

### Overview

Exposed heat cables with glued down retention clips on metal roofs have been the conventional way to drain ice dams for many years. HotEdge's patented and patent pending products have taken the roof ice melt system industry to the next level. High snow load regions now have a low cost and reliable alternative to the traditional vertical heat cable retention approach.

Raised seam clamp and padded cable loop products securely attach vertical heat cable runs on most roof surfaces. This method is much more reliable than the glued down retention clips common in the industry.

Seam cover and seam clamp products provide a method to compress the heat cable against the existing metal roof panels. This retention provides more heat transfer to the metal surface resulting in a wider melt path. The covers also provide an attractive street view appearance.

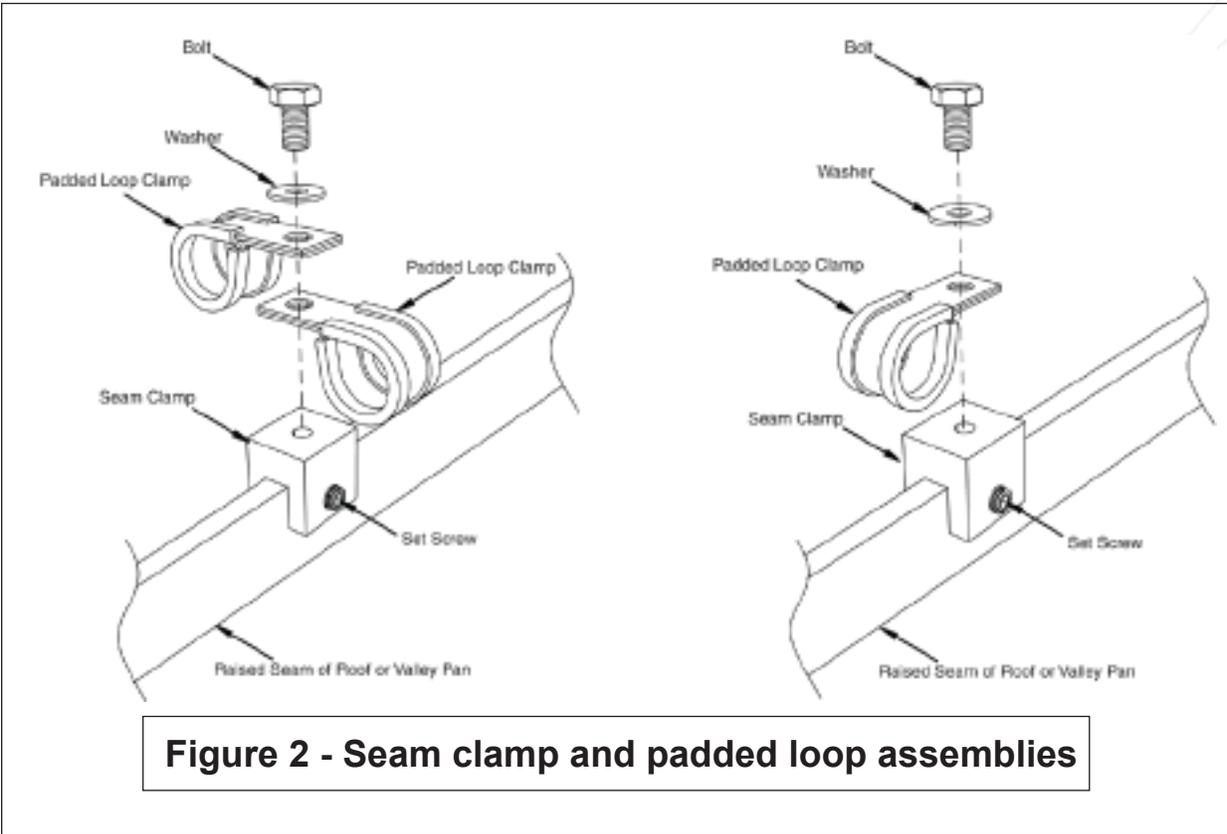
#### NEC (National Electrical Code) Compliant

The HotSeam cover partially exposes the heat cable. This exposure is in compliance with the NEC and makes insertion, inspection and replacement an easy task.

