User guide

Floor construction
and suitable heating cables or mats
(Indoor floor heating)

DEVI® by Danfoss

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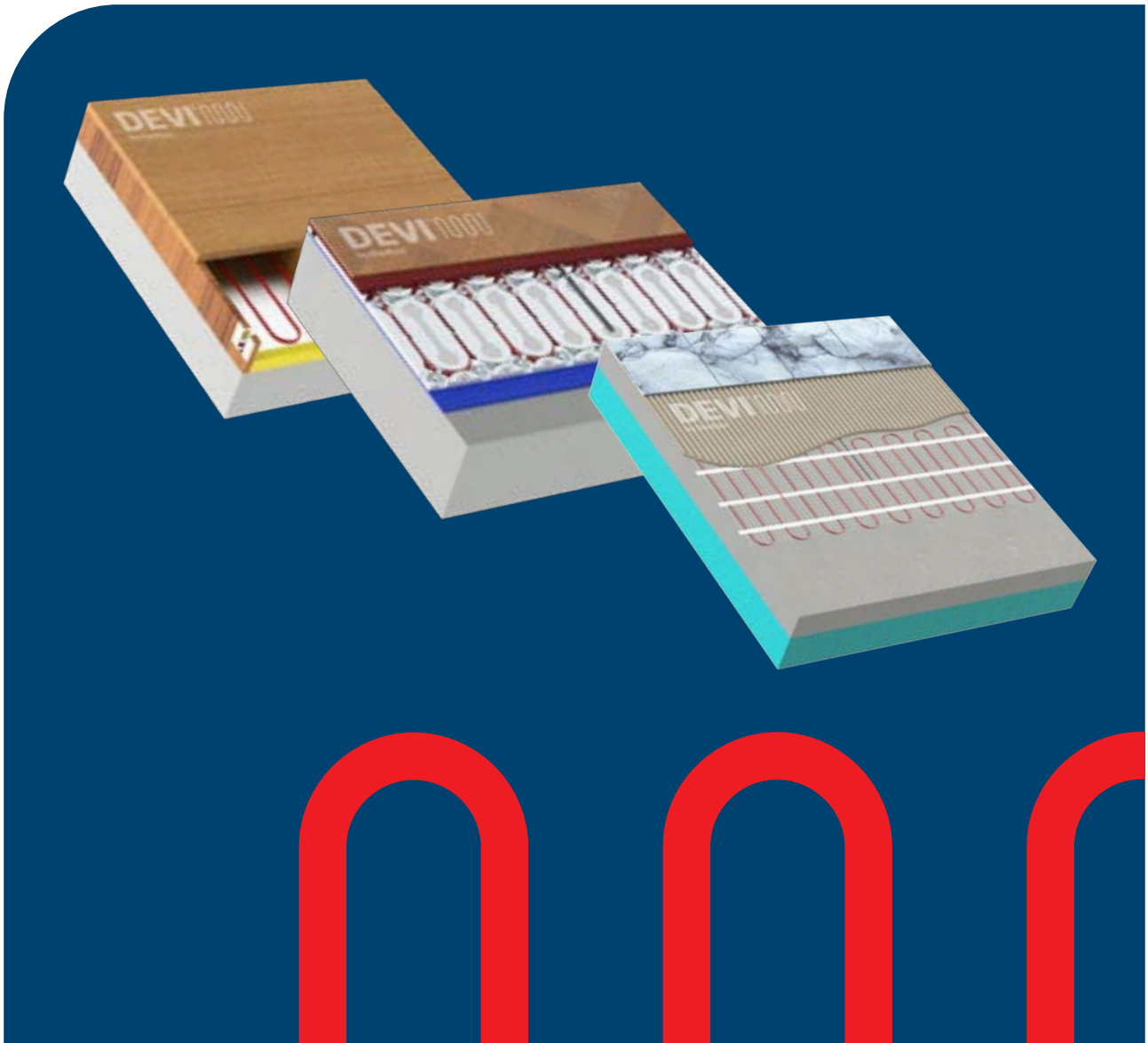

Table of contents

1 Introduction and basic information

This document provides a comprehensive overview of various types of floor constructions and their compatibility with electric heating solutions. With the growing demand for energy-efficient and comfortable heating systems, understanding the nuances of floor construction is essential in selecting the appropriate heating cables or mats. This guide outlines the key characteristics of popular floor types — including concrete, timber, and tile installations — and recommends suitable electric heating solutions tailored to each.

By addressing the specific requirements and thermal properties of each floor construction, this document aims to assist architects, contractors, and homeowners in making informed choices that enhance comfort, optimize energy efficiency, and ensure long-lasting performance. Whether for new builds or retrofits, selecting the right heating product for the specific floor type can significantly impact both functionality and user satisfaction.

Through detailed descriptions and practical recommendations, this guide serves as a valuable resource for achieving safe, effective, and compatible floor heating solutions across diverse construction environments.

Cable-to-cable distances (C-C distance with DEVIfast™ step) and corresponding outputs per m² for some linear outputs of heating cables (W/m²)

* The outputs at 220 V has to be recalculated with the coefficient of 0,91.

	C-C distance with **DEVIfast™** step cm	Specific output of DEVI heating cables at 230 V			
		6 W/m	**10 W/m**	**18 W/m**	**20 W/m**
		DEVIflex™ 6T	DEVIflex™ 10T, DEVIcomfort™ 10T, DEVIbasic™ 10S	DEVIflex™ 18T	DEVIbasic™ 20S
Comfort floor heating*	**5**	**120**	**200**		
	7,5	80	**133**		
	10	60	**100**	**180**	**200**
	12,5	48	80	**144**	**160**
	15	40	67	120	133
	17,5	34	57	103	114
	20	30	50	90	100
	22,5	26	45	80	89
	25	24	41	72	80

NOTE: To avoid any cold spots between cable lines for Comfort floor heating, only use C-C distance marked in **red box**.
All specific outputs marked in yellow are recommended for Comfort floor heating.
The entire table can be used for **Total (Direct) floor heating**.

* **Comfort floor heating** or "Warm Floor" system provides heated floor surface.
* **Total (Direct) floor heating** is the only heating system installed in a room (or area) for maintaining a user specified room temperature according to the room heat loss.

Cable-to-cable distances (C-C distance with DEVIclip™ c-c step) and corresponding outputs per m² for some linear outputs of heating cables (W/m²)

* The outputs at 220 V has to be recalculated with the coefficient of 0,91.

	C-C distance with **DEVIclip™ c-c** step, cm	Specific output of DEVI heating cables at 230 V			
		6 W/m	**10 W/m**	**18 W/m**	**20 W/m**
		DEVIflex™ 6T	DEVIflex™ 10T, DEVIcomfort™ 10T, DEVIbasic™ 10S	DEVIflex™ 18T	DEVIbasic™ 20S
Comfort floor heating*	**5**	**120**	**200**		
	7	86	**143**		
	10	60	**100**	**180**	**200**
	12	50	83	**150**	**167**
	15	40	67	120	133
	17	35	59	106	118
	20	30	50	90	100
	23	26	43	78	87
	25	24	40	72	80

NOTE: To avoid any cold spots between cable lines for Comfort floor heating, only use C-C distance marked in **red box**.
All specific outputs marked in yellow are recommended for Comfort floor heating.
The entire table can be used for **Total (Direct) floor heating**.

