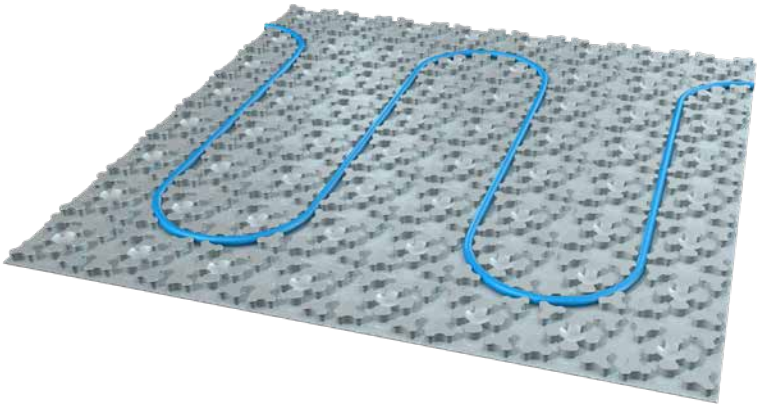
IndorTec® THERM-E

Electric underfloor heating

For flexible and textile coverings and wood/laminate in indoor areas.

For ceramics and natural stone, please refer to technical data sheet
“IndorTec® THERM-E – For ceramic and natural stone coverings”



Product properties and application areas

IndorTec® THERM-E

- Electric underfloor heating for floor covering heating/ temperature control
- Uncouples coverings from critical substrates
- For flexible and textile coverings, wood/laminate
- Tension equalising

For indoor use

- On unheated and heated substrates
- On cracked screeds
- On wooden substrates and dry screeds
- On hollow floors
- On mixed substrates
- On mastic asphalt screeds


VDE Prüf- und Zertifizierungsinstitut

GUTACHTEN MIT FERTIGUNGSÜBERWACHUNG
CERTIFICATE OF CONFORMITY WITH FACTORY SURVEILLANCE

VDE

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Technical data sheet with laying instructions

Floor coverings

Substrates

Substrates must be even, pressure resistant, load bearing, vibration free and non-flexing. The requirements of the respective regulations of the relevant floor covering basically apply.
Adhesion-reducing constituents on the surface must be removed. Any remaining uneven areas must be levelled with a levelling compound that is appropriate for the substrate before laying IndorTec® THERM-E.

Approved substrates

- Cement screeds
- Calcium sulphate screeds
- Concrete substrates
- Wooden sub-structures and dry screeds
- Hollow floor structures
- Mastic asphalt screeds
- Load-bearing mixed substrates consisting of different materials, but also with cracks, if these have been secured to prevent height differences
- Heated and unheated substrates

See application matrix for other details.

General instructions

Trowelling off

Suitable materials
Fluid floor filling compounds with low contraction and low tension characteristics must be used to trowel off IndorTec® THERM-E. Appropriate products can be found in the construction recommendations at www.gutjahr.com.

Coverings

Suitable coverings
Coverings such as the ones recommended by the covering manufacturer for the respective application area are suitable.

Unsuitable coverings
Covering materials which tend to deform when affected by moisture are unsuitable.

Joints

- Connecting joints to rising parts of the structure and penetrations in the covering must not be friction fitted. A proper connection is made by using AquaDrain® RD
edge insulation strips with a self-adhesive foot.
- Structural separating and expansion joints must be taken over congruently and with the specified width in IndorTec® THERM-E and the top covering. The formation of joints must take place in accordance with the regulations and manufacturer specifications of the appropriate fluid floor filling compound and the floor covering.
- Contraction joints must be evaluated in accordance with the regulations and laying specifications for fluid floor filling compounds and floor coverings and implemented accordingly. If a takeover is required / reworking without separation is not possible, implementation must take place in the same way as for expansion joints.

Heating cable, floor sensor cable and thermostat

The heating cable consists of a cold and warm conductor area.
The transition is sleeveless and is marked with a “transition label”. The warm conductor area must not be shortened, since this will destroy the function thereof. The cable (4 m in length) can be shortened up to ≥ 1 m in the cold conductor area. An extension of unrestricted length is possible at the cold conductor side.

