




Raychem

HANDBOOK FOR COMFORTABLE WARM FLOORS

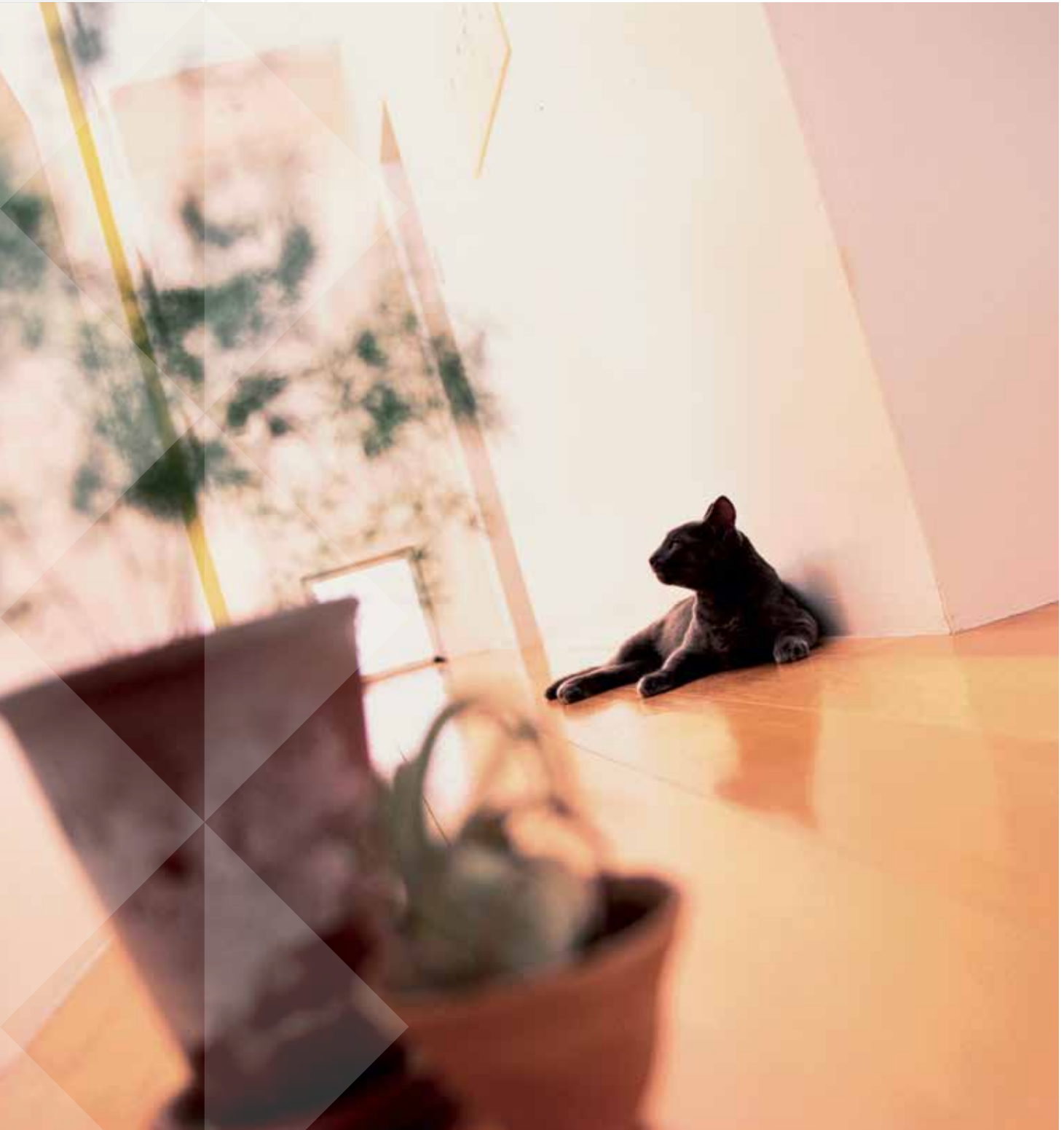
 @pentairTBS

ABOUT THIS HANDBOOK

We all know, that when our feet are cold, our whole body feels cold... Smart underfloor heating is the answer.

Put those woollen socks away, your children can play comfortably on the floor... even the cat will be grateful!

This handbook shows how to choose the right underfloor heating system, gives you information about the installation and many smart tips. If you have already selected the right system go to page 41 to draw your project and request a **free design**.



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The Smart Tip provides you with extra information.

WHY ELECTRICAL UNDERFLOOR HEATING?

Comfort is everything, especially in the home. With Raychem's smart electrical underfloor heating, you can offer a beautiful warm floor, hassle free, to your customers!

INCREASED COMFORT WHILST SAVING ON HEATING COSTS



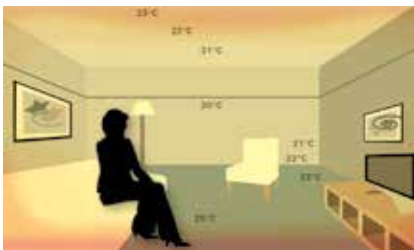
Heat radiation from a conventional heating system with radiators. Large temperature variations (18–65°C) in the room.

Underfloor heating brings great comfort and helps to save on heating costs!

Electric underfloor heating is installed close to the floor surface resulting in a quick warm-up of the room. Thanks to the uniform heat distribution across the floor, it is possible to set the thermostat 2 degrees lower than usual, without any loss of comfort or warmth.

It is an excellent system to provide complete room heating or to complement the existing heating system. During spring or autumn, you can turn off the conventional heating, and keep your floors warm, comfortable, and cozy. The dog will confirm this!

HEALTHY AND SAFE HEATING



Heat radiation from an underfloor heating system. Small temperature variations (20–25°C) and heat where you need it.

Dry floors: more hygienic and easier to clean

Electrical underfloor heating causes less air movement, hence less dust. Another advantage can be found in the bathroom or wet rooms. Wet floors will dry much faster, rugs in the bathroom

will as well and there will be less risk of mildew or mites.

A dry floor is also easier to keep clean as the dust doesn't "stick" to the floor.

Negligible electro-magnetic fields

Household appliances and home electronics can produce electro-magnetic fields.

Raychem products emit the lowest possible electro-magnetic fields thanks to the twin wire construction.



5 good reasons to choose Raychem smart underfloor heating:

- 1 Comfortable and safe.
- 2 Hassle free installation and maintenance free.
- 3 Energy-efficient and cost saving.
- 4 Can be installed under all floor coverings.
- 5 Total Care Warranty.

Insulation boards for energy efficiency

Every Raychem system can be combined with an insulation layer to obtain significant energy savings by shortening the heat-up time to reach the desired temperature. An insula-

tion board also improves the insulation for insufficiently insulated subfloors and will lead to cost savings during the operation of an electric underfloor heating system.

EASY-TO-INSTALL AND SUITED TO ALL FLOOR TYPES

Smart underfloor heating can be installed under any floor. It does not take up any space in your living area, giving the freedom to position furniture freely.

At home or in the office, in the bathroom or in the living area, Raychem

smart underfloor heating systems provide a warm floor and a pleasant room temperature. Our various systems can be installed under all floor coverings like tiles, marble, wood, laminate or carpet.

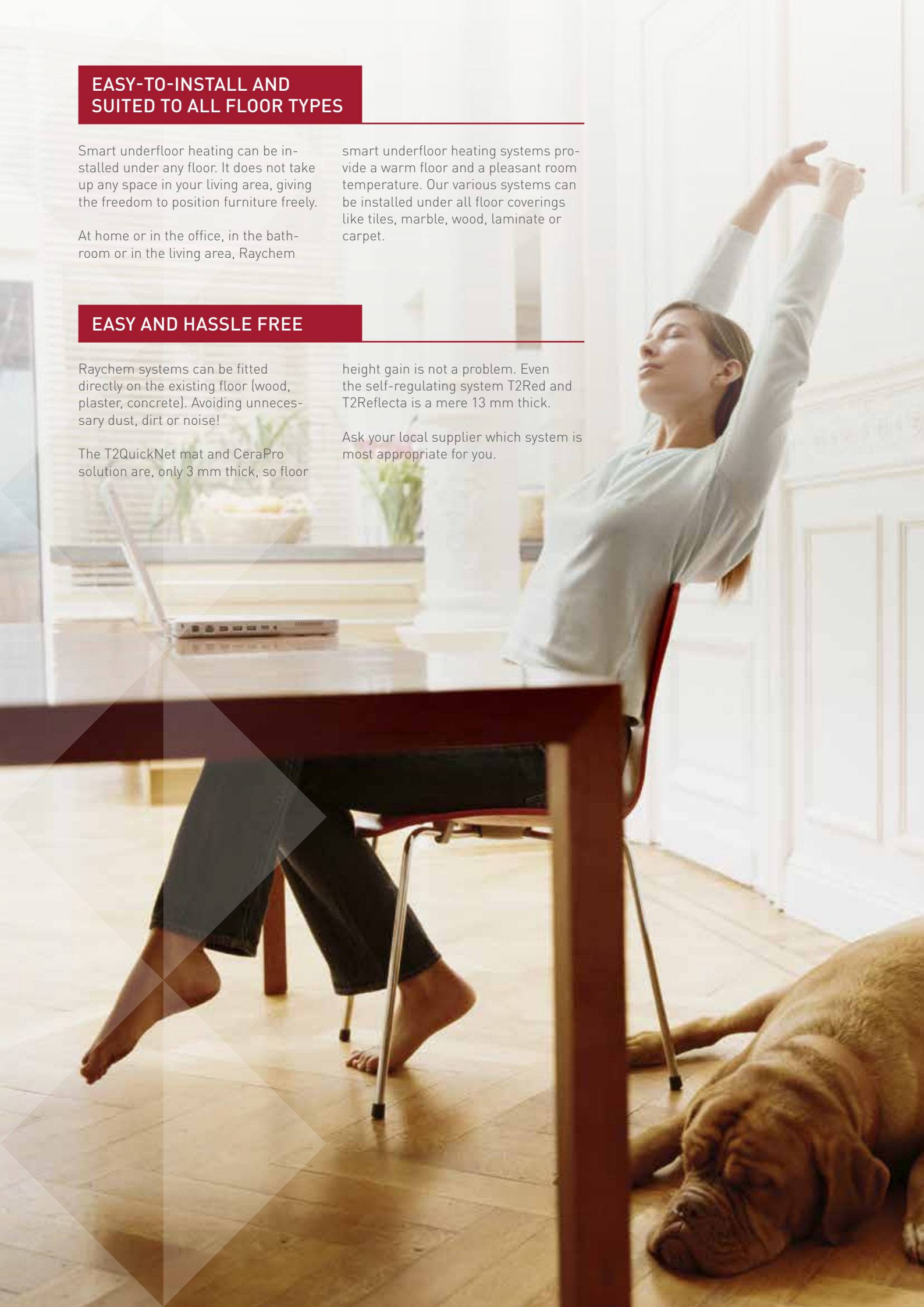
EASY AND HASSLE FREE

Raychem systems can be fitted directly on the existing floor (wood, plaster, concrete). Avoiding unnecessary dust, dirt or noise!

The T2QuickNet mat and CeraPro solution are, only 3 mm thick, so floor

height gain is not a problem. Even the self-regulating system T2Red and T2Reflecta is a mere 13 mm thick.

Ask your local supplier which system is most appropriate for you.



THE RIGHT SYSTEM FOR EACH APPLICATION

There is a Raychem smart underfloor heating solution for every situation: renovation and new construction.

T2RED

The intelligent underfloor heating system

The T2Red self-regulating system senses other heat sources such as solar radiation, electrical appliances and lighting and it automatically **adjusts its heat output** accordingly. More heat is produced in colder areas –such as near windows or doors- and less heat is produced in warmer areas –such as under rugs and furniture. There is **no risk of overheating** which gives unlimited flexibility for moving furniture around.

It can be **installed on all subfloors** (plastic, concrete, wood) -in dry or wet areas- and it can be easily adapted to all room sizes and shapes.



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T2RED WITH T2REFLECTA

The energy-saving underfloor heating system

This system combines the self-regulating T2Red heating cable with T2Reflecta, the pre-grooved, thermally insulated, aluminium-covered plate. It provides extra **energy savings of 20% or more**. (it even achieves energy savings up to 65% during the heat-up phase)

The thermal insulation and aluminium plates reduce heat losses and provide an even heat distribution.

The T2Red with T2Reflecta system is the first choice for wooden or laminate floors and is recommended by many wood flooring manufacturers. It can be adapted to **all room sizes** and can **be installed on most subfloors**.



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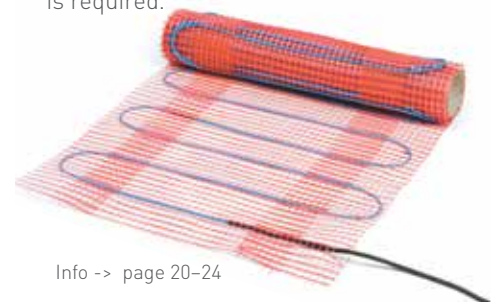
T2QUICKNET

The thin, self-adhesive heating mat

The thin T2QuickNet mat is the ideal solution for renovation – especially for tile floors. The ultra-thin (3 mm) mat is laid directly in the filler or tile adhesive.

It can be installed on all subfloors which are sufficiently insulated and conforming to applicable building regulations.

T2QuickNet exists in two versions: T2QuickNet 90 can be used on all solid subfloors and T2QuickNet 160 when more output and a faster heat up time is required.



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Make your choice...

T2BLUE

The flexible underfloor heating cable

The flexible underfloor heating cable is the first choice for complex ground plans in renovation. T2Blue can be installed on all conventional and stable substructures. The heating cable is embedded in the levelling compound, screed or concrete, with the floor covering on top.

T2Blue is available in two power outputs: T2Blue 10 W/m is used for standard floor constructions, and T2Blue 20 W/m is the preferred solution in areas where higher power is required.



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CERAPRO

The ultra-thin, robust heating cable solution

CeraPro is the ideal solution for installation in tile adhesive directly under the tiles. The cable is only 3mm thick which makes it perfect for renovation projects where the height of the floor cannot be adjusted.

It can be installed on all stable subfloors including cement, screed, insulation board (Isolecta) and wooden subfloors. CeraPro is particularly useful for irregular shaped floor areas and is applicable for bathrooms, kitchens and conservatories.



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ISOLECTA

The energy saving insulation board for a faster heat-up of T2QuickNet, T2Blue and CeraPro

The specially designed insulation board is the ideal solution for achieving a fast reaction time and a high level of thermal insulation for your heated floor in combination with T2QuickNet heating mats, CeraPro and T2Blue heating cables. It significantly reduces the heat-up time and achieves energy savings up to 65% during the heat-up phase.

It is fully compatible with most proprietary tile adhesives and filler material and its low height make it an ideal system for renovation projects.