* **Comfort floor heating** or "Warm Floor" system provides heated floor surface.
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2 Electrical heating **mats**

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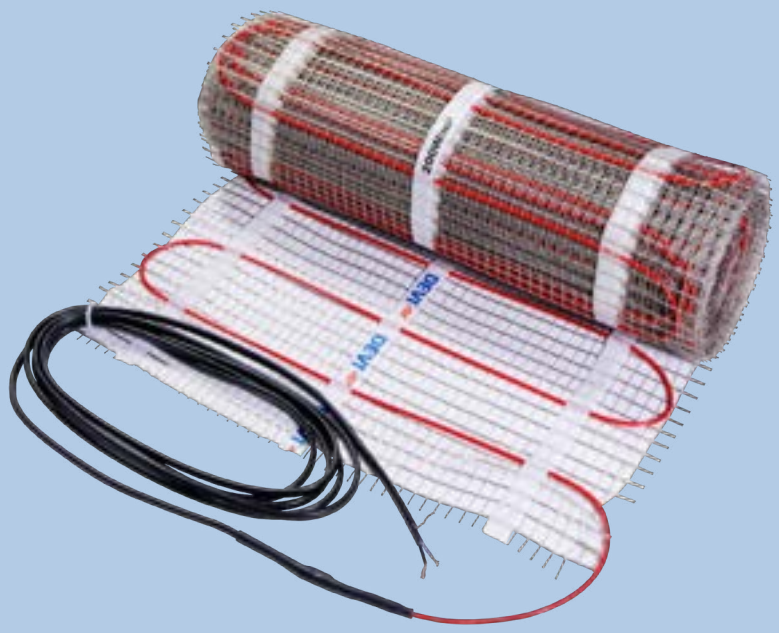
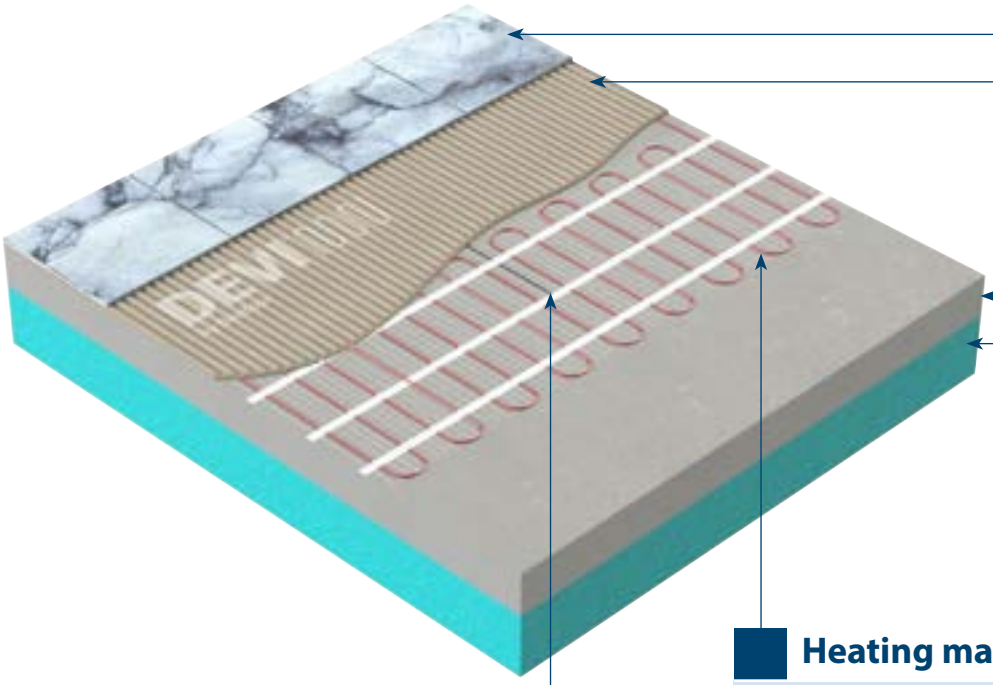


Electrical heating **mats**

WET installation

2.1 Concrete subfloor + heating mat embedded into tiles glue + tiles

Suitable outputs:
Specific output: **max. 200 W/m²**



Heating mat

Suitable heating mats:

- DEVIheat™ 150S
- DEVIcomfort™ 100T
- DEVIcomfort™ 150T
- DEVImat™ 70T
- DEVImat™ 100T
- DEVImat™ 150T
- DEVImat™ 200T

Floor sensor in plastic conduit pipe

Suitable products:

- Flexpipe Ø6,7 mm, 2,5 m
- AstroFlex Ø8,5 mm, roll 50 m

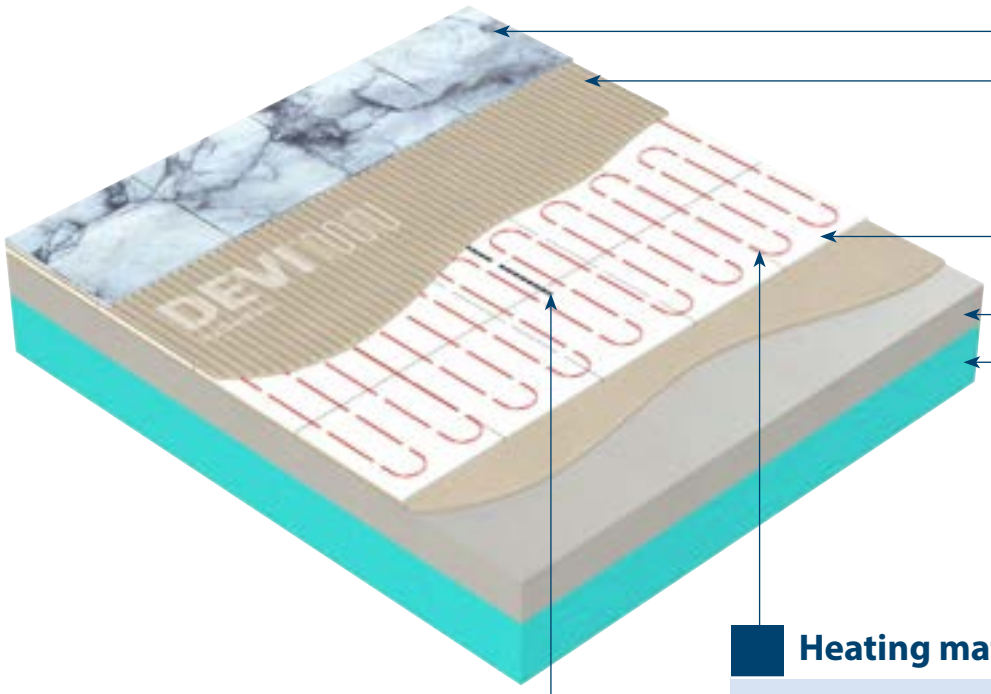
Click on the product and visit our website **devi.com** for more details.

Electrical heating **mats**

WET installation

2.2 Old tiles + heating mat embedded into tiles glue + tiles

Suitable outputs:
Specific output: **max. 200 W/m²**



Heating mat

Suitable heating mats:

- DEVIheat™ 150S
- DEVIcomfort™ 100T
- DEVIcomfort™ 150T
- DEVImat™ 70T
- DEVImat™ 100T
- DEVImat™ 150T
- DEVImat™ 200T

Floor sensor in plastic conduit pipe

Suitable products:

- Flexpipe Ø6,7 mm, 2,5 m
- AstroFlex Ø8,5 mm, roll 50 m

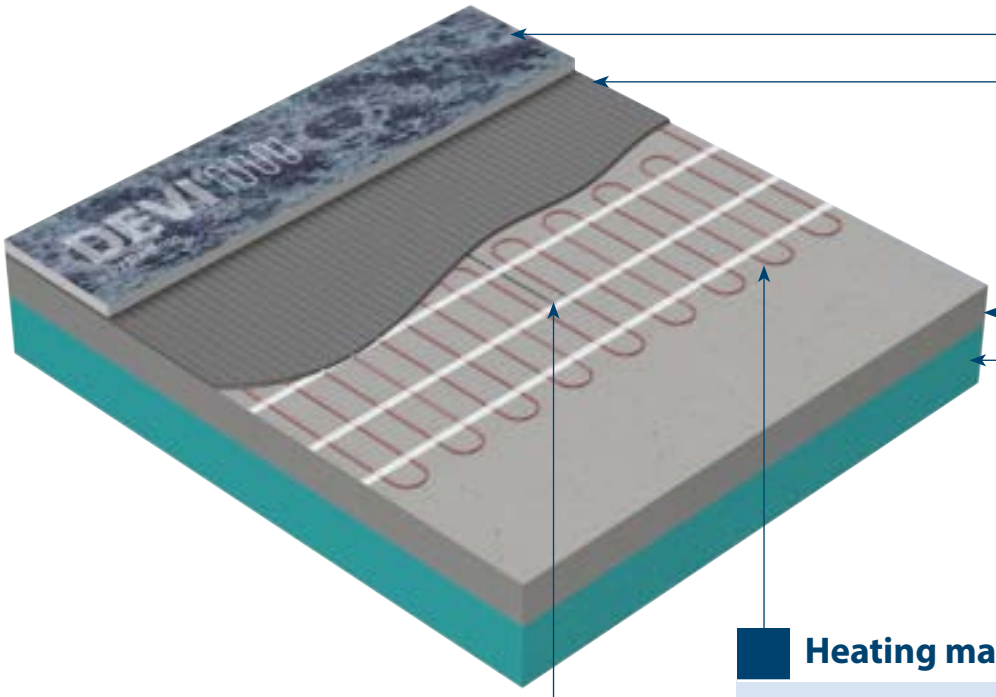
Click on the product and visit our website **devi.com** for more details.

