

Installation Guide

Soil, Asphalt & Concrete De-icing Heating Ribbons





Legal Notice

Important legal notice:

Area laws differ concerning the handling and installation of heating cables, building materials, electrical connections, plumbing, etc. Please check and comply with your local laws. HSI will not be held responsible for those who do not comply with their local or national laws while installing HSI products.



Note

Take all necessary safety precautions in order to

1. Create a safe working environment
2. Use the materials recommended by the supplier
3. Heed the applicable electricity standards and codes.

Because fields are mostly different from each other, we recommend you use your best judgment when installing our products to attain the best possible results for appearance, safety and effective operation.



Warning:

This guide does not reflect National Electrical Code, National Fire Protection Association regulations, IEEE standards and/or any other applicable laws or regulations. HSI advises you to seek qualified professional installation from a licensed electrician familiar with electrical code and/ or other pertinent regulations in your area.



About HSI

Heating Solutions International offers an extensive range of sustainable heating solutions for sport fields, roofs, buildings, infrastructure, agriculture and customized applications worldwide. The heating solutions are based on a unique infrared technology which, depending on the specific application, require 30-50% less energy than competitive systems.

We offer you:

1. A team consisting of dedicated and professional staff members. Employees with years of practical experience. In short: they know our products and solutions and will deal with your enquiries in a professional way.
2. Tailored advice.
3. Total concepts for indoor as well as outdoor applications.
4. The efficiency of our heating products has been proved by acknowledged research institutes and has been proved in practice.

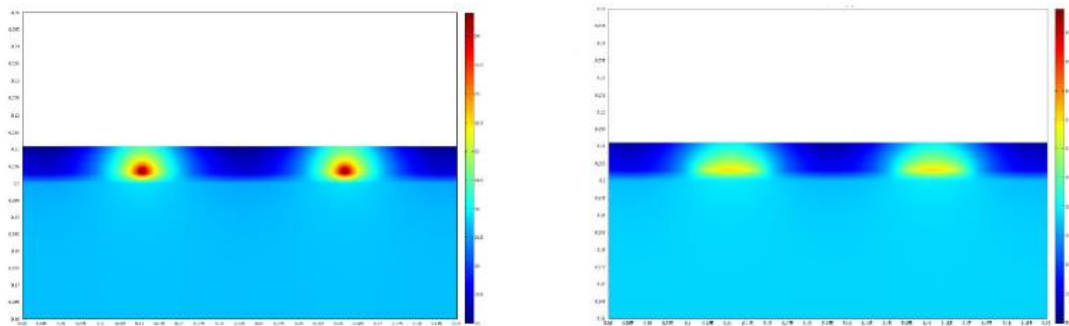
Our products and solutions have been independently tested with certifications accepted and approved worldwide.

Heating ribbons

HSI Asphalt & Concrete De-Icing Heating Ribbons utilize amorphous metal technology to generate heat. This technology reduces the energy consumption compared to standard copper based heating wires.



Amorphous heating material in comparison to traditional heating wire.



Due to its shape and larger heating surface, the heating efficiency of the amorphous heating ribbon is 40 times higher than the efficiency of traditional heating wires.

Product Description

- The amorphous heating ribbons are designed and intended for snow and ice prevention, keeping (parts of) walking lanes, bridges, parkings, bike paths, etc de-iced and de-snowed. Eliminating the dangers of ice and snow frozen surfaces.
- The heating ribbons, part of the infrastructure heating solution vary in length. The length of the heating ribbons depends on the size of the field. The solutions offered by Heating Solutions International always include the length of the ribbons and the respective Voltage in the range of 120 – 600 Volt AC/DC.
- The product cannot be cut or modified. The power is fed to each element through one end only. Cutting or altering the product will void the warranty.
- The conductive layer of the heating ribbon is grounded. This ground has to be connected to a suitable grounding/earth terminal. The grounding of the conductive layer runs via the power cord to the circuit breaker (all is part of the standard solution / delivery).



Delivery

The delivery contains the following components:

- 1) Heating ribbons including 1 power supply cord and 1 connector
- 2) Junction boxes for assembling the heating ribbons
- 3) Control Unit/ power supply

The items described above are an integral part of the total certified solution and cannot be changed or substituted by other (locally) purchased parts/components.

The heating system is not suitable for use with other heating devices.