Info -> page 32-35

A system for every top floor

	Floor covering						
	Tiles	Natural stone	Laminate	Wood	Linoleum	Plastic floor covering	Textile floor coverings**
T2Red in filler	☺☺☺	☺☺☺	☺☺☺	☺☺☺	☺☺☺	☺☺☺	☺☺☺
T2Red with T2Reflecta	☺☺☺	☺☺☺	☺☺☺	☺☺☺	☺	☺	☺
T2QuickNet*	☺☺☺	☺☺☺	☺	☺	☺	☺	☺
T2Blue	☺☺☺	☺☺☺	☺	☺	☺	☺	☺
CeraPro	☺☺☺	☺☺☺	-	-	-	-	-
Isolecta with T2 QuickNet T2Blue/CeraPro	☺☺☺	☺☺☺	☺	☺	☺	☺	☺

☺☺☺ Very good • ☺☺ Good • ☺ Contact Pentair Thermal Management 0800 969 013 • - Not applicable

* T2QuickNet 160 not on wooden subfloors.

** Must be suitable for underfloor heating (maximum resistance to heat transfer 0,15 m²K/W).

RAYCHEM SELF-REGULATING TECHNOLOGY

What does self-regulating mean?

Many years ago, Raychem developed self-regulating heating cables. They automatically adjust their power output to compensate for temperature changes.

The outer jacket, braid and inner jacket provide mechanical, chemical and electrical protection... but the magic happens in the conductive core. The conductive core is extruded over the two, parallel conductors.

As the ambient temperature drops, ¹ the core contracts microscopically and the number of electrical paths through the core increases. More heat is produced. Conversely, as the ambient temperature rises, the core expands and has fewer electrical paths. Less heat is produced ³.

A self-regulating heating cable adjusts its power output along its entire length. That's what makes it a safe and reliable solution for many applications.

The advantages of a self-regulating underfloor heating system

1. Safety and reliability



- Avoids overheating.
- The cable can be closely spaced.
- Maintenance-free.

2. Easy installation

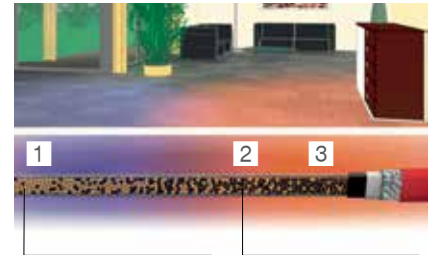


- The cable can be cut-to-length (e.g. when it needs to be adjusted to complex room shapes).
- The cable can be installed directly on the existing subfloor.

3. Energy efficiency



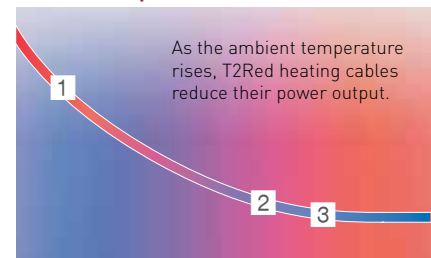
- By adjusting its output to the room temperature, the energy consumption is optimised.



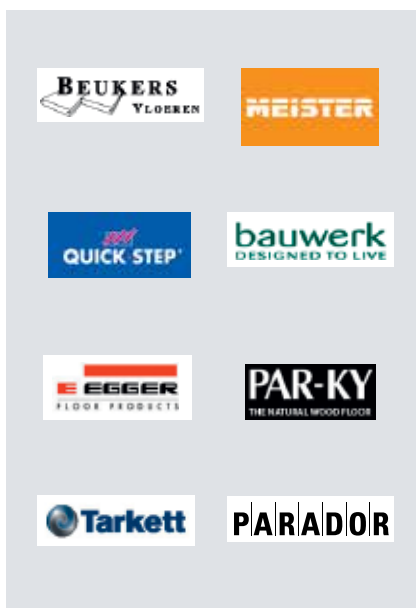
In colder areas, (e.g. near doors or windows), more heat is produced.

In warm areas, (e.g. in the middle of the room or under carpets and furniture), less heat is produced.

Power output



Ambient temperature



Raychem self-regulating electric underfloor heating certified for wooden floors

Leading manufacturers of wooden flooring have now certified Raychem's T2Reflecta self-regulating electric underfloor heating system as suitable for use under wooden floor coverings. The Raychem system offers a reliable and durable solution, especially for parquet and laminate floors which expand and contract depending on the humidity and temperature. After the system is switched on, the T2Red heating cable heats up slowly to ensure that the wooden floor is not damaged by abrupt temperature changes. Once the desired operating

temperature is reached, the system provides a uniform heat distribution across the entire floor.

Prior to the certification, leading manufacturers of wooden flooring throughout Europe extensively tested the T2Reflecta system, and it has been proven that the system can be used under wooden floor coverings without concern.

Further information is available from www.raychemfloorheating.com

A unique technology for more comfort and safety



Near the door there is a cold draught.

- The cable senses the need for more heat, and increases its heat output.



During the day, the sun heats the floor next to the window.

- The cable will lower its heat output automatically.
- No risk of overheating.

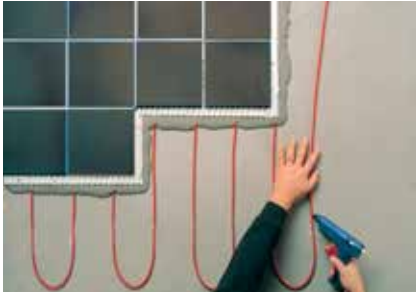


Under the carpet, there is less need for heat.

- The cable will sense this and lower its heat output accordingly.
- There is no risk of overheating or damage to the floor.

T2RED: THE INTELLIGENT UNDERFLOOR HEATING SYSTEM

T2RED



T2Red is a self-regulating underfloor heating cable for reduced height installation. The cable can be installed under any type of floor surfaces without a risk of overheating. The intelligent heating cable is ideal for improved living comfort in the entire house, from bathroom to children's room.

- **Easy-to-design:** one heating cable for all shapes of rooms.
- **Flexible:** cut-to-length, no cold lead needed.
- **Ideal for renovation:** reduced height (max. 8 mm).

Applications

Living rooms, kitchens, bathrooms, dining rooms, children's room, conservatories:

- **Top floor:** Tiles, parquet, natural stone, laminate, carpet*.
- **Subfloor:** Cement screed, anhydrite screed, wooden floor, gypsum board, timber floor board, asphalt screed.

* must be suitable for underfloor heating (maximum resistance to heat transfer 0,15 W/m²K)

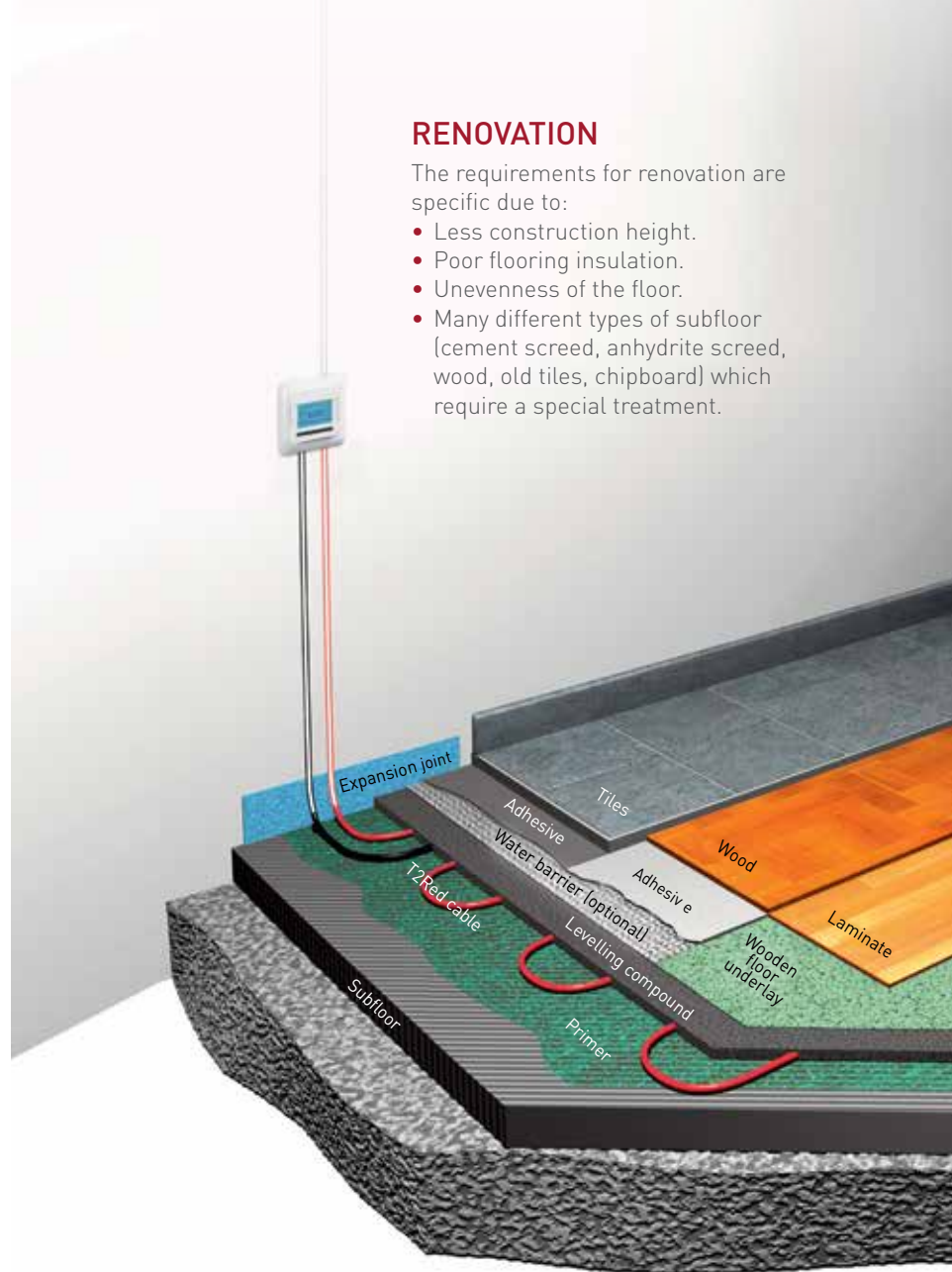
Embedding options

Height	T2Red
until 15 mm	😊😊😊
15 mm until 50 mm	😊😊

RENOVATION

The requirements for renovation are specific due to:

- Less construction height.
- Poor flooring insulation.
- Unevenness of the floor.
- Many different types of subfloor (cement screed, anhydrite screed, wood, old tiles, chipboard) which require a special treatment.



Renovation

Floor construction	Approx. output (W/m ²)	Heating cable length (m/m ²)	Cable spacing (mm)
15 mm cover plus • tiles	100	10	100
	90	8	120
	80	7	140
	70	6	160
	60	5	180
15 mm cover plus • wood / laminate • plastic covering/ carpet	100	10	100
	80	8	120
	70	7	140
	60	6	160
	50	5	180

NEW CONSTRUCTION

- Screed thickness 50 mm.
- New construction of floor construction including insulation in respect to the building regulations. Installation of cable will be embedded in a layer of 5 cm screed.



New construction

Floor construction	Approx. output (W/m ²)	Heating cable length (m/m ²)	Cable spacing (mm)
30-50 mm cover plus • tiles	100	8	120
	90	7	140
	80	6	160
	70	5	180
30-50 mm cover plus • wood / laminate • plastic covering/ carpet	90	8	120
	80	7	140
	70	6	160
	60	5	180

Which power output do I need?

1. **New construction – good insulation**
35 W/m² - 60 W/m².
2. **Renovation – good insulation**
60 W/m² - 100 W/m².
3. **Insufficient insulation – more output required** >100 W/m².

The above values are for comfort underfloor heating. Make a heat-loss calculation if in doubt (insulation, room size, number of windows, ...) or contact us at 0800 969 013.

Which quantity do I need?

1. Select the required power output and required cable length per m²

The table below shows the spacing and required cable length per m² and the spacing between the cables. The power output gives approx. 20–25°C (depending on the subfloor construction). For higher power output, contact us at 0800 969 013.

2. Multiply the cable length m² by the total floor surface (m²)

Example: Renovation of bathroom (5 m²) with tile floor.

1. Select '15 mm cover plus tiles'.
2. Select '80 W/m²' → 7 m cable needed /m². Spacing between two cable runs is 140 mm.
3. Required cable length = 7 x 5 = 35 m T2Red heating cable + 2 m for connection in junction box = 37 m.

Technical data

T2Red	
Power output	50 – 100 W/m ² (5 - 15 W/m) *
Voltage	AC 230 V
Max. heating cable circuit length	100 m @ 10 A
Min. bending radius	35 mm
Max. self-generating temperature	45°C
Max. exposure temperature	65°C
Max. dimensions (width and height)	6,0 mm x 8,7 mm
Thermostat (see p 36–39)	NRG-DM, NRG-Temp or GREEN LEAF

* depending on the cable spacing/floor construction and covering. Values stated in stable conditions at 25°C floor temperature.

T2RED: THE INTELLIGENT UNDERFLOOR HEATING SYSTEM

How to install in new construction?

CABLE INSTALLATION	SCREED INSTALLATION	TILE INSTALLATION	FINISHED FLOOR
			
<p>Determine the position of the heating zones before starting the installation of the heating cable, in agreement with the planner/ architect and screed layer. Attach the cable on a metal mesh (with KBL-10 cable ties) using the desired cable spacing.</p>	<p>Carefully apply a screed on top of the cable. Let it cure according to the manufacturers' instructions. Depending on the type of screed this process can start after 7 days (anhydrite screed) or 21 days (cement screed). The first heating up and down procedure of the screed has to be agreed with the supplier and documented.</p>	<p>Spread the tile adhesive and then lay out and join the tiles. In wet areas, apply a watertight coating before the tile adhesive.</p>	<p>Seal between tiles and walls with a silicon sealant. Allow the floor to cure completely before turning the underfloor heating system on.</p>

How to install in renovation?

CABLE INSTALLATION	FILLER LAYER	TOP FLOOR INSTALLATION	FINISHED FLOOR
			
<p>Clean the floor. Apply a layer of adhesive primer. Attach the cable (eg. use glue gun) on the floor.</p>	<p>Carefully apply an even layer of filler on top of the cable. Let it cure according to the manufacturers' instructions.</p>	<p>Place a wood floor underlay on top of the filler and then lay the wooden or laminated floor according to the instructions of the manufacturer.</p>	<p>Approximately 24 hours later you can enjoy your nice warm floor.</p>

Attention:

- All electrical work must be performed by an authorised electrician.
- In general it is to be ensured that only floor coverings which are suitable for underfloor heating are used.

Electrical connection

Max. circuit length	100 m
Cold lead	Not required, direct connection possible in junction box or to thermostat
Electrical protection	10 A circuit breaker (Type C)
Earth leakage current (rca)	30 mA, 100 ms

Installation of thermostat + sensor (see page 36-39)



"Zero height" installation. Install T2Red directly into pre-cut grooves. Call 0800 969 013.

What do I need to order?