Electrical heating **mats**

WET installation

2.3 Concrete subfloor + heating mat embedded into marble glue + marble

Suitable outputs:
Specific output: **max. 200 W/m²**



Heating mat

Suitable heating mats:

- DEVIheat™ 150S
- DEVIcomfort™ 100T
- DEVIcomfort™ 150T
- DEVImat™ 70T
- DEVImat™ 100T
- DEVImat™ 150T
- DEVImat™ 200T

Floor sensor in plastic conduit pipe

Suitable products:

- Flexpipe Ø6,7 mm, 2,5 m
- AstroFlex Ø8,5 mm, roll 50 m

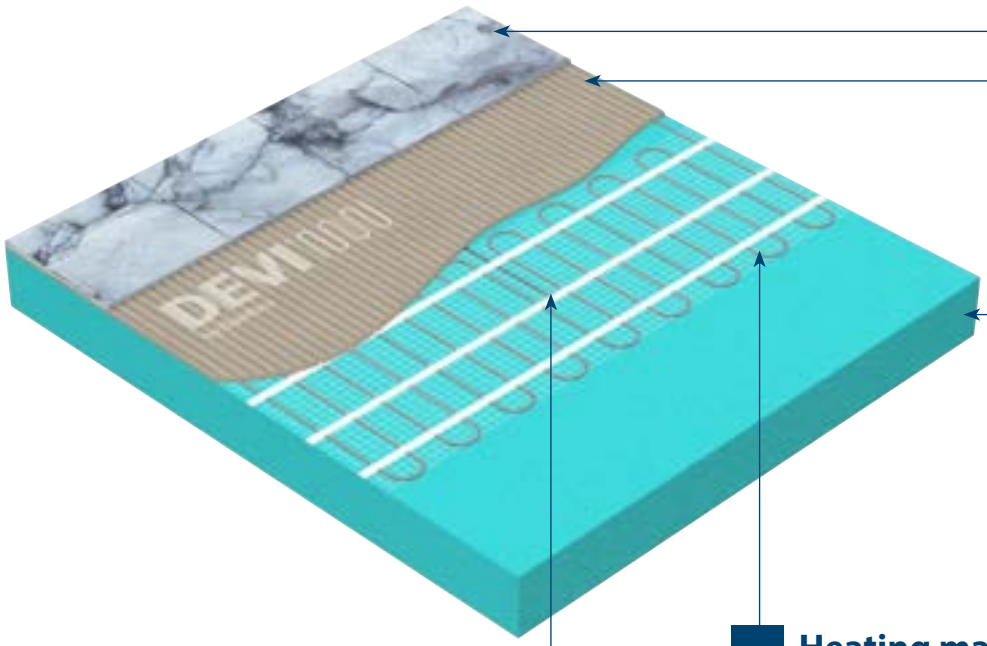
Click on the product and visit our website **devi.com** for more details.

Electrical heating **mats**

WET installation

2.4 Insulation layer + heating mat embedded into tiles glue + tiles

Suitable outputs:
Specific output: **max. 150 W/m²**



Heating mat

Suitable heating mats:

- DEVIheat™ 150S
- DEVIcomfort™ 100T
- DEVIcomfort™ 150T
- DEVImat™ 70T
- DEVImat™ 100T
- DEVImat™ 150T

Floor sensor in plastic conduit pipe

Suitable products:

- Flexpipe Ø6,7 mm, 2,5 m
- AstroFlex Ø8,5 mm, roll 50 m

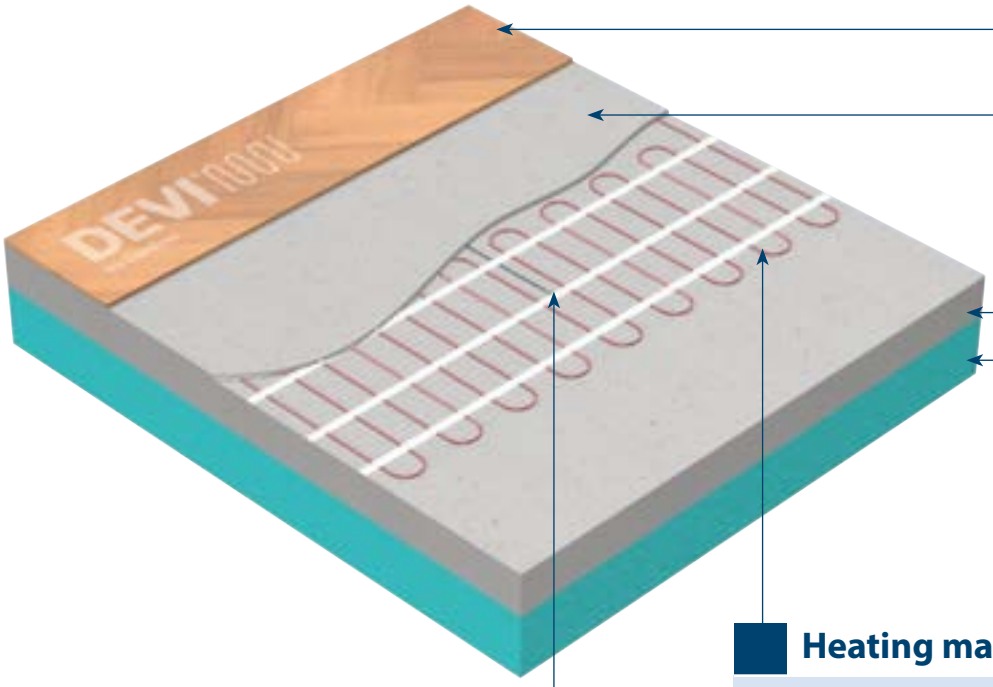
Click on the product and visit our website **devi.com** for more details.

Electrical heating **mats**

WET installation

2.5 Concrete subfloor + heating mat embedded into screed + wooden floor

Suitable outputs:
Specific output: **max. 100 W/m²**



Heating mat

Suitable heating mats:

- **DEVIcomfort™ 100T**
- **DEVImat™ 70T**
- **DEVImat™ 100T**

Floor sensor in plastic conduit pipe

Suitable products:

- **Flexpipe Ø6,7 mm, 2,5 m**
- **AstroFlex Ø8,5 mm, roll 50 m**

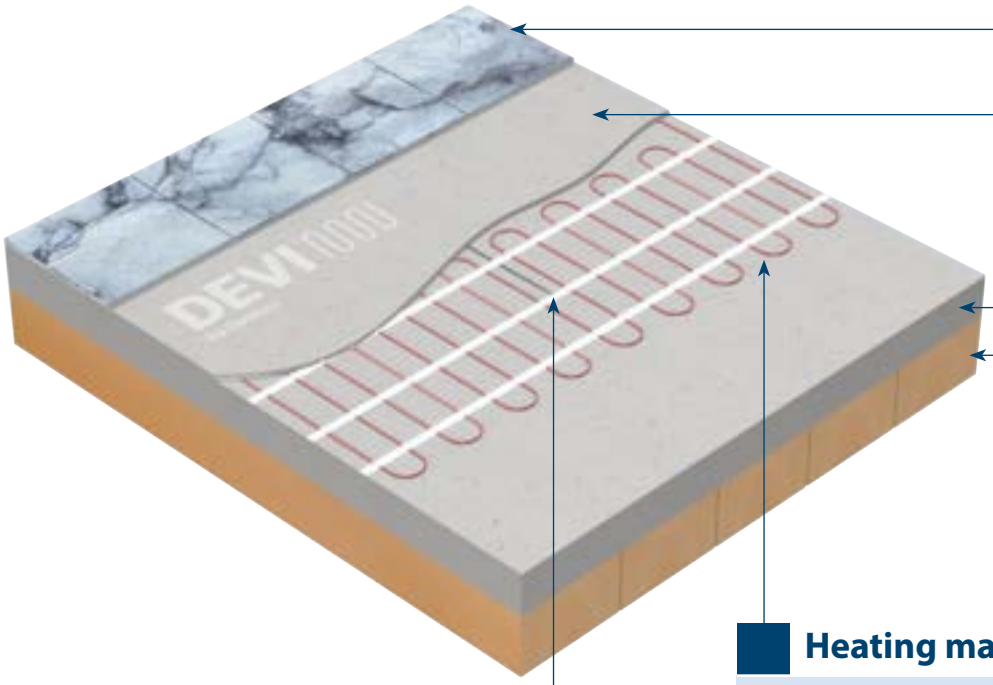
Click on the product and visit our website **devi.com** for more details.