The maximum size of field areas is 27.00 m² in accordance with the maximum heating cable length. Temperature control takes place with 1 thermostat in each case.

Field areas can be combined into a single unit, provided that the electro-technical preliminary planning is taken into consideration. Temperature control takes place with 1 thermostat per unit in each case.

Covering areas with several field areas must be separated from each other by expansion joints.

Independent installation and operating/programming instructions apply to the thermostats of the IndorTec® THERM-E, which are enclosed with the packaging or are available for downloading on the product pages on the Internet.

The heating and floor sensor cables fulfil the requirements of protection class IPX7 “Protection against occasional immersion” in water.

The IndorTec® THERM-E covering support mat must always be laid over the entire room area. The heating cables must be arranged on the areas that are actually free. The resulting quantity difference between heating cables and covering support mat must be taken into consideration during order processing.

Extracts from relevant regulations

The heating cables must be checked for damage and overall resistance in Ohms (Ω) before and during laying and after laying of the covering in accordance with the acceptance report and logged therein.

Prior to processing, it is advisable to produce a layout plan showing the position of heated and unheated areas, heating cables with transition of cold conductor to warm conductor, floor sensors and possible subdivision into heating circuits.

Electric heating cables may not be installed beneath fixed sanitary installations such as shower trays and bathtubs. Furniture cabinets must be supported on feet, and facings such as the ones used with built-in cabinets are not permitted. Back ventilation must be guaranteed. Failure to comply with this may results in loss of the warranty due to heating cable damage.

The heating cables and the floor sensor cables must be led in separate empty tubes in wall areas up to the transition to the covering area.

Heating cables (warm conductors) must be routed inside a heating field area and must not cross the expansion joints. Supply cables (cold conductors) can cross expansion joints with tension-free laying (loop formation) taking the anticipated movements into consideration.

Heating cables and floor sensors must be connected to thermostats by a qualified electrician.

The earliest possible point in time for commissioning the surface heating and making any maximum operating temperature settings is in accordance with the specifications of the regulations and the laying guidelines of the relevant floor covering and floor covering adhesive manufacturers.

Installation instructions

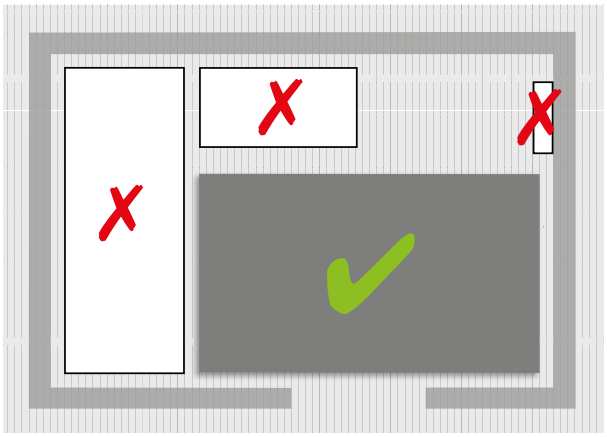
1. The substrates must be prepared in accordance with the directives of the adhesive manufacturer. See application matrix.
2. AquaDrain® RD edge insulation strips with a self-adhesive foot must be attached to rising components/penetrations. The IndorTec® THERM-E support mat must be separated with the specified joint width at structural separating and expansion joints.
3. The IndorTec® THERM-E support mat is glued on using an SMP adhesive (silane-modified polymer adhesive), coordinated with the substrate, using a B14–B15 TKB trowel notch. Embed the IndorTec® THERM-E support mat in the layer of adhesive and press it on over the entire surface. IndorTec® THERM-E can also optionally be glued on using adhesive mortar (tile adhesive). To do this, apply adhesive mortar with a 6 mm notched trowel, coordinated with the substrate, and embed the IndorTec® THERM-E support mat in the fresh layer of adhesive mortar and press on over the entire surface. Adhesive mortar with pourable bed characteristics must be used for optimum compound adhesion. The use of quick-setting adhesive mortar reduces the waiting time until the next work step.
4. Cable laying/routing
   a) After carrying out successful resistance checking (see "Heating cable, floor sensor and thermostat"), place the heating cables into the covering support mat and press on.
   b) The floor sensors must be placed centrally between 2 heat conductors in a serpentine shape, and the floor sensor cable clicks in place due to the serpentine-shaped laying.

