

# **RESISTANCE CABLE FOR EARTH THERMAL STORAGE**

Delta-Therm Corporation  
398 W. Liberty St., P.O. Box 345  
Wauconda, IL 60084  
800-526-7887

## **MR-MANUFACTURER**

For over a quarter of a century, Delta-Therm Corporation has been successfully designing, manufacturing, and selling high quality heat-transfer components. Established in 1969, our company initially supplied mineral insulated cable assemblies for snow melting and pipe tracing applications. Since that time, we have dramatically expanded our line of products and accessories -- without sacrificing any of the quality our customers have come to expect. For more information or for a binder which lists all of our products, please call 1-800-526-7887.

Our engineering staff can help you design and order a heating system using the most efficient and cost-effective products for your specific application. Fax your dimensions, a layout of the area to be heated, and the available voltage, and we will return a design proposal and a preliminary quote -- normally within 24 hours.

We provide comprehensive, easy-to-understand installation instructions written specifically for electricians and installation crews.

Delta-Therm is UL listed as an industrial control panels designer and manufacturer.

## **PP-PRODUCT PRESENTATION**

### **Resistance Cable for Earth Thermal Storage**

Delta-Therm's thermal storage heating system uses the concrete ground slab of a building as a radiant heat source. Electrical power is converted into heat by means of a specially designed electrical resistance cable buried in a sand bed beneath a building's floor. The sand bed stores the heat and radiates it over time through the building. Thermostat controls are available. UL listed.

### **Construction**

Our resistance cable is constructed of high-tensile-strength resistance wire encased in silicone rubber, which acts as its primary electrical insulation. Silicone is used because of its high-temperature properties, resistance to water, and its flexibility. A copper braid over the silicone rubber provides a ground path. To provide additional mechanical strength, an outer silicone jacket is extruded over the braid. Quality materials throughout assure you of a system that will last.

### **Off-Peak Rates Reduce Heating Costs**

Many utility companies offer inexpensive off-peak rates to lower electrical

loads during the day when demand is higher. Our thermal storage heating system is designed to allow users to capitalize on these low rates. The system generates heat during off-peak hours. The sand bed stores the heat and radiates it slowly through the building floor over the course of the day. The building is kept comfortably heated all day while reducing your heating cost.

### **Inexpensive Heat Supply for Large Buildings**

Delta-Therm's earth thermal heating systems can be used as a primary heat source in single-story buildings with high ceilings and large, open areas (warehouses, airport hangars). Some installations may require a small amount of secondary heat to compensate for sudden, unexpected increases in heat loss, such as when overhead doors remain open for a period of time.

### **High Watt Densities**

The primary electrical insulation of silicone rubber is rated at 150°C. This high rating allows the cable to be operated at 12 watts per linear foot.

### **One-Foot Spacing**

Delta Therm recommends 12" spacing between cable runs to produce a watt density of 12 watts per square foot.

### **Plow Feeder Tube Accessible**

Our crafted termination splices have a diameter of 0.40" to allow the cable to pass easily through most plow feeder tubes.

### **Low Installation Costs**

The high watt densities and one-foot spacing, combined with flexible heating cable, reduce labor installation costs. Less time is spent loading and unloading plows because of termination design.

### **Standard and Custom Sizes**

Our standard cables have 10-foot cold leads and will operate at 240 volts. Other voltages and cold-lead lengths can be furnished on request.

## **UA-USES, APPLICATIONS**

Delta-Therm's resistance cable is designed primarily for earth thermal storage. For snow melting applications, see the section below titled **Snow Melt Mats**.

## **MF-MATERIALS, FINISHES**

Our resistance cable consists of a high-tensile-strength resistance wire encased in silicone rubber. A copper braid over the silicone rubber provides a ground path. To provide additional mechanical strength, an outer silicone jacket is extruded over the braid.

## **TS-TECHNICAL SUPPORT**

## **SPECIFYING DELTA-THERM RESISTANCE CABLE FOR EARTH THERMAL STORAGE**

(Place specification details in Section 16855, CSI Master Format)

### **Floor Warming**

The floor warming system shall consist of *Earth Thermal Storage Resistance Heating Cables* as shown and schedules on the drawings, including all associated boxes, wire condulets, etc., required for a complete installation.

The electrical contractor shall refer to the architectural and structural drawings to determine conditions affecting the installation of the work, such as expansion and control joints, etc.