1. T2Red self-regulating cable on spool




Product name	Part number	Description
T2Red	948739-00	T2Red floor heating cable 5-15 W/m 230 V



2. Components

Product name	Part number	Description
CE-T2Red/ETL	323608-000	T2Red Connection and End Seal Kit

3. Thermostat (see page 36–39)

Product name	Part number	Description
NRG-DM	1244-015152	Intuitive electronic thermostat with flexible weekly schedule and 1.8" display. Easy to use and to program. 
GREEN LEAF	1244-013810	Attractive electronic thermostat with 4 event weekly schedule 
NRG-Temp	1244-002513	Electronic thermostat with timer, illuminated LCD display with floor sensing, room sensing or room sensing with floor sensing limiter 

Pre-terminated T2Red packs

Include:

- Pre-terminated T2Red cable with end seal.
- Thermostat NRG-DM.
- 1 extra front plate.
- 1 sensor cable 3,0 m.
- 1 conduit 2,5 m.
- Glue sticks.
- 1 installation manual.
- 1 commissioning report.



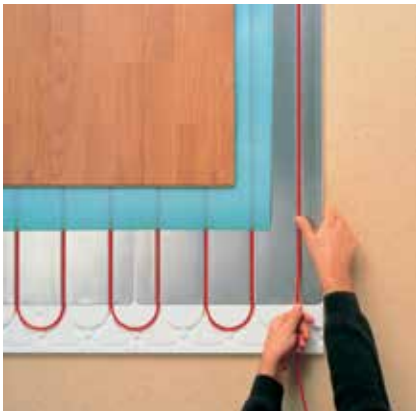
Product name	Length (m)	Part number	Description
T2Red pack -16M	16 m	389736-000	T2Red-pack 16 m incl. Thermostat and spare termination kit
T2Red pack -23M	23 m	658414-000	T2Red-pack 23 m incl. Thermostat and spare termination kit
T2Red pack -30M	30 m	016962-000	T2Red-pack 30 m incl. Thermostat and spare termination kit
T2Red pack -37M	37 m	066424-000	T2Red-pack 37 m incl. Thermostat and spare termination kit
T2Red pack -44M	44 m	416966-000	T2Red-pack 44 m incl. Thermostat and spare termination kit
T2Red pack -58M	58 m	531288-000	T2Red-pack 58 m incl. Thermostat and spare termination kit
T2Red pack -72M	72 m	318684-000	T2Red-pack 72 m incl. Thermostat and spare termination kit
T2Red pack -86M	86 m	275876-000	T2Red-pack 86 m incl. Thermostat and spare termination kit
T2Red pack -100M	100 m	036848-000	T2Red-pack 100 m incl. Thermostat and spare termination kit

Accessories

Product name	Part number	Description
CE-T2Red/ETL	323608-000	T2Red Connection and End Seal Kit
S-T2Red	397408-000	T2Red Splice Kit
T2Red starter-pack 300 m	821116-000	Complete starter pack: 300 m heating cable, 5 thermostat, 10 connection and end seal kit-kits, trolley
T2Red trolley	701370-000	T2Red trolley
T2Red hot glue sticks	503052-000	70 pcs in 1 box
KBL-10	102823-000	Cable ties

T2RED WITH T2REFLECTA: THE ENERGY-EFFICIENT SYSTEM

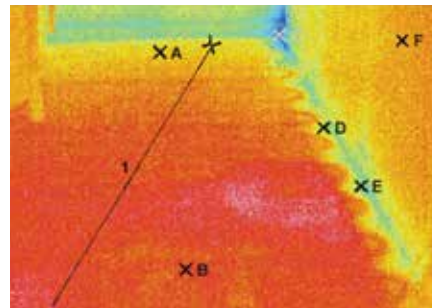
T2RED WITH T2REFLECTA



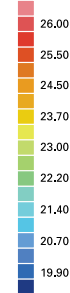
Advantages

Uniform temperature levels across the room.

Thermo graphic



Color & Temp (°C)

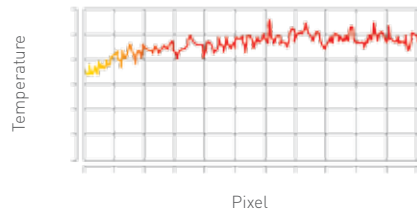


The aluminum layer of the plate guarantees a uniform heat distribution across the room.

System components

- T2Red self-regulating heating cable.
- T2Reflecta plate:
 - With installation grooves.
 - With insulation + integrated aluminum heat distribution layer.
- End plates.

Profile: 1



Max: 25,65°C
Avr: 24,58°C
Min: 23,47°C
PstP (x/y/l) 53/204
LstP (x/y) 37/11
Pnts: 194

Small temperature differences across the room

Applications

Living rooms, kitchens, bathrooms, dining room, children's rooms, conservatories:

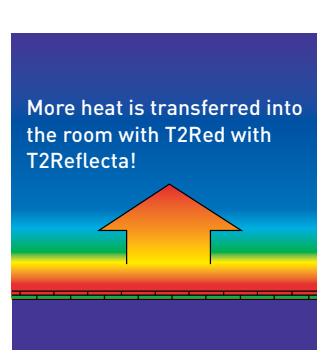
- **Top floor:** Tiles, parquet, natural stone, laminate, carpet*.
 - **Subfloor:** Cement screed, anhydrite screed, wooden floor, gypsum board, timber floor board, asphalt screed.
- * must be suitable for underfloor heating (maximum resistance to heat transfer 0,15 W/m²K)

The energy-efficient system

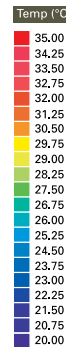
- 20% extra energy saving through integrated insulation.
- Even and adaptive heat distribution in floor.
- Flexible interior design. Thanks to the self-regulating effect, there is no risk for overheating under rugs, furniture, etc.
- Automatic self-regulating output depending on environment (more output in cold zones, less output in warm zones).
- No measurable electro-magnetic fields.
- Long life and maintenance free.

Extremely fast heat up

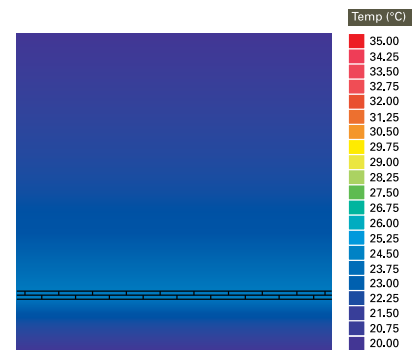
Heat transportation in stationary air, after 1 hour operation.



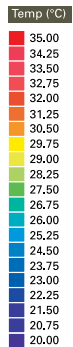
More heat is transferred into the room with T2Red with T2Reflecta!



T2Red with T2Reflecta - 100 W/m² under tiles (after 1 hour operation).

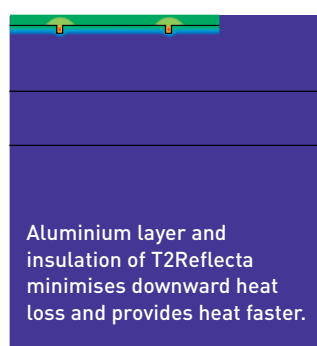


Heating cable in filler - 100 W/m² under tiles (after 1 hour operation).



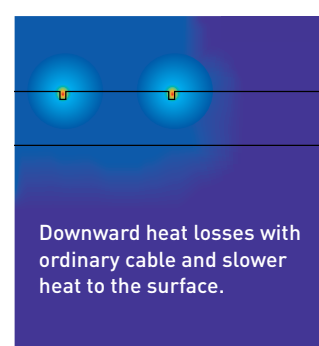
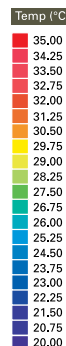
Reduced heat-loss

Heat where it matters: under the top floor.

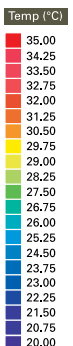


Aluminium layer and insulation of T2Reflecta minimises downward heat loss and provides heat faster.

T2Red with T2Reflecta on concrete.



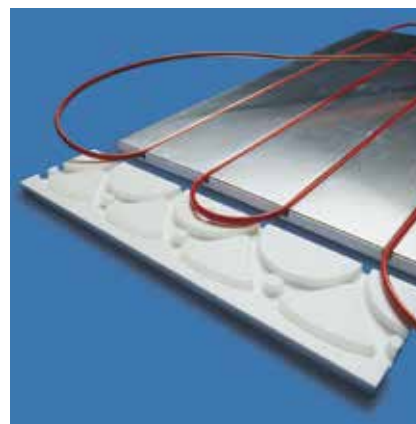
Heating cable in filler on concrete subfloor.



Which power output do I need?

1. New construction – good insulation	35 W/m ² - 60 W/m ²
2. Renovation – good insulation	60 W/m ² -100 W/m ²
3. Insufficient insulation – more output required	>100 W/m ²

The above values are for comfort underfloor heating. Make a heat-loss calculation if in doubt (insulation, room size, number of windows, ...) or contact us at 0800 969 013.



Top floor type	Approx. output (W/m ²)	Heating cable length (m/m ²)	Cable spacing (mm)
Tile flooring	45	3,3	300
	70	5	200
	100	10	100
Wood/laminate/ plastic floor covering/carpet	35	3,3	300
	50	5	200
	70	10	100

Technical data

T2Reflecta plate	
Materials	Alu (0,5 mm thickness/ & EPS (12,5 mm)
Plate dimensions	720 mm x 400 mm x 13 mm
End plate dimensions	100 mm x 400 mm x 12,5 (no alu)
Fire classification	DIN 4102-B1
U-value	2,33 W/m ² K
Thermal conductivity	0,033 W/(mK)
Thermal expansion coefficient	2,4 x 10 ⁵ 1/K
Long term pressure capability	140 kPa (14000 kg/m ²)

Technical data of the T2Red cable see page 11.

Which quantity do I need ?

1. Select the required power output and required T2Red cable length per m²

The table below shows the required spacing and cable length per m² and the spacing between the cables. The power output gives approx. 20–25°C.

2. Determine the required number of T2Reflecta insulated plates

One T2Reflecta insulated plate package covers 3,12 m². It consists of 10 T2Reflecta plates (720 x 400 mm) and six end plates (100 x 400 mm).

Example: Entrance hall of 5 m² with wooden floor:

1. Select '70 W/m²' power output → 10 m T2Red cable per m².

Spacing between two cable runs is 100 mm.

2. Number of T2Reflecta insulated plates = 5 ÷ 3,12 = 1,6 → 2 packs.

T2RED WITH T2REFLECTA: THE ENERGY-EFFICIENT SYSTEM

How to install laminate or wood on T2Red with T2Reflecta?

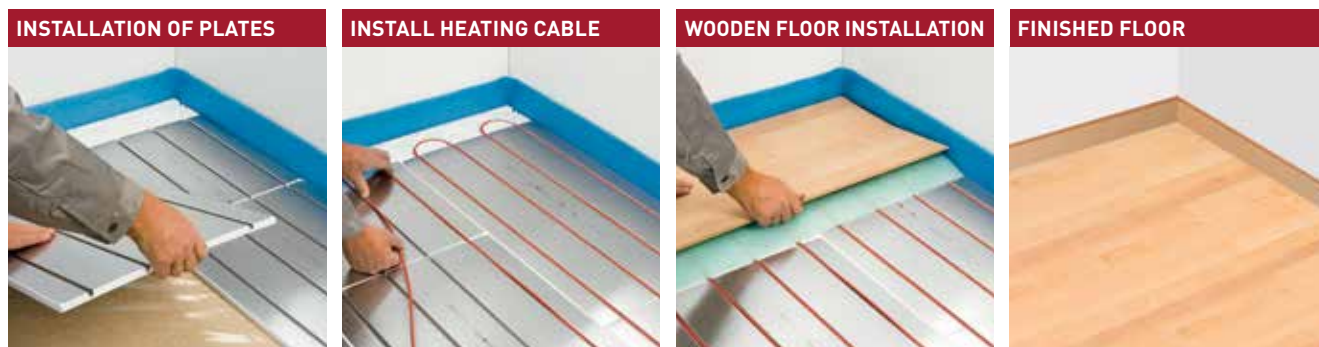
- T2Reflecta can be installed as a floating system, which saves days or weeks of curing time.
- No filler needed.
- The wooden floor can be laid directly on the T2Reflecta plates.



The floating system is the fastest installation possible: no curing time.



Floating system



INSTALLATION OF PLATES
Lay out the T2Reflecta plates (no need to screw or glue them) on the subfloor.

INSTALL HEATING CABLE
Place the T2Red heating cable into the grooves. The desired heat output is determined by the spacing of the cable.

WOODEN FLOOR INSTALLATION
Place a wood floor underlay on top of the T2Reflecta plates and then lay the new wooden or laminate floor according to the instructions of the manufacturer.

FINISHED FLOOR
Your customers can enjoy the nice warm floor straight away.

Attention:

- All electrical work must be performed by an authorised electrician.
- Make sure to use a floor covering that is suitable for underfloor heating.

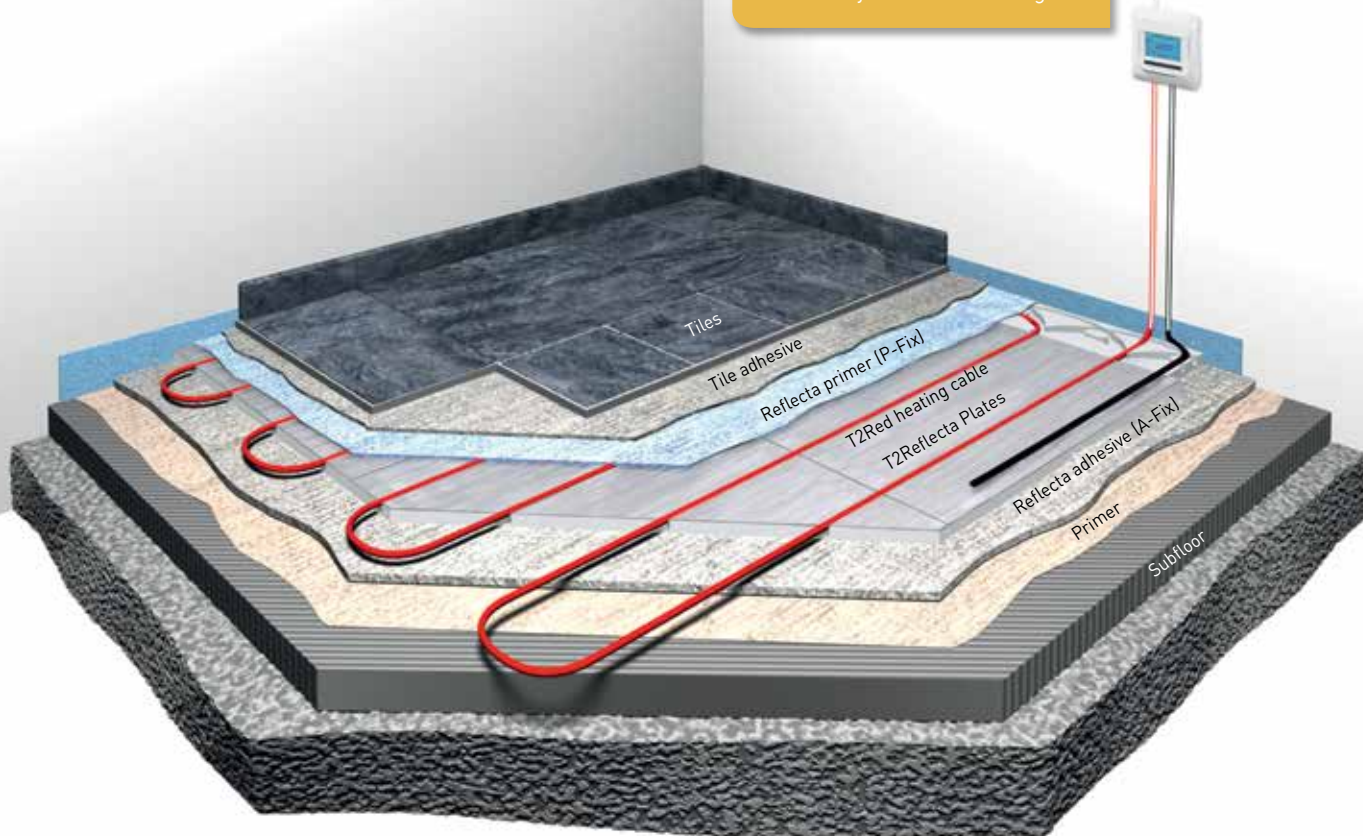
T2RED WITH T2REFLECTA: THE ENERGY-EFFICIENT SYSTEM

How to install tiles or natural stone on T2Red with T2Reflecta?