Electrical heating **mats**

WET installation

2.6 Wooden subfloor + heating mat embedded into screed + tiles

Suitable outputs:
Specific output: **max. 150 W/m²**



Heating mat

Suitable heating mats:

- DEVIheat™ 150S
- DEVIcomfort™ 100T
- DEVIcomfort™ 150T
- DEVImat™ 70T
- DEVImat™ 100T
- DEVImat™ 150T

Floor sensor in plastic conduit pipe

Suitable products:

- Flexpipe Ø6,7 mm, 2,5 m
- AstroFlex Ø8,5 mm, roll 50 m

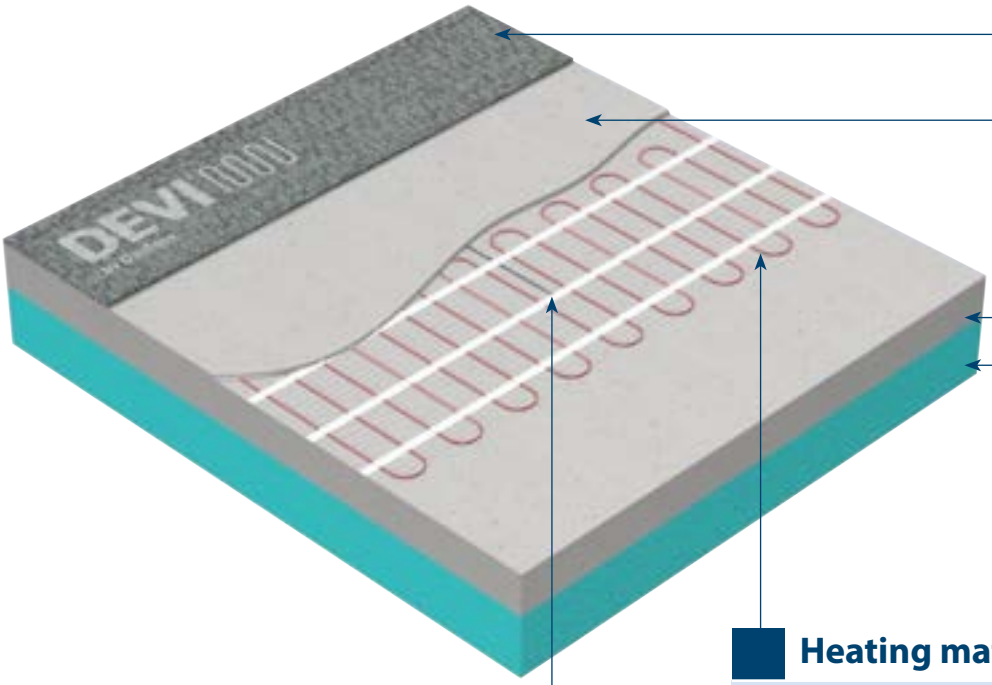
Click on the product and visit our website **devi.com** for more details.

Electrical heating **mats**

WET installation

2.7 Concrete subfloor + heating mat embedded into screed + carpet

Suitable outputs:
Specific output: **max. 100 W/m²**



Heating mat

Suitable heating mats:

- **DEVIcomfort™ 100T**
- **DEVImat™ 70T**
- **DEVImat™ 100T**

Floor sensor in plastic conduit pipe

Suitable products:

- **Flexpipe Ø6,7 mm, 2,5 m**
- **AstroFlex Ø8,5 mm, roll 50 m**

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3 Electrical heating **cables**

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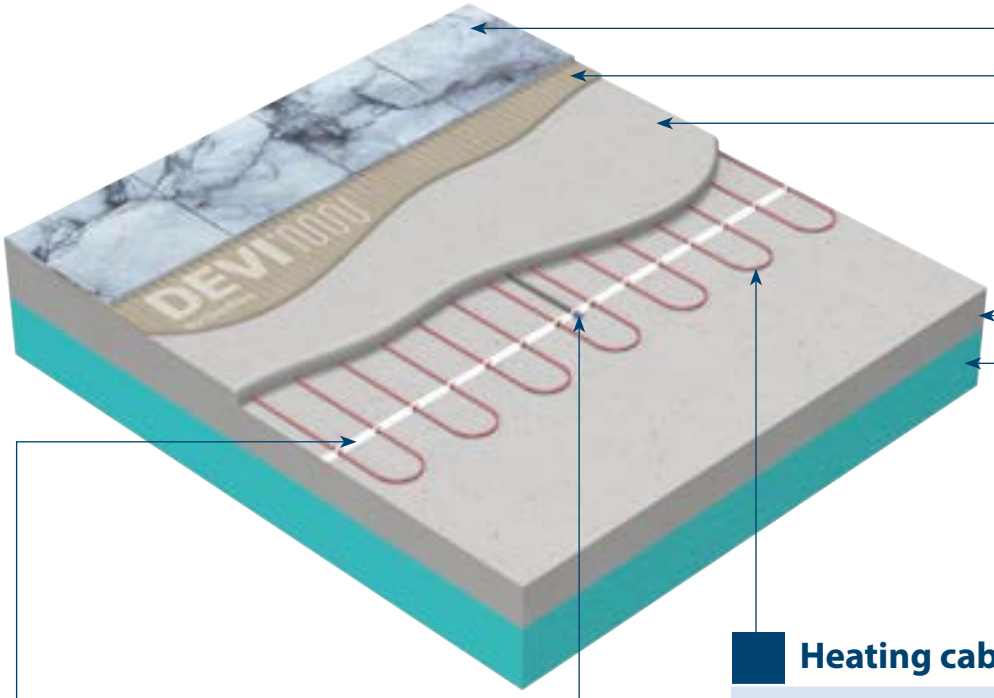
Electrical heating **cables**

WET installation

3.1 Concrete subfloor + heating cable embedded into concrete + tiles

Suitable outputs:
Linear output: **6, 10, 18, 20 W/m**
Specific output: **max. 200 W/m²**



Fixing element

Suitable fixing element:

- **DEVIfast™ 5 m**
- **DEVIfast™ 25 m**
- **DEVIclip™ c-c**

Heating cable

Suitable heating cables:

- **DEVIbasic™ 10S**
- **DEVIbasic™ 20S**
- **DEVIcomfort™ 10T** (concrete thickness above the cable can be >1 cm)
- **DEVIflex™ 6T**
- **DEVIflex™ 10T**
- **DEVIflex™ 18T**

Floor sensor in plastic conduit pipe

Suitable products:

- **Flexpipe Ø6,7 mm, 2,5 m**
- **AstroFlex Ø8,5 mm, roll 50 m**

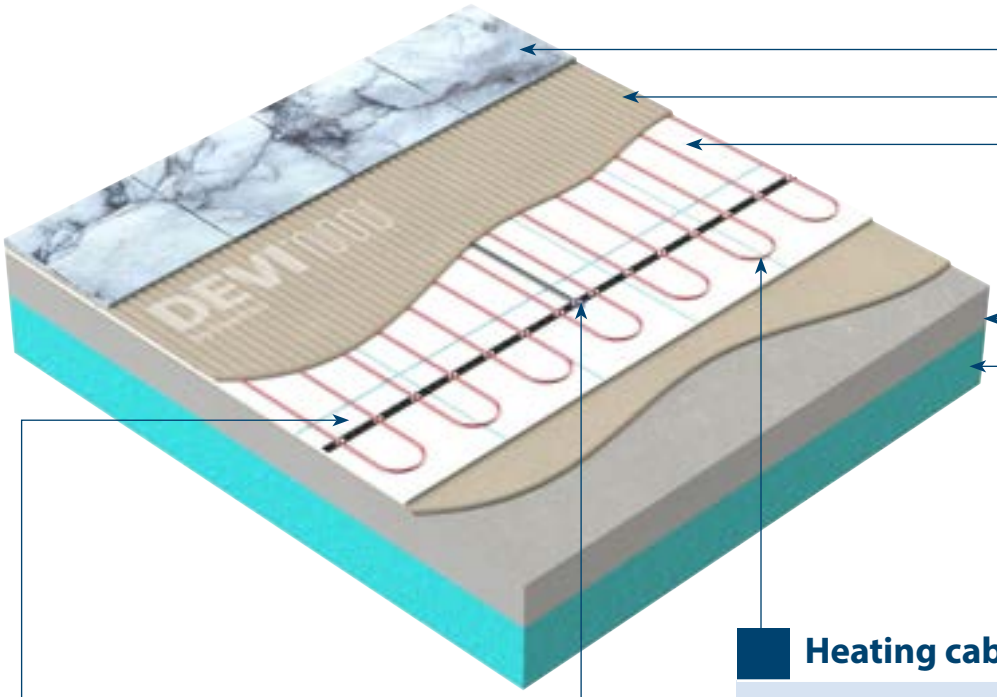
Click on the product and visit our website **devi.com** for more details.

Electrical heating **cables**

WET installation

3.2 Old tiles+ heating cable embedded into tiles glue + tiles

Suitable outputs:
Linear output: **10 W/m**
Specific output: **max. 200 W/m²**



Heating cable

Suitable heating cables:

- **DEVIcomfort™ 10T** (concrete thickness above the cable can be >1 cm)

Fixing element

Suitable fixing element:

- **DEVIfast™ 5 m**
- **DEVIfast™ 25 m**
- **DEVIclip™ c-c**

Floor sensor in plastic conduit pipe

Suitable products:

- **Flexpipe Ø6,7 mm, 2,5 m**
- **AstroFlex Ø8,5 mm, roll 50 m**

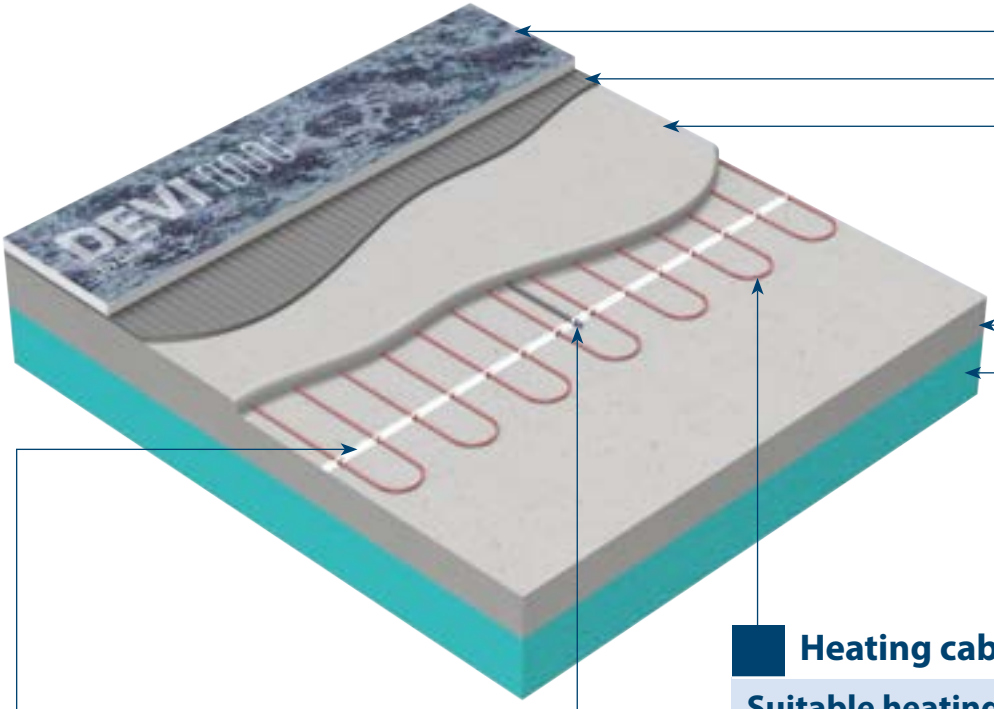
Click on the product and visit our website **devi.com** for more details.

Electrical heating **cables**

WET installation

3.3 Concrete subfloor + heating cable embedded into concrete + marble

Suitable outputs:
Linear output: **6, 10, 18, 20 W/m**
Specific output: **max. 200 W/m²**



Heating cable

Suitable heating cables:

- **DEVIbasic™ 10S**
- **DEVIbasic™ 20S**
- **DEVIcomfort™ 10T** (concrete thickness above the cable can be >1 cm)
- **DEVIflex™ 6T**
- **DEVIflex™ 10T**
- **DEVIflex™ 18T**

Fixing element

Suitable fixing element:

- **DEVIfast™ 5 m**
- **DEVIfast™ 25 m**
- **DEVIclip™ c-c**

Floor sensor in plastic conduit pipe

Suitable products:

- **Flexpipe Ø6,7 mm, 2,5 m**
- **AstroFlex Ø8,5 mm, roll 50 m**

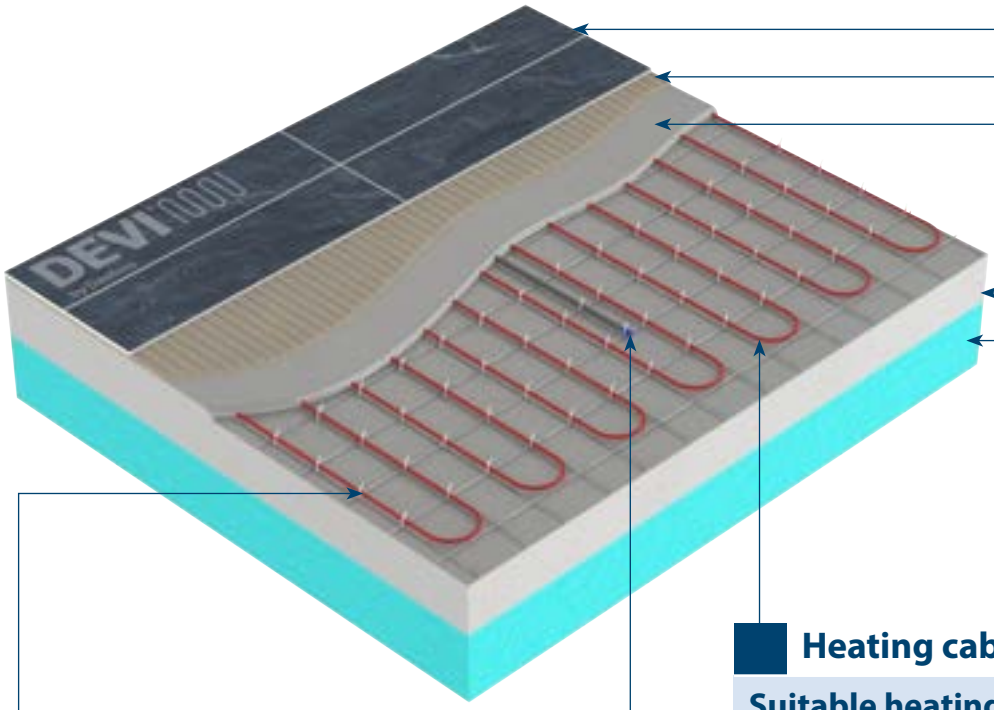
Click on the product and visit our website **devi.com** for more details.