   The connection to the thermostat etc. must be made by a qualified electrician. In order to avoid damage to the system, construction site traffic must be excluded until the covering laying has been completed.
5. Then trowel off the entire surface with a minimum covering of 5 mm of a pourable floor filling compound on top of the IndorTec® THERM-E support mat. Just before applying the filling compound it is advisable to carry out another heating cable resistance check (see "Heating cable, floor sensor and thermostat").
6. After the filling compound has hardened and dried, the covering is laid.
7. In locations where the covering ends next to lower-lying covering surfaces, end rails must be fitted to the load absorbing substrate with a frictional bond, flush with the covering.
   The covering surface to be created including IndorTec® THERM-E must be produced with an expansion joint.

Note: Before the floor filling work is completed, the IndorTec® THERM-E support mat and the heating cable must be protected from damage using suitable materials, particularly in the transport and walking areas.

Preparation and laying

It is advisable to draw up a layout plan before the material is processed. This shows the location of the heated and unheated areas, the "floor sensor" and "transition of cold conductor to warm conductor of the heating cable" system components and subdivision into heating circuits. Any thermal insulation that is required must be taken into consideration. Electric heating cables may not be installed beneath fixed sanitary installations such as shower trays and bathtubs. Objects such as furniture which are supported over their entire area must also not be placed directly onto heated surfaces.
Back ventilation such as that which occurs when furniture is supported on feet must be guaranteed. Failure to comply with this may results in loss of the warranty due to heating cable damage. If the temperature of heating circuits is controlled with more than one thermostat, floor coverings in field surfaces must be separated with expansion joints in accordance with the heating circuits. The IndorTec® THERM-E covering support mat must always be laid over the entire room area. The heating cables must be arranged on the areas that are actually free. The resulting quantity difference between heating cables and covering support mat must be taken into consideration during order processing.



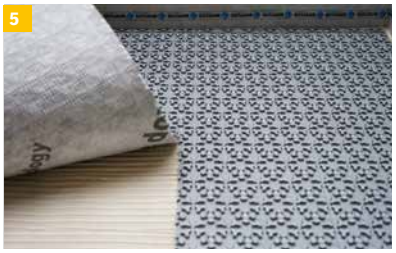
Laying plan (avoid heat-free zones)

Testing the substrate for suitability and evenness. Levelling work may have to be carried out if required.

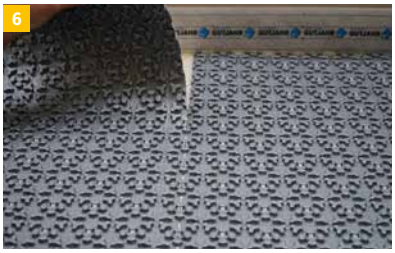
Clean and the substrate and prime if necessary.

AquaDrain® RD edge insulation strips must be used along rising parts of the structure and penetrations in the covering.

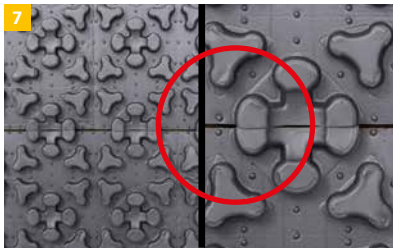
Apply adhesive using a suitable trowel notch.



Embed the IndorTec® THERM-E which has been cut to size in the adhesive together with the fleece.



Fit together with a butt joint.



