Technical data sheet with installation

Indor Tec[®] **Therm**-E

Electric panel heating

For resilient and textile floor coverings as well as wood/laminate indoors.

For ceramic and natural stone, please refer to the technical data sheet "IndorTec® THERM-E - For coverings made of ceramic and natural stone".



Product properties and field o f application

IndorTec* THERM-E

- An electric panel heating system for heating/tempering floor coverings.
- Decouples coverings from critical substrates
- For resilient and textile coverings, wood/laminate
- Stress relieving

Indoor use

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







Substrates

Substrates must be level, pressure-resistant, load-bearing, vibrationfree and deflection-free. Basically, the requirements of the respective regulations of the corresponding floor covering apply. Components on the surface that reduce adhesion must be removed. Any existing unevenness must be leveled with suitable leveling compounds matched to the substrate before laying ^{IndorTec®} THERM-E.

Permitted substrates

- Cement screeds
- · Calcium sulfate screeds
- Concrete substrates
- Wooden substructures and dry screeds
- Cavity floor constructions
- Mastic asphalt screeds
- load-bearing mixed substrates of different materials, but also with cracks, if they are secured against vertical displacement
- · Heated and unheated substrates Further

information under Application Matrix.

General n o t e s

Filling

Suitable materials

For filling ^{IndorTec®} THERM-E, flowable floor fillers with low-shrinkage and low-stress properties must be used. Suitable products are see the setup recommendations at www.gutjahr.de.

Coverings

Suitable coverings

Suitable coverings are those recommended by the covering manufacturer for the respective area of application.

Unsuitable coverings

Surfacing materials that tend to deform when exposed to moisture are unsuitable.

Joints

- Connection joints to rising structural components/covering penetrations must not be force-fitted. The professional connection is made by using AquaDrain® RD edge insulation strips with selfadhesive foot.
- Structural separation and movement joints must be congruent and of the specified width in IndorTec® THERM-E and the top layer. take over. The joints are formed in accordance with the regulations and manufacturer's installation instructions for the corresponding flowable floor filling compound and the floor covering.
- Mock joints are to be evaluated in accordance with the regulations and installation instructions for flowable floor fillers and floor coverings and then executed. If a transfer is necessary/no reworking possible without separation, the formation is analogous to movement joints.

Heating cable, floor sensor cable and thermostat

The heating cable consists of a cold and hot conductor section. The transition is sleeveless and marked by a "transition label". The warm conductor area must not be shortened, this destroys the function. In the PTC resistor section, the cable can be (4 m long) can be shortened to \geq 1 m. An extension on the PTC resistor side is possible in unrestricted length.

The max. size of field areas is 27.00 m^2 according to the largest possible heating cable length. The temperature control is done with 1 thermostat each.

Field areas can be combined into one unit, taking into account the preliminary electrotechnical planning.

Temperature control is done with 1 thermostat/unit each.

Pavement areas with several field surfaces are to be separated from each other by forming movement joints.

The IndorTec® THERM-E thermostats have their own installation and operating/programming instructions, which are enclosed with the packaging or can be downloaded from the product pages on the Internet.

Heating and ground sensor cables meet the requirements of protection class IPX7 "Protection against temporary immersion" in water.

The IndorTec® THERM-E floor covering support mat must always be laid over the entire room surface. The heating cables are arranged on the actual free areas. The resulting difference in quantity between the heating cable and the floor covering mat must be taken into account during application.

Excerpts from relevant regulations

The heating cables and floor sensors must be checked for damage and total resistance in ohms (Ω) before and during installation and after installation of the covering in accordance with the acceptance protocol and recorded therein.

Before processing, it is recommended to draw up a floor plan showing the location of heated and unheated surfaces, heating cables with transition from cold conductor to hot conductor, floor sensor, as well as any subdivision into heating circuits.

Electric heating cables must not be installed under fixed sanitary fixtures such as shower trays and bathtubs. Furniture cabinets must stand on feet; coverings such as those used for built-in cabinets are not permitted. Under-ventilation must be ensured. Failure to do so may result in loss of warranty due to heating cable damage.

In wall areas, heating and floor sensor cables must be routed in separate conduits up to the transition to the covering surface.

Heating cables (warm conductors) must be laid within a heating field surface and must not cross the movement joints. Supply cables (PTC thermistors) can cross movement joints with tension-free installation (loop formation), taking into account the expected movements.

The connection of heating cables and floor sensors to thermostats must be carried out by a qualified electrician.