Electrical heating **cables**

WET installation

3.4 Reinforced concrete subfloor + heating cable embedded into concrete + tiles

Suitable outputs:
Linear output: **6, 10, 18, 20 W/m**
Specific output: **max. 200 W/m²**



Fixing element

Suitable fixing element:

- **DEVIclip™ Twisto**

Heating cable

Suitable heating cables:

- **DEVIbasic™ 10S**
- **DEVIbasic™ 20S**
- **DEVIcomfort™ 10T** (concrete thickness above the cable can be >1 cm)
- **DEVIflex™ 6T**
- **DEVIflex™ 10T**
- **DEVIflex™ 18T**

Floor sensor in plastic conduit pipe

Suitable products:

- **Flexpipe Ø6,7 mm, 2,5 m**
- **AstroFlex Ø8,5 mm, roll 50 m**

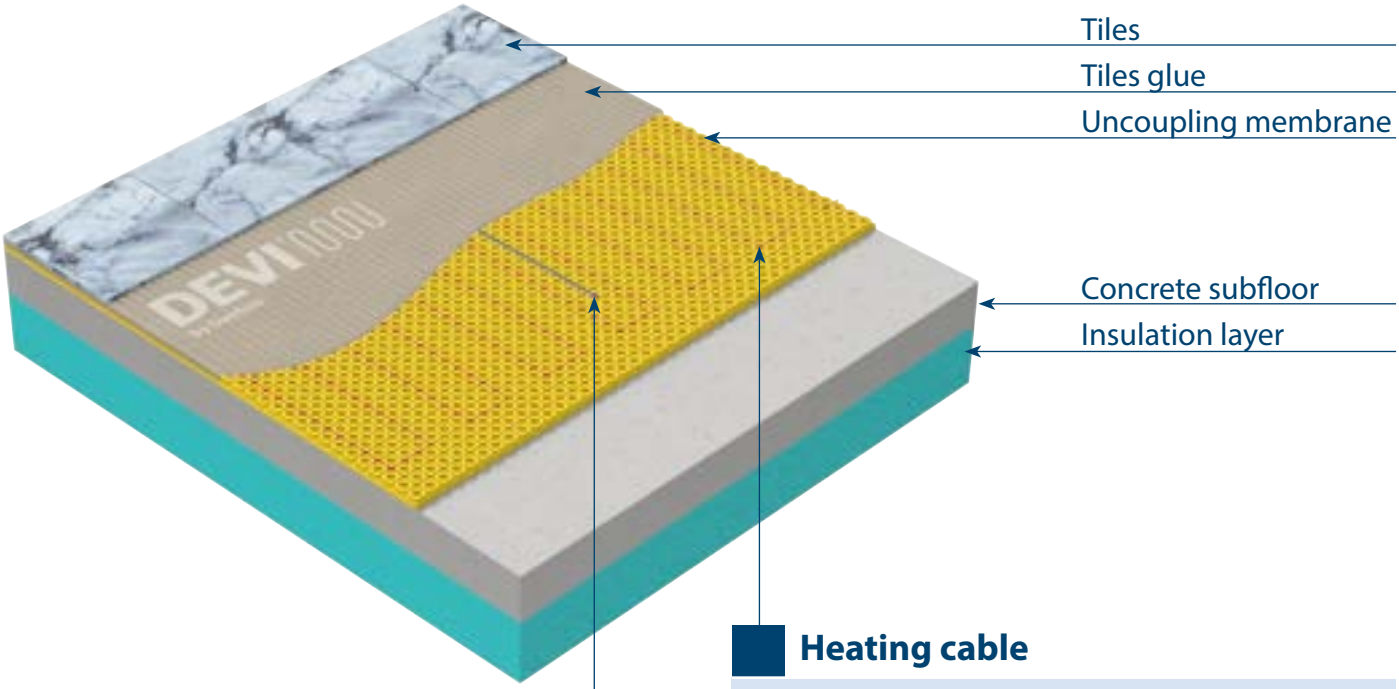
Click on the product and visit our website **devi.com** for more details.

Electrical heating **cables**

WET installation

3.5 Concrete subfloor + Uncoupling membrane + heating cable + tiles glue + tiles

Suitable outputs:
Linear output: **10 W/m**
Specific output: **max. 100 W/m²**



Heating cable

Suitable heating cables:

- **DEVIcomfort™ 10T**

Floor sensor in plastic conduit pipe or 2 wire sensors (main and reserved)

Suitable products:

- **Flexpipe Ø6,7 mm, 2,5 m**
- **AstroFlex Ø8,5 mm, roll 50 m**

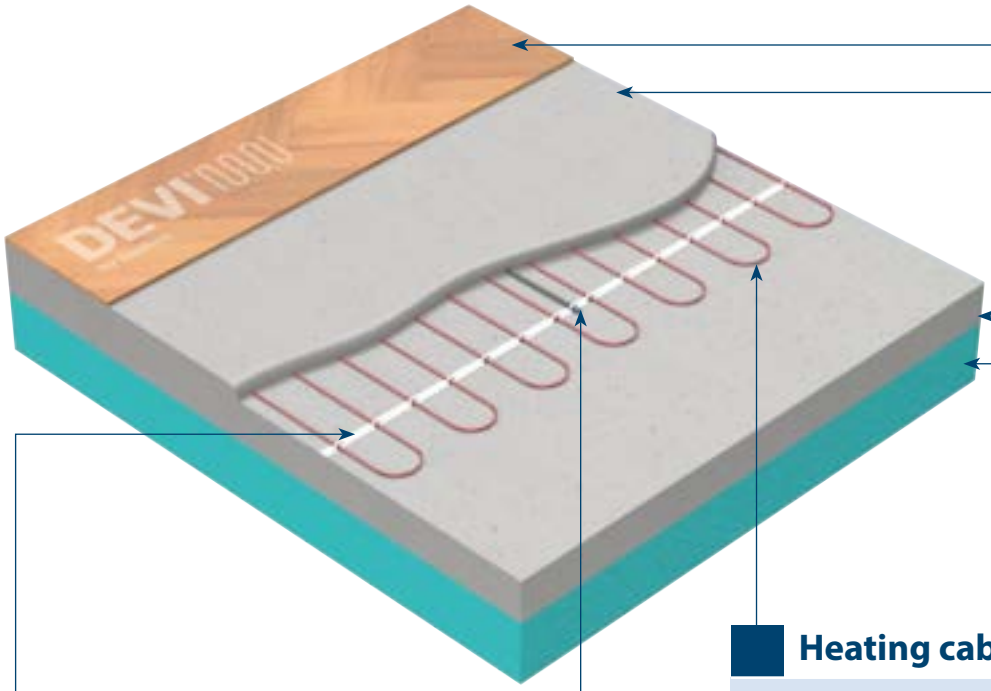
Click on the product and visit our website **devi.com** for more details.

Electrical heating **cables**

WET installation

3.6 Concrete subfloor + heating cable embedded into concrete + wooden floor

Suitable outputs:
Linear output: **6, 10 W/m**
Specific output: **max.150 W/m²**



Heating cable

Suitable heating cables:

- **DEVIbasic™ 10S**
- **DEVIcomfort™ 10T** (concrete thickness above the cable can be >1 cm)
- **DEVIflex™ 6T**
- **DEVIflex™ 10T**

Fixing element

Suitable fixing element:

- **DEVIfast™ 5 m**
- **DEVIfast™ 25 m**
- **DEVIclip™ c-c**

Floor sensor in plastic conduit pipe

Suitable products:

- **Flexpipe Ø6,7 mm, 2,5 m**
- **AstroFlex Ø8,5 mm, roll 50 m**

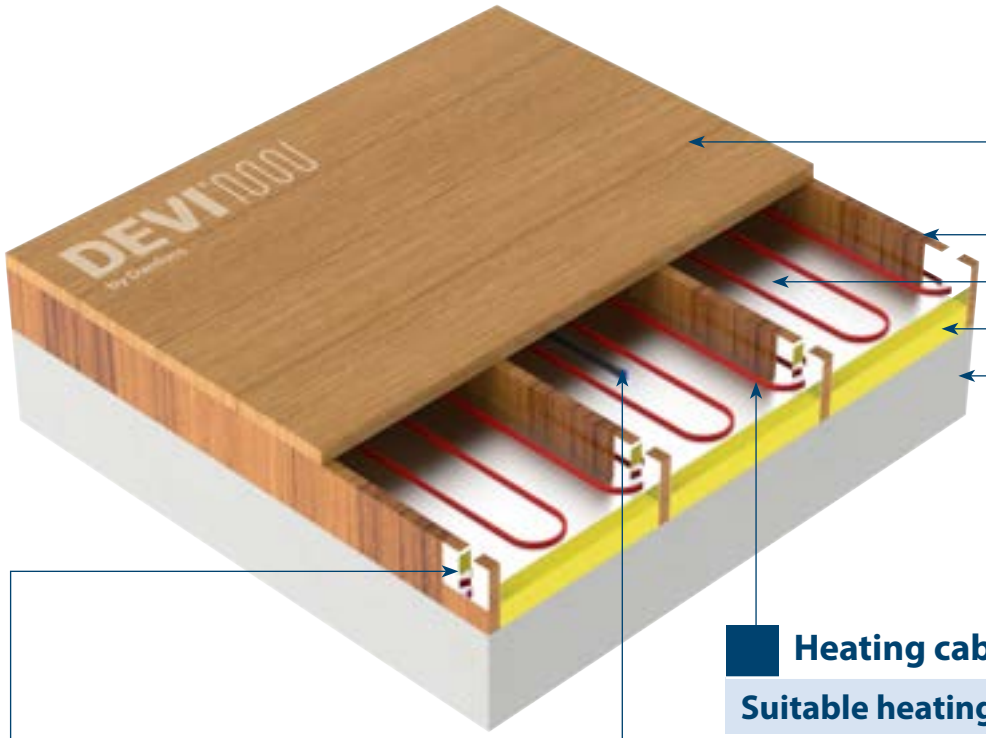
Click on the product and visit our website **devi.com** for more details.

Electrical heating **cables**

DRY installation

3.7 Concrete subfloor + heating cable wooden joists + wooden floor

Suitable outputs:
Linear output: **10 W/m**
Specific output: **max. 80 W/m²**



Heating cable

Suitable heating cables:

- DEVIbasic™ 10S
- DEVIcomfort™ 10T
- DEVIflex™ 6T
- DEVIflex™ 10T

Fixing element

Suitable fixing element:

- Tape aluminum

Floor sensor in plastic conduit pipe

Suitable products:

- Flexpipe Ø6,7 mm, 2,5 m
- AstroFlex Ø8,5 mm, roll 50 m

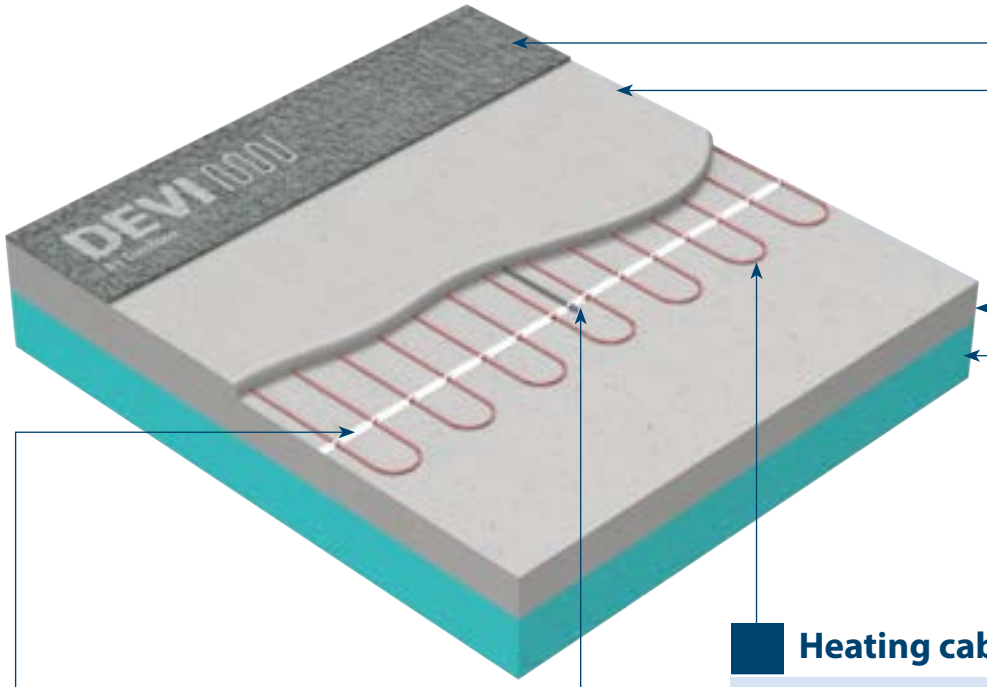
Click on the product and visit our website **devi.com** for more details.

Electrical heating **cables**

WET installation

3.8 Concrete subfloor + heating cable embedded into concrete + carpet

Suitable outputs:
Linear output: **6, 10 W/m**
Specific output: **max.100 W/m²**



Heating cable

Suitable heating cables:

- **DEVIbasic™ 10S**
- **DEVIcomfort™ 10T** (concrete thickness above the cable can be >1 cm)
- **DEVIflex™ 6T**
- **DEVIflex™ 10T**

Fixing element

Suitable fixing element:

- **DEVIfast™ 5 m**
- **DEVIfast™ 25 m**
- **DEVIclip™ c-c**

Floor sensor in plastic conduit pipe

Suitable products:

- **Flexpipe Ø6,7 mm, 2,5 m**
- **AstroFlex Ø8,5 mm, roll 50 m**

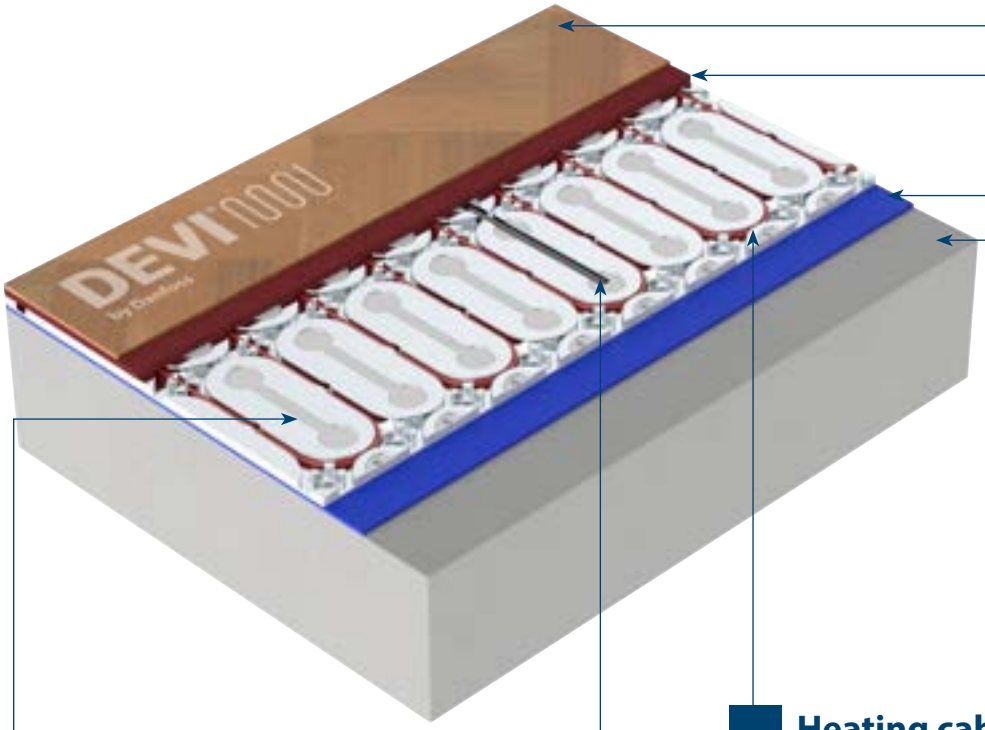
Click on the product and visit our website **devi.com** for more details.

