primer, e.g. GUTEX® Isoliergrund

SUBSTRATE	PREPARATION	PRODUCT
Dusty, dirty	Sweep, brush, then wash with clean water and allow to dry	-
Mortar ridges and excess mortar	Remove	-
Efflorescence	Remedy the cause then sweep, brush, wash with clean water and allow to dry	-
Mould and mildew	Remedy the cause, remove	Algaecide, fungicide disinfectant solution
Surface uniformity +/- 1 cm	Equalisation/ filler coat	GUTEX® Klebe- und Armierungsmörtel
Skips	Lime-cement mortar (manufacturer's recommended setting time)	GUTEX® Klebe- und Armierungsmörtel
Oil residues and other release agents	Remove using a suitable cleanser and sand with a mild abrasive if necessary	-
Moisture	Remedy cause of rising damp if present	-
Plaster porous, crumbly	Remove via mechanical means	-
Damaged plaster	Remove plaster in hollow areas and patch	GUTEX® Klebe- und Armierungsmörtel
Emulsion paint	Remove using mechanical means or paint remover prior, rinse with clean water and allow to dry completely	-
Chalking	Clean and apply a primer	GUTEX® Isoliergrund/ isolating primer
Blistering, peeling paint or old wallpaper	Remove	-
Unknown substrate	Determine bonding propensity	-





## 3.2 Installing the insulation

### 3.2.1 Cutting and adhering

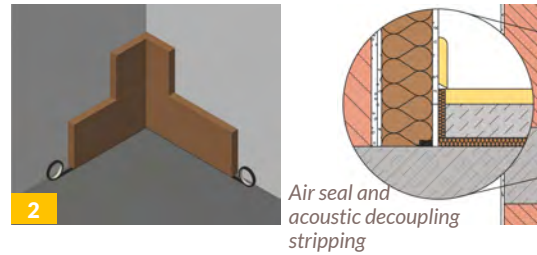
#### 1. Cutting the fibre boards to size

Cut GUTEX Thermoroom® using jigsaw, circular saw or power reciprocating saw



#### 2. Sealing and acoustic decoupling

We recommend isolating the insulation course from the adjacent building elements via pre-compressed sealing stripping. This limits acoustic transmission and air movement through joints, which are the most vulnerable points in building envelopes.



#### 3. Application of adhesive

Apply GUTEX® Klebe- und Spachtelputz evenly to the boards with a 8 x 8 mm or larger serrated trowel.



#### 4. Installing the boards

Install the GUTEX Thermoroom® so the full area of its rear side adheres to the suitably prepared substrate. Make sure the joints and boards are vertically and horizontally plumb. Use of additional mechanical fasteners is unnecessary when using GUTEX Thermoroom®.



#### 5a. Casings (if openings are present)

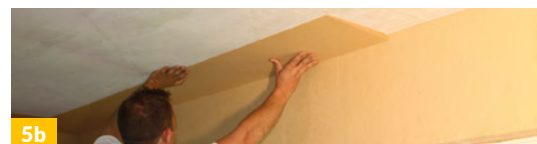
Around the openings of windows and doors and under window sills, install GUTEX Thermoroom® in 20-mm thickness. To eliminate convection, joints with other building elements must be airtight.

↪ [Joints P. 24](#)



#### 5b. Insulation of junction corners (if applicable)

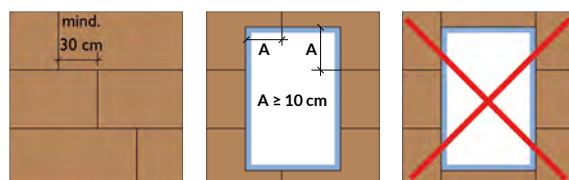
Install with adhesive GUTEX® Flankendämmkeil to the interior of the walls and/or the ceilings.



↪ [GUTEX® Flankendämmkeil P. 13](#)

### NOTE

Stagger/offset the joints from row to row by min. of 30 cm. Avoid cross butt joints. Do not install insulation so its joints meet the corners of door or window openings



### 3.2.2 Fastening w. mechanical means

The use of mechanical fasteners in addition to adhesives is only necessary if the interior insulation is subject to **heavy loads or stress**, such as structural, substrate, ground movement, etc.

#### Masonry

Wall heights exceeding 3.80 m warrant the use of **mechanical anchors**:

- › Once the adhesive has sufficiently cured, install an anchor in the middle of the board and near wall corners.

#### Wood

Use screw-type or cramp (staple) fasteners to install to wood composite board or solid wood element that are installed on the interior side of wall, **staggering/offsetting the joints from row to row by min. of 30 cm**. 4.5-mm common wood screws or staples, the latter with a back width of 10 mm are suitable.

- › The required penetration depth of the fasteners is a minimum of 12 mm.
- › Counter sink cramps 1 - 3 mm into the insulation.
- › Refer to figures on P. 7 for amount of fasteners required.

#### Half-timbered

Since half-timbered structures are subject to movement, GUTEX requires you to provide mechanical fixation in addition to the adhesive for such applications.

The following guidelines apply:

- › Fixing washer diameter  $\geq 60$  mm
- › Penetration depth into sound substrate as per fastener type
- › Minimum of 3 anchors with washers per insulation board
- › Minimum of 6 washers per m<sup>2</sup>

➔ **More information is available in the Half-timbered section on page 22**

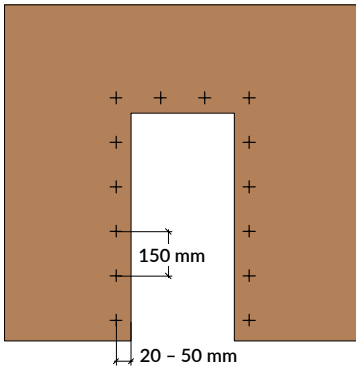




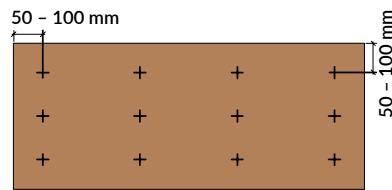
### 3.2.3 Fixation schematic for wood constructions

#### Wall installation

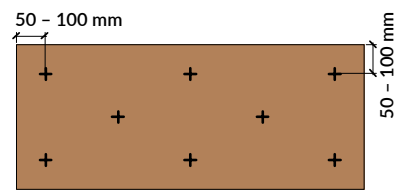
- › Make sure you have a strong, uninterrupted substrate with a minimum of 12 mm thickness.



Fixation schematic for use with rust-proof cramps or screws for door and window openings



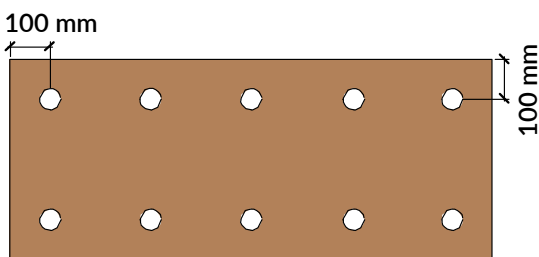
GUTEX Thermoroom® 20 mm;  
12 cramps/screws per board



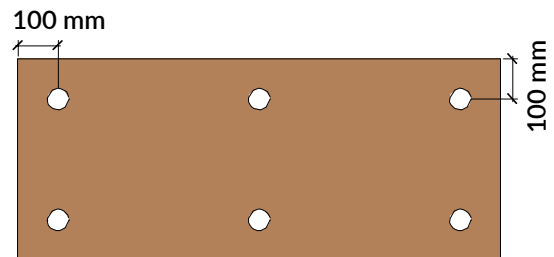
GUTEX Thermoroom® 40 - 100 mm;  
8 cramps/screws per board

#### Under-rafter installation

- › Make sure you have a strong, uninterrupted substrate with a minimum of 20 mm thickness.
- › If you use screws, you need to use **60-mm plastic washers without sleeves**. The weight of the board and plaster make this necessary.