All heating cables shall be new and UL listed and approved for earth thermal storage applications.

The system shall be manufactured by Delta-Therm Corporation, 398 W. Liberty, P.O. Box 345, Wauconda, IL 60084 (Phone: 800-526-7887) (Fax: 708-526-4456).

The Earth Thermal Storage Resistance Heating Cable shall consist of a high-tensile-strength resistance wire encased in silicone rubber for insulation. The insulation shall be rated at 150°C to allow the heating cable to produce 12 watts per square foot on 12-inch spacing. The silicone insulation shall be surrounded by a copper braid to provide a ground path. A silicone overjacket shall in turn be extruded over the copper braid. The end termination splice shall have a diameter of 0.475 inches or less, allowing the cable to pass through plow feeder tubes.

The floor warming system shall be automatically controlled by a semi-recess mount, floor warming thermostat with pre-wired terminals and ground lead. The thermostat shall be a bulb and capillary type with a temperature range of 40 to 100 degrees F (4 to 38 degrees C). The capillary length shall be 10 feet. The maximum bulb temperature shall be 140 degrees F.

For additional technical information, please call our engineering staff at 1-800-526-7887.

### **CC-CODES, CERTIFICATION**

Our resistance cable is UL listed.

### **SNOW MELT MATS**

Delta-Therm Corporation  
398 W. Liberty St., P.O. Box 345  
Wauconda, IL 60084  
800-526-7887

### **MR-MANUFACTURER**

For over a quarter of a century, Delta-Therm Corporation has been successfully designing, manufacturing and selling high quality heat-transfer components. Established in 1969, our company initially supplied mineral insulated cable assemblies for snow melting and pipe tracing applications. Since that time, we have dramatically expanded our line of products and accessories -- without sacrificing any of the quality our customers have come to expect. For more information or for a binder which lists all of our products, please call 1-800-526-7887.

Our engineering staff can help you design and order a heating system using the most efficient and cost-effective products for your specific application. Fax your dimensions, a layout of the area to be heated, and the available voltage, and we will return a design proposal and a preliminary quote -- normally within 24 hours.

We provide comprehensive, easy-to-understand installation instructions written specifically for electricians and installation crews.

Delta-Therm is UL listed as an industrial control panels designer and manufacturer.

## **PP-PRODUCT PRESENTATION**

### **Snow Melt Mats**

Delta-Therm snow melt mats are designed for residential and commercial installations in either concrete or asphalt. They can be used in new installations or in repaving applications.

### **Construction**

Our snow melt mats are constructed of silicone-jacketed resistance wire attached to a high density polyethylene substrate with openings approximately 1 inch by 3 inches. The coarse mesh allows concrete to flow through during a pour.

### **High Watt Density**

The nominal watt density is 50 watts per square foot, enough to effectively melt up to two inches of snowfall per hour.

### **Options**

A wide range of voltages can be specified. Standard widths are 18" and 36". Step mats are also available, as are custom sizes. Mats should be controlled by a Delta-Therm Snow Sensing System.

## **UA-USES, APPLICATIONS**

Snow melting and de-icing applications.

## **MF-MATERIALS, FINISHES**

Our resistance cable is composed of a high-tensile-strength resistance wire encased in silicone rubber. A copper braid over the silicone rubber provides a ground path. To provide additional mechanical strength, an outer silicone jacket is extruded over the braid.

Our substrate is composed of a high density polyethylene.

## **TS-TECHNICAL SUPPORT**

### **SPECIFYING DELTA-THERM SNOW MELT MATS**

(Place specification details in Section 16855, CSI Master Format)

#### **Snow Melting - Concrete**

The snow melting system shall consist of snow melt mats as shown and scheduled on the drawings, including all associated boxes, wire, condulets, etc., required for a complete installation.

The electrical contractor shall refer to the architectural and structural drawings to determine conditions affecting the installation of the work, such as expansion and control joints, etc.

All snow melt mats shall be new.

The system shall be as sold by Delta-Therm Corporation, 398 W. Liberty St., P.O. Box 345, Wauconda, IL 60084 (Phone: 800-526-7887 Fax: 708-526-4456).

