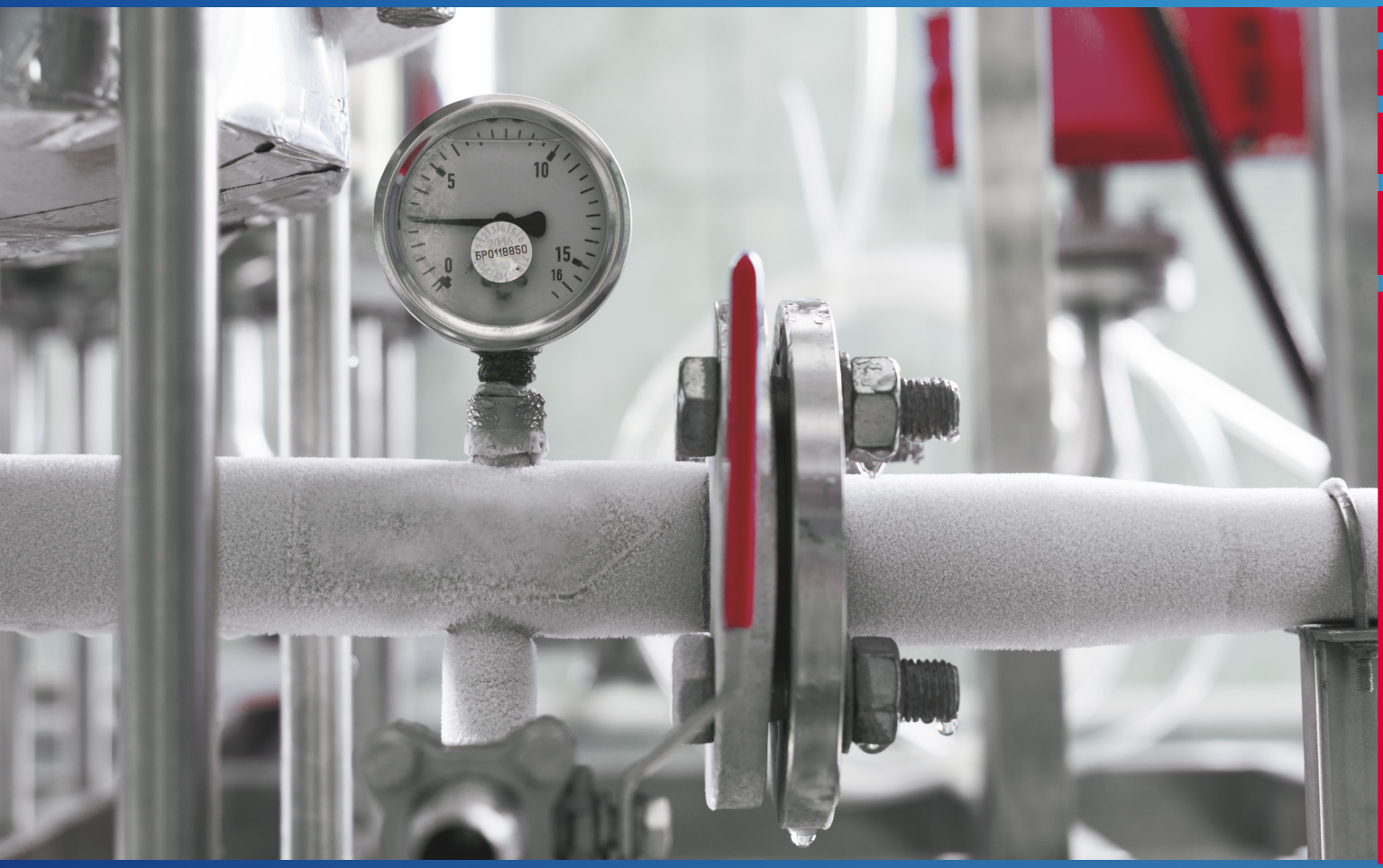
BriskHeat®

FREEZE PROTECTION INDUSTRIAL GUIDE

SAFEGUARDING APPLICATIONS IN COLD WEATHER



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YOUR GUIDE TO SAFEGUARDING APPLICATIONS IN COLD WEATHER

Unpredictable weather is becoming the new norm, and that means you need a solid plans to protect your critical equipment, materials, and infrastructure from the costly damage freezing temperatures can cause. Globally, industries are facing significant financial hits due to freeze damage. This guide will help you understand, anticipate, and prevent these issues, so you can keep things running smoothly and safely all winter long.

GET READY BEFORE THE COLD HITS

Think of effective freeze protection as more than just a winter chore; it's a vital part of keeping your operations resilient and your assets lasting longer. When you understand how freezing impacts your process, explore your heating options, and have a proactive maintenance plan in place, you'll protect your facility, equipment, and materials from the harsh effects of cold weather.

At BriskHeat, we're here to be your go-to partner for innovative and reliable heating and temperature control solutions. With over 75 years in the business, we offer a complete lineup of products—from heating tapes and cables to drum and tote heaters—designed to meet the unique needs of various industries. Plus, our expert application and engineering teams are ready to help you design the most efficient and effective freeze protection system for whatever you need.

FOR OUR FULL LINE OF FREEZE PROTECTION SOLUTIONS, SCAN THE QR CODE TO VISIT OUR FREEZE PROTECTION CENTRAL ONLINE!

INDUSTRIES BENEFITING FROM FREEZE PROTECTION

- Oil & Gas
- Water Treatment
- Transportation
- Agriculture
- Construction
- Mining
- Chemical Processing
- Food Processing
- Biotech
- Aviation
- Laboratory
- Power Generation
- Pharmaceutical
- Marine/Shipping
- HVAC & Refrigeration
- Warehousing & Logistics
- General Manufacturing

UNDERSTANDING FREEZE PROTECTION

Freeze protection is the practice of preventing materials, fluids, and equipment from reaching temperatures at which they begin to freeze, crystallize, or become excessively viscous. The term "freeze protection" can also be used to prevent undesirable physical changes to materials when the ambient temperature decreases. Different materials react uniquely to cold, demanding varied protection strategies. Those strategies may change based on application.

WHAT FREEZES?

COMMON SUBSTANCES AND THEIR COLD WEATHER BEHAVIOR

Water-Based Products: These are the most straightforward, beginning to crystallize and freeze at 32°