#### HotSeam System Applications

- Metal roof – attaches to the existing raised seam
- Shingled & shake roofs – attaches to the raised seam of the valley pan
- Vertical flashing – attaches to the raised seam of a vertical flashing

HotSeam is normally used in conjunction with HotEdge for a total roof ice melt solution. Heated gutters and downspouts are also recommended for maximum protection against icicles and ice dams. Many major icicle and ice dam issues can be traced to upper roof snow dumping onto lower roofs.



**Figure 2 - Seam clamp and padded loop assemblies**

### Exposed Heat Cable Retention

HotSeam is the ideal cable attachment method for raised seam metal roofs. This approach can also be used on any raised seam, including the special raised seam flashing products discussed on the following pages.

The mid-roof seam clamps and padded cable loops shown in Figure 2 retain the heat cable next to the raised seam. This is the type of installation recommended by most manufacturers of heat cable for raised seam metal roofs. This exposed cable approach has been used successfully for many years. The horizontal center to center spacing of these cable runs is covered in detail in the heat cable manufacturer's installation instructions.

At the same ambient temperature, self-regulating heat cable will use about twice the electrical energy when exposed to ice and snow compared to free air. When the ice and snow melts back away from the cable, two things happen. A hollow drain path through the ice dam opens and the standing ice melt water from higher up on the roof drains safely away from the structure. Since the self-regulating heat cable is no longer in direct contact with ice and snow, the electrical current used by the cable goes down. This exposed cable approach will save energy in an average installation.

### Seam to Seam Cross Over

Normally, the seam-to-seam cross over is done in the bottom of the gutter. Run the cable from the bottom of the gutter up to the padded cable loop at the top and then down to the bottom of the gutter. These two cables are then secured together with a UV-resistant cable tie.

The cable is then run in the bottom of the gutter to the next seam that will be traced and the process is repeated. This “run to the bottom of the gutter” requirement ensures a continuously heated melt path. An additional heat cable run is usually required in the gutter and downspouts.

It is sometimes permissible to cross the cable from seam to seam under the ridge cap if a retention clamp and loop is installed on both seams.

If there is no gutter, cable loops are extended about 4” to 6” past the drip edge to maintain a heated drain path for the ice melt water. It is very important to make sure the dripping water does not refreeze on the colder lower surfaces of the structure.

Heated gutters and downspouts are always recommended. Additional information on cable runs without gutters is available in the heat cable manufacturer’s installation instructions provided with the heat cable. HotEdge product, which heats the existing metal drip edge, is recommended for all HotSeam installations.

A three to four foot drip loop at each junction box allows a licensed electrical contractor to install the heat cable power feeds. An extra one foot at the dead end allows for the installation of the end cap outside the standing water in the gutter.

Home runs to junction boxes are always recommended. Heat cable splices have been shown to be unreliable and difficult to trouble shoot in the case of ground faults.

