Carbon Heater®

ELECTRIC FOIL HEATING SOLUTIONS

User Instructions

Flexible Film/Surface Heating Elements

Silicone, Polyester, Kapton, and Textile Heating Elements

Dear Customer,

Please read these user instructions carefully before use to obtain important safety and application information for this component.

For more information about our products and system solutions, please visit our website at **www.carbon-heater.com**.

Content

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Introduction

Film/Surface Heating Elements are used wherever it is necessary to heat a surface evenly and effectively. The construction, consisting of a wound, printed, or full-surface heating conductor between two insulation layers, allows for custom adaptation to almost any surface geometry. At the same time, optimal heat distribution across the surface to be heated is achieved. The only limitation of this versatile heating element is the maximum surface temperature of:

200 °C (220 °C for short periods) for silicone/kapton heating elements in non-self-adhesive versions
180 °C (200 °C for short periods) for textile heating elements in non-self-adhesive versions
90 °C (130 °C for short periods) for polyester heating elements
175 °C for self-adhesive versions

When applied correctly, optimal heat distribution over the surface to be heated is achieved. Uneven contact between the heating element and the surface can lead to heat buildup. It is important that the generated heat can dissipate. Heat dissipation can only be achieved through optimal contact with the object to be heated. Insufficient contact leads to partial overheating of the heating conductor. This can damage the insulation and may cause a breakdown. The overstrained heating conductor becomes brittle and breaks and/or burns through.

If the heating elements are made as etched films, i.e., the "heating conductor" is made of a thin film, they should be moved only infrequently.

General Information and Handling

- The application must not be operated without a heated object, unless the heating element itself is electronically and/or temperature-regulated with a temperature control device.
- The connection wires must not be subjected to any pulling forces (risk of tearing).
- The maximum permissible operating temperature for continuous operation is:

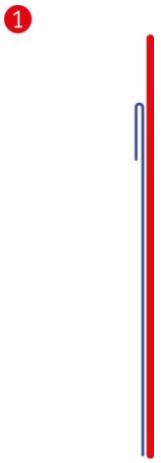
200 °C (220 °C for short periods) for silicone/kapton heating elements in non-self-adhesive versions
180 °C (200 °C for short periods) for textile heating elements in non-self-adhesive versions
90 °C (130 °C for short periods) for polyester heating elements
175 °C for self-adhesive versions

- The surface to which the heating element is applied must be clean, dry, and free from grease and solvents.
- The heating element must be applied evenly and without air bubbles.
- Once the heating element is applied, it can usually no longer be removed without damage.
- Since in practical applications there are operating and environmental parameters that cannot be precisely determined in theory, we recommend testing the application under actual operating conditions.

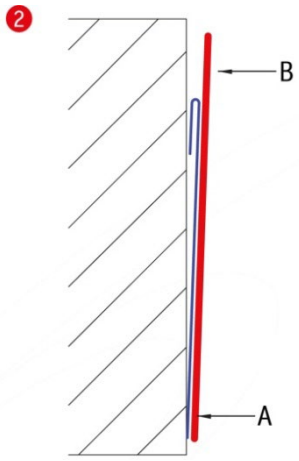
Application with Self-Adhesive Film

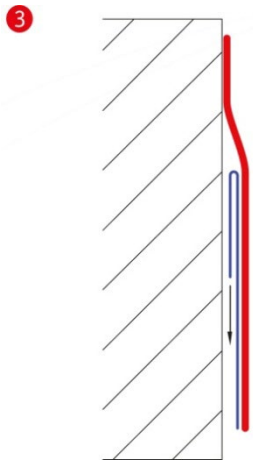
Caution! Check the adhesive properties of the material or surface to which the heating element is to be applied and ensure that it is suitable for permanent adhesion. Once applied, the heating element can generally not be removed without damage!

1. Please ensure not to bend, fold, or flex the heating element (observe minimum bending radius). This is especially important while the protective film is still on the back of the self-adhesive film.
2. Clean the surface to be heated and ensure it is clean, dry, and free from grease and solvents. If necessary, use solvent-free cleaning agents and/or primers. Foreign objects on the surface can damage the heating element during application or pressing.
3. Lay the heating element with the protective film on the surface as a test and, if necessary, mark the position of the heating element corners.
4. Peel off a piece of the protective film from the corner opposite the connectors (see Image 1).
5. Immediately position the heating element after removing the protective film to avoid dust or other particles sticking to the adhesive surface (see Image 2).
6. Finally, position the heating element and press or smooth it from the center outward to ensure good heat transfer from the heating element to the material (see Image 3).
7. Lay the connection cable.
8. Visually and manually check if the heating element has been applied without air bubbles and correctly. Air bubbles must be removed to the side (this is easiest using a foam roller). Air bubbles can cause localized overheating, leading to damage to the heating element.
9. Check the leakage current and dielectric strength according to the relevant standards for the device.
10. All electrically conductive parts that come into contact with the heating element or may touch it during use must be insulated or grounded according to the protection class of the device.



Remove approximately 50 mm of the protective film and fold it back.





While positioning the heating element, keep the exposed self-adhesive film away from the surface. Once you have found the correct position, press the heating element onto the surface starting from point "B."

Application without Self-Adhesive Film

1. Although the heating elements are flexible, make sure to handle them carefully and avoid bending or folding them.
2. Ensure that the surface to be heated is clean, dry, and free from grease and solvents. If necessary, use solvent-free cleaning agents. Foreign objects on the surface can damage the heating element during application.
3. Position the heating element on the surface to be heated and fix it fully (firm and permanent fixation) to ensure good heat transfer from the heating element to the surface.
4. Lay the connection cable.
5. Visually and manually check if the heating element has been applied without air bubbles. Air bubbles must be removed. Air bubbles can cause localized overheating, leading to damage to the heating element.
6. Check the leakage current and dielectric strength according to the applicable standards for the device.
7. All electrically conductive parts in contact with the heating element or that could touch it during use must be insulated or grounded according to the device's protection class.

Notes

No warranty, guarantee, and/or liability claims can be derived from these user instructions.

The warranty applies exclusively if the heating element remains in its original condition and is used and/or processed in a professional and proper manner. The buyer must verify and test the proper and sustained function of the heating element for the specific application in advance.

Important

The heating element must not be bent!
The heating element may only be used/fixed on a firm or hard surface!
The maximum operating temperature of the heating element must be observed!
Conductive parts or contacts must be insulated (touch/personal protection)!