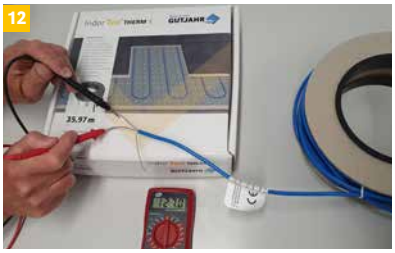
The crossbones of the IndorTec® THERM-E must form a closed unit to do this.

Press on or roll on the IndorTec® THERM-E over its entire surface.

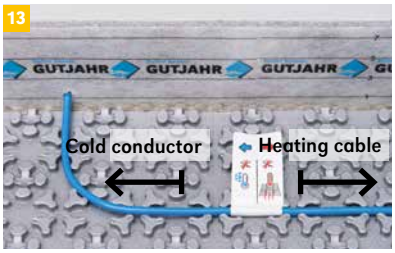
This results in embedding in the substrate over the entire surface. Further work takes place after the bonding of the IndorTec® THERM-E has hardened.

The support mats must be separated at structural separation and expansion joints. The formation of joints must take place in accordance with the regulations and manufacturer specifications of the appropriate fluid floor filling compound and the floor covering.

Heat-free zones must be marked before laying the heating cables and left clear. These must be marked on the enclosed laying plan (see laying plan).

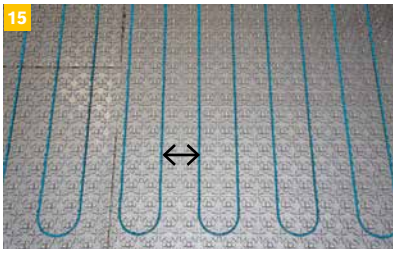


Before installing the heating cable, the overall resistance must be checked and logged in accordance with the acceptance report.



The sleeveless transition between the cold conductor and the warm conductor is marked exactly, and must be laid in the IndorTec® THERM-E mat. This transition must be laid in such a way that the warm conductor is always grouted over in the IndorTec® THERM-E mat.

The heating cables are routed around the crossbones, which protects them.



The heating cables are always laid with spacing of at least 2 crossbones (9.85 cm).

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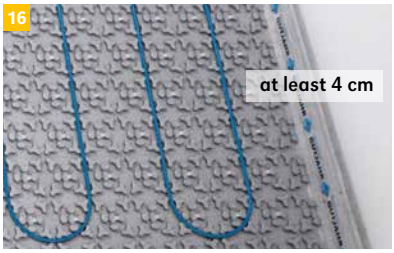

A distance of at least 4 cm must be maintained between the heating cables and rising parts of the structure. Heating cables may not cross or touch.

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Inserting the floor sensor between two heating cable warm conductors.

18

For the end of the warm conductor, you cut a notch in the mat depending on the length. Important: shortening the warm conductor is not permitted, and causes damage to the system!

19

In the next step, the total resistance of the heating cable must be checked and logged in accordance with the acceptance report.

20

Then the IndorTec® THERM-E support mat is grouted with a pourable floor filling compound with minimum coverage of 5 mm.

21

When the pourable floor filling compound is ready for covering, the covering is laid in compliance with the regulations and specifications of the relevant floor covering and floor covering adhesive manufacturer.

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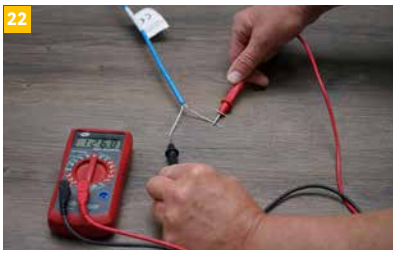

The total resistance of the heating cable must be checked and logged in accordance with the acceptance report prior to connecting the cable to the thermostat.

23

The heating cable connection and the connection between the floor sensor and the thermostat are carried out by a qualified electrician. Independent installation and operating/programming instructions apply to the thermostats of the IndorTec® THERM-E, which are enclosed with the packaging or are available for downloading on the product pages on the Internet.