Mechanical considerations in the planning stage:

1. The minimum bending radius of the heating ribbon is 1 feet (30cm).



2. Installation temperature: minimum $> 41^{\circ}\text{F}$ / 5°C .
3. The ribbons will be installed in 3 types of underground:
 - a. Concrete => ribbons has to be anchored to concrete iron or the ribbons will be applied in slots (6 cm Deep (2.3 inch)) and 8 mm width (0.3 Inch) that are pre-cutted in existing surface. The distance between the ribbons is approx. 15 – 20 cm / 6.5-7.5 inch.



Heating ribbons fixed on Iron



Slots for heating ribbons

- b. Asphalt => ribbons will be attached/ fixed to first layer. Second and third layer will be put on the ribbons. The distance between the ribbons is approx. 15 – 20 cm / 6.5-7.5 inch.



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Heating ribbons fixed first layer and below first asphalt layer.



Fixing the heating cables

- c. Soil => ribbons will be put in the soil on a depth of 10-25 cm. (4- 10 inches)



Special Considerations:

1. The heating elements may not be installed when the outdoor temperature is above 115°F / 45°C or lower than 41°F / 5°C.
2. For any application that is not mentioned in this document, consult your distributor or dealer for recommendations.
3. Switch off all power circuits before installation or servicing.



Determine heating ribbon length

Heating solutions will provide the design for the project. The length of the ribbons and the width between the ribbons depends on:

- Climate circumstances of the last 25 years
- Customer requirements for speed of de-icing the field
- Available Power Supply

The area requiring heating has to be determined based on the size and shape of the surface structure.

Power supply/ controller system

Define the position of the power supply connection. The power supply connection should be located in a protected area and should always be easy accessible.

HSI provides each individual ribbon with an electric cord which is rated at least IP68. Each cable consists of live, neutral and earth wires.

Each individual ribbon has to be connected to a junction box to which a maximum of 5 heating ribbons will be connected. Each junction box will have its own circuit breaker and should be connected to a GFEP (Ground Fault Earth Protector) of 30 mA.

Sensor temperature control

For infrastructure applications HSI recommends a controller system based on a combination of ambient air temperature and moisture detection sensors. This controlling method ensures that the heating ribbons will be energized only when a combination of ambient temperature and moisture are present, thereby keeping the surface free of snow/ice.

- 1) The temperature sensor should be installed in an open air environment.
- 2) The temperature sensors are located in the field between two heating ribbons.



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Junction boxes: Wieland connectors
IP 68.



Preparation of temperature and moisture sensor.



Both sensors installed in surface.



Electrical Components:

Installation of Electrical Connections must be made by a certified licensed electrician and in accordance with NEC National electric Code Section 426 – fixed outdoor electric de-icing and snow melting equipment, ANSI/NFPA 70. Ground fault protection for equipment must be provided. It is recommended to obtain a local permit prior to installation.

Pre - Installation procedure

A resistance check has been performed and recorded prior to shipment of the product. A list of the applicable resistance value of the heating element is part of the delivery. Below picture is exemplary of resistance reading.



Figure A

Prior to the installation of the heating ribbons:

- a. Look for any physical damage which may have occurred during shipping.
- b. Verify that you use the correct product in terms of wattage output and voltage rating.
- c. Inspect the mounting surface for sharp edges where the heating ribbon will be located.



Installation guidelines

The effectiveness of a surface heating system is determined not only by the design and layout but also by the quality of installation.

- It is important that the heating ribbons are properly installed. Handle the ribbons with care to prevent damage.
- When installing the heating ribbons it is preferable to have an HSI consultant or project manager on location.
- Junction boxes, whenever possible, should be located in a weather protected area: indoors or in a cable gutter.

Testing after installation:

After installation and before powering the system, perform a resistance check to ensure the integrity of the heating ribbons. Use an ohm meter for this purpose. Note and record the measured values on the enclosed forms.

Trouble Shooting

1. Turn off the power to the system.
2. Check the resistance readings.
3. Check the controller for its operation.
4. Check the functionality of the GFEP (Ground Fault Equipment Protector Device)
5. Check the electrical junction boxes to verify that they are free of moisture and water.
6. Clear the gutters and downspouts of any debris.

Important:

Do not solve repeating faults yourself. Contact HSI.

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