GUTEX Thermoroom® 20 mm:  
10 screws with plastic washers (60-mm diameter) per board



GUTEX Thermoroom® 40 - 100 mm;  
6 screws with plastic washers (60-mm diameter) per board

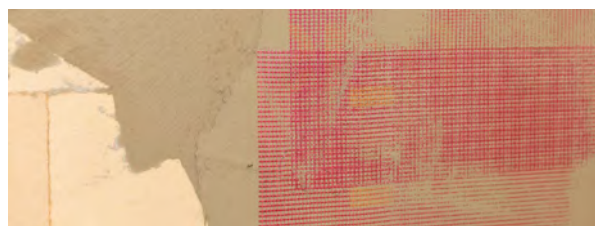
## 3.3 Use with specific wall coverings

GUTEX Thermoroom® wood fibre insulation boards easily accommodate many different render systems, mineral and clay based, but to be on the safe side, tests should be performed to confirm with certainty, specific suitability, compatibility and functional performance.

You'll find the manufacturers of these render systems on page 28. Follow their instructions closely!

### 3.3.1 Reinforcement

- › Before installing the reinforcement, make sure the substrate is free of dust, cracks or joints.
- › Apply a coat of GUTEX® Klebe- und Spachtelputz, minimum 4-mm thick, to the Thermoroom® wood fibre insulation boards.
- › Embed the reinforcement mesh in the outer third of the coat with a uniform overlap of 10 cm.
- › Install additional sections diagonal to the corners of openings in the walls, such as windows, etc.
- › Then apply another thin coat of GUTEX® Klebe- und Spachtelputz over the reinforcement mesh.



*Then apply another thin coat of GUTEX® Klebe- und Spachtelputz over the reinforcement mesh.*

### 3.3.2 Final render

#### Prepping the render base

Depending on the quality and character of the final coat, you may need to upgrade the plaster surface.

- › For finished wall surfaces with medium and heavy grade lining/wall papers, non-woven wallpapers or equalising emulsion paint, (interior plaster Quality Q2) is necessary, which requires a base coat with no visible ridges or grooves. GUTEX suggests a **finely grained mortar**, such as GUTEX® Klebe- und Spachtelputz Feinspachtel for the creation of a floating layer, followed by a light sanding, if required.
- › For finished wall surfaces textured lining papers or matt paint, the latter produced using a low-depth pile roller or airless application, you must establish an interior plaster Quality 3 surface. These guidelines also apply for final coats of less than 1-mm grain. To achieve Quality 3, apply GUTEX® Feinspachtel over the entire surface, without creating pores. Once the coat has dried, sand the surface.



- › For glossy wallpapers, semigloss painted or stained surfaces, you must establish an interior plaster Quality 4 (very smooth) substrate. In addition, apply a 3-mm coat of fine mortar. If necessary, repeat and sand to finish.

### NOTE

An interior insulation system is consistently effective only when absorbed moisture can release into a room's interior without hindrance. For this reason, wall coverings must be diffusion-open (sd-value = approx. 0.5 m). Generally, any wall covering is possible, provided the surface quality of the substrate permits this.



Application of final render

### Mineral-based, final render

Depending on the desired texture/condition of the final coat, it may be advisable to apply GUTEX® Feinspachtel to create a suitable floating layer and surface. Over this coat, apply the final mineral-based render with the desired grain size and texture.

### Earthen plaster render top coat

Allow the clay base coat to fully cure before applying the final coat with the desired grain size and texture. Follow manufacturer's instructions and suggestions as to your choice of material and use.

### Wallpaper and lining paper

Wallpapers must **permit diffusion**. Particularly desired are those that provide a degree of moisture buffering, such as heavy-grade, fibrous and paper-based coverings. Additional coats must be diffusion-open, in order not to hinder the moisture management of the assembly.

### Paint

You always can expect the best results and performance from using coatings that are compatible with the final render coat.

- › Particularly attractive and effective are **clay paints** or clay design renders that will accommodate paint.
- › **Lime- or silicate-based** paints are your best choices to cover final mineral render.

### Tile and backsplashes

Avoid covering larger surface areas of Intevio® insulation with products, such as tile, that prevent diffusion. Backsplashes around sinks less than a metre wide are possible. However, critical spaces, including showers, are not suitable.

To prepare substrates for heavier loads, such as tile backsplashes, you'll need to secure the insulation boards with four evenly spaced insulation anchors and washers with 60-mm or greater diameter.

### 3.3.3 Plasterboard lining

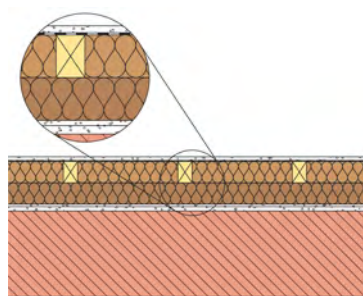
#### Applications

- › Bathrooms, in particular, those with tiled walls
- › High amount of electrical and/or plumbing installations (service installation cavities)
- › Exterior walls with special acoustic insulation requirements or needs for reduced horizontal sound transmission (decoupling function)

#### System description

Facade facing systems typically consist of two insulation layers: GUTEX Thermoroom® on the interior and the actual exterior facing structure.

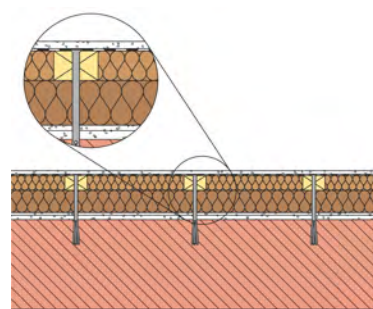
- › Typically the facing structure is a framed construction employing either metal or wood studs with cavity insulation. Gypsum boards, fibrous gypsum boards or similar products install to the framing.
- › Between the studs and the gypsum board, install a vapour retarder. This is consistent with best building science practices and will safeguard the integrity of the structure for many years.



Design 1: Free-standing framing

#### Design variation 1

The design variation with the best building science features is the freestanding design, because it decouples the metal or wood framed construction completely from the GUTEX Thermoroom® insulation course. Fill the cavities tightly, right up to around their inner perimeters with GUTEX Thermoflex®. This design reduces thermal bridges and makes the structure even more soundproof. There is, however, a limit as to how thin the assembly can be without compromising the construction's structural integrity.



Design variation 2: Subconstruction secured with fasteners passing through GUTEX Thermoroom®

#### Design variation 2

This design calls for you to use mechanical fasteners, which go through the wood strapping and insulation, to fix the entire assembly to the masonry. It allows you to reduce the thickness of the assembly, saving valuable living space. In addition, the thinner insulation course is actually an advantage on the interior side of the exterior wall when it comes to minimising condensation. The means of fastening, however, takes more time and installing fasteners into the masonry creates thermal bridges.

#### NOTE

The use of gypsum boards together with insulation for interior insulation applications requires careful, professional consideration in the planning and execution, in order to ensure the proper function of the system, as well as the health of the building and its inhabitants. Care must be taken to keep the joints and interfaces between envelope elements airtight.



## 3.4 Important information for specific installation needs

### 3.4.1 Corner insulation

#### Why corner insulation?

DIN 4108-2 specifies a minimum surface temperature of 12.6° C for the sides of interior walls to prevent condensation and subsequent mould and mildew.

To maintain 12.6° C across all the interior surfaces, extra attention must be given to a building envelope's weak points, which are namely the corners formed by the junction of exterior walls, interior walls and ceilings. You can resolve this problem by increasing insulation at the intersection between the ceiling and interior wall or by installing thicker insulation on the exterior wall.

#### Determining the necessity of corner insulation

For the junctions of exterior and interior walls, the general rule is as follows: If the U-value of exterior wall is below 1.5 and the U-value of the interior wall is at least 3.0, corner insulation is not necessary. If, however, the U-value of the exterior wall is higher (more poorly insulated) and the U-value of the interior wall is lower (better insulated), specific measures to insulate the corners are necessary, depending on and relative to the specified thickness of the interior insulation.

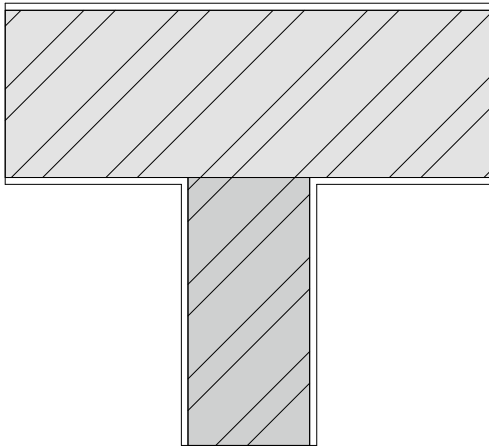
The tables on pages 13 and 14 show for which joints (wall junctions) added corner insulation is necessary. Deviations from the specifications in the tables are possible, but require hygrothermal validation.

#### Using the table, Case 1:

- › Non-insulated exterior wall: U-value = 1.9 W/m<sup>2</sup>K
  - › Third U-value row "2.0 > U ≥ 1.5".
- › Adjacent interior wall: U-value = 1.8 W/m<sup>2</sup>K
  - › Last table column "2.0 > U ≥ 1.5".
- › Third table row and last table column
  - › "If THK\* less than 50 mm" corner insulation required, provided GUTEX Thermoroom® thickness less than 50 mm.

U-value Exterior Wall W/m <sup>2</sup> K	U-value Interior Wall W/m <sup>2</sup> K				
	≥ 3.5	3.5 > U ≥ 3.0	3.0 > U ≥ 2.5	2.5 > U ≥ 2.0	2.0 > U ≥ 1.5
≥ 2.5	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 80 mm
2.5 > U ≥ 2.0	If THK* less than 80 mm	If THK* less than 80 mm	If THK* less than 80 mm	If THK* less than 80 mm	If THK* less than 60 mm
2.0 > U ≥ 1.5	Never	Never	Never	If THK* less than 50 mm	If THK* less than 50 mm
1.5 > U ≥ 1.0	Never	Never	Never	Never	Never

Detailed information to Situation 1 appears in the table on the following page.

**Situation 1: Junction of masonry interior walls and masonry exterior walls**

**Interior-facing corner insulation**

U-value Exterior Wall W/m <sup>2</sup> K	U-value Interior Wall W/m <sup>2</sup> K				
	≥ 3.5	3.5 > U ≥ 3.0	3.0 > U ≥ 2.5	2.5 > U ≥ 2.0	2.0 > U ≥ 1.5
≥ 2.5	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 80 mm
2.5 > U ≥ 2.0	If THK* less than 80 mm	If THK* less than 80 mm	If THK* less than 80 mm	If THK* less than 80 mm	If THK* less than 60 mm
2.0 > U ≥ 1.5	Never	Never	Never	If THK* less than 50 mm	If THK* less than 50 mm
1.5 > U ≥ 1.0	Never	Never	Never	Never	Never

\* THK= GUTEX Thermoroom® thickness

**Corner insulation in non-insulated adjacent spaces**

U-value Exterior Wall W/m <sup>2</sup> K	U-value Interior Wall W/m <sup>2</sup> K				
	≥ 3.5	3.5 > U ≥ 3.0	3.0 > U ≥ 2.5	2.5 > U ≥ 2.0	2.0 > U ≥ 1.5
≥ 2.5	If THK* less than 60 mm	If THK* less than 60 mm	If THK* less than 60 mm	If THK* less than 60 mm	If THK* less than 50 mm
2.5 > U ≥ 2.0	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 40 mm
2.0 > U ≥ 1.5	Never	Never	Never	If THK* less than 30 mm	If THK* less than 30 mm
1.5 > U ≥ 1.0	Never	Never	Never	Never	Never

\* THK= GUTEX Thermoroom® thickness

 **Further examples P.26**





### 3.4.2 Electrical

#### Important considerations

Installations, electrical and otherwise, weaken the insulation efficiency of exterior walls. They are thermal bridges and, depending on their design, decrease the air-tightness of exterior walls, too. Thus, you should observe the following guidelines for electrical in-wall installations:

- › Whenever possible, avoid installation in exterior walls. Instead, install them on/in adjacent perpendicular interior walls.
- › If unavoidable, install the electrical installation on the foundation wall, behind the interior insulation or in the new reinforcement course.
- › A minimum insulation thickness of 20 mm between flush electrical boxes and the non-insulated (pre-insulation) cross-section of the wall is necessary. Thus, in Germany (based on German box dimensions) the GUTEX Thermoroom® must be 60-mm thick.



Brand: Kaiser, 35 mm high, shallow, airtight flush box



Brand: Kaiser, 48 mm high, shallow, airtight flush box

#### Installation

- › Cut a 68-mm hole for the flush box in the GUTEX Thermoroom®.
- › Embed the box on all sides and behind in GUTEX® Klebe- und Spachtelputz or GUTEX® Fugendicht (adhesive caulking).
- › Run electrical wires from cold areas through walls to warm areas without compromising the walls' air-tightness. Use cable instead of conduit and install only airtight-certified boxes.
- › If you are running electrical lines only on the warm sides of walls, use 35-mm flush wall boxes, in order to affect the interior insulation as little as possible. The boxes needn't be airtight-certified and you may use conduit instead of cable.



Airtight flush box: cable inlet and box connector

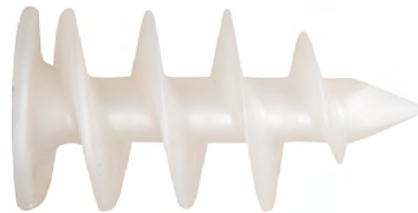
### 3.4.3 Plumbing

It is important to consider that plumbing lines installed in or on the original (initially non-insulated) wall must contend with colder, even freezing temperatures, when covered by insulation since they no longer have the benefit of the warmth from open spaces.

Move such lines as close as possible to the heated space's surface, preferably on the exterior (interior space-facing) side of the insulation.

### 3.4.4 Fastening of lightweight objects

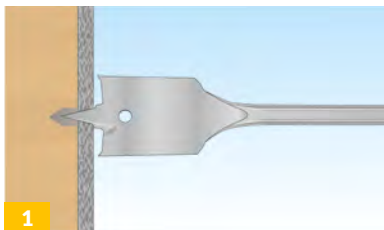
Use **spiral fasteners** to fix lightweight objects, such as lighting fixtures, pictures, etc., to GUTEX Thermoroom®. You may install the insulation fixings before or after the application of render.



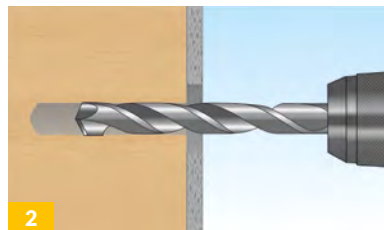
#### NOTE

You may use insulation fasteners from Fischer, Würth, Ejoy, Tox etc.. Follow the manufacturers' load specifications closely!

### Installation through the render (E.g. Tox anchors)



1 Cut a round circle through the render using a special-purpose spade bit. Do not use the impact function if you're using a hammer drill.

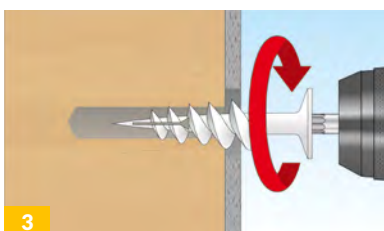


2 Pre-drill the Thermoroom® wood fibre insulation with a 6-mm wood bit.

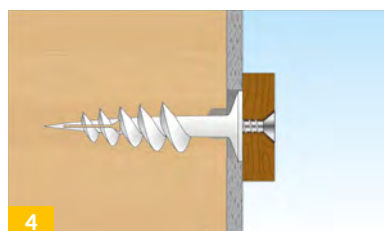
#### NOTE

Before screwing the anchor in, apply some GUTEX® Fugendicht under the collar of the flanged head.

Once you've tightened in the anchor, clean off the excess Fugendichtmasse between the render and spiral fixing.



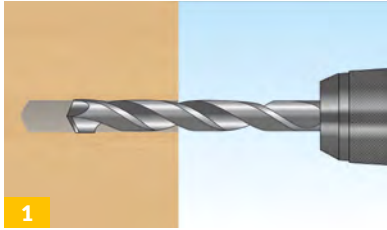
3 Screw the spiral fixing with a Torx 40-drive until it's flush with the surface.



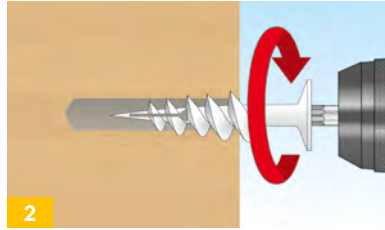
4 Mount the object using a 4.5 – 5-mm wood screw.



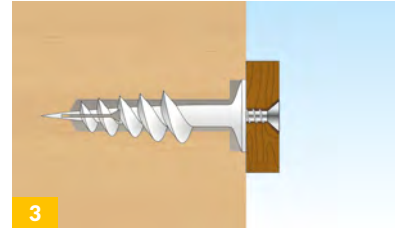
### Attachment in the wood fibre insulation board (Example: Tox fixing)



1 Pre-drill the Thermoroom® wood fibre insulation with a 6-mm wood bit.



2 Screw the spiral fixing with a Torx 40-drive until it's flush with the surface.



3 Mount the object using a 4.5 – 5-mm diameter wood screw.

### Suggested loads

The load-bearing capacity is proportionately relative to the insulation anchor. Below, you will find the capacities and descriptions for various anchors (e.g. Tox).

Comparison of Insulation Materials	Length (mm)	Drill Bit ( $d_0 \text{ } \varnothing$ mm)	Suitable Screw Diameter $\varnothing$ mm	Anchor Cap/ Drive ( $d_x$ /TX)	Anchor Depth ( $h_{ef}$ mm)	Max. Screw Depth ( $s \leq$ mm)	Load Capacity (kg)
Thermo 50	50	6	4.5 – 5.0	25 / 40	50	30	3
Thermo 85	85	6	4.5 – 5.0	25 / 40	85	40	6
Thermo Plus 55	55	12	8 – 10	50	50	50	5
Thermo Plus 85	85	12	8 – 10	50	85	50	8

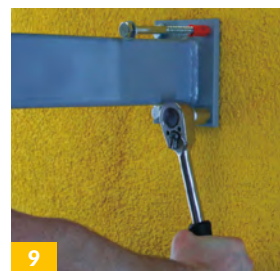
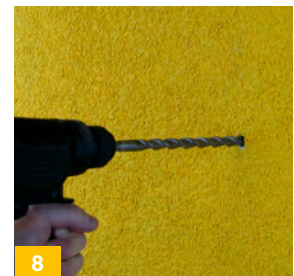
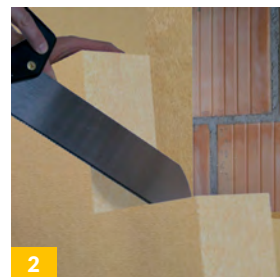
### 3.4.5 Fastening of heavier objects

Fasten heavy objects, such as heating radiators, cabinets, etc., with fixings that penetrate GUTEX Thermoroom® and fasten to the original walls. To prevent impressions in walls from the weight of objects use an underlay block made from solid wood or polyurethane (e.g. Dosteba Quadroline Montagequader).

**Remember the anchors anchor in masonry not the mounting blocks.**

#### Installation instructions

1. Mark the intended location with a pencil.
2. Cut a hole out with a suitable insulation cutting tool.
3. Remove the piece and clean the opening.
4. Apply adhesive to the polyurethane block.
5. Press the fill block into the opening.
6. Apply mortar or spray foam to seal the joints.
7. Mark the position of the fill block with a screw before installing the reinforcement and final coat.
8. Drill a hole through the fill mounting block, using a hammer drill, into the masonry wall.
9. Mount and fasten the object with suitable screws.

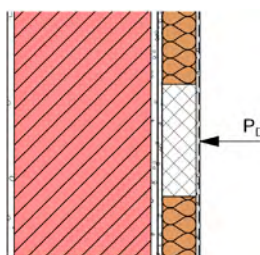


#### Dosteba Quadroline Montagequader -

##### Load Capacities

Suggested Loads  
Load ( $P_D$ ) across entire  
mount block

198 x 198 mm:	5.90 kN
138 x 238 mm:	4.90 kN



### 3.4.6 Interior walls subject to impact

Interior wall surfaces subject to impact, dents and other surface damage are typically staircases and highly frequented spaces. Protect such surfaces with increased reinforcement, such as products designed specifically to install over the usual reinforcement. Press these reinforcement

meshes into the reinforcement mortar over the regular reinforcement. Do not overlap the extra reinforcement but rather butt the sections against the adjacent mesh.

Increase the reinforcement coat by 1 – 2 mm.



## 4. SPECIAL BUILDING TECHNOLOGIES/MATERIALS

### 4.1 Integral radiant wall heat

#### 4.1.1 Radiant hot water

##### Prepping the substrate

Follow the guidelines on page 4 section 3.1 Prepping substrate. In addition, the following applies:

- › Use additional coats of base coat to even out significant hollows, waves, rises, ripples, etc. in the substrate (greater than 10 mm). Use a suitable mortar, e.g. WEM Naturkalk-Universalputz.

##### Fastening GUTEX Thermoroom®

1. Install the GUTEX Thermoroom® so the full area of its back side adheres (using WEM Naturkalk-Haftputz adhesive) to the substrate.
2. Use a 10-mm serrated trowel to apply a 5-mm thick coat of the adhesive.
3. Fasten the boards' corners with at least 5 insulation fasteners (per m<sup>2</sup>) that are suitable for the masonry.
4. Fasten the boards when the mortar on the substrate is still wet.

Follow the manufacturers' guidelines!

##### Preparing the board surfaces

- › Make sure GUTEX Thermoroom® surfaces are dry and free of dust.
- › Lime plaster: Apply a uniform 3-mm coat of WEM Naturkalk-Haftputz (a brand of natural lime plaster adhesive for hydronic wall radiant heat) with a serrated trowel and allow to dry (approx. 1 day/mm coat thickness). If you're using clay render, disregard this step.

##### Installing hydronic radiant wall heating

1. Attach the mount with screws (e.g. chipboard screws; 6 x 40 mm for 60-mm insulation)
2. Connect the hydronic elements to each other using WEM press fittings.
3. Perform a pressure test before you cover with render.



Fastening a hydronic heat element



### Installing radiant wall heat in a wall with clay plaster

Apply several courses of WEM Lehm-Universalputz:

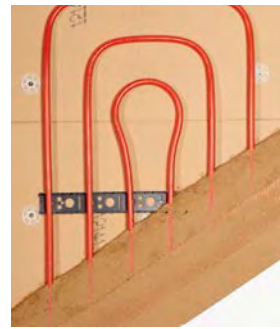
1. Spray on the first coat (maximum 15 mm). Remove excess plaster from the hot water pipes. To speed up the curing process, you can turn on the radiant heat and let it run at operating temperature.
2. Apply the Universalputz (a universal plaster) to just cover the heating lines and smooth, removing excess.
3. With the third course, cover the hot water lines completely and embed the reinforcement mesh completely. Overlap the joints by a minimum of 10 cm.
4. For the final coat, use WEM Lehm-Feinputz. Strive to achieve a 3-mm coat and finish with a felt float or appropriate float to achieve a fine, smooth finish.

#### NOTE

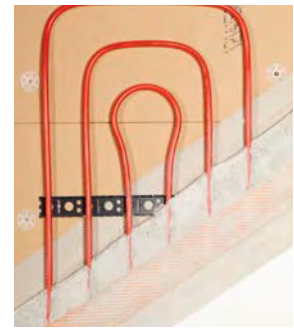
Important! Allow every coat of plaster to dry thoroughly before continuing to the next step.

#### NOTE

- › Follow the instructions for drying at (in German): [www.wandheizung.de/tp](http://www.wandheizung.de/tp)
- › Do not use heat to dry lime plaster.
- › Follow closely the manufacturer's installation instructions.



Clay render



Installing lime plaster

### Installing radiant wall heat in a wall with lime plaster

1. Apply the WEM Naturkalk-Universalputz to just cover the heating line and smooth.
2. Roughen the surface once it has begun to set and remove any skin (plaster layer approx. 23 mm). Allow one day per mm of render course thickness to cure.
3. Apply the second coat (approx. 7 mm) to cover the hot water lines.
4. Install the WEM reinforcement so it is fully embedded. Joints should overlap at least 10 mm.
5. When the reinforcement coat has thoroughly cured, apply a final render coat of WEM Naturkalk-Feinputz, and smooth or use an appropriate float to create a fine texture.

#### 4.1.2 Electric systems: IR-heating (Frenzelit hicoTHERM)

##### Prepping the substrate

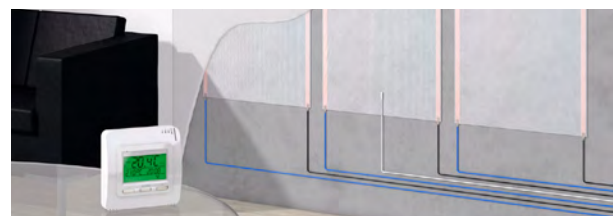
Refer to the applicable substrate preparation instructions and requirements in section 3.1 on page. 4.

##### Fastening GUTEX Thermoroom®

- › Use GUTEX® Klebe- und Spachtelputz or another mortar suggested by GUTEX, with a 8 x 8 mm or greater serrated trowel to adhere the GUTEX Thermoroom®
- › Apply a 5-mm or thicker adhesive coat

##### Spread fibre-reinforced, setting mortar

- › Spread a 4-mm reinforcement coat of GUTEX® Klebe- und Spachtelputz or comparable reinforcement mortar recommended by GUTEX.
- › Work GUTEX® Universal-Armierungsgewebe (fibre reinforcement mesh) into the outer third section of the reinforcement course.







## Installing hicoTHERM® systems

1. Apply a thin coat of spackling/filling compound or adhesive over the dry reinforcement course.
2. Embed the 0.4-mm thick hicoTHERM® heat film, including wires, to a uniform depth in the thin bed of compound, so that the surface is uniformly even.

### Alternative placement of the heating film

If you install the heating film under the reinforcement course specified by your system, you can expect a delay in the effect of the heating, but not a reduction in its output.

- 2a. Apply a thin course of spackling/plaster compound on the GUTEX Thermoroom® and embed the heating film and wire uniformly in the thin bed of compound.
- 2b. Install the reinforcement course (see p. 18), after approx. 48 hours, over the dry and hard spackling/filler compound coat.
3. Embed the 24-V-/36 wiring (extra low voltage) and connect it to your source of power.
4. Float the spackling/levelling compound to create a smooth surface suitable for paint. Allow to cure a minimum of one day per mm of applied compound thickness.

### Top coat finish

- › Apply the final wall covering, which may be wall paper, paint, render, etc.

#### NOTE

Make sure the plaster components are suitable for the specified heating element temperature, usually under 40° C. In some cases, however, the temperature may exceed 40° C, e.g. when some of the heating elements are covered.



1



2



3



4

#### NOTE

Retrofits, such as lighting, electrical outlets, etc., installed through the heating film in walls or ceilings are possible, but must not exceed 70 mm in diameter. When making the hole, exercise care that you do not damage the copper strips on the sides. Since the hicoTHERM® operates on ELV (extra low voltage), such retrofits do not create hazards for contractors or users.

IR heating film is particularly useful for the reduction of thermal bridges, e.g. those created by plate-joint junctions, where a small infrared heating film heats the localized endangered area, specifically the interior-facing plaster surface.

## 4.2 Half-timbered



### Challenges

Half-timbered structures' dimensions, both width- and depth-wise, are typically inhomogeneous. In addition, they consist of various building materials (wood, clay, plaster, etc.) with different properties. Thus, the individual cavities are prone to expansion and contraction.

Further complicating matters is that moisture from outdoors can permeate the structure, which means it must be able to dissipate, releasing to both the building's interior and exterior.

### Demands on the interior insulation

To master these challenges, the interior insulation system must meet certain requirements:

- › Vapour barriers/ blocks are not recommended because they hinder the movement of moisture in one direction.
- › The interior insulation system, consisting of adhesive, insulation and surface finish, must possess the following physical properties:
  - › High capacity of moisture buffering
  - › High diffusion openness
  - › High degree of capillary action

- › The insulation must possess high mechanical buffering capacity. For this reason, wood fibre insulation boards or batten constructions with wood fibre cavity insulation and wall liner/cladding are especially suitable.
- › Exterior building wall faces that are especially subject to weather influences are suitable for fitting with interior insulation systems only if they have the protection of a suitable exterior cladding, such as shingles (often slate).

### Special installation instructions

Because of the specific characteristics of these types of structures, we urge you to pay careful attention to the following guidelines:

1. Adhere the insulation board so its backside has full contact to the substrate across its breadth and width and so there are no open joints. Limit the insulation thickness to 60 mm in order keep the temperature in critical areas above the dew point. Avoid cement-based products.
2. Cover the half-timbered wood with plaster mesh, preferably from reed grass.
3. Apply the base coat. Clay is especially suited because it reacts to moisture like wood. Moreover, it is a highly effective medium for the filling of hollows in substrates and creating uniform surfaces.
4. In addition to the adhesive, use insulation anchors to mechanically fasten the insulation boards.

➔ **Mechanical fixation page 8**



## 4.3 Cellar ceilings

### Building science background information

Insulating cellar ceilings is an easy and effective way to improve the energy efficiency of a building significantly.

Because the insulation of cellar ceilings is from below, i.e. the cold side of the installation, you should consider it a type of exterior insulation. As far as building science and its application go, the principles for handling this situation are the same as those that common ETIC systems employ. Since the Intevio® interior insulation system is extremely diffusion-open and especially effective at buffering moisture, it is ideal for this application, allowing moisture in the structure to diffuse and dissipate independently of the floor assembly above.

To ensure the system performs to its fullest in terms of diffusion and drying, use only plaster and paint systems that are suitable for Intevio®!

### Insulation thickness

As per EnEV 2016 (German energy efficiency standard), the maximum U-value for both subdeck and above-deck energy refurbishment applications is 0.3 W/m<sup>2</sup>K.

Minimum requirements as per applicable lending institute apply. KfW-Förderbank, Germany 2017, requires a U-value of 0.25 W/m<sup>2</sup>K.

Shown in the table on the right are examples of applicable requirements for insulation thickness in conjunction with specific German standards.

### NOTE

As a rule, unheated cellar areas are especially damp. Consider this when you are deciding on the exterior finish, top coat, etc!

Present Cellar Ceiling W/m <sup>2</sup> K	Required insulation thickness (mm)*	
	EnEV 2016 U ≤ 0.30 W/m <sup>2</sup> K	KfW 2017 U ≤ 0.25 W/m <sup>2</sup> K
3.0	130	150
2.5	120	150
2.0	120	150
1.5	110	140
1.0	100	130

\* Rounded off to 10 mm for the default value of 0.041 W/mK

### Installation guidelines

Please follow the guidelines provided on page 4 for substrate preparation, installation and recommended products in conjunction with the Intevio® interior insulation system. In sum they are:

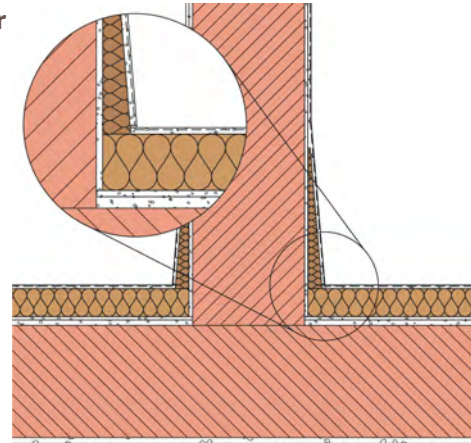
1. Make sure the cellar ceiling substrate is intact, dry and free of oily substances and dust. If the surface is not uniform, use a suitable (system-compatible) base coat.
2. Apply GUTEX® Klebe- und Spachtelputz to the GUTEX Thermoroom® so the full area of its rear side adheres to the suitably prepared substrate.
3. Install the boards butted tightly. Stagger/offset the joints from row to row by min. of 30 cm. Avoid cross butt joints.
4. In addition to the adhesive, use insulation anchors to mechanically fasten the insulation boards into the substrate: 6 anchors with washers per m<sup>2</sup> > 60 mm are necessary. Follow exactly the manufacturer's penetration depth specifications for the the specific product!
5. Install an approved plaster system. Alternatively, you may install exterior facing.

## 5. DESIGN DETAILS AND JOINTS

### 5.1 Instructional details for typical designs

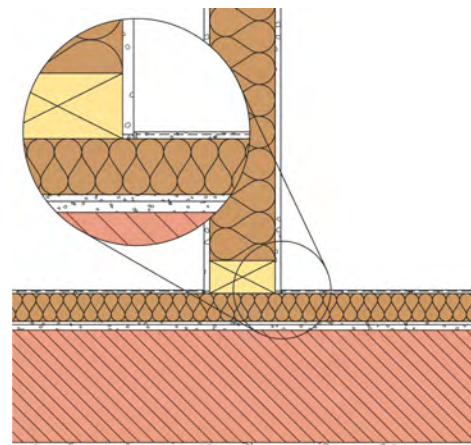
#### Exterior wall – Connecting (perpendicular) interior

To minimise thermal bridges, it may be necessary to insulate with corner insulation the junctions of exterior and interior walls (GUTEX Flankendämmung or reveal/casing insulation board). NOTE: You may need to insulate the corners on both sides of interior walls.



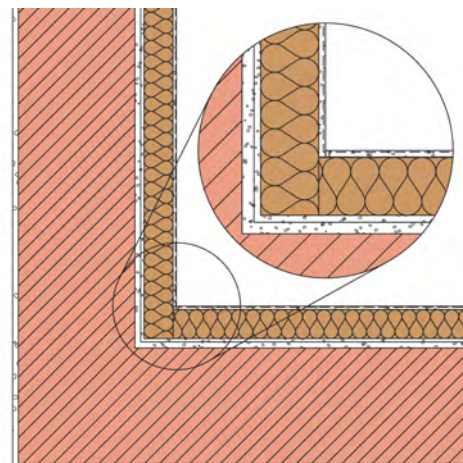
#### Exterior wall – Isolated adjacent wall

If possible, you should make sure the insulation covers the substrate completely without interruption. This will discourage the occurrence of thermal bridges. However, if you do this, you must provide for additional soundproofing, as such a design facilitates sound transmission.



#### Exterior wall corner – Interior insulation

Install the insulation so it butts tightly in the corner with the adjacent board. We recommend caulking the joint with GUTEX® Fugendicht. To prevent against cracks in the plaster forming through movement, create in the corner in the reinforcement coat a “trowel cut” to isolate the two wall plaster coats.

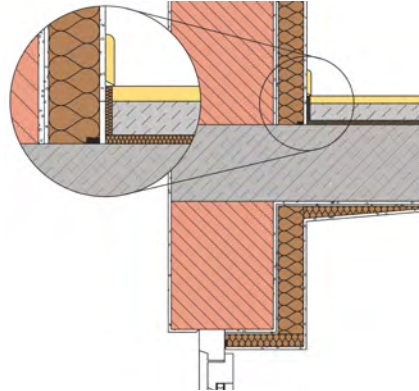






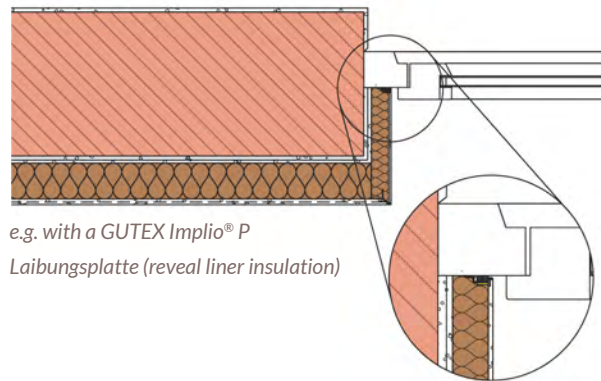
### Insulation between two stories

To minimise thermal bridges, you may need to install insulation in the ceiling corner of the space below. To eliminate or avoid thermal bridges, you need to remove a strip of the floor covering and underlayment, so that you can access the raw subfloor/floor. Install Intevio® so it butts against the exposed floor.



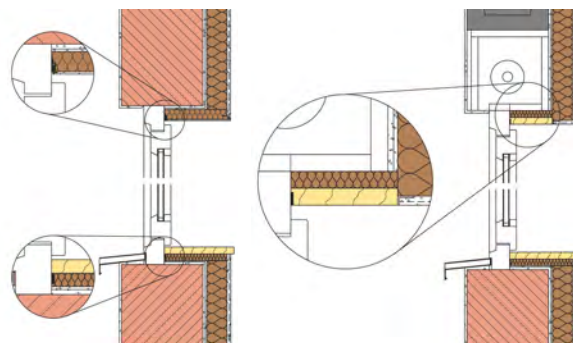
### Junction with window jambs

- › Always use the thickest possible GUTEX Thermoroom® insulation to cover casings, in order to minimise thermal bridging. This is decisive to lowering the risk of mould and mildew.
- › The minimum insulation thickness for window casings is 20 mm.
- › The casing insulation thickness may be at the most 40 mm less than that of the wall insulation. For example, if the wall insulation is 60 mm, the casing insulation must be at least 20 mm.
- › If it's not possible to meet the casing insulation requirement, you will have to make the necessary modifications to alter the window or casing dimensions.



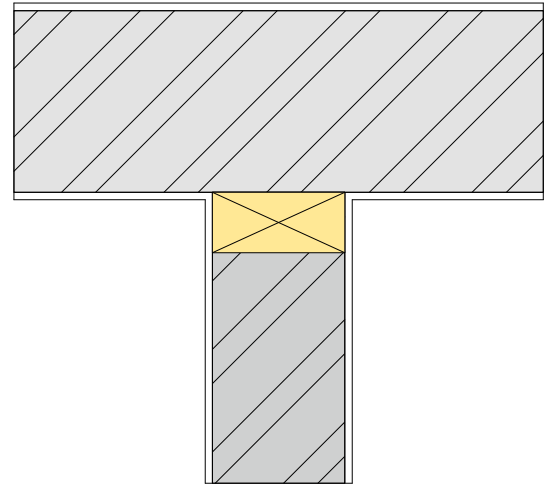
### Window junctions - Sill /sunshade housing

Install the interior windowsill, so that it is airtight, using expanding foam tape to prevent convection through the joint between the bottom of the windowsill and the wall structure under the window.



## 5.2 Corner insulation – additional examples

**Situation 1: Junction of interior and exterior walls**  
**Interior and exterior masonry walls**  
**(with timber uprights at the joints)**



### Interior-facing corner insulation

U-value Exterior Wall W/m <sup>2</sup> K	U-value Interior Wall W/m <sup>2</sup> K				
	≥ 3.5	3.5 > U ≥ 3.0	3.0 > U ≥ 2.5	2.5 > U ≥ 2.0	2.0 > U ≥ 1.5
≥ 2.5	If THK* less than 60 mm	If THK* less than 60 mm	If THK* less than 60 mm	If THK* less than 80 mm	If THK* less than 80 mm
2.5 > U ≥ 2.0	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 60 mm	If THK* less than 60 mm
2.0 > U ≥ 1.5	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 50 mm
1.5 > U ≥ 1.0	Never	Never	Never	Never	Never

\* THK= GUTEX Thermoroom® thickness

### Corner insulation in non-insulated adjacent spaces

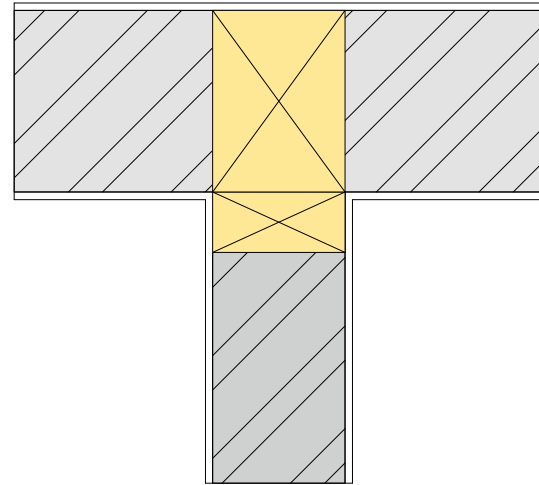
U-value Exterior Wall W/m <sup>2</sup> K	U-value Interior Wall W/m <sup>2</sup> K				
	≥ 3.5	3.5 > U ≥ 3.0	3.0 > U ≥ 2.5	2.5 > U ≥ 2.0	2.0 > U ≥ 1.5
≥ 2.5	If THK* less than 40 mm	If THK* less than 40 mm	If THK* less than 40 mm	If THK* less than 50 mm	If THK* less than 50 mm
2.5 > U ≥ 2.0	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 40 mm	If THK* less than 40 mm
2.0 > U ≥ 1.5	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 30 mm
1.5 > U ≥ 1.0	Never	Never	Never	Never	Never

\* THK= GUTEX Thermoroom® thickness





**Situation 3: Junction of masonry interior walls and masonry exterior walls (with timber uprights)**



**Interior-facing corner insulation**

U-value Exterior Wall W/m <sup>2</sup> K	U-value Interior Wall W/m <sup>2</sup> K				
	≥ 3.5	3.5 > U ≥ 3.0	3.0 > U ≥ 2.5	2.5 > U ≥ 2.0	2.0 > U ≥ 1.5
≥ 2.5	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 50 mm	If THK* less than 60 mm
2.5 > U ≥ 2.0	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 50 mm
2.0 > U ≥ 1.5	Never	Never	Never	Never	Never
1.5 > U ≥ 1.0	Never	Never	Never	Never	Never

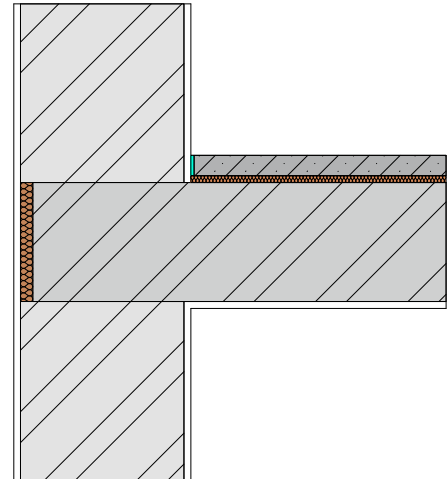
\* THK= GUTEX Thermoroom® thickness

**Corner insulation in non-insulated adjacent spaces**

U-value Exterior Wall W/m <sup>2</sup> K	U-value Interior Wall W/m <sup>2</sup> K				
	≥ 3.5	3.5 > U ≥ 3.0	3.0 > U ≥ 2.5	2.5 > U ≥ 2.0	2.0 > U ≥ 1.5
≥ 2.5	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 30 mm	If THK* less than 40 mm
2.5 > U ≥ 2.0	Never	Never	Never	Never	If THK* less than 30 mm
2.0 > U ≥ 1.5	Never	Never	Never	Never	Never
1.5 > U ≥ 1.0	Never	Never	Never	Never	Never

\* THK= GUTEX Thermoroom® thickness

**Situation 4: Exterior wall & concrete ceiling junctions**



**Interior-facing corner insulation**

Insulation of Concrete Slab Ceiling's External-Facing Side				
U-value Exterior Wall W/m <sup>2</sup> K	Without	Wool wood 20 mm 0.09 thermal conductivity W/ mK	PS 20 mm Thermal conductivity 0.04	PUR 20 mm Thermal conductivity 0.03
≥ 2.5	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 100 mm
2.5 > U ≥ 2.0	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 100 mm	If THK* less than 100 mm
2.0 > U ≥ 1.5	If THK* less than 100 mm	If THK* less than 80 mm	If THK* less than 60 mm	If THK* less than 50 mm
1.5 > U ≥ 1.0	If THK* less than 80 mm	Never	Never	Never

\* THK= GUTEX Thermoroom® thickness

**Corner insulation in non-insulated adjacent spaces**

Insulation of Concrete Slab Ceiling's External-Facing Side				
U-value Exterior Wall W/m <sup>2</sup> K	Without	Wool wood 20 mm 0.09 thermal conductivity W/ mK	PS 20 mm Thermal conductivity 0.04	PUR 20 mm Thermal conductivity 0.03
≥ 2.5	If THK* less than 60 mm	If THK* less than 60 mm	If THK* less than 60 mm	If THK* less than 60 mm
2.5 > U ≥ 2.0	If THK* less than 60 mm	If THK* less than 60 mm	If THK* less than 60 mm	If THK* less than 60 mm
2.0 > U ≥ 1.5	If THK* less than 60 mm	If THK* less than 50 mm	If THK* less than 40 mm	If THK* less than 30 mm
1.5 > U ≥ 1.0	If THK* less than 60 mm	Never	Never	Never

\* THK= GUTEX Thermoroom® thickness



## 6. PRODUCT RANGE

### GUTEX Thermoroom® wood fibre insulation board

THICKNESS (MM)	DIMENSIONS (MM)	EDGE	WEIGHT (kg/unit)	Per Pallet (units)	Per Pallet (m <sup>2</sup> )
20	1,200 x 500	Butt	1.6	96	57.60
40	1,200 x 500	Butt	3.1	48	28.80
50	1,200 x 500	Butt	3.9	36	21.60
60	1,200 x 500	Butt	4.7	30	18.80
80	1,200 x 500	Butt	6.2	24	14.40
100	1,200 x 500	Butt	7.8	18	10.80

### GUTEX System Accessories

- › GUTEX® Flankendämmkeil/corner insulation wedge
- › GUTEX® Fugendichtband / adhesive sealing strip
- › GUTEX® Fugendicht/ caulking
- › GUTEX® WDVS Thermoschraubdübel/ thermally decoupled screw fasteners for GUTEX ETICS
- › GUTEX® Gewebe-Eckwinkel/ corner bead w. mesh
- › GUTEX® Sturzeckwinkel/ inverted angle mesh for reveal corners, e.g. windows and doors
- › GUTEX® Anputzleiste/ plastic strip (architrave bead)
- › GUTEX® Putzabschlussprofil / GUTEX stop bead
- › etc.

### GUTEX Main Plaster Products

PRODUCT	CONTAINER	WEIGHT (KG/ UNIT)	Units/Pallet	Per Pallet (kg or m <sup>2</sup> )
GUTEX® Klebe- und Spachtelputz/ cementitious dry base coat mortar	Bag	25	36	900
GUTEX® Feinspachtel/ filler	Bag	20	36	720
GUTEX® Isoliergrund/ isolating primer	Tub	25	24	600
GUTEX® Universal-Armierungsgewebe/ fibre reinforcement mesh	Roll 50 m x 1.1 m	12	20	1,100

## 7. RENDER AND SYSTEM COMPONENT

### MANUFACTURING PARTNERS



Baumit GmbH  
www.baumit.de



CLAYTEC e.K.  
www.claytec.com



conluto  
www.conluto.de



DRACHOLIN GmbH  
www.dracholin.de



eiwa Lehm GmbH  
www.eiwa-lehmbau.de



Frenzelit GmbH  
www.frenzelit.com



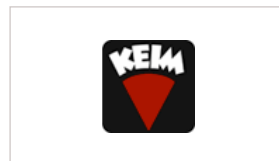
Wolfgang Endress Kalk- und  
Schotterwerk GmbH & Co. KG  
www.graefix.de



GUTEX Holzfaserplattenwerk  
www.gutex.de



HASIT Trockenmörtel GmbH  
www.hasit.de



KEIMFARBEN GmbH  
www.keimfarben.de



KNAUF Gips KG  
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Egginger-Naturbaustoffe-  
Handels-GmbH  
egginger-naturbaustoffe.de



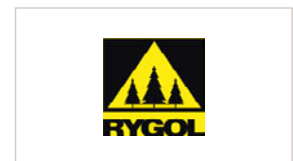
Pilosith GmbH  
www.pilosith.de



quick-mix Gruppe GmbH &  
Co. KG  
www.quick-mix.de



Röfix AG  
www.roefix.com



Kalkwerk RYGOL  
GmbH & Co. KG  
www.rygol-sakret.de



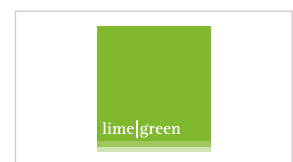
Tröndle Putztechnik Handels  
und Vertriebs GmbH  
www.troendle-putztechnik.de



Saint-Gobain Weber GmbH  
www.sg-weber.de



WEM Wandheizung GmbH  
www.wandheizung.de



Lime Green Products Ltd  
www.lime-green.co.uk



## 8. APPLICATIONS AND SOLUTIONS



### Roofs

- › **▣** Tecadio® GUTEX roof reurbishment system
- › Above-rafter insulation
- › Sarking boards
- › Flat roof insulation
- › Cavity insulation (GUTEX Thermoflex®)
- › Cavity insulation (GUTEX Thermofibre® blow-in insulation)

### Interior

- › **▣** Intevio® GUTEX interior insulation system
- › Vapour permeable underlay installed from interior between rafters
- › Rafter underside insulation boards
- › Insulation under screed (dry / wet)
- › Top storey ceiling
- › Suspended ceiling
- › Solid wood flooring / Solid wood plank flooring
- › Service cavity insulation course
- › Partition walls
- › Cavity insulation (GUTEX Thermoflex®)
- › Cavity insulation (GUTEX Thermofibre® blow-in insulation)

### EXTERIOR WALLS

- › **▣** GUTEX Thermowall® ETICS  
GUTEX Exterior Thermal Insulation  
Composite System
- › Render
- › Rainscreen
- › Brick facing
- › **▣** Durio® GUTEX system for unique facade design
- › **▣** Implio® GUTEX window integration system
- › Cavity insulation (GUTEX Thermoflex®)
- › Cavity insulation (GUTEX Thermofibre® blow-in insulation)

# INTEVIO®

## ADVANTAGES



Pleasant indoor climate



Ideal acoustic insulation



Insulation in summer



Insulation in winter



Systems deliver greater dependability



Sustainability



Service

*Knowing you've  
done the right thing.  
That's the  
GUTEX effect.*



### Intevio® is the first interior insulation system with RAL quality seal

For products to receive the RAL seal of quality, they must meet more than just the highest quality standards. In addition, they must display a uniquely high degree of sustainability and health safety as well as exceptional customer and service orientation. Regular audits, performed by GUTEX and independent institutes assure the products' continued compliance with the RAL quality terms and stipulations.

#### OUR PRODUCT AND SERVICE DESIGNATIONS



Roof



Wall



Interior



#### Ecological Building Systems

For further information and full technical support for your project, please contact Ecological Building Systems or visit [www.EcologicalBuildingSystems.com](http://www.EcologicalBuildingSystems.com)

Ireland: 046 9432104 Fax: 046 9432435 UK: 01228 711 511 Fax: 01228 712 280



[info@EcologicalBuildingSystems.com](mailto:info@EcologicalBuildingSystems.com)

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