GUTTERS, ROOFS & DRAINS DE-ICING SERGE BARIL

The Serge Baril 12 GRD gutter, roof and drain de-icing system offers the best way to help prevent ice dams and icicles using a selfregulating heating cable that provides a continuous drain path for melted ice and snow from the roof through the gutters and downspouts to the drain.

THE REAL PROPERTY.

SIMPLE SOLUTION:

The Serge Baril 12 GRD heating cable provides a solution for ice dams that can build up and damage buildings and gutters. The self-regulation feature of the cable provides additional benefits:

- LOWER ENERGY CONSUMPTION the cable reduces its power output as the ice and snow disappear.
- FAIL SAFE TEMPERATURE LIMIT the cable cannot overheat and melt or damage temperature sensitive roof coatings.

BY FAR - THE BEST SYSTEM:

- Cable can be cut-to-length on site.
- Very flexible, therefore easier to install
- Can be used with or without thermostats.
- Can be installed on any type of roof.

THE PROBLEM: Ice formation on the edge of the roof leading to water ingress in the house.



In cold weather, heat from the house rises and eventually heats the attic area. Ceiling insulation, while needed to reduce heating requirements in the house, does not prevent but only delays this build-up of heat in the attic. Snow on the roof acts as a good insulator creating a temperature differential between the attic and the outside. The temperature of the attic increases compared to the outside temperature. This allows the underside of the snow on the roof to gradually melt and form water droplets. These will flow down the roof forming ice dams by freezing as they reach the unheated cold roof edge (over the eaves, outside the walls). These water droplets may eventually freeze in the gutters, climb over the ice-filled gutter and form major, dangerous icicles.

As this ice builds-up, it creates a bigger dam. The ice forms a barrier and melted water accumulates behind this ice dam and may leak inside the wall space, under the shingles and into the building, causing water damage.

"The roof is leaking!" ... not really, what has happened is the ice build-up stopped the flow of water down the roof and allowed it to leak into the house.

THE SOLUTION: Relatively easy. Just keep the flow of water directed off the roof. KEEP THE PATH OPEN!

Shingle roof

STEP 1. HEATER ON ROOF

Install the 12GRD heater (120 or 240 Volts) looped up and down 12" (30 cm) beyond the eave overhang to the edge of the roof and to the bottom of the gutter to prevent ice build-up over the gutter. Cable spacing between the loops is normally 2 ft (60 cm). The amount of cable to be used will be affected by the depth of the eave overhang as shown in **TABLE I** below. This table provides the total number of feet or meters of cable required per foot or meter of roof edge. The cable must be looped down over the edge of the roof and tied to the cable in the gutter using UV resistant cable ties. This is to help prevent the ice from bridging over the gutter.



TABLE 1: CABLE LENGTH PER FT (M) OF ROOF EDGE Cable spacing is 2 ft (60cm)

Eav Overh	ve nang	Lo Hei	op ght	Feet (m) of cable/ Foot (m) of roof					
inches	cm	inches	cm						
12	30	24	60	3					
24	60	36	90	4					
36	90	48	120	5					
48	120	60	150	6					

STEP 2. HEATER IN GUTTER

The gutter requires a length of heater along the bottom to keep the flow of water to the drain. For gutters larger than 6" (15 cm), multiple runs of heater cable are recommended. It is preferable to tie the cable down with the use of aluminum tape (AT-150) in order to keep the cable flat and on the bottom of the gutter. This also helps dissipate the heat along the bottom of the gutter providing wider coverage.

NO GUTTER?

- 1) Install the cable on the roof as shown above leaving loops protruding about 3" (7.5 cm) over the edge of the roof.
- 2) A heat tracing cable can also be installed longitudinally under the drip lip of the roof. This could help prevent the built-up of ice and icicles along the edge of the roof.

TRACING GUTTERS ONLY?

This may well be adequate and could prove to be a good first step if there are no obvious ice dams forming on the roof. If this does not suffice, the roof can be heat traced following the above procedure at a later date.

STEP 3. DOWNSPOUTS

The downspouts which serve to lead the water to the ground or drain must also be heat traced. The cable is looped down and back, unless the downspout is on the end of circuit with the cable terminating at the bottom.

If the cable is terminated at the bottom, the end should protrude some distance into the ground drainage under the frost line to prevent freezing or tied to the exterior of the downspout.

STEP 4. ROOF VALLEYS

Install the cable up to two thirds the height of the valley and back down.

STEP 5. DORMERS OR SKYLIGHTS

Install the cable all around the perimeter of the dormer or skylight.

STEP 6. CABLE LENGTH CALCULATION

TABLE 2: TOTAL CABLE REQUIREMENTS: SLOPED SHINGLE ROOF

Roof		Х		=	
	Roof length		Cable multiplier (from Table I)		
Dormers		Х		=	
	Quantity		Perimeter		
Valleys		Х		=	
	Quantity		2/3 up and 2/3 down		
Gutters		X		=	
	Length		1 pass / 6" (15 cm) width		
Downspouts		X		=	
	Quantity		Length x 2 (or 1 if end of circuit)		
Connections		X	2 ft (60 cm)	=	
	Quantity				
			Cable length	=	
			Cable length x 5%	=	
			Total cable length	=	

Circuit breaker selection

Caution: Both the National and Canadian Electrical Codes require the use of a ground fault protection device (GFPD) at all times in conjunction with the installation of all heat tracers.