The earliest possible time for starting up the surface heating and any settings of max. operating temperature are made according to the specifications of the regulations as well as the installation guidelines of the corresponding floor covering and floor covering adhesive manufacturers.

Processing information

- 1. The additional processing guidelines of the VDE, on the last page, must be observed.
- Substrates must be prepared accordingly according to the adhesive manufacturer's guidelines. See application matrix.
- The AquaDrain® RD edge insulation strip with self-adhesive foot must be applied to rising structural components/penetrations. IndorTec® THERM-E support mat with specified joint width must be separated at structural separation and movement joints.
- 4. The ^{IndorTec®} THERM-E backing mat is bonded with an SMP adhesive (silane-modified polymer adhesive), matched to the substrate, using a TKB toothed strip B14-B15. Embed ^{IndorTec®} THERM-E backing mat in the adhesive layer and press it down over the entire surface. Optionally, ^{IndorTec®} THERM-E can also be bonded with adhesive mortar (tile adhesive). To do this, apply adhesive mortar matched to the substrate with a 6 m notched trowel and embed ^{IndorTec®} THERM-E backing mat in the still fresh adhesive mortar layer and press it on flat. For optimum bond adhesion, use adhesive mortars with flow bed properties. Fast-setting adhesive mortars shorten the waiting time until the next work step.
- 5. Cable laying/routing
 - a) After a successful resistance check (see "Heating cables, floor sensors and thermostat"), insert the heating cables and floor sensors into the base mat and press them in place.
 - b) Floor sensors are to be inserted snake-shaped in the middle between 2 warm conductors, due to the snake-shaped laying the floor sensor cable clicks in.

Preparation and I a y i n g

It is recommended to prepare a floor plan before processing the material. From it you can see the location of heated and unheated surfaces, system components "floor sensor" and

The "transition cold conductor to warm conductor of the heating cable" as well as a s u b d i v i s i o n into heating circuits. Requirements for any thermal insulation that may be necessary must be observed. Electric heating cables must not be installed under permanently installed sanitary facilities such as shower trays and bathtubs. Likewise, objects standing on their full surface, such as furniture, must not be placed directly on heating surfaces.

Under-ventilation, e.g. by setting up with feet, must be ensured. Failure to do so may result in loss of warranty due to heating cable damage. If the temperature control of heating circuits is carried out with more than one thermostat, the floor coverings in field areas corresponding to the heating circuits must be separated with movement joints. The IndorTec® THERM-E floor covering support mat must always be laid over the entire room surface. The heating cables are arranged on the actual free areas. The resulting difference in quantity between the heating cable and the floor covering mat must be taken into account during application.

The connection to the thermostat, etc. must be carried out by a qualified electrician. To avoid damage to the system, construction traffic must be excluded until the installation of the covering is completed.

- 6. Subsequently, fill the entire surface with a flowable floor filler with a minimum coverage of 5 mm over ^{IndorTec®}THERM-E support mat. It is recommended to check the resistance of the heating cables and floor sensors again immediately before applying the filler (see "Heating cables, floor sensors and thermostat").
- 7. After the filler has cured and dried, the covering is laid.
- At pavement ends with adjacencies to deeper lying pavement surfaces, end rails are to be installed flush with the loadbearing substrate in a force-locking manner. The surface to be paved, including IndorTec® THERM-E, must be prepared with a movement joint.

Note: IndorTec® THERM-E support mat, heating cable and floor sensor, especially in the area of transport and walkways, must be protected against damage with suitable materials until the floor leveling work is completed.



Laying plan (leave out heat-free zones)



Check the substrate for suitability and evenness. If necessary, leveling work must be carried out.



Clean and possibly prime the substrate.



The AquaDrain® RD edge insulation strip must be installed along rising structural elements and pavement penetrations.



Apply adhesive with a suitable toothed strip.



Embed ^{IndorTec®} THERM-E in cut form with the fleece in the adhesive.



Butt join.



In this case, the cross bones of IndorTed® THERM-E must form a closed unit.



Press or roll $^{\mbox{IndorTec} \mbox{B}}$ THERM-E onto the surface.



Thus, a full-surface embedding to the substrate is achieved. Further work is carried out after the bonding of ^{IndorTec®} THERM-E has hardened.



The support mats must be separated at construction separation and movement joints. The joints are formed in accordance with the regulations and manufacturer's instructions for laying the corresponding flowable floor levelling compound and the floor covering.



Heating-free zones must be marked and omitted before laying the heating cables. These must be sketched in the enclosed installation plan (see installation plan).