Raychem systems are certified with building materials from leading brands.

→ More on **page 41** or www.raychemfloorheating.com



INSTALLATION OF PLATES



Apply T2Reflecta Adhesive A-FIX onto the subfloor (or use 15 screws per plate for wooden subfloors). Place the T2Reflecta plates on top of the glue.

INSTALLATION OF CABLE



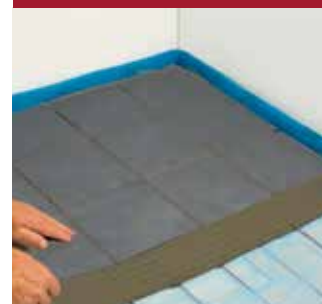
Place the T2Red heating cable in the grooves. The desired heat output is determined by how closely you space the cable (100, 200 or 300 mm).

APPLY PRIMER WITH A ROL



Apply the Primer P-Fix on the aluminum layer.

INSTALLATION OF TILES





Tiles are placed directly on top of the T2Reflecta plates with tile adhesive, according to the instructions. Approximately 24 hours after joining the tiles, you can enjoy your nice warm floor.

Attention:

- All electrical work must be performed by an authorised electrician.
- Make sure to use a floor covering that is suitable for underfloor heating.

T2RED WITH T2REFLECTA: THE ENERGY-EFFICIENT SYSTEM

Choose your fixing system for T2Reflecta plates

Working steps	T2Reflecta Fix-System for standard installation
Fix the plates on the subfloor	T2Reflecta A-Fix Cement-based adhesive Walk on 24 hours 
Apply primer on the T2Reflecta Plates	T2Reflecta P-Fix Special primer 
Install the tiles	Any flexible tile adhesive or natural stone adhesive
Total curing time	More than 24 hours

What do I need to order?

1. T2Reflecta insulation plates

Product name	Part number	Description
T2Reflecta-pack 3,0 m ²	450052-000	10 pcs of T2Reflecta-plates (720 mm x 400 mm) and 6 pcs of end plates (100 mm x 400 mm) for 3,12 m ²
T2Reflecta-pack 1,0 m ²	6012-8946251	3 pcs of T2Reflecta-plates (720 mm x 400 mm) and 2 pcs of end plates (100 mm x 400 mm) for 0,944 m ²
T2Reflecta-end plates-pack	241662-000	6 pcs of extra end plates (100 mm x 400 mm)



2. T2Red self-regulating cable on spool

Product name	Part number	Description
T2Red on spool	948739-000	T2Red floor heating cable 5-15 W/m 230 V
Components	Part number	Description
CE-T2Red/ETL	323608-000	T2Red Connection and End Seal Kit



3. Accessories

Fixing materials for tiles and natural stone tiles		
Product name	Part number	Description
T2Reflecta A-Fix	1244-001372	Adhesive for gluing T2Reflecta plates on the subfloor, 15 kg paper bag for 6 m ² . Consumption: 2.2 kg/cm ² (2,2 kg/m ² with 6 mm tooth comb)
T2Reflecta P-Fix	1244-001371 1244-003528	Primer for the aluminium layer of the T2Reflecta plates to apply standard natural stone or tile adhesive: <ul style="list-style-type: none"> • 5 kg bucket for 33 m². Consumption: 150 g/m². • 1 kg bucket for 6 m². Consumption: 150 g/m².



4. T2Red & T2Reflecta packs

Product name	Part number	Description
T2Reflecta-Laminate-10Plus	1244-002561	Complete pack for 10 m ² . (T2Red 100 m heating cable, 1 CE-Kit, 4 T2Reflecta packs = 33 T2Reflecta plates and 20 end plates)
T2Reflecta-Tiles-10Plus	1244-002564	Complete pack for 10 m ² . (T2Red 100 m heating cable, 1 CE-Kit, 4 T2Reflecta packs = 33 T2Reflecta plates and 20 end plates; 2 Adhesive A-FIX, 1 Primer P-FIX)



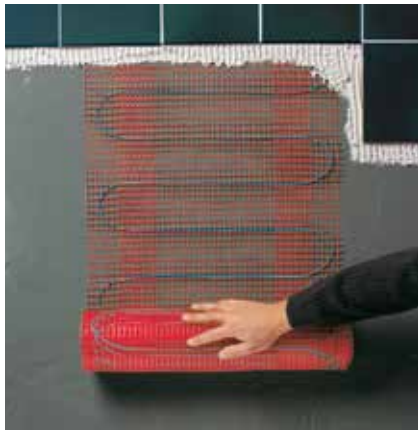
5. Thermostat (see page 36-39)

Product name	Part number	Description
NRG-DM	1244-015152	Intuitive electronic thermostat with flexible weekly schedule and 1.8" display. Easy to use and to program.
GREEN LEAF	1244-013810	Attractive electronic thermostat with 4 event weekly schedule
NRG-Temp	1244-002513	Electronic thermostat with timer, illuminated LCD display with floor sensing, room sensing or room sensing with floor sensing limiter



T2QUICKNET: THE THIN, SELF-ADHESIVE HEATING MAT

T2QUICKNET



Self-adhesive, 3 mm thick underfloor heating mat for direct installation under ceramic tiles or natural stone.

- Only 3 mm thick!
- **One** cold lead (dual wire system).
- Ideal as direct underfloor heating for embedding in tile adhesive or filler underneath the top floor.
- Minimum construction height including tiles is 15 mm.

Applications

Living rooms, kitchens, bathrooms, dining rooms, children's room, conservatories:

- **Top floor:** Tiles, natural stone (max. 30 mm thick).
- **Subfloor:** Cement screed, anhydrite screed, wooden floor (T2QuickNet-90 only), gypsum board, timber floor board.



T2QuickNet heating mats can be installed directly underneath the tile top floor close to bath tubs and showers and in walk-in showers.

Which T2QuickNet mat do I need?

T2QuickNet-90

- For well insulated floors.
- For complementary heating.

T2QuickNet-160

- For fast heat up.
- For poorly insulated subfloor.



Area (m ²)	Output T2QuickNet-90 (W)	Output T2QuickNet-160 (W)	Dimensions (W x L)
1	90	160	0,5 x 2,0
1,5	135	240	0,5 x 3,0
2	180	320	0,5 x 4,0
2,5	225	400	0,5 x 5,0
3	270	480	0,5 x 6,0
3,5	315	560	0,5 x 7,0
4	360	640	0,5 x 8,0
4,5	405	720	0,5 x 9,0
5	450	800	0,5 x 10,0
6	540	960	0,5 x 12,0
7	630	1120	0,5 x 14,0
8	720	1280	0,5 x 16,0
9	810	1440	0,5 x 18,0
10	900	1600	0,5 x 20,0
12	1080	-	0,5 x 24,0
For a surface bigger than 12 m ² ; a pack of 10 m ² without thermostat is available			
10	915	1600	0,5 x 20,0



Which quantity do I need?

T2QuickNet is available in ready-made kits. All T2QuickNet kits include heating mat with pre-attached cold lead cable, thermostat with sensor (+installation conduit) and complete installation instructions.

Calculate the total surface (m²) to be heated and select the T2QuickNet mat with a smaller surface area closest in size.

Example: Renovation of bathroom (9,4 m²) with tile floor. Select T2QuickNet pack for 9 m².



Raychem systems are certified with building materials from leading brands.

→ More on [page 41](#) or www.raychemfloorheating.com

Technical data

T2QuickNet heating mat composition		
	T2QuickNet-90	T2QuickNet-160
Heating cable	Constant wattage cable: 8,1 W/m	Constant wattage cable: 11,2 W/m
Power output	90 W/m ²	160 W/m ²
Voltage	AC 230 V	AC 230 V
Cable spacing	90 mm	70 mm
Insulation outer jacket	Fluoropolymer	Fluoropolymer
Cold lead length	2,5 m	5 m
Heating cable diameter	3,4 mm	3,4 mm
Min. bending radius	30 mm	30 mm
Mat material	Fiber glas; self adhesive	Fiber glas; self-adhesive
Net width	50 cm	50 cm
Thermostat (see page 36–37)	NRG-DM	NRG-DM



For maximum energy savings (up to 65% during the heat-up phase) combine T2QuickNet with Isolecta

→ [See page 32](#)

T2QUICKNET: THE THIN, SELF-ADHESIVE HEATING MAT

How to install T2QuickNet?



CABLE INSTALLATION
Clean the floor. Apply a layer of adhesive primer. Roll out the heating mat on the floor.

APPLY TILE ADHESIVE
Apply the tile adhesive directly on the T2QuickNet mat. In wet areas, apply a filler and watertight coating before the tile adhesive.

TILE INSTALLATION
Spread the tile adhesive and let it cure according to instructions. Then install the tiles.

FINISHED FLOOR
Seal tiles with silicone. Allow the floor to cure completely before turning the underfloor heating system on.

Attention:

- All electrical work must be performed by an authorised electrician.
- Make sure to use a floor covering that is suitable for underfloor heating.



To repair a broken cable use the T2QuickNet repair kit.
→ See accessories **page 24**

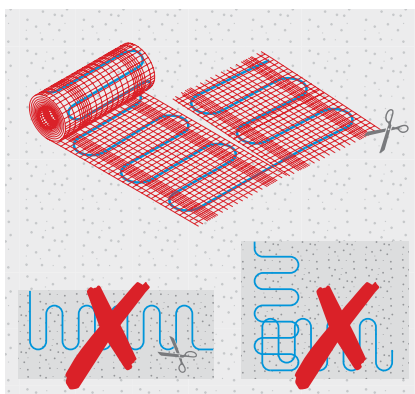
Installation information

The installation of the T2QuickNet mat is fast, safe and smart:

- The T2QuickNet mat with pre-mounted heating cable is available in ready-made lengths.
- Only 3 mm thick; no need to raise floor levels.
- Self-adhesive backing; no need for glue or staples.
- Is laid directly in the filler or the adhesive.
- Needs only connection of one end of the heater. (Twin wire system).
- For rooms with a complicated shape the cable can be easily loosened from the net to cover all heating areas.
- The cable may not be shortened, extended or crossed.

Electrical connection T2QuickNet

Installation of the heating cable Thermostat + sensor		
Max. load without contactor to thermostat	3000 W	
Thermostat	NRG-DM (see page 36–37)	
Electrical connection T2QuickNet		
	T2QuickNet 90	T2QuickNet 160
Maximum heated area for 3000 W load	33 m ²	18 m ²
Cold lead length	2,5 m	5 m
Electrical protection circuit breaker	13 A max.	
FI earth leakage current (I _{rcd})	30 mA, 100 ms	



To make a turn, cut the mat (avoid damaging the cable) and turn.



T2QuickNet-90 can be installed on a wooden subfloor under tiles.
Call 0800 969 013
to find out more about the ideal installation method.

What do I need to order? Heating mat pack

T2QuickNet-Plus-160 kit (with NRG-DM thermostat)

Pack contents:

- 1 self adhesive T2QuickNet mat 160 W/m², 1 cold lead 5 m.
- 1 thermostat NRG-DM
- 1 extra front plate.
- 1 sensor end plug.
- 1 sensor installation conduit.
- 1 installation manual.
- 1 commissioning report.



Product name	Part number	Area (m ²)	Output (W)	Dimensions (W x L in m)
T2QuickNet-P-160-1,0/Therm	424320-000	1	160	0,5 x 2,0
T2QuickNet-P160-1,5/Therm	1244-001827	1,5	240	0,5 x 3,0
T2QuickNet-P-160-2,0/Therm	806564-000	2	320	0,5 x 4,0
T2QuickNet-P160-2,5/Therm	1244-001828	2,5	400	0,5 x 5,0
T2QuickNet-P-160-3,0/Therm	802530-000	3	480	0,5 x 6,0
T2QuickNet-P160-3,5/Therm	1244-001829	3,5	560	0,5 x 7,0
T2QuickNet-P-160-4,0/Therm	404112-000	4	640	0,5 x 8,0
T2QuickNet-P160-4,5/Therm	1244-001830	4,5	720	0,5 x 9,0
T2QuickNet-P-160-5,0/Therm	055938-000	5	800	0,5 x 10,0
T2QuickNet-P-160-6,0/Therm	825740-000	6	960	0,5 x 12,0
T2QuickNet-P-160-7,0/Therm	440084-000	7	1120	0,5 x 14,0
T2QuickNet-P-160-8,0/Therm	782896-000	8	1280	0,5 x 16,0
T2QuickNet-P-160-9,0/Therm	857168-000	9	1440	0,5 x 18,0
T2QuickNet-P-160-10,0/Therm	128170-000	10	1600	0,5 x 20,0

Extension kits

T2QuickNet 160 (without thermostat)

Pack contents:

- 1 self-adhesive T2QuickNet mat 160 W/m², 1 cold lead 5 m.
- 1 installation manual.
- 1 commissioning report.
- 1 sensor plug.
- 1 sensor installation conduit.

Select the right thermostat on page 36–39.



