

8.1 Ground thawing

Excavating and preparation of the ground can be a problem when the frost sets in during winter. With DEVI's electrical heating cables or mats these problems can be solved quickly and efficiently.

A temporary placing of heating cables covered by a winter mat/insulation mat, for example during the night, can thaw the ground so it resembles a damp day in the spring.

The typical areas of use are construction sites, building areas, excavations, and churchyards.

Installed output

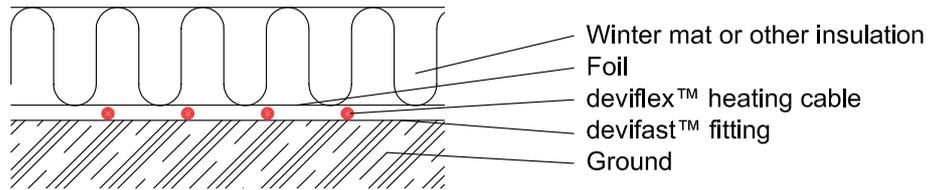
250-350 W/m² should be installed at temperatures from -5° to -10°C. At lower temperatures a higher output is recommended. For practical reasons the maximum output is 400 W/m² (DSIG-20, C-C distance 5 cm). Alternatively, the thawing period should be prolonged or/and a thicker layer of insulation should be used.

Example

Frost has set in, and for the last few weeks the night temperature has been approx. -10°C.

A hole of 1 x 2 x 2 m is to be dug in order to access an underground electrical junction box.

Ground thawing



The day before the hole is to be dug, 44 m of deviflex™ DTIP-18 heating cable is laid with a total output of 790 W. The cable is laid on devifast™ fitting bands with a C-C distance of 5 cm, providing an output of 360 W/m².

The cable is switched on overnight. The next day it is possible to dig in the ground like on an ordinary spring day. The power consumption for this solution is 10-15 kWh.

Installation

The deviflex™ electrical heating cable or mat is placed directly on the ground and covered with a foil coated winter mat (mineral wool) or the like. When the deviflex™ heating cable is laid, it should be fixed with devifast™ fitting band to ensure a correct C-C distance. Alternatively, a 300 W/m² devimat™ DSIA may be used.

Product choice

The deviflex™ heating cables with an output of 17-20 W/m or devimat™

300 W/m² are chosen.

No regulation is necessary in connection with this type of application but the connection must be earthed for safety reasons.

8.2 Condensation protection of floors

In doorways between cold stores and heated rooms condensed water may form on the floor due to the constant shifts between cold and warm air caused by the opening and closing of doors. This can result in dangerous ice formations on the floor and therefore, the floor in these areas must be heated. As an extra comfort it will also limit the flow of cold air to the heated area.

Installed output

The installed output for condensation protection of floors is normally 250 W/m².

Installation

The deviflex™ or devimat™ is installed in the same way as in ordinary concrete floors but should be placed as close to the floor surface as possible without spoiling the structural integrity of the floor.

Heating cables/mats must be installed at both sides of the doorway but they should not be laid across expansion joints. This means that separate heating elements must be installed on the inside and outside of the doorway.

To solve the problem an output of approx. 250 W/m² on each side of the doorway is sufficient. The





system should cover an area of min. 1 metre from the door and 0,5 metre to each side.

The wire sensor of the thermostat must be placed between two cables and as close to the floor surface as possible. Wire sensors must always be placed in a protection pipe which is sealed at the end so they can easily be replaced.

Product choice

The deviflex™ with an output of 17-20 W/m and the devimat™ 300 are ideal products for these applications.

The devireg™ 330 (-10°C to +10°C) is chosen for this application. The temperature of the thermostat must be set to ensure that the floor surface is kept frost-free (approx. +2°C).

8.3 Heating of thermal bridges

DEVI's heating systems can be used to avoid temperature differences in floors caused by thermal bridges.

DEVI's heating systems can also be used to avoid or limit draughts, e.g. at windows, doors, exterior walls, and central elements in concrete buildings.

Installed output

In connection with thermal bridges along walls an output of 15-30 W/m is installed, depending on the wall and floor construction. In connection with single-store buildings on ground it is often sufficient to install one cable length whereas two cable lengths are necessary in multi-store concrete buildings.

Example

In a concrete building where the horizontal division (200 mm) adjoins open air, a double deviflex™ DTIP-18 (36 W/m) is installed in the concrete layer directly under the exterior wall.

This protects against heat losses through the exposed concrete layer, prevents condensation, and helps avoid cold floors and draughts along the wall down to approx. -20°C.

Installation

In connection with rim zone heating the heating cable must be installed approx. 20 mm below floor surface and must not be led more than 1 m into the floor.

Thermal bridges are installed exactly where the floor and the wall meet (on the inside) or directly under an exterior wall.

Product choice

In rim zones it is recommended to use a thermostat capable of limiting the temperature in the floor, e.g. a devireg™ 122, 522, 540, or 550. These combi-thermostats are equipped with a built-in room sensor, which registers the room temperature, and a wire sensor to be placed under the floor, which keeps the temperature in the floor within a preset maximum temperature.

For thermal bridges thermostats with wire sensors to be placed in a suitable position in the thermal bridge are used.

The deviflex™ with an output of 17-20 W/m can be used for applications in rim zones and thermal bridges.