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Commissioning and the temperature settings are carried out in accordance with the specifications of the regulations and the laying directives of the relevant floor covering and floor covering adhesive manufacturer.

Cable damaged during installation? You can see here how easy it is to repair!

Application matrix

Properties of substrates/Covering materials/Areas of application

Laying onto calcium sulphate screeds (CA)	≤ 0.5 CM% residual moisture with unheated CA screeds, ≤ 0.3 CM% residual moisture with heated CA screeds.
Laying onto cement screeds (CT)	≤ 2.0 CM% residual moisture with unheated CT screeds, ≤ 1.8 CM% residual moisture with heated CT screeds
Laying onto wooden substructures	Substrates deflection and vibration free
Dry screed elements heated/unheated	Substrates deflection and vibration free
Hollow floors heated/unheated	Substrates deflection and vibration free
Old substrates/other substrates	Securely bonded – only possible with special adhesive/priming – Consult adhesive manufacturer if necessary
If reworking is allowed, cracked screeds/constriction joints	Must be secured to prevent height differences
Mastic asphalt	At least AS-IC 10 (GE 10) with sanded/rough surface
Concrete, fresh concrete from 6 months	With surface ready for laying which has been sealed to prevent rising residual moisture and has a dry surface. Connection joints to rising parts of the structure must be sized in accordance with the anticipated degree of shrinkage

Load group 1

Residential buildings and floor coverings with comparable mechanical load	✔
Hotel bathrooms	✔
Health service rooms	✔

Load group 2

Canteens	✔
Walk-on traffic zones such as corridors in office buildings	✔
Vehicle showrooms (pushed, rolled over)	✔
Vehicle showrooms and vehicle acceptance (driven over)	✔
Sales rooms	✔

Deliverable heating cable, 230 V				
Item no.	**Cable length (in m)**	**Area (in m²)**	**Output (in W)**	**Total resistance (in Ohms Ω)***
810 12 301 TE	12.07	1.40	138	383.95
810 12 302 TE	17.66	2.00	207	256.07
810 12 303 TE	23.77	2.60	275	192.06
810 12 304 TE	29.87	3.30	345	153.53
810 12 305 TE	35.97	3.90	413	128.05
810 12 306 TE	41.56	4.50	482	109.72
810 12 307 TE	47.67	5.10	555	95.34
810 12 308 TE	53.77	5.80	619	85.49
810 12 309 TE	59.87	6.30	690	76.63
810 12 310 TE	71.57	7.50	831	63.70
810 12 311 TE	83.77	8.80	972	54.45
810 12 312 TE	95.47	10.00	1108	47.74
810 12 313 TE	107.67	11.30	1228	43.07
810 12 314 TE	119.37	12.40	1385	38.20
810 12 315 TE	133.80	14.00	1544	34.25
810 12 316 TE	155.70	16.00	1798	29.43
810 12 317 TE	173.50	18.00	1993	26.55
810 12 318 TE	193.70	20.00	2239	23.63
810 12 319 TE	227.00	23.00	2618	20.20
810 12 320 TE	244.50	25.00	2810	18.83
810 12 321 TE	266.30	27.00	3070	17.23

*Deviation of –5 % to +10 % possible.

Acceptance report

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Building: _____ Date of laying: _____

Builder: _____ Date of commissioning: _____

Electrical installer: _____

Heating cable control measurement by builder

	Before laying the heating cable	After laying the heating cable	After laying the covering
Total resistance (Ohms Ω)			

Heating cable control measurement by electrical installer

	Before commissioning
Total resistance (k-Ohms Ω)	
Total resistance (Ohms Ω)	