Product name	Part number	Area (m ²)	Output (W)	Dimensions (W x L in m)
T2QuickNet-P-160-1,0	986618-000	1	160	0,5 x 2,0
T2QuickNet-P-160-1,5	1244-001831	1,5	240	0,5 x 3,0
T2QuickNet-P-160-2,0	060364-000	2	320	0,5 x 4,0
T2QuickNet-P-160-2,5	1244-001832	2,5	400	0,5 x 5,0
T2QuickNet-P-160-3,0	168506-000	3	480	0,5 x 6,0
T2QuickNet-P-160-3,5	1244-001833	3,5	560	0,5 x 7,0
T2QuickNet-P-160-4,0	036330-000	4	640	0,5 x 8,0
T2QuickNet-P-160-4,5	1244-001834	4,5	720	0,5 x 9,0
T2QuickNet-P-160-5,0	441162-000	5	800	0,5 x 10,0
T2QuickNet-P-160-6,0	349790-000	6	960	0,5 x 12,0
T2QuickNet-P-160-7,0	712522-000	7	1120	0,5 x 14,0
T2QuickNet-P-160-8,0	605750-000	8	1280	0,5 x 16,0
T2QuickNet-P-160-9,0	723132-000	9	1440	0,5 x 18,0
T2QuickNet-P-160-10,0	728236-000	10	1600	0,5 x 20,0

T2QUICKNET: THE THIN, SELF-ADHESIVE HEATING MAT

Heating mat pack

T2QuickNet 90 (with NRG-DM thermostat)




Pack contents:

- 1 self-adhesive T2QuickNet 90 W/m² mat, 1 cold lead 2,5 mm.
- 1 thermostat NRG-DM.
- 1 extra front plate.
- 1 sensor end plug.
- 1 sensor installation conduit.
- 1 installation manual.
- 1 commissioning report.



Product name	Part number	Area (m ²)	Output (W)	Dimensions (W x L in m)
T2QuickNet-1,0	6012-8948401	1	90	0,5 x 2,0
T2QuickNet-1,5	6012-8948415	1,5	135	0,5 x 3,0
T2QuickNet-2,0	002974-000	2	180	0,5 x 4,0
T2QuickNet-2,5	6012-8948416	2,5	225	0,5 x 5,0
T2QuickNet-3,0	130640-000	3	275	0,5 x 6,0
T2QuickNet-3,5	6012-8948417	3,5	315	0,5 x 7,0
T2QuickNet-4,0	114372-000	4	360	0,5 x 8,0
T2QuickNet-4,5	6012-8948418	4,5	405	0,5 x 9,0
T2QuickNet-5,0	332398-000	5	450	0,5 x 10,0
T2QuickNet-6,0	606482-000	6	545	0,5 x 12,0
T2QuickNet-7,0	017708-000	7	630	0,5 x 14,0
T2QuickNet-8,0	043254-000	8	725	0,5 x 16,0
T2QuickNet-9,0	171520-000	9	800	0,5 x 18,0
T2QuickNet-10,0	742077-000	10	915	0,5 x 20,0
T2QuickNet-12,0	441639-000	12	1100	0,5 x 24,0
Extension pack for surfaces above 12 m ² . Without thermostat.				
T2QuickNet-10,0 /No Therm	034118-000	10	915	0,5 x 20,0

Thermostat (see page 36-39)

Product name	Part number	Description
NRG-DM	1244-015152	Intuitive electronic thermostat with flexible weekly schedule and 1.8" display. Easy to use and to program. 
GREEN LEAF	1244-013810	Attractive electronic thermostat with 4 event weekly schedule 
NRG-Temp	1244-002513	Electronic thermostat with timer, illuminated LCD display with floor sensing, room sensing or room sensing with floor sensing limiter 

Accessories

Product name	Part number	Description
T2QuickNet Repair kit	1244-008869	Repair and Extension kit for T2QuickNet



T2BLUE: THE FLEXIBLE UNDERFLOOR HEATING CABLE

T2BLUE



The flexible underfloor heating cable is suitable for installation directly in a levelling compound, screed, or concrete.

- Heating cable with pre-fabricated power cable.
- Ideal for complex floor layouts.
- Power output flexibility by varying the distance between heating cables.
- Suitable for laying in milled grooves in the screed/concrete without increasing the total height of the floor structure.

Applications

Bathrooms, stairs, living areas, conservatories.

- **Floor covering:** Suitable for most floor coverings, subject to installation guidance and floor covering manufacturer approval.
- **Subfloor:** Cement screed floor; concrete.

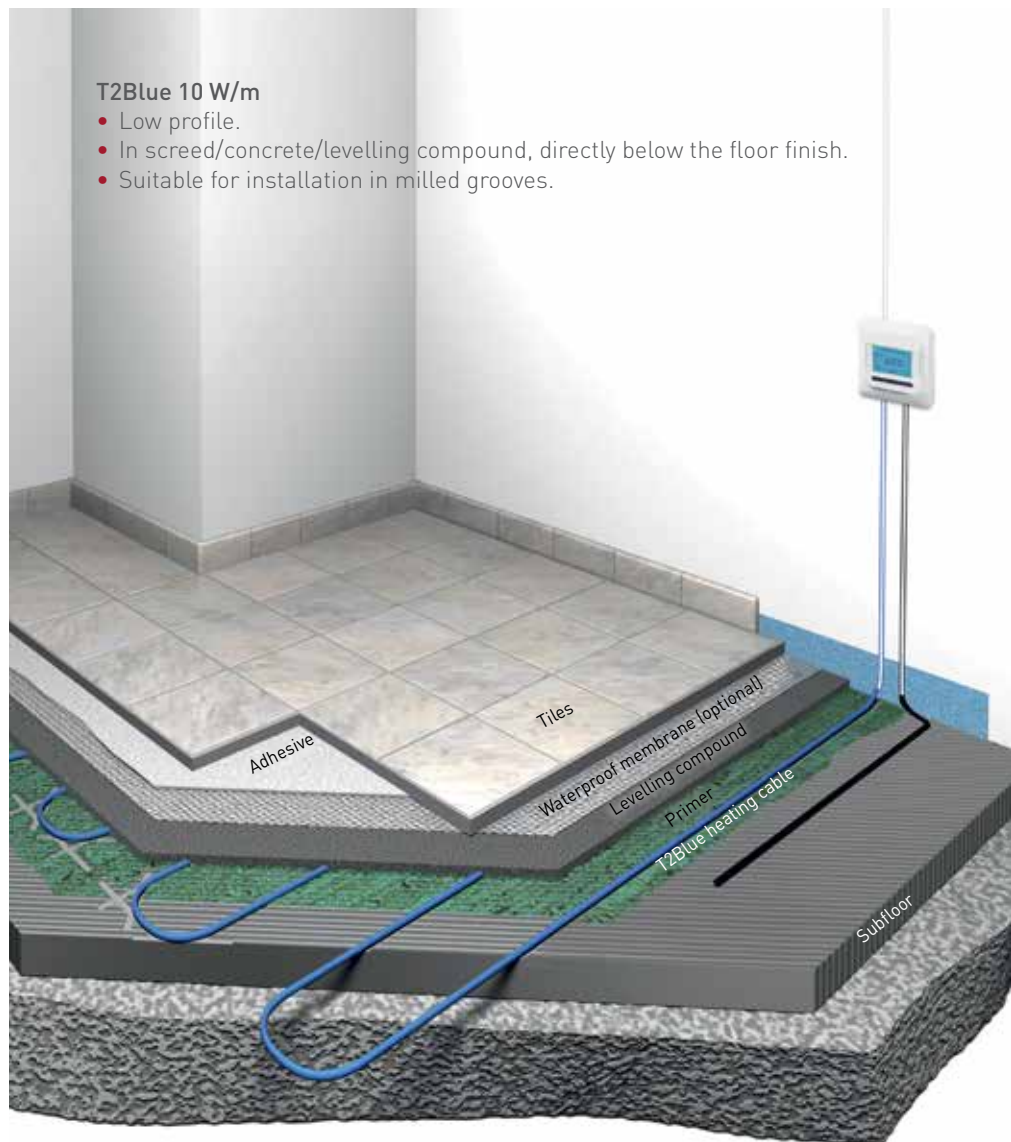
Installation heights

Height	T2Blue-10	T2Blue-20
15 mm – 30 mm	☺☺☺	–
30 mm – 50 mm	☺	☺☺☺



For maximum energy savings (up to 65% during the heat-up phase) combine T2Blue with Isolecta.

➔ See page 33



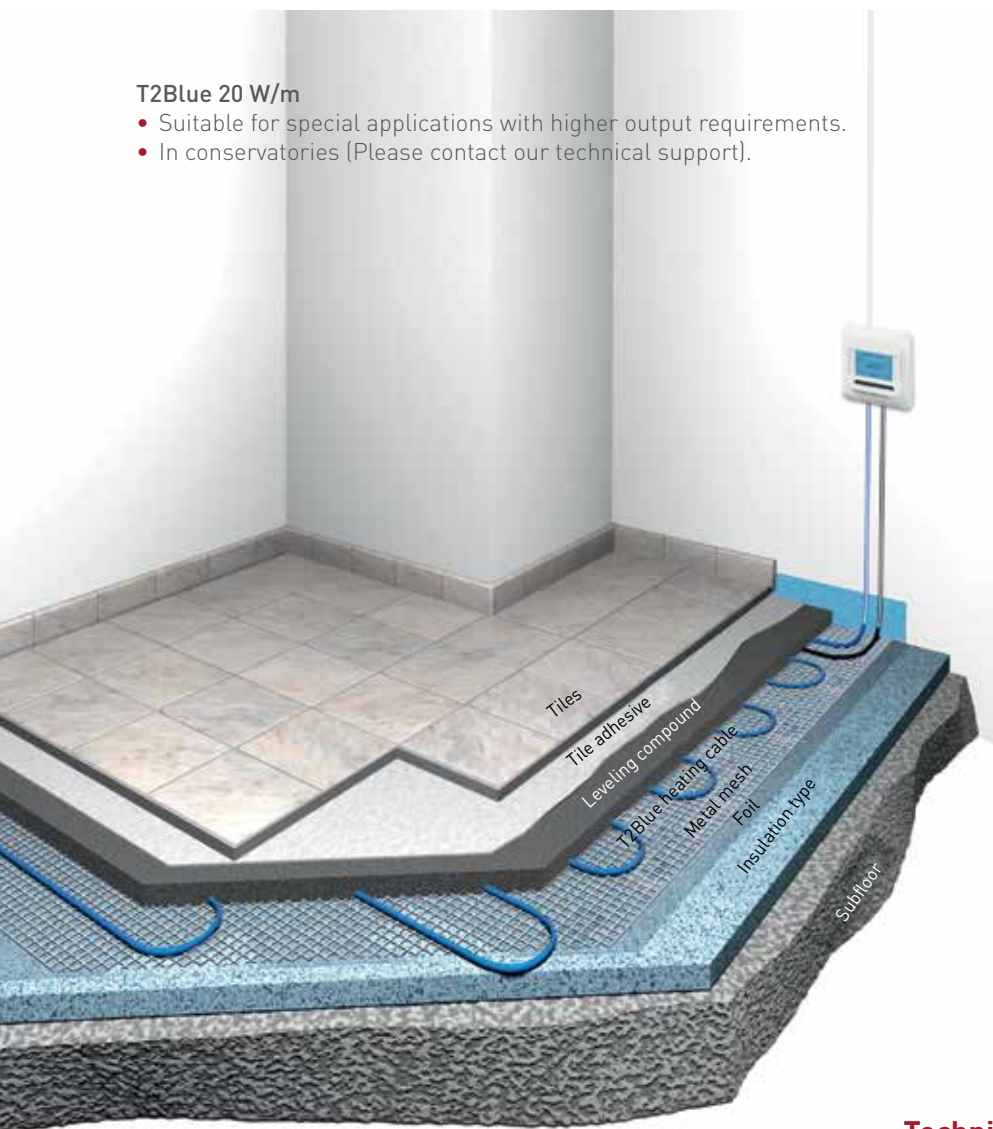
T2Blue 10 W/m

- Low profile.
- In screed/concrete/levelling compound, directly below the floor finish.
- Suitable for installation in milled grooves.

T2Blue 10 W	P heating power (W)	L length (m)	A area (m ²)				
			60 W/m ²	70 W/m ²	80 W/m ²	100 W/m ²	125 W/m ²
T2Blue-10-20 m	200	20	3,3	2,9	2,5	2,0	1,6
T2Blue-10-30 m	305	30	5,1	4,4	3,8	3,0	2,4
T2Blue-10-40 m	400	40	6,7	5,7	5,0	4,0	3,2
T2Blue-10-50 m	505	50	8,4	7,2	6,3	5,0	4,0
T2Blue-10-60 m	605	60	10,1	8,6	7,6	6,0	4,8
T2Blue-10-70 m	700	70	11,7	10,0	8,7	7,0	5,6
T2Blue-10-80 m	805	80	13,4	11,5	10,0	8,0	6,4
T2Blue-10-90 m	890	90	14,8	12,7	11,0	9,0	7,1
T2Blue-10-101 m	1010	101	16,8	14,4	12,6	10,0	8,1
T2Blue-10-121 m	1215	121	20,2	17,4	15,2	12,0	9,7
T2Blue-10-142 m	1420	142	23,7	20,3	17,8	14,2	11,4
T2Blue-10-160 m	1600	160	26,7	22,9	20,0	16,0	12,8
T2Blue-10-180 m	1800	180	30,0	25,7	22,6	18,0	14,4
T2Blue-10-200 m	2000	200	33,3	28,6	25,0	20,0	16,0
Heating cable spacing (mm) = $x = \frac{A}{L} \times 1000$			160 mm	140 mm	120 mm	100 mm	80 mm

T2Blue 20 W/m

- Suitable for special applications with higher output requirements.
- In conservatories (Please contact our technical support).



Which power output do I need?

1. **New construction – good insulation**
35 W/m² - 60 W/m².
2. **Old building renovation – good insulation**
60 W/m² - 100 W/m².
3. **Old building renovation – less well insulated**
125 W/m² - 150 W/m².

The specified values are recommended values and apply for comfort heating. A minimum installation depth of 30–50 mm must be provided when using T2Blue 20.

Which cable do I need?

1. Determine the room area in m²: e.g. 13.5 m².
2. Determine the (free) area in m² to be heated: e.g. 10 m².
3. Select the total power output required for the area in W. e.g. 1,200 W.
4. Calculate the power per square metre: e.g.: 1,200 W/10 m² = 120 W/m².
5. Select the product with the nearest total power from the table below
T2Blue-10: e.g. T2Blue 10-121M = 1,215 W/230V (121 W/m²).
6. Define the heating cable spacing: 10 m²/121 m heating cable length = 0.08 m (approx. 82 mm).
7. Select your thermostat NRG-DM, NRG-Temp or GREEN LEAF.