Before installing the heating cable and the floor sensor, check and record the total resistance according to the acceptance protocol.



The socketless transition between the PTC thermistor and the hot conductor is precisely marked 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 trowelled over in the ^{IndorTec®}THERM-E mat.



The heating cables are gently guided around the cross bones.



The heating cables are always laid at a distance of at least two cross bones (9.85 cm).



A distance of at least 4 cm between the heating cables and rising components must be maintained. Heating cables must not cross or touch each other.



Insert the floor sensor between two heat conductors of the heating cable.



Cut a notch lengthwise in the mat for the end of the warm conductor. Important: Shortening the warm conductor is not permitted and will damage the system!



In the next step, the total resistance of the heating cable and the floor sensor must be checked and recorded according to the acceptance protocol.



Subsequently, the IndorTec® THERM-E support mat is filled with a flowable floor filler with a minimum coverage of 5 mm.



Once the flowable floor levelling compound is ready for covering, the covering is laid in compliance with the regulations and the specifications of the relevant floor covering and floor covering adhesive manufacturers.



Before connecting the cable to the thermostat, the total resistance of the heating cable and the floor sensor must again be checked and recorded according to the acceptance protocol.



The heating cable, the floor sensor and the thermostat must be connected by a qualified electrician. For the ^{IndorTec®} THERM-E thermostats, there are separate installation and operating/programming instructions; these are enclosed with the packaging or are available as a download on the product pages on the Internet.

	Mo 16:15		
	■ 21.0° 2	2:00	
	Manuel Ande	NU	

Commissioning and temperature adjustments are carried out in accordance with the regulations and installation guidelines of the relevant flooring and flooring adhesive manufacturers.

Cable damaged during installation? See here how you can easily repair it!



Properties of substrates/covering materials/application areas

Installation on calcium sulfate screeds (CA)	\leq 0.5 CM% residual moisture for unheated CA screeds, \leq 0.3 CM% residual moisture for heated CA screeds.
Installation on cement screeds (CT)	\leq 2.0 CM% residual moisture for unheated CT screeds, \leq 1.8 CM% residual moisture for heated CT screeds
Installation on wooden substructures	Subfloors free of deflection and vibration
Dry screed elements heated/unheated	Subfloors deflection and vibration free
Cavity floors heated/unheated	Subfloors deflection and vibration free
Old substrates/other substrates	Firmly adhering - only possible with special adhesive/primer - consultation with adhesive manufacturer may be necessary
cracked screeds/sham joints if these may be revised	are to be secured against height misalignment
Mastic	min. AS-IC 10 (GE 10) with sanded/rough surface
Concrete, young concrete from 6 months	with a ready-to-lay surface that is sealed against rising residual moisture and is dry on the surface. Connection joints on upstanding structural components are to be dimensioned according to the expected shrinkage

Stress group 1

Residential construction and floor coverings with comparable mechanical	\checkmark
stresses	
Hotel bathroom	\checkmark
Rooms of the health service	\checkmark

Stress group 2

Canteens	\checkmark
accessible traffic zones, e.g. corridors in office buildings	\checkmark
Motor vehicle showrooms (pushed, rolled)	\checkmark
Motor vehicle showrooms and motor vehicle reception (driven on)	\checkmark
Salesrooms	√

Resistance measured values of the THERM-E heating cables

	Available h	eating cable	e, 230 V	
ltem no.	Cable length (in m)	Area (in m²)	Power (in W)	Total resistance (in Ohm 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 from -5 % to +10 % possible

Measured values of THERM-E floor sensors NTC 12 k Ω				
Temperature °C	Resistance (k-Ohm kΩ)*	Temperature °C	Resistance (k-Ohm kΩ)*	
-20	90,12	22	13,53	
-10	55,08	23	13,00	
0	34,60	24	12,49	
5	27,69	25	12,00	
10	22,28	26	11,53	
11	21,25	27	11,09	
12	20,46	28	10,66	
13	19,62	29	10,25	
14	18,81	30	9,86	
15	18,04	35	8,14	
16	17,30	40	6,75	
17	16,60	45	5,62	
18	15,93	50	4,69	
19	15,29	55	3,94	
20	14,67	60	3,32	
21	14,09	70	2,38	

*Deviation from - 5 % to + 10 % possible

Acceptance protocol



Object:	Date of laying:
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 Fabricator:

 Date of commissioning:

Electrician:

Control measurement on heating cable and floor sensor by the processor

	before inserting the cables	After inserting the cables	After laying the pavement
Heating cable Total resistance (Ohm Ω)			
Soil sensor Total resistance (k-Ohm Ω)			

Control measurement on heating cable and floor sensor by the electrician

Before commissioning		
Heating cable Insulation resistance (k-Ohm Ω)		
Heating cable Total resistance (Ohm Ω)		
Soil sensor Total resistance (k-Ohm Ω)		

^{IndorTec®} THERM-E heating cable, 230 V

Available heating cable, 230 V				
ltem no.	Cable length (in m)	Area (in m²)	Power (in W)	Total resistance (in Ohm Ω)*
810 12 301 TE	12,07	1,40	138	383,95
810 12 302 TE	17,66	2,00	207	256,07
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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 from - 5% to + 10% possible.

The warranty claim only comes into effect if the acceptance protocol is completed in full and the installation/assembly instructions are taken into account in accordance with the manufacturer's specifications.

bricator/Electrical Installer)

Company stamp (fabricator/electrical installer)





Laying plan

Room:_____ Date:_____ Processor:_____

The position of the heated and unheated surfaces as well as the transition cold conductor/hot conductor, the end sleeve of the heating cable and the floor sensor must be precisely documented with measurements.



IMPORTANT:

Please attach the completed installation plan, the completed acceptance protocol and the attached label in the electrical distribution board.

System accessories

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



IndorTec® THERM-E TD touchscreen thermostat, 230 V 84/84/40 mm (21.8 mm depth)



^{IndorTec®} Therm-E heating cable, 230 V



Frame for TD/TW in anthracite





Floor sensor ^{IndorTec®} THERM-E BF for thermostat TW and TD



AquaDrain® RD Edge Insulation Strip with Self-Adhesive



Indor Tec THERM-E Heating cable

Heating cable VDE-certified: VDE-REG F292

Additional processing guidelines according to V D E

The VDE processing guidelines must be read carefully and taken into account before starting the installation work.

- Do not use the heating cables in areas subject to heavy mechanical loads
- The floor sensor, sleeves and the heating cable heat conductor must be completely embedded in the adhesive mortar or filler.
- The lowest processing temperature of IndorTec THERM-E is 5 °C, the highest permissible surface temperature of the heating cables is 80° C
- The smallest permissible bending radius is 5 times the outer diameter of the heating cable, 5 x 5 mm = 25 mm
- The PTC thermistor of the heating cable, as well as the supply line to the floor sensor, must be routed to the thermostat in separate conduits.
- The heating cable or the junction box must be installed in such a way that the PTC thermistors or PE protective conductors can be routed into the junction boxes without extension
- The heating cables are provided with a metal sheath. These must be connected directly to the protective conductor of the supplying circuit via protective conductors or equipotential bonding conductors
- The circuit to be supplied must be protected with a residual current device (RCD) of maximum 30mA
- The enclosed warning label of the heating cables must be placed in the electrical distribution in a clearly visible position
- If the heating cables have an electrically conductive cover, this must be connected to a ground terminal. In addition, an overload protection fuse must be installed.

Material

IndorTec® THERM-E sheets/rolls consist of a specially shaped, nonrotting plastic film (PP) with a thickness of approx. 6 mm and a factory-laminated interlocking fleece (PP) on the underside.

Temperature resistance -30 °C to +70 °C (briefly up to +80 °C) Delivery form Total thickness approx. 6 mm Plates: 0.77 m², 0.79 x 0.98 m Rolls: 12.5 m², 12.75 x 0.98 m

Filler consumption for filling the mat approx. 3.0 l/m² with cable approx. 3.3 l/m² without cable for filling flush with the surface

Notes on transport and s t o r a g e

Transport and store sheet products only horizontally, roll products only vertically in the original packaging. The products must be stored protected from sunlight and moisture. The original packaging provides only short-term UV protection.

The information contained in this technical data sheet is based on our careful investigations and on our experience. The many substances and materials used in the overall construction as well as the different construction site and processing conditions cannot be checked or influenced by us in detail. Expert knowledge, technically correct judgment and correct product use are the basis for permanently functionally reliable construction work. In case of doubt, carry out your own tests or seek technical advice. In addition to the information in this technical data sheet, the relevant rules and regulations of the responsible organizations and trade associations as well as the respective national standards for the service to be provided must be observed. With the publication of this technical data sheet, lose their validity.

No liability for printing errors. Subject to change without notice

The currently valid versions of the technical data sheets and the current installation instructions can be found at https://www.gutjahr.com/downloads/.

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Instructions