The snow melt mat heating cable shall consist of a high-tensile-strength alloy conductor coated with 4 mil Kapton. The conductor shall be encased in a .031 inch thick silicone rubber rated at 150°C. A copper braid equivalent to 18 AWG shall be woven over the primary insulation to serve as a ground path. A .020 inch thick layer of silicone rubber shall be extruded over the copper braid to provide additional mechanical strength. The resistance cable shall be joined to the substrate using cable ties and spaced to produce a watt density of approximately 50 watts per square foot. The cable output shall be limited to approximately 12 watts per lineal foot.

The snow melt mat cold leads shall be at least 20 feet long and either 10 or 12 AWG, depending upon amperage ratings. The cold lead conductor shall be stranded copper encased in .031 inch thick PVC insulation, MTW construction. A copper braid equivalent to 18 AWG shall be woven over the primary insulation to serve as a ground path. A .020 inch thick layer of PVC rated at 105°C shall be extruded over the copper braid to provide additional mechanical strength. The hot-cold junctions shall be terminated using parallel connectors which are first crimped then soldered for extra strength. Two layers of self-fusing silicone rubber tape shall be applied over the junction. The ground braids shall be joined using parallel connectors which are crimped. The entire splice area shall be sealed with a polyolefin shrink sleeve.

The snow melt mat substrate shall consist of a very coarse mesh of high-density polyethylene with openings large enough (approximately 1 inch by 3 inches) to allow concrete to flow through during a pour.

Snow melt mats shall be installed in a concrete slab at least 4 inches thick. The mats shall be embedded at least 1-1/2 inches deep but not more than 3-1/2 inches deep.

The snow melting system shall be automatically controlled using a redundant moisture sensing system produced by the manufacturer. The control system shall automatically prevent the system from activating if either the slab or air temperature are above 32°F. Once activated, the ice melting system shall automatically remain activated until the moisture from melting ice has evaporated. The system shall then automatically rearm itself.

For additional technical information, please call our engineering staff at 1-800-526-7887.

### **Snow Melting - Asphalt**

The snow melting system shall consist of snow melt mats as shown and scheduled on the drawings, including all associated boxes, wire, condulets, etc., required for a complete installation.

The electrical contractor shall refer to the architectural and structural drawings to determine conditions affecting the installation of the work, such as expansion and control joints, etc.

All snow melt mats shall be new.

The system shall be as sold by Delta-Therm Corporation, 398 W. Liberty St., P.O. Box 345, Wauconda, IL 60084 (Phone: 800-526-7887 Fax: 708-526-4456).

The snow melt mat heating cable shall consist of a high-tensile-strength alloy conductor coated with 4 mil Kapton. The conductor shall be encased in a .031 inch thick silicone rubber rated at 150°C. A copper braid equivalent to 18 AWG shall be woven over the primary insulation to serve as a ground path. A .020 inch thick layer of silicone rubber shall be extruded over the copper braid to provide additional mechanical strength. The resistance cable shall be joined to the substrate using cable ties and spaced to produce a watt density of approximately 50 watts per square foot. The cable output shall be limited to approximately 12 watts per lineal foot.

The snow mat cold leads shall be at least 20 feet long and either 10 or 12 AWG, depending upon amperage ratings. The cold lead conductor shall be stranded copper encased in .031 inch thick PVC insulation, MTW construction. A copper braid equivalent to 18 AWG shall be woven over the primary insulation to serve as a ground path. A .020 inch thick layer of PVC rated at 105°C shall be extruded over the copper braid to provide additional mechanical strength. The hot-cold junctions shall be terminated using

parallel connectors which are first crimped then soldered for extra strength. Two layers of self-fusing silicone rubber tape shall be applied over the junction. The ground braids shall be joined using parallel connectors which are crimped. The entire splice area shall be sealed with a polyolefin shrink sleeve.

The snow melt mat substrate shall consist of a very coarse mesh of high-density polyethylene with openings large enough (approximately 1 inch by 3 inches) to allow concrete to flow through during a pour.

Snow melt mats shall be installed in compacted asphalt. Mat depth shall be at least 1-1/2 inches but not more than 3-1/2 inches.

The snow melting system shall be automatically controlled using a redundant moisture sensing system produced by the manufacturer. The control system shall automatically prevent the system from activating if either the slab or air temperature are above 32°F. Once activated, the ice melting system shall automatically remain activated until the moisture from melting ice has evaporated. The system shall then automatically rearm itself.

For additional technical information, please call our engineering staff at 1-800-526-7887.

#### **CC-CODES, CERTIFICATION**

UL listing applied for.