Technical Details

T2Blue 20 W	P heating power (W)	L length (m)	A area (m ²)			
			80 W/m ²	100 W/m ²	125 W/m ²	150 W/m ²
T2Blue-20-11 m	205	11	2,6	2,0	1,6	1,4
T2Blue-20-14 m	285	14	3,6	2,9	2,3	1,9
T2Blue-20-18 m	355	18	4,4	3,6	2,8	2,4
T2Blue-20-21 m	435	21	5,4	4,4	3,5	2,9
T2Blue-20-28 m	575	28	7,2	5,8	4,6	3,8
T2Blue-20-35 m	720	35	9,0	7,2	5,8	4,8
T2Blue-20-43 m	845	43	10,6	8,5	6,8	5,6
T2Blue-20-50 m	980	50	12,3	9,8	7,8	6,5
T2Blue-20-57 m	1130	57	14,1	11,3	9,0	7,5
T2Blue-20-63 m	1270	63	15,9	12,7	10,2	8,5
T2Blue-20-71 m	1435	71	17,9	14,4	11,5	9,6
T2Blue-20-86 m	1710	86	21,4	17,1	13,7	11,4
T2Blue-20-101 m	2015	101	25,2	20,2	16,1	13,4
T2Blue-20-115 m	2300	115	28,8	23,0	18,4	15,3
Heating cable spacing (mm) = $x = \frac{A}{L} \times 1000$			250* mm	200* mm	160 mm	135 mm

* Only recommended with subfloor of 50 mm

T2Blue		
Heating power	T2Blue-10	10 W/m; constant wattage heating cable with electrically protective covering
	T2Blue-20	20 W/m; constant wattage heating cable with electrically protective covering.
Voltage rating	AC 230 V	
Min. bending radius	30 mm	
Minimum heater spacing	50 mm	
Rated maximum temperature	65°C	
Heating cable external diameter	5,5 mm	
Outer jacket material	LSOH	
Heating conductor insulation	Fluoropolymer	
Length of connecting cable	2,5 m	
Approvals	VDE; SEMKO; CE, UkrSEPRO and EAC	
Thermostat (see page 36-39)	NRG-DM, NRG-Temp or GREEN LEAF	

T2BLUE: THE FLEXIBLE UNDERFLOOR HEATING CABLE

How is T2Blue-10 installed for the renovation of a building?

INSTALLING OF THE HEATING CABLE



Apply a layer of adhesive primer. Attach the heating cable (e.g. use hotglue gun) on the clean floor.

APPLYING LEVELLING COMPOUND



Carefully apply an even layer of levelling compound on top of the heating cable. Let it cure according to the manufacturers' instructions.

INSTALLATION OF TILES



Spread the tile adhesive and then lay out and join the tiles. In wet areas, apply a watertight coating before the tile adhesive.

FINISHED FLOOR



Seal between tiles and walls with a silicon sealant. Allow the floor to cure completely before turning the underfloor heating system on.

How is the T2Blue-20 heating system installed in a 30-50 mm screed?

INSTALLING OF THE HEATING CABLE



First determine the areas to be heated before beginning the installation of the heating cable. Agree this with the planner/architects and screed layer.

SCREED INSTALLATION



Apply the screed carefully without damaging the heating cable. Let the screed cure according to the manufacturers' instructions.

INSTALLING THE NATURAL STONE



Spread the natural stone adhesive and then lay out and join the natural stone. In wet areas, apply a watertight coating before the natural stone adhesive.

FINISHED FLOOR



Seal between the natural stone and walls with a silicon sealant. Allow the floor to cure completely before turning the underfloor heating system on.

Attention:

- All electrical work must be performed by an authorised electrician.
- The suitability of the floor covering in conjunction with floor heating should be verified with the manufacturer.

Electrical connections

Installation of the heating cable + sensor		
Maximum load without power contactor	3000 W	
	T2Blue-10	T2Blue-20
Maximum heating cable length	200 m	115 m
Cold lead	2,5 m	2,5 m
Circuit breaker	Max.13 A	
Fault current switch	30 mA, 100ms	

Installation of thermostat + sensor (see page 36–39)



Repair a damaged heating cable with the T2Blue repair kit.
→ See accessories **page 29**



“Zero millimetre installation height” Install the T2Blue heating cable directly in milled installation grooves in the screed. Call us!

What do I need to order?

Underfloor heating cable T2Blue 10 W/m

T2Blue-10

- Prefabricated underfloor heating cable 10 W/m with 1 power cable 2.5 m
- Installation instructions with commissioning report
- Warning sign

Pack contents:



Product name	Length in m	Item number	Power in W
T2Blue-10-20M	20	1244-002603	200
T2Blue-10-30M	30	1244-002604	300
T2Blue-10-40M	40	1244-002605	400
T2Blue-10-50M	50	1244-002606	500
T2Blue-10-60M	60	1244-002607	600
T2Blue-10-70M	70	1244-002608	700
T2Blue-10-80M	80	1244-002609	800
T2Blue-10-90M	90	1244-002610	900
T2Blue-10-101M	101	1244-002611	1010
T2Blue-10-121M	121	1244-002612	1210
T2Blue-10-142M	142	1244-002613	1420
T2Blue-10-160M	160	1244-002614	1600
T2Blue-10-180M	180	1244-002615	1800
T2Blue-10-200M	200	1244-002616	2000

Underfloor heating cable T2Blue 20 W/m

T2Blue-20

- Prefabricated underfloor heating cable 20 W/m with 1 power cable 2.5 m
- Installation instructions with commissioning report
- Warning sign

Pack contents:



Product name	Length in m	Item number	Power in W
T2Blue-20-11M	11	1244-002007	220
T2Blue-20-14M	14	1244-001918	280
T2Blue-20-18M	18	1244-002008	360
T2Blue-20-21M	21	1244-001919	420
T2Blue-20-28M	28	1244-001920	560
T2Blue-20-35M	35	1244-001921	700
T2Blue-20-43M	43	1244-001922	860
T2Blue-20-50M	50	1244-001923	1000
T2Blue-20-57M	57	1244-001924	1140
T2Blue-20-63M	63	1244-001925	1260
T2Blue-20-71M	71	1244-001926	1420
T2Blue-20-86M	86	1244-001927	1720
T2Blue-20-101M	101	1244-002212	2020
T2Blue-20-115M	115	1244-001928	2300

Thermostat (see page 36-39)

Product name	Item number	Description
NRG-DM	1244-015152	Intuitive electronic thermostat with flexible weekly schedule and 1.8" display. Easy to use and to program.
GREEN LEAF	1244-013810	Attractive electronic thermostat with 4 event weekly schedule
NRG-Temp	1244-002513	Electronic clock thermostat with illuminated LCD display with either floor sensing, room sensing or room sensing with floor sensing limiter

Accessories

Product name	Item number	Description
Hot glue rods	503052-000	70 pcs. in 1 box
Hot glue rods	6012-8949540	10 pcs. in 1 bag
KBL-9	941735-000	Cable ties
TF kit	6012-8949541	Sensor installation pipe and sensor end plug for Raychem thermostat
T2Blue repair kit	1244-008869	Repair and extension kit for T2Blue

CERAPRO: THE ULTRA-THIN, ROBUST HEATING CABLE

CERAPRO



- Only 3 mm thick heating cable.
- One connection lead (dual wire system).
- Ideal for renovation projects where the floor height cannot be adjusted.
- An extremely robust fluoropolymer heater cable for long life, durability, and exceptional resistance to mechanical damage.
- Supplied in an "Easy-Spool" box for a quick and easy installation.

Applications

Bathrooms, kitchens, living areas, conservatories.

Particularly useful for irregularly shaped floor areas.

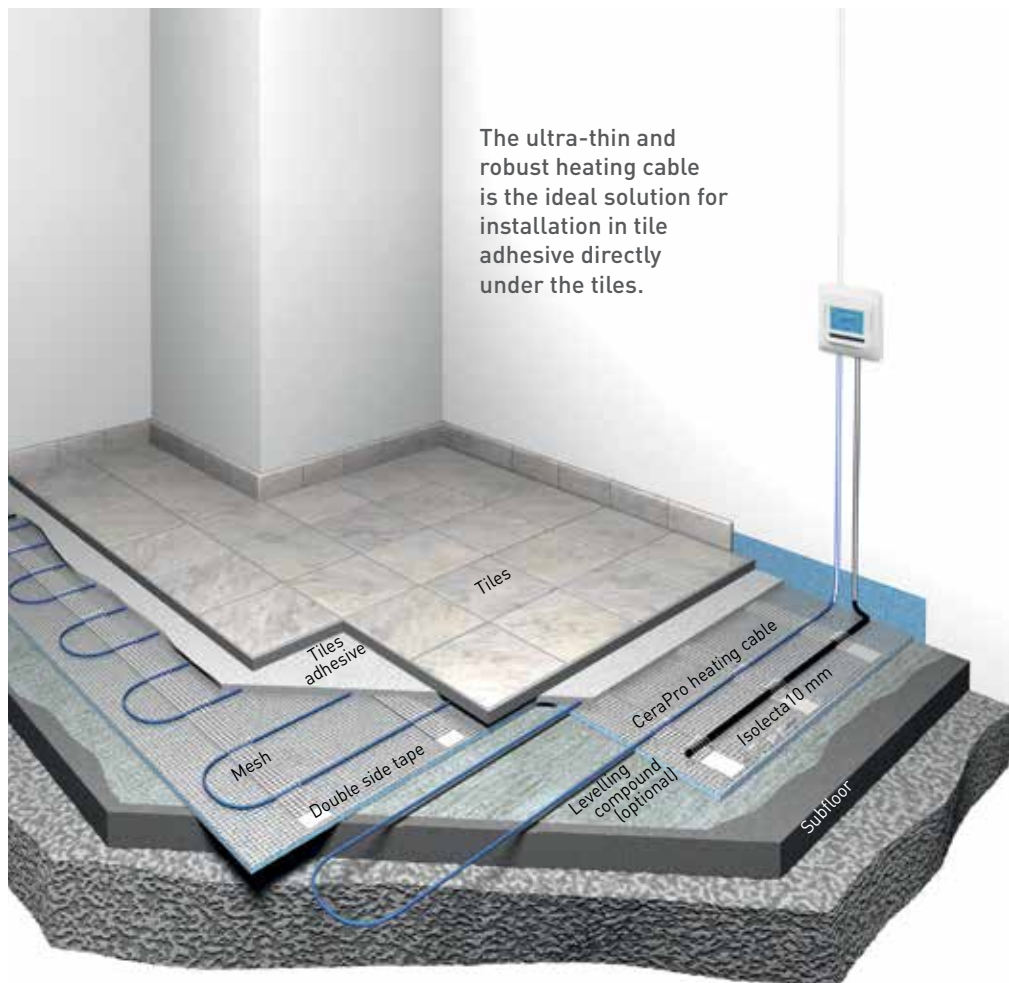
- **Floor covering:** Tile and natural stone. Installation directly into the adhesive.
- **Subfloor:** all stable subfloors including cement, screed, insulation board (Isolecta) and timber floor*.

* When installed on a wooden subfloor, the maximum output per m² should be limited to 100 W/m².



For maximum energy savings (up to 65% during the heat-up phase) combine CeraPro with Isolecta.

➔ See page 32



The ultra-thin and robust heating cable is the ideal solution for installation in tile adhesive directly under the tiles.

Which CeraPro product do I need?

Product name	Power output (W)	Length (m)	For approx. areas (m ²)	Approx. output per m ² (depending on area) (W/m ²)	Cable spacing for 100 W/m ² (cm)	Cable spacing for 125 W/m ² (cm)	Cable spacing for 150 W/m ² (cm)
CeraPro-160W	160	14	1.0-1.5	100-150 W/m ²	11	9	7.5
CeraPro-240W	240	21	1.5-2.5	100-150 W/m ²	11	9	7.5
CeraPro-320W	320	28	2.0-3.0	100-150 W/m ²	11	9	7.5
CeraPro-400W	400	35	2.5-4.0	100-150 W/m ²	11	9	7.5
CeraPro-475W	475	43	3.0-4.5	100-150 W/m ²	11	9	7.5
CeraPro-635W	635	57	3.0-4.5	100-150 W/m ²	11	9	7.5
CeraPro-800W	800	71	5.0-7.5	100-150 W/m ²	11	9	7.5
CeraPro-1140W	1140	100	7.5-11.0	100-150 W/m ²	11	9	7.5

Installation method

CeraPro is quick and easy to install following the following steps:

- ① Clear subfloor of dust and dirt.
- ② Prime the floor.
- ③ Mark floor with cable spacing and install the floor sensor cable between 2 runs of heater cable.
- ④ Install the double sided tape across the subfloor.
- ⑤ Remove the tape covering.
- ⑥ Affix CeraPro to the double sided tape at the desired spacing.
- ⑦ Affix CeraPro firmly in place by installing the adhesive mesh.*
- ⑧ Install the tiled floor.

* When tiling does not directly follow the installation of the heating product, or when installing the product in a self levelling compound, the cables should be further held in place with the addition of hot melt glue. This will prevent the cable moving over longer periods of time.



Which CeraPro kit do I need?

Heat output 100-150 W/m², simply select the product based on the table on the previous page.

If you require a specific power output, use the following calculation formula:

1. Determine the power output per m:
e.g. 125 W/m².
2. Determine the (free) area in m² to be heated:
e.g. 5,5m².
3. Multiply the power output by the area to be heated:
e.g. 125 W/m² x 5,5m² = 687,6 W.
4. Select the CeraPro kit with the closest power output:
e.g. CeraPro-635 W.
5. Define the heating cable spacing:
Divide CeraPro power output by the cable length.
e.g. 635 W/57m.
Divide 100 cm by this answer
e.g. 100/11 = 9 cm.
This is the required spacing of the cable to achieve the given output per m².
6. Select your Raychem thermostat (see page 36-39).

What do I need to order?

Product name	Length (m)	Part number	Power (W)
CeraPro-160W	14	1244-012136	160
CeraPro-240W	21	1244-008550	240
CeraPro-320W	28	1244-008551	320
CeraPro-400W	35	1244-008552	400
CeraPro-475W	43	1244-012137	475
CeraPro-635W	57	1244-008553	635
CeraPro-800W	71	1244-008554	800
CeraPro-1140W	100	1244-008555	1140

Accessories

Product name	Item number	Description
CeraPro repair kit	1244-008869	Repair kit for CeraPro

Technical Details

CeraPro	
Heating cable	11 W/m
Power output	Dependent on cable spacing, 100-150 W/m ² recommended
Voltage rating	230 VAC
Outer jacket material	Robust, durable fluoropolymer
Length of connecting cable	2,5 m
Heating cable external diameter	3,4 mm
Min. bending radius	30 mm
Approvals	CE marked, tested to IEC60800 heating cable standard, UkrSEPRO and EAC
Thermostat	NRG-DM, NRG-Temp, GREEN LEAF
Minimum heater spacing	50 mm

ISOLECTA: THE ENERGY SAVING INSULATION BOARD FOR A FAST HEAT-UP

ISOLECTA



System components

- Isolecta insulation board with double-sided glass-fiber-reinforced cement layer.
- Can be installed with T2QuickNet heating mat, T2Blue-10 W/m or CeraPro heating cables.
- Accessories:
 - Washers and screws for fixing on wooden floors.
 - Fixing pins for concrete or cement screed subfloors.

