



Installation Guide

Field 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.

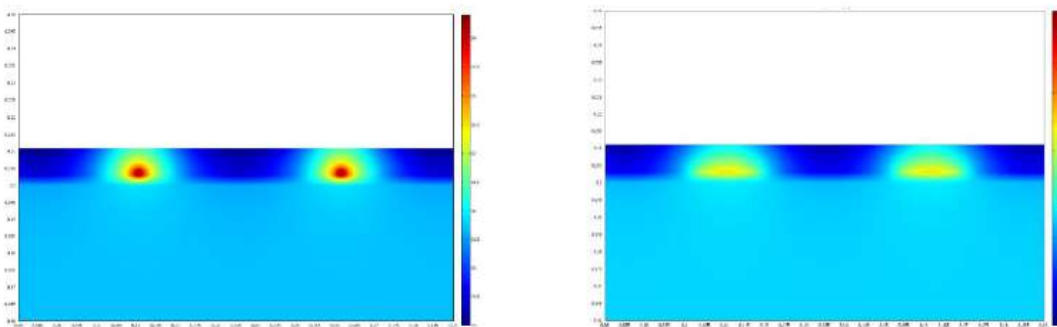


Heating ribbons

HSI Field 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) fields de-iced and de-snowed. Eliminating the dangers of ice and snow frozen fields.
- Product is flame retardant.
- The heating ribbons, part of the field 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
- 4) Cable gutters

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.

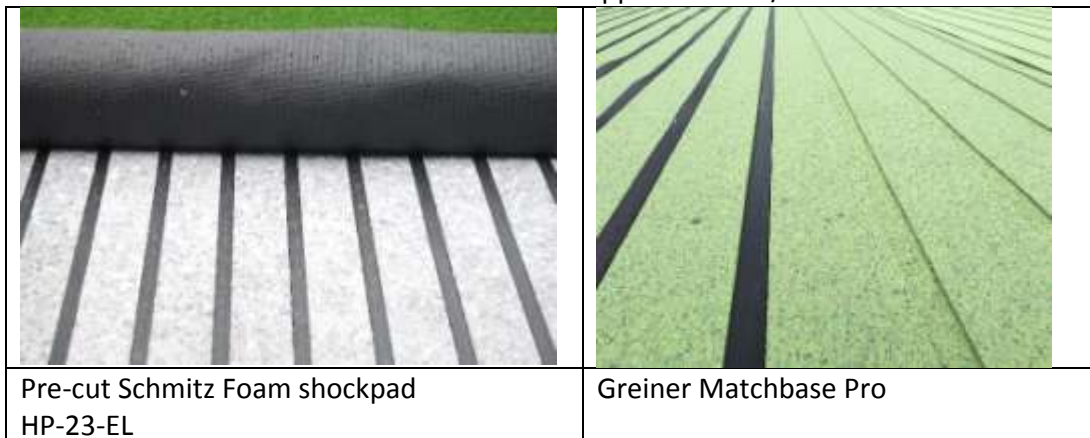
The heating system is not suitable for use with other heating devices.

Mechanical considerations in the planning stage:

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



2. Installation temperature: minimum > 41°F / 5°C.
3. The ribbons will be installed in 3 types of underground:
 - a. Artificial turf with e-layer => ribbons will be put in pre-cut mats and defined mats by HSI. At this moment 2 layers are formally prepared and tested with the HSI Heating ribbons. The distance between the ribbons is approx. 16 cm / 6.5 inch.



- b. Artificial turf without e-layer. The distance between the ribbons is approx. 20 cm / 7.8 inch.



On top of the ribbons 1.5 – 2 inch of sand or dirt/clay

- c. Natural grass. Within natural grass the ribbons will be installed approx. 30 cm / 0.95 ft deep. The distance between the ribbons will be approx. 25 cm / 0.82 ft.



On top of the ribbons 30 c / 0.9 ft of sand.

Location of junction boxes

To ensure that the connectors are always easy accessible and are in a secured environment HSI can offer their standard cable duct which is built from a HDPE material. Also local cable ducts can be used. All ribbons are provided with a pre-assembled Wieland RStI3 connectors and junction boxes.



Installation of a cable gutter with entry of heating ribbons on top side



Installation of a cable gutter with entry of heating ribbons length wise approx. 3 inch deep

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.



Junction boxes and controller system

Define the position of the power supply connection. The power supply connection should be located in a protected area/ cable gutter and should always be easily accessible.

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

Each individual ribbon will 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 field applications HSI recommends a controller system based on a combination of ambient air temperature and field temperature detection sensors. This controlling method ensures that the heating ribbons will be energized only when a combination of ambient temperature and low field temperature are present, thereby keeping the field 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.



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.

Installation procedures

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

1. 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.

2. During installation:

Field:

- a. Start the installation at the power connection by unrolling the product. Keep a mutual distance of xxx between the ribbons (distance depends on top-layer).
- b. It is not required to anchor the ribbons.



Installation guidelines

The effectiveness of a field 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.

3. 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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