

# GENERAL NOTES & INFORMATION

## READ ALL INFORMATION PROVIDED IN THIS GUIDE BEFORE ATTEMPTING TO INSTALL THIS PRODUCT

The installation of this heating product must be in accordance with both the manufacturer's instructions, and the regulations of the authority having jurisdiction. Failure to do so will result in a voided warranty.

Caution must be taken to guard against risk of electric shock, fire, and bodily injury during installation of this product.

All floors & subfloors should be prepared in accordance to ANSI & TCNA specifications. All masonry, adhesives, moisture barriers, and bonding agents used in the installation must be fully cured (per the manufacturer's recommendations - but not less than 14 days) prior to energizing the product for the first time. All components must be recognized and rated for their use.

**NEVER OVERLAP, LAYER, OR STACK THE HEATING FILM ON TOP OF ANOTHER PIECE OF THE HEATING FILM.**

The installation of this heating product must always be connected to a DEDICATED electrical circuit.

The system shall be installed with a disconnecting means.

The system should always be disconnected from its power source during service. This includes service to the thermostat.

All systems MUST be installed with a GFCI compliant thermostat or breaker.

The supply wire or terminals cannot be repaired. If the wire or terminal is damaged, it must be replaced.

The National Electric Code does not allow the placement of nails, staples, or other fasteners through the carbon heating or copper bus bar zones. If a nail or staple is accidentally placed through this area, they must be removed and securely taped shut.

Prior to installation please consult the local codes. If any of the information in this guide is not consistent with local codes, the local codes should be followed. However, electrical wiring is required to be run from a circuit breaker or other electrical circuit to the control. It is recommended that a qualified electrician perform these installation steps. Please be aware that local codes may require that this product and/or the control to be installed by an electrician.

Operating the system without a floor covering in place will void the warranty of the product.

**ALL REQUIRED INSPECTIONS MUST BE COMPLETED BEFORE COVERING THE HEATING FILM INSTALLATION.**

1. **DO NOT** install the Heating Film under large appliances such as refrigerators, freezers, washers, or dryers (as the heat can be detrimental to the operation of the appliances).
2. **DO NOT** install the Heating Film under large, flat-bottomed furniture, built in cabinetry, vanities, or in any application in which air circulation over the floor is limited (as the heat can be detrimental to the products).
3. **DO NOT** install the Heating Film between floor joists under the sub-floor, in wall cavities, or in ceilings.
4. **DO NOT** install the Heating Film in food pantries or under floating vanities (as the heat can be detrimental to the products stored in these areas).
5. **DO NOT** overlap, layer, or stack the Heating Film on top of another piece of the Heating Film.
6. **DO NOT** install the Heating Film over the pre-existing linoleum, PVC, or vinyl floor coverings. (All must be removed, including all pre-existing adhesive, prior to the installation of the Heating Film).

# THANK YOU FOR SELECTING CARBONIC HEAT®

This informational manual is provided as a guide to installing Carbonic Heat Film, including design suggestions, installation steps, precautions, limitations, and floor covering guidelines.

## SPECIFICATIONS FOR HEATING FILM:

**Applications:** Indoor floor heating.

**Listings:** UL Listed for U.S. and Canada under UL 1693 and CAN/CSA C22.2 No. 130.2-93, File No. 20140325-E465902, ETL 4007353, CE 120509, TUV K5140/E112

**Controls:** Heating Film must be controlled by a Carbonic Heat approved direct voltage floor heat-sensing thermostat.

**Voltage:** 120 VAC Max 100 sq. ft. (9.29 sq.m)  
50/60hz,  
240 VAC Max 200 sq. ft. (18.58 sq.m)  
50/60 Hz

**Watts:** 15 W/sq. ft. (51 Btu/sq. ft.), 166.1 W/sq.m

**Maximum circuit load:** 15 Amp

**Maximum circuit overload protection:** 20 Amp breaker GFCI: (Ground Fault Circuit Interrupter) required for each circuit (included in the thermostat control).

**Maximum bend radius:** Not to exceed 90 degrees. Do not crease Heating Film.

**Maximum exposure temperature:** (Continuous and storage) 150°F (65.5°C)

**Minimum installation temperature:** 50°F (10°C)



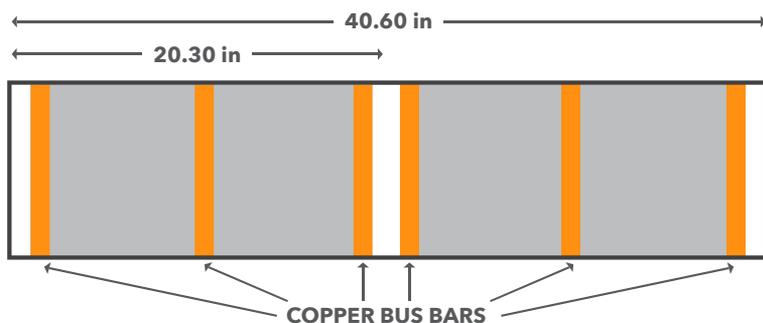
## SKILL REQUIREMENTS:

Installation must be performed by qualified persons, in accordance with local codes, ANSI/NFPA 70 (NEC Article 424), and CEC Part 1 Section 62 where applicable. All electrical work must be installed in accordance with Article 424 Part IX of the National Electric Code (NEC) ANSI/NFPA 70. "STATEMENT OF NATIONAL ELECTRIC CODE PRODUCT COMPLIANCE (NEC). This product from Carbonic Heat™ Products, LLC is compliant to Article 424, Part IX of the National Electric Code (NEC), "Electric Radiant Heating Sheets and Heating Sheet Sets" and as a Heating Sheet Set. Electrical installations must use a Terminal Junction Assembly manufactured only by Carbonic Heat™ Products, LLC per NEC 424.96 (2)".

## UNDERSTANDING CARBONIC HEAT FILM

Carbonic Heating Film is a revolutionary solution to today's radiant floor heating applications. The Heating Film is manufactured to make radiant floor heating more readily available, far more adaptable for unique applications and designs, and far easier to install than many other radiant floor products. Carbonic Heating Film is 40.6 inches wide (but can be cut to half the width if desired for certain applications) and is available in many lengths to accommodate your specific needs. The Heating Film may be cut to any length with the use of scissors, a razor knife, or other cutting instruments. It can also be cut at any angle needed for each application, including the cutting of a hole for an electrical outlet, toilet flange, or floor register.

There are a few things to know about the structure of the Heating Film. Electrical current-conducting copper bus bars run down the length of the Heating Film (2 bus bars are required to create heat - see drawing). Should a copper bus bar be cut during the installation of the product, you may repair it by either adding an "Adder" at the end or by installing a "Jumper" at the cut point. More about these later.



Under no circumstances should the active areas (gray) of the Heating Film be allowed to overlap itself or an adjacent piece of the Heating Film. The product includes three areas (The two white outer edge strips and the white center "Cut Line" strip) suitable for nailing and stapling to sub-floor, if deemed necessary, for the designed installation of the product. These strips are non-conductive and non-heat generating. All fasteners used to secure the Heating Film to the subfloor (excluding adhesives), including staples or nails that are to be used, must only be placed through these designated areas and not in the active carbon (gray) heating areas. Failure to do so will cause problems with the system and/or damage the Heating Film and associated areas including the building structure. The Heating Film can be installed with either side facing up.

## EXPECTED FLOOR TEMPERATURE

Heating performance is never guaranteed. Carbonic Heat is designed to deliver 15 W/sq. ft., with an average attainable temperature between 75°F (23.9°C) and 104°F (40°C), depending upon the subfloor, the layers of materials included in the floor installation, and the type of flooring used. The attainable floor temperature is dependent on how well the floor is insulated, the temperature of the floor prior to start up, and the overall thermal drain of the floor mass. Insulation is recommended under the Heating Film for best performance.

## WIRING ASSEMBLIES

Since this is a high voltage product, a connection system is required for power. A “Harness” is used to connect the Heating Film to a thermostat and power supply, and a Harness is used to connect multiple pieces of Heating Film in certain installations. Carbonic Heat Harnesses, Adders, and Jumpers are manufactured for either 120V or 240V applications. The wiring assemblies are designed for maximum efficiency and will work well for almost any layout requirements. It is important to note that there are six crimping terminals per sheet for the 120v Harness and four crimping terminals per sheet for the 240v Harness.

### THERE ARE THREE TYPES OF WIRING ASSEMBLIES:



**HARNESSES**

**1. Harnesses (J, J2, J3, J4):** Harnesses are used for connecting sheet(s) of Heating Film with a 12 foot long “cold lead” that is run to a thermostat, or to connect to another sheet of Heating Film. Harnesses are available in 120 volt and 240 volt configurations. For a single panel 120 volt application a “J-120” (J indicates one sheet, and 120 is the voltage) would be required. For a dual sheet

configuration using 240 volts a “J2-240” (J2 indicates two sheets, and 240 is the voltage) would be required. Connections for a three sheet system would require a J3. A J4 Harness will connect four sheets of Heating Film together. If there are three and a half sheets needed, a J4 can be used by trimming off the unused portion of the Harness.



ADDER

**2. Adders (A, A2, A3, A4):** Adders are used to attach one sheet of Heating Film to another, when a thermostat cold lead connection is not required. Adders are available in 120 volt and 240 volt configurations. To add a single sheet of Heating Film to a 120 volt system, an "A-120" (A indicates one additional sheet, 120 indicates the voltage) would be required. To add two sheets to an

existing sheet, use an A2. To add three sheets, an A3 will be required. An A4 will connect up to four sheets to an existing sheet or sheet set.



JUMPER

**3. Jumper (JP-60):** A Jumper can be used to reconnect a copper bus bar if it has been cut for completion of the layout. The Jumper is sixty (60") inches in length and can be used on both 120 volt and 240 volt systems. They are helpful for going through door ways, around corners, around posts, and around columns. Jumpers can also be used around cut outs for floor ports

such as receptacles, registers, and floor ports.