Applications

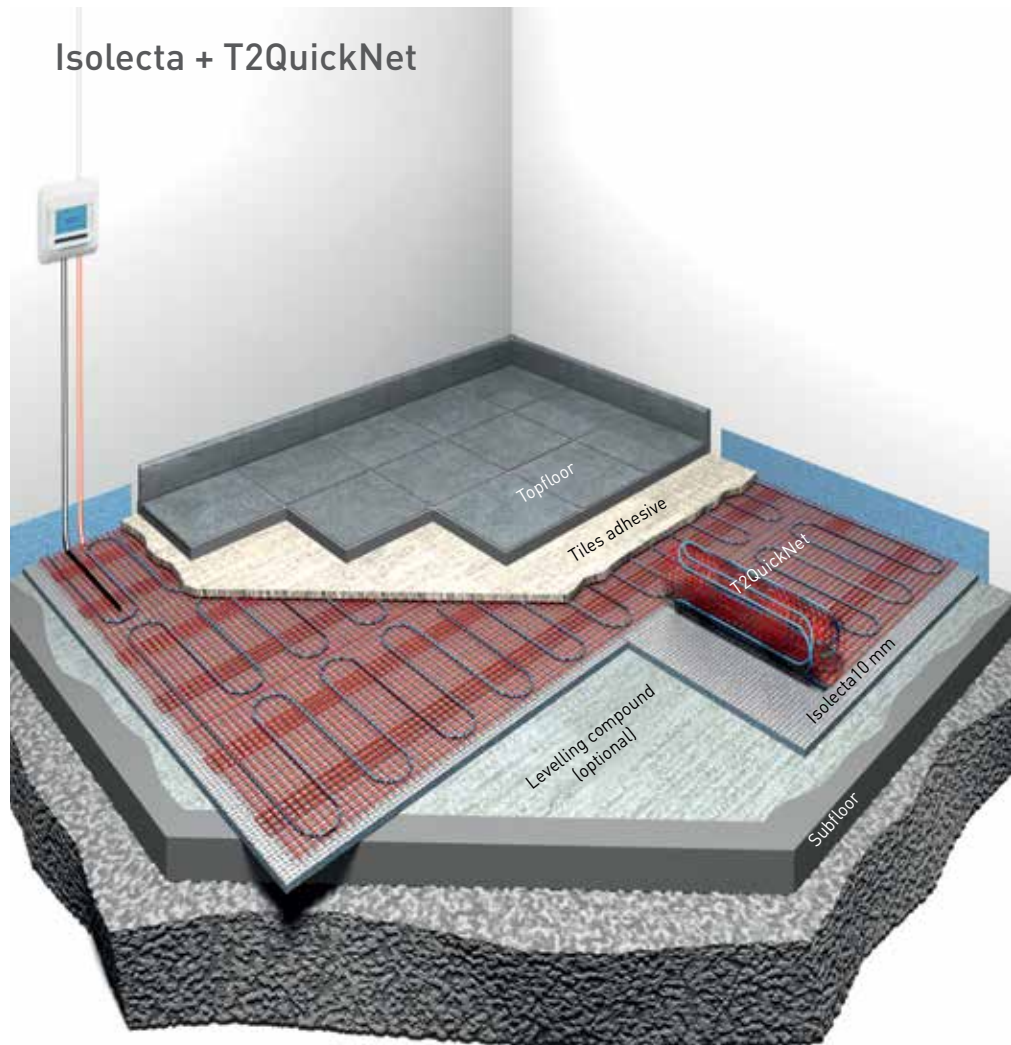
Living rooms, bathrooms, kitchens, dining rooms, children's rooms, conservatories, home offices.

- **Floor covering:**
Tiles, natural stones.
- **Sub-floor:**
Concrete, cement screed, anhydrite screed, wooden sub floor, timber floor board.

Energy savings and a fast heat-up

- The heat-up time for T2QuickNet, T2Blue and CeraPro is three times faster in combination with Isolecta. This results in energy savings of up to 65% during the heat-up phase.
- Approximately 20% of extra energy savings during operation due to reduced downward heat loss.
- The ideal substrate for tiling due to the double sided cement layer with integrated glass fiber mesh.

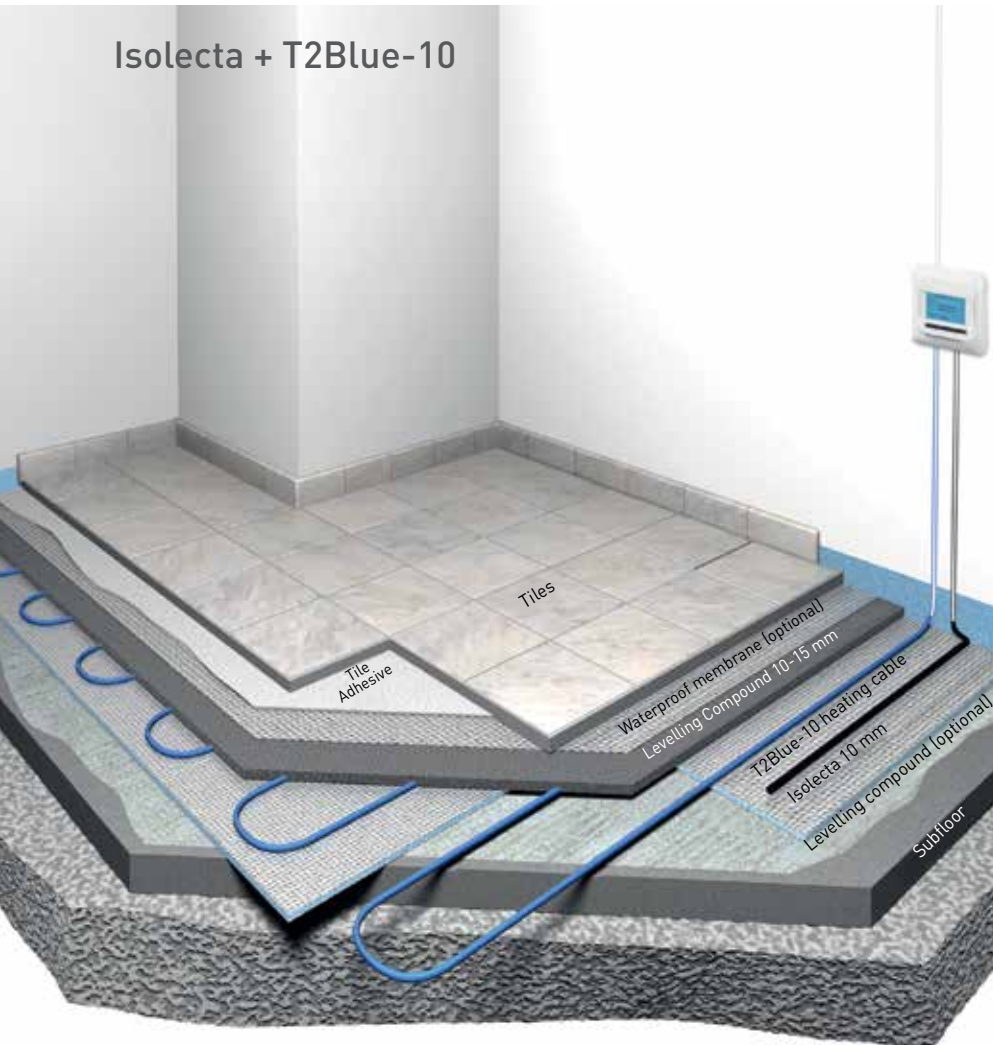
Isolecta + T2QuickNet



Technical Details

Properties of the foam	
Material	HCFC free, blue extruded polystyrene foam with closed cell structure
Board dimensions	1180 mm x 600 mm x 10 mm (0,71 m ²)
Compressive strengths at 10% deflection DIN EN 826	0,25 N/mm ²
Elastic modulus DIN EN 826	10 N/mm ²
Thermal Conductivity at 10°C DIN EN 12667/DIN EN 12939	0,035 W/m K
Heat transfer resistance	0,286 m ² K/W
U-Value	2,19 W/m ² K
Bulk density Din EN 1602	30 kg/m ³
Water vapour resistivity (μ) DIN EN 12086	100
Water absorption by long-term immersion DIN EN 12087	<1,5 Vol %
Fire classification DIN 4102	B1

Isolecta + T2Blue-10



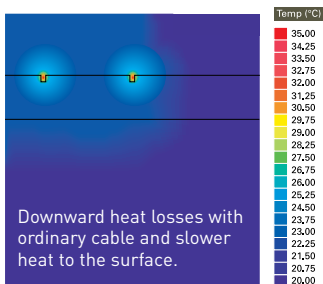
Which quantity do I need?

1. Determine the room area in m²
e.g. 9,5 m²
2. Determine the (free) area in m²
to be heated:
e.g. 8 m²
3. Calculate the amount of Isolecta
boxes needed; one box covers 2,85 m²
e.g. 3 boxes
4. Select your underfloor heating
system
e.g. T2QuickNet 8,0 m²
5. Select your Raychem thermostat
(see page 36-39):
NRG-DM, NRG-Temp or GREEN LEAF

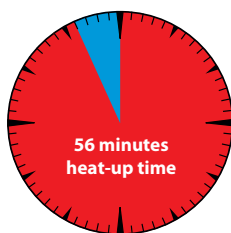
- The lightweight insulated tile backing board provides an excellent subfloor for use with Raychem underfloor heating systems.
- Energy savings of approximately 20%
- Vapour barrier provides an excellent resistance to moisture.
- High level of thermal insulation.
- Ideal subsurface for thin bed tiling and underfloor heating systems.
- Compatible with most proprietary tile adhesives and filler materials.

Reduced heat-loss

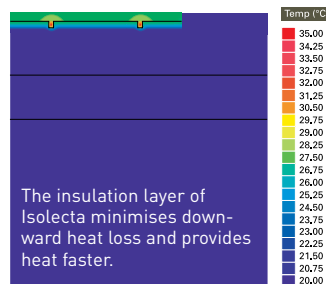
Heat where it matters: under the top floor.



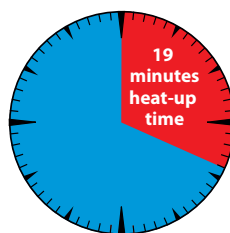
Heating cable in filler on concrete subfloor.



T2QuickNet-160
Heat-up time without Isolecta



T2 QuickNet with Isolecta on concrete.



T2QuickNet-160
Heat-up time with Isolecta



For maximum energy savings (up to 65% during the heat-up phase) combine CeraPro with Isolecta.

→ See page 32

ISOLECTA: THE ENERGY SAVING INSULATION BOARD

How to install Isolecta on wooden subfloors?



Lay out the Isolecta boards on an even and stable sub floor. Fix the board onto the wooden sub floor with washers and screws.



Apply the self-adhesive tape to cover the joints.



Install the heating system; T2QuickNet, T2Blue or CeraPro.



Lay out and join the tiles.
Minimum tile format: 10 x 10 cm
Minimum thickness of the tiles: 7 mm.

How to install Isolecta on cement screed subfloors?



Lay out the Isolecta boards on an even sub floor. Fix the board to the concrete sub floor by using the fixing pins.



Apply the self-adhesive tape to cover the joints.



Install the heating system; T2QuickNet, T2Blue or CeraPro.



Lay out and join the tiles.
Minimum tile format: 10 x 10 cm
Minimum thickness of the tiles: 7 mm.

FIXING T2 QUICKNET ON ISOLECTA



- Roll out self-adhesive heating mat.
- Follow the installation instructions for T2QuickNet.

FIXING T2BLUE ON ISOLECTA








- Use Isolecta spacers or a glue gun to fix the heating cable onto the Isolecta board.

What do I need to order?

Isolecta insulation boards

Product name	Item number	Description	Picture
Raychem-Isolecta-3,0/10 mm	1244-008402	4 Isolecta boards (1180 mm x 600 mm x 10mm) for 2,85 m ² ; Thickness 10 mm	

Accessories

Product name	Item number	Description	Picture
R-IS-Netband-25 m	1244-008404	Self-adhesive tape; 25 m x 125 mm for covering the joints	
R-IS-Fixing	1244-009277	Galvanized fixing nails for concrete sub floors; 35 pcs per plastic bag, 8 pcs per board	
R-IS-Washer	1244-009247	Galvanized washer + screws for wooden sub floors; 35 pcs per plastic bag, 8 pcs per board	
R-IS-Spacer-400 /20	1244-008415	Plastic cable spacer for T2Blue; lengths: 400 mm, grid: 25 mm; 20 pcs/bag	
R-IS-Spacer-400 /100	1244-008405	Plastic cable spacer for T2Blue; lengths: 400 mm, grid: 25 mm; 100 pcs/bag	

RAYCHEM NRG-DM THERMOSTAT

THE NEW INTUITIVE FLOOR HEATING THERMOSTAT

Large Dot Matrix display (1.8") with blue backlight

Extremely simple navigation structure

3 working modes

- Constant Mode
- Event Mode
- Boost Mode

3 Sets of settings

- Event setting (programming of the weekly schedule)
- User settings (settings that helps users customizing their thermostat)
- Engineer settings (expert settings that help installers fine tune to specific needs)

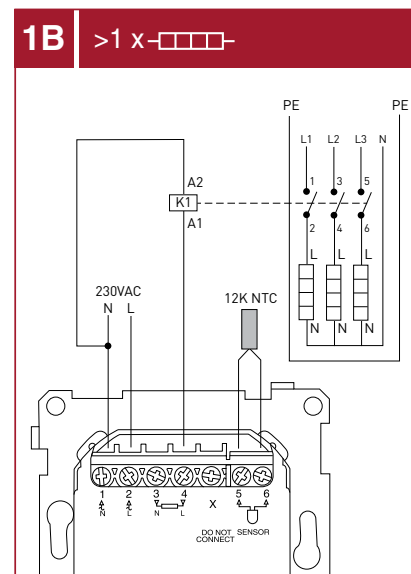
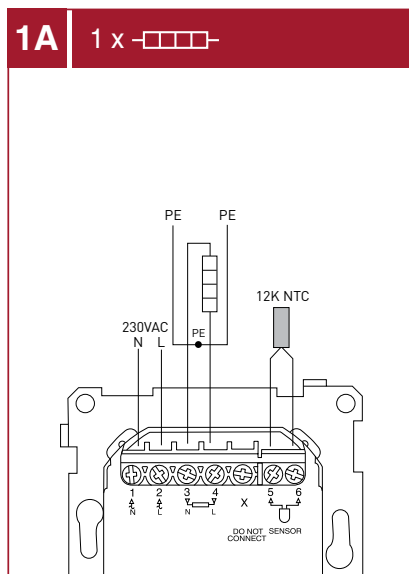
Software in 11 languages