Electrical heating **cables**

DRY installation

3.9 Concrete subfloor + DEVIcell + heating cable + parquet

Suitable outputs:
Linear output: **6, 10 W/m**
Specific output: **max. 100 W/m²**



DEVIcell™

Suitable fixing element:

- DEVIcell™
- Tape aluminum
- Connective clips
- Edge plates

Heating cable

Suitable heating cables:

- DEVIflex™ 6T
- DEVIflex™ 10T

Floor sensor in plastic conduit pipe

Suitable products:

- Flexpipe Ø6,7 mm, 2,5 m
- AstroFlex Ø8,5 mm, roll 50 m

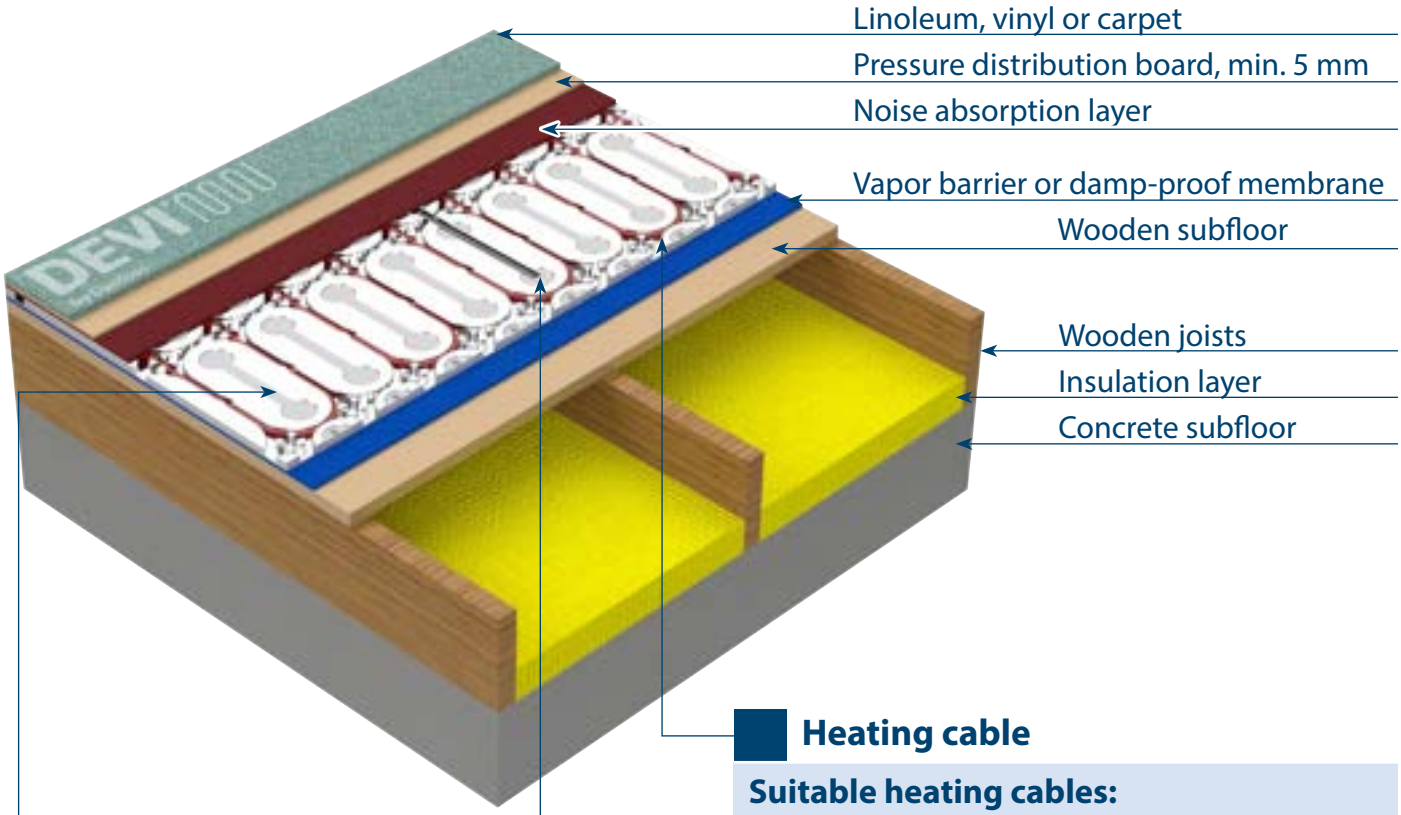
Click on the product and visit our website **devi.com** for more details.

Electrical heating **cables**

DRY installation

3.10 Concrete subfloor + wooden joists + DEVIcell + heating cable + linoleum

Suitable outputs:
Linear output: **6 W/m**
Specific output: **max. 60 W/m²**



Heating cable

Suitable heating cables:

- DEVIflex™ 6T

DEVIcell™

Suitable fixing element:

- DEVIcell™
- Tape aluminum
- Connective clips
- Edge plates

Floor sensor in plastic conduit pipe

Suitable products:

- Flexpipe Ø6,7 mm, 2,5 m
- AstroFlex Ø8,5 mm, roll 50 m

Click on the product and visit our website **devi.com** for more details.

4 Safety instructions

Heating cables/mats must always be installed according to local building regulations and wiring rules as well as the guidelines in this installation manual.

The enclosed label must be filled in and placed adjacent to the distribution board, describing location of the heating cables/mats.

De-energize all power circuits before installation and service.

Residual current device (RCD) protection is required. RCD trip rating is max. 30 mA.

The screen from each heating cable/mat must be connected to the earthing terminal in accordance with local electricity regulations.

Heating cables/mats must be connected via a switch providing all pole disconnection.

The heating cable/mat must be equipped with a fuse or circuit breaker that is correctly sized according to local regulations.

Never exceed the maximum heat density (W/m or W/m^2) for the actual application.

In case of a wooden subfloor, the maximum installed output is 100 W/m^2.

On concrete subfloor the maximum of 200 W/m^2 is allowed if: the thickness of the concrete covering above the heating element, is more than 3 cm (30 mm).

Heating cables/mats must always be controlled by a thermostat that limits the floor temperature to max. 35 °C (DEVIreg™ Smart, DEVIreg™ Touch, DEVIreg™ Room or DEVIreg™ Basic).

Strongly recommended to use the heating cable/mat together with an appropriate thermostat to secure against overheating.

Caution! Do not use M1 classified cables in areas subject to high mechanical loads or impact, such like outdoor applications, on steel reinforcing grids, in concrete with sharp stones, roof and gutters, etc.

The presence of a heating cable/mat

- must be made evident by affixing caution signs in the fuse box and in the distribution board or markings at the power connection fittings and/or frequently along the circuit line where clearly visible (tracing)
- must be stated in any electrical documentation following the installation.

If supply cord is damaged it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid hazard.

5 DOs and DON'Ts

DOs:

- **DO read the manufacturer's manual** thoroughly before starting the installation to understand specific requirements and restrictions.
- **DO check subfloor requirements** for compatibility with heating mats and cables (e.g., concrete, plywood, etc.).
- **DO perform insulation and resistance tests** on cables/mats before, during, and after installation to ensure no damage has occurred.
- **DO use a thermostat** specifically designed for electric heating systems to control temperature accurately.
- **DO secure the heating mats or cables properly** according to the manufacturer's guidelines, ensuring they are flat and evenly distributed.
- **DO test the system before covering** it with flooring to confirm it functions correctly.
- **DO use an appropriate insulation layer** under the heating system where recommended, as it increases energy efficiency.
- **DO maintain a minimum spacing** between heating cables or mats to avoid overheating or cold spots.
- **DO keep a record** of the installation details (e.g., layout, resistance measurements) for future reference.

DON'Ts:

- **DON'T power on the heating system** until the flooring adhesive, mortar, or leveling compound has fully cured.
- **DON'T cut or shorten heating cables** as it can cause uneven heating or a potential fire hazard. Only specific mats allow cutting (following strict guidelines).
- **DON'T overlap heating cables or mats,** as this can lead to overheating.
- **DON'T install heating cables/mats directly under fixed appliances** (e.g., under kitchen cabinets or furniture without airflow) to prevent localized overheating.
- **DON'T install heating systems in damp areas** without checking IP (Ingress Protection) ratings, as moisture exposure could be unsafe.
- **DON'T install any insulation objects close** to the cables, as this can interfere with the heating.

Danfoss A/S
Nordborgvej 81
6430 Nordborg
Denmark

Danfoss A/S
DEVI • devi.com • +45 7488 2222 • EH@danfoss.com

devi.com

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