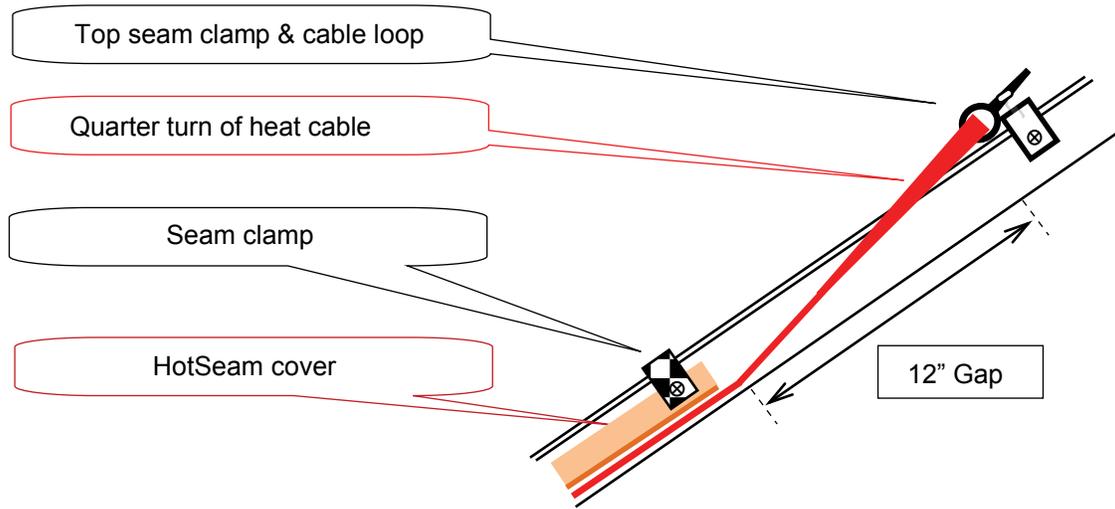


Figure 4 – HotSeam cover

### HotSeam cover

The HotSeam cable cover shown in Figure 4 is similar to an upside down HotEdge configuration. The cable cover provides a pleasing street view appearance. The partial exposure of the heat cable meets the NEC Article 426 requirements.

The covers ensure compression and maximum heat transfer between the heat cable and the metal roof panels. Using the covers will increase energy use because the self-regulating heat cable is always heat sinking to the metal roof structure. Energy usage will decrease after the snow and ice melts and is drained away but not to the level of the same cable in free air.

### The Hot Plate Effect

On the other hand, this firm contact can create a completely heated surface area. This is beneficial for smaller lower metal roofs in high snow load regions that have excessive snow dumping from larger upper roofs. Double runs on each raised seam can melt a very large volume of snow and ice.

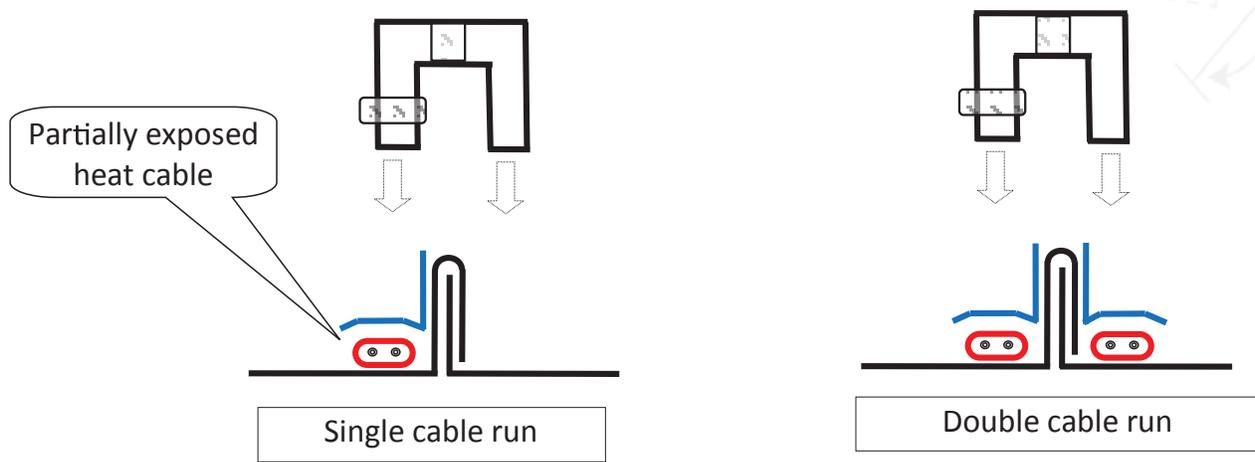


Figure 5 – HotSeam heat cable cover

## Overview

The top seam cable crossover retention loop, as shown in Figure 4, is required to retain the heat cable at the top of the cable run. Sliding snow and ice can pull the entire cable run away from the roof unless this attachment point is secure. A 12" transition gap, shown in Figure 4, allows the heat cable to be twisted a quarter turn to enter the raceway under the HotSeam cover.

## Installation Instructions - HotSeam Heat Cable Cover

1. Install the heat cable and top of the run seam clamp and single padded cable loop as per the instructions in the previous section.
2. Each cable run must go to the bottom of the gutter to ensure a continuously heated drain path.
3. Install the heat cables so that they lay flat against the metal surface of the roof or flashing.
4. **Important:** The HotSeam covers require a flat surface contact with the ice melt cable (Figure 5).
5. At the top of each run, allow a twelve inch space between the top of the HotSeam cover and the bottom of the cable loop to allow a quarter turn of the heat cable. See Figure 4 for details.
6. At the bottom of the run, the cable requires a quarter turn to make the horizontal right angle bend at the bottom of the gutter to run to the next heated seam (Figure 3).
7. Place the HotSeam covers over the heat cables and against the raised seam. The covers may overlap if the jaw of the seam clamp is large enough. The cross sectional dimension will vary depending on the structure of the raised seam.
8. Secure the covers to the raised seam of the roof by installing the larger seam clamps every five feet over the seam covers. Tighten the side screw on each seam clamp. (See Figure 5)

## Important Notes

### Seam Profile Drawings

A very accurate raised seam profile drawing must be submitted to the HotEdge sales department to order the correct cover and seam clamp components. The objective is to make the cross sectional profile large enough to accommodate the covers but small enough to minimize the downward shear force of the sliding snow and ice. Most raised seam profiles can be accommodated, but the information supplied by the contractor must be accurate.

### Cover

For the cover, the vertical flange is available in different heights and can be trimmed at the job site. The overall thickness can be reduced by keeping the top of the cover flange below the bottom of the increased thickness of the roof seam fold-over at the top of the roof's raised seam.

### Clamp

The clamp needs to have a cavity large enough to accommodate the roof seam and four layers of the cover's vertical flange.

### Cable Runs

A single or double heat cable run can be used depending on the snow loads, etc.

### Electrical Guide

Below is the maximum heat cable circuit length summation guide for the 12-watt/ft cable typically supplied with HotEdge roof ice melt systems. This information is only an overview and is not complete.

Heating Cable Maximum Circuit Length Start-up Temperature of 0°F (-18°C)				
Heat cable 12-watts/ft @ 32°F in snow & ice	15A Circuit breaker	20A Circuit breaker	30A Circuit breaker	40A Circuit breaker
12W at 120V	80ft	100ft	155ft	200ft
12W at 208V	145ft	195ft	290ft	380ft
12W at 240V	155ft	205ft	305ft	400ft
12W at 277V	165ft	225ft	330ft	415ft

Very high start-up currents can be expected due to the self-regulating nature of this cable. Cold weather start-up peak currents for the entire system should be considered. Cold weather system start-ups due to the use of manual switches, timers, snow fall controllers or after a power outage can demand very high currents. In large multi-circuit systems, time delay relays for the individual circuits are recommended to prevent the master breaker from tripping.

EPD ground fault breakers with 30mA trip points must be used for each individual power feed circuit, as per Article 426.28 of the NEC. The master breaker needs to be sized for the total peak currents encountered during cold weather start-ups.

Heat cable splices are not permitted. Individual home runs to an electrical junction box are highly recommended. The use of heat cable splices should be minimized as they have been shown to be unreliable. Splices make troubleshooting and repair difficult and expensive. The expense of the extra footage of heat cable and additional junction boxes are an important investment.

Three extra feet of heat cable must be provided at each electrical junction box to allow the licensed electrical contractor to provide a drip loop and a power connection. At the end of the run, an extra one foot of cable is required for the installation of the end sealing device which should not be immersed in standing water. If this extra cable is not provided, the entire run of ice melt cable will need to be replaced. Cable is easy to cut but it does not stretch.

**Warning:** Low cost, constant current heat cable must not be used. Only safety agency UL Listed, self-regulating ice and snow heat cable for structures that is provided with the system can be used. Consult with a licensed electrical contractor for system layout, junction box placement, maximum cable run lengths and power feed requirements as defined by the National Electrical Code (NEC), local building codes and the heat cable manufacturer.