2 sensors / 4 sensing modes

- Floor sensing
- Room Sensing
- Room sensing with floor limiter
- No sensor mode



 pentairthermal.com/manuals/



RAYCHEM NRG-DM THERMOSTAT

RAYCHEM NRG-DM INTUITIVE AND EFFICIENT TEMPERATURE MANAGEMENT

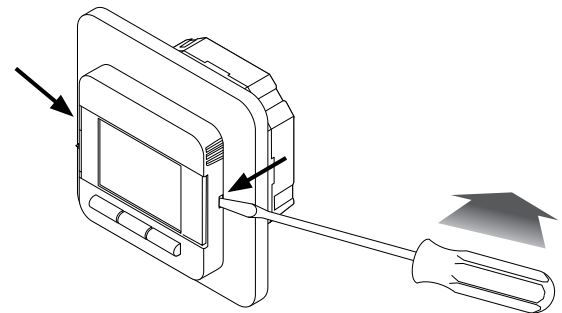
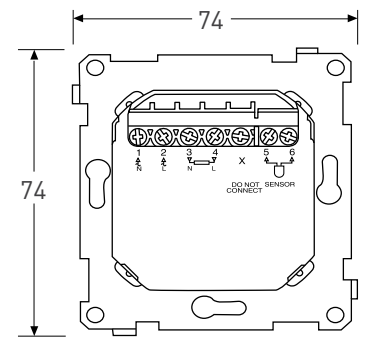
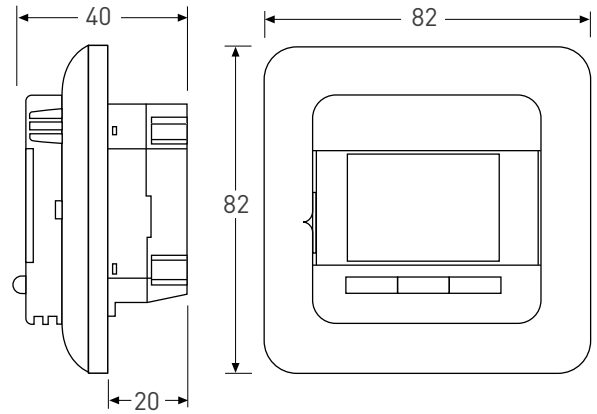
Accurate regulation PWM with PI control loop

Smart and precise adaptive function

- Calculates when to start heating to reach desired temperature when required
- Adapts to the environment
- Adapts to floor construction
- Is calculated 2x per day

Flexible

- Time schedule with 1 to 6 events/day (1 temperature/event)
- Adjustable boost mode (time and temperature)
- Compatible with most common switch gear frames (including Exact frames)
- Compatible with other floor sensors (2kΩ, 10kΩ, 12kΩ, 15kΩ and 30kΩ)




Technical data NRG-DM

Supply capacity / Voltage	13A/230VAC
Temperature range	5°C to +40°C
Ambient temperature-operation	0°C to 25°C
Ambient temperature-transport	-20°C to +70°C
Sensor Accuracy	0.2°C in the range 0°C to +40°C
Temperature control method	PID
Control modes	Floor sensor Room sensor Room sensor with floor limiter No sensor
Ingress protection	IP21
Floor sensor	Compatible with floor sensors from 2kΩ to 30kΩ

PCN NRS

NRG-DM	1244-015152
Raychem floor sensor*	1244-002952

* In case of replacement of the floor sensor by 1244-002952, the "NRG-Temp" sensor needs to be selected in Settings/Engineer settings/Sensor

 The intelligent adaptive function calculates when the heating is to be switched on to make sure that the comfort temperature is reached when required.

Approvals



RAYCHEM GREEN LEAF THERMOSTAT

RAYCHEM GREEN LEAF PROGRAMMABLE THERMOSTAT

No one likes to spend a fortune on electricity. That's why our Raychem underfloor heating systems are designed to minimise electricity costs. The GREEN LEAF Thermostat has a contemporary look and feel.

It can be used with following floorheating systems

- T2QuickNet 90 W/m² and 160 W/m²
- T2Red – Self-regulating heating cable
- T2Blue 10 W/m² and T2Blue 20 W/m² floor heating cables
- CeraPro thin floor heating cable

Smart features

- Large and clear display.
- Easy navigation.
- The same button is used for changing programmes, for saving values and for turning off the GREEN LEAF thermostat.
- Built-in 4 event programmable function.



3 operation modes

- Standard Comfort mode (1 temperature set point- manual on/off).
- Editable program (4 temperature and time periods per day).
- Holiday mode (standby).

Retrofit- compatible with other Raychem floor sensor cables e.g. NRG-Temp, making it easy to upgrade your existing Raychem thermostat.



Technical data GREEN LEAF

Supply voltage	230V (+10% / -15%) - 50 Hz
Relay output	Maximum 13A
Ingress protection	IP 20
Floor sensor (external sensor)	With 3 metre cable Type NTC 10K @ 25°C Compatible with existing Raychem NRG-Temp floor sensor (1244-002952)
Internal room sensor	

	PCN NRS
GREEN LEAF Thermostat	1244-013810
Raychem floor sensor	1244-002952



RAYCHEM NRG-TEMP THERMOSTAT

SMART FEATURES FOR AN EASIER OPERATION

Features

- Large LCD - display.
- Heat-Booster function for fast heat up (+5°C for max. 2 hours).
- Read out of the actual floor sensor temperature.
- Auto - calibration in room sensing mode.

Design for long lasting safety

- Safe disconnection due to 2-pole on/off switch.
- Protection class IP 21.
- Fail - safe operation.

Easy to install

- Big terminals & earth terminal for an easy and fast connection.
- Automatic detection of the sensor mode where appropriate (floor/room/room with floor temperature limiter).

Flexible in design

- Compatible with most switch gear (extra square front in the box).
- Silver colour version available.
- Exxact Frame compatibility kit available.



Our thermostat are compatible with Switch gear of the leading brands

Busch-Jaeger • Merten • Eljo • Ensto • Gira • Jung • Elko • Schneider Electric

Technical data NRG-Temp

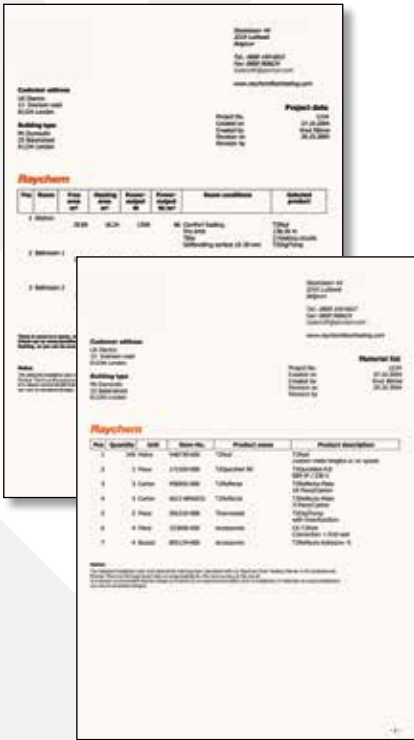
Temperature range floor sensing	5-35°C
Temperature range room sensing	5-40°C
Temperature range floor limiter	low 5°C/high 35°C
Switch capacity/Voltage	13 A/230 VAC
Ingress Protection	IP 21
Sensor type	NTC, 10kΩ/25°C
Sensor cable length	3 m
Dimensions	H 82 x W 82 x D 57 mm

Ordering information

Product name	Colour	Part number	Description
NRG-Temp	Polarwhite	1244-002513	Timer thermostat with floor and ambient sensor
Sensor N10 K Ohm	-	1244-002952	Spare sensor
Silver Raychem TC-NRG-Round	Silver	1244-010130	Silver colour rounded front plate for NRG-Temp
Silver Raychem TC-NRG-Squared	Silver	1244-010132	Silver colour squared front plate for NRG-Temp
Adapter UK wall box	Polarwhite	1244-010134	Adapter frame for UK wall boxes

SMART SERVICES

We offer a set of tools and services that aims to simplify the professional installers' life. Not only do we offer the best quality products; we also back them up with unrivalled services.



FREE DESIGN SERVICE

Save time on preparing your next project and ask for our free design service. With a simple request, our engineers will provide a detailed offer, using our bespoke software.

What will you get?

- Project list with all relevant project data.
- Detailed bill of materials.
- Installation plan with circuit lengths and technical details of the recommended heating system in 2- or 3-D.
- Recommendation sheet for the building materials.

How can you get it?

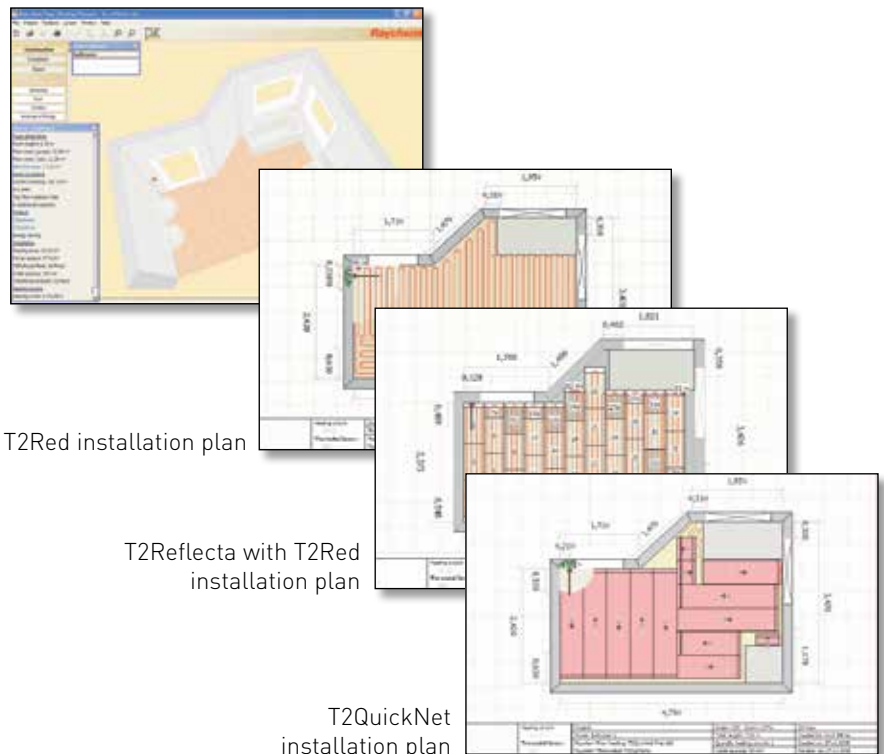
Contact your local supplier or just send a sketch or drawing of your room(s) to us at:

- **United Kingdom**
Fax 0800 968 624, E-mail: salesUK@pentair.com
- **Ireland**
Fax 1800 654 240, E-mail: salesIE@pentair.com
- Use the Faxform for Free design service at the last page of this brochure.

Installation plan

Installation plan with circuit lengths and technical details of the recommended heating system in 2- or 3-D.

The installation plan makes your life easier too. It details the start and end of each circuit and the position of the thermostat.



T2Red installation plan

T2Reflecta with T2Red installation plan

T2QuickNet installation plan

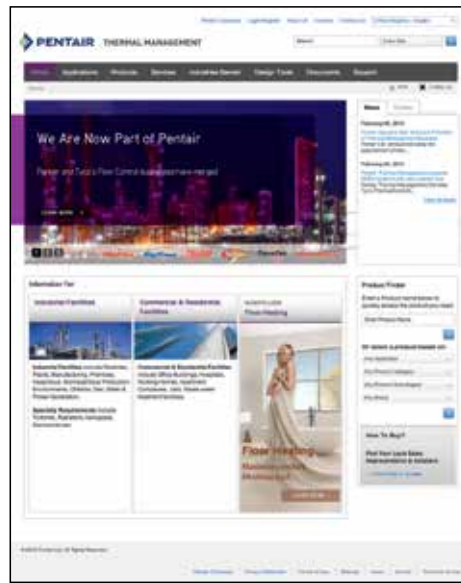
Tips and tools for easy installation
Visit our YouTube channel!



Our website helps you discover more:

www.raychemfloorheating.com

Design wizard



A step-by-step guide that will help you select the right product for your application. Once you have made your selection you can submit this for a quote or further information. We will get back to you with necessary information.



To learn more about these smart services, call our
free number: 0800 969 013

CERTIFIEDPRO PROGRAMME AND TOTAL CARE WARRANTY

Raychem CertifiedPro Installer Programme:

A network of professionals who share our passion for quality

The Raychem CertifiedPro network are trained experts in our underfloor heating systems. Only CertifiedPro installers can extend the 12 Year and offer 20 years of Total Care Warranty.

Raychem CertifiedPro Member benefits:

- Offer 20 Years Total Care Warranty on Raychem underfloor heating installations.
- Participate to practical and hands-on trainings on: product selection, installation tips, testing and commissioning, sales techniques, construction directives and guidelines
- Generate additional business using Raychem's promotional tools
- Become a member of the Certified-Pro network of specialists

For more information, contact your sales representative or visit www.raychemfloorheating.com



Total Care Warranty:

Up to 20 years without worries with a different warranty concept

Quality products – installed and checked by a professional electrician – assure home owners the long-lasting comfort of a warm floor. When installing Raychem underfloor heating systems, electricians can now offer a 12 Year Total Care Warranty to their customers. The full support of a quality brand comes with it. Certified Pro installers can extend the Total Care Warranty to 20 years.



Total Care = doing what it takes to assure a warm floor

In the rare event that our product would fail and we cannot repair it, we will not only provide you with a new product and pay the costs of installing it. We will also take care that the floor covering is repaired or replaced to the equivalent standard.



The concept in a nutshell

For the complete information, download the Warranty Certificate and Registration form from www.raychemfloorheating.com.

The Total Care Warranty is valid in all EU, EFTA and CIS countries and covers all defective Raychem underfloor heating systems.

It is only valid when:

1. The products are installed by a qualified electrician according to applicable rules and regulations, and in accordance with our installation instructions.
2. The warranty registration form is completed and signed by the electrician.
3. The registration form is kept by the property owner, together with the purchase invoice and photographs and/or sketches of the installation.
4. The installation is done by a CertifiedPro installer and registered online (only required for 20 Years Total Care Warranty).

We are committed to offering the best response to each situation. We:

1. Repair or replace the products – free of charge.
2. Restore the floor to its original state, or to the equivalent standard – free of charge.
3. For thermostat, the warranty is limited to the supply of a new product for 12 years.

For more information, contact your sales representative or visit www.raychemfloorheating.com

Request form for free Design Service for **Raychem** Underfloor Heating Projects

Please send it to your Pentair representative or fax to 0800 96 86 24

Your address:

Name:

Street:

Postcode:

City:

Country:

E-mail:

Phone:

Fax:

Your project data:

Project name:

Customers name:

Street:

Postcode:

City:

Country:

Constuction type:

Family house Apartment Hotel

Commercial building Retirement home

other:

Heating purpose:

Comfort heating

Room heating W/m² required output

Floor construction:

Subfloor:

Topfloor:

Tiles/natural stone

Wood/laminate

Thermostat:

NRG-Temp NRG-DM

GREEN LEAF

Please send me following information by (dd/mm/yy)

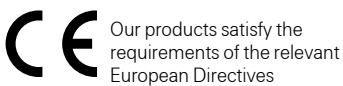
Quote
[incl. material list, project list, installation plan 3D]

Technical Data sheet
Comments:

Building materials recommendation
(adhesive, leveling compound, grout filler etc.) for the installation of tiles and natural stone for preferred brand(s):

Ardex Casco Deitermann

Mapei PCI





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