The circuit breaker is selected on the basis of the maximum length (ft or m) that can be connected at a specific start-up temperature.

TABLE: 3

		Maximum Heater Length (feet and meters)																
Catalog	Start-up Temperature		120V								240V							
			15	5A	A 20A		30A		40A		15A		20A		30A		40A	
Number	٥F	°C	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m	ft	m
12GRD	50	10	98	30	131	40	197	60	262	80	197	60	262	80	328	100	394	120
	32	0	92	28	121	37	180	55	197	60	180	55	246	75	312	95	377	115
	4	-20	75	23	98	30	148	45	180	55	148	45	197	60	297	85	344	105
	-40	-40	52	16	66	20	105	32	131	40	115	35	131	40	197	60	262	80

NOTE: For 208, 220, 277 Volt applications, please contact SBA.

Start the cable installation at the junction box, thus leaving a drip loop where the cable exits the junction box.

WARNING: If nuisance tripping of ground fault breakers occurs due to condensation in the junction box, electrical connections should be moisture proofed by use of a sealant.





Using the same logic as above, we basically have to guide a water droplet down the roof. The droplet should therefore meet a cable as it comes down. As such, we have to trace each second rib as shown on the drawing but not more than 2 ft (60 cm) between traces.

CABLE REQUIREMENTS ON ROOF

The cable requirements for the loop on the roof are calculated as follows: the eave overhang plus 1½ ft (45 cm) which allows for extra cable to cover the portion of roof inside wall space plus the loop down to the gutter multiplied by the number of ribs (2 traces on every second rib is equivalent to one trace per rib) plus the length of roof. See formula below.

FORMULA: (Eave overhang + 1½ ft (45 cm)) x number of ribs + length of roof.

Other cable requirements are as per Table 2.

SAVING: Because the loops at the edges of the roof have to be brought down to the bottom of the gutter, we can thus save the cable in the bottom of the gutter by attaching the loops together using UV protected Ty-raps and tie the cable down with the use of the aluminum tape (AT-150) in order to keep the cable flat in the bottom of the gutter. This also helps to dissipate the heat along the bottom of the gutter.

NOTES: 1) Every second rib is to be traced but not beyond a spacing of 2 ft (60 cm).

2) All the rest of applications such as dormers, gutters, downspouts are as per requirements for a shingle roof above.





The principle is to keep a pathway open for the flow of water to the drain. There is generally a slope towards a central drain or towards an edge. Run the heat tracing cables from all corners to the drain making sure that the loops are bent into the drain. It is good practice to have one cable go down into the drain to prevent freezing. Lay heat tracers all along the perimeter.



Simply put one length of cable into the full length of the drain to be freeze protected.

Roof attachment

For shingle roofs

Roof clips can be used in conjunction with pipe strapping nailed directly into the shingles of a new roof (see sketch A). For existing structures, bend the top edge of the pipe strapping before slipping it under the tile or shingle. Push up and pull back down to have the bent edge hook onto the top of the tile (see sketch B).



An alternative solution: A bead of adhesive (not furnished) should run along the pipe strapping for a length of 3" (76 mm) prior to slipping the strapping up under the tile. Do not use an excessive amount so as to leave a visible blob of adhesive on the outer edge of the tile. The adhesive bead should be large enough to deform and smear along the surface of the tile underneath. Allow the adhesive to cure to full bonding strength before attempting to install the cable and clips..

For metal roofs



Use roof clips making sure to use self-sealing screws or other appropriate sealing mechanism to prevent water ingress. A typical rib cross-over is shown.

Fasten with sheet metal screws using neoprene sealing washers. If washers are not available, coat the screw and the upslope edge of the clip with silicone sealant. The exact cable spacing may vary depending on the rib design of the roof. Typically trace every other rib.

For flat roofs

Use fibreglass or other appropriate sheet material to glue to the roof while having the GRK-C clips attached underneath this sheet as shown.

Adhesive (not furnished) should be used to bond clip studs to the flat surface. The roof surface should be clean at the bonding locations. Do not penetrate flat roofs with screws or nails as leaks may develop. Allow the adhesive to cure to full bonding strength before attempting to install the cable and clips.

For complete installation instructions please refer to our manual HT244.



Components

GRD-PSK/ESK	Power and end seal kit
SB-GRD-PSK	Power seal kit
SB-ESK	End seal kit
SB-PSB-L	Power seal boot
GRK-DH-1	Downspout hanger
GRK-C	Roof clips, plastic (25/bag)
GRK-MC	Roof clips, metal (25/box)
AT-150	Aluminum tape 2" x 150 ft
CL-GRD	Caution label, defrost/de-icing

Cord sets

Cord sets for preassembled cables are available with standard or GFI plugs on 120V, up to the maximum length allowable on a 15A breaker.

Controls

This can be as simple as an ON/OFF switch, a thermostat or fully automated. Please contact SBA.

GENERAL NOTE:

The above are general suggestions for applications of our cables and are not meant to replace the normal requirements of local, construction, electrical, or other codes. The installer must verify the conformity to all applicable codes or standards.

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