IndorTec® THERM-E heating cable, 230 V

Deliverable heating cable, 230 V				
Item no.	Cable length (in m)	Area (in m²)	Output (in W)	Total resistance (in Ohms Ω)*
810 12 301 TE	12.07	1.40	138	383.95
810 12 302 TE	17.66	2.00	207	256.07
810 12 303 TE	23.77	2.60	275	192.06
810 12 304 TE	29.87	3.30	345	153.53
810 12 305 TE	35.97	3.90	413	128.05
810 12 306 TE	41.56	4.50	482	109.72
810 12 307 TE	47.67	5.10	555	95.34
810 12 308 TE	53.77	5.80	619	85.49
810 12 309 TE	59.87	6.30	690	76.63
810 12 310 TE	71.57	7.50	831	63.70
810 12 311 TE	83.77	8.80	972	54.45
810 12 312 TE	95.47	10.00	1108	47.74
810 12 313 TE	107.67	11.30	1228	43.07
810 12 314 TE	119.37	12.40	1385	38.20
810 12 315 TE	133.80	14.00	1544	34.25
810 12 316 TE	155.70	16.00	1798	29.43
810 12 317 TE	173.50	18.00	1993	26.55
810 12 318 TE	193.70	20.00	2239	23.63
810 12 319 TE	227.00	23.00	2618	20.20
810 12 320 TE	244.50	25.00	2810	18.83
810 12 321 TE	266.30	27.00	3070	17.23

*Deviation of –5 % to +10 % possible.

The guarantee only comes into force when the acceptance report has been completed and taking the laying/installations instructions into consideration in accordance with the manufacturer's specifications.

Date

Signature
(Builder/electrical installer)

Company stamp
(Builder/electrical installer)

IndorTec® THERM-E

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Laying plan

Room: _____ Date: _____ Builder: _____

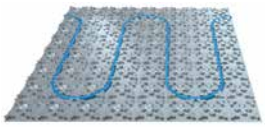
The position of the heated and the unheated areas and the transition from the cold conductor to the warm conductor, the end sleeve of the heating cable and the floor sensors must be documented exactly together with the dimensioning.

IMPORTANT:
Please attach the provided warning sign/label in the electrical distributor. Keep the completed laying plan and the completed acceptance report for documentation.

Date	Signature (builder)	Company stamp (builder)

System accessories

IndorTec® THERM-E
support mat
(98 x 79 x 0.6 cm)



IndorTec® THERM-E
heating cable, 230 V

IndorTec® THERM-E TW
touch screen thermostat with Wifi, 230 V
84/84/40 mm (21.8 mm deep)

IndorTec® THERM-E TD
touch screen thermostat, 230 V
84/84/40 mm (21.8 mm deep)

AquaDrain® RD
edge insulation strip
with self-adhesive foot

IndorTec® THERM-E Heating cable

VDE certified heating cable: VDE-REG F292

Additional processing guidelines

- Do not use the heating cable in areas which are subject to heavy mechanical loads.
- A class A (FI = maximal 30 mA) leakage current switch must be provided during installation as protection against direct contact.
- If the heating cable has an electrically conducting covering, this must be connected to an earthing clamp.
  An overload circuit breaker must also be installed.
- The enclosed heating cable warning sign must be affixed in the electrical distributor in a clearly visible location.

Material

IndorTec® THERM-E sheets/rolls consist of a specially shaped, non-rotting plastic film (PP) which is approx. 6 mm thick and with a interlocking fleece (PP) on the underside which has been laminated on in factory.

Temperature resistance

–30 °C to +70 °C (up to +80 °C for short periods)

Form of delivery
Total thickness approx. 6 mm
Sheets: 0.77 m², 0.79 x 0.98 m
Rolls: 12.5 m², 12.75 x 0.98 m

Filling compound consumption for filling and smoothing the mat
approx. 3.0 l/m² with cable
approx. 3.3 l/m² with cable
For filling flush with the surface

Transport and storage instructions

Transportation and storage of sheets horizontal only, rolls vertically only in the original packaging. The products must be protected against sunlight and damp. The original packaging only provides short-term UV protection.

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Gutjahr Systemtechnik GmbH
Philipp-Reis-Str. 5–7 · D-64404 Bickenbach, Germany
Tel.: +49 62 57/93 06-0 · Fax: 93 06-31
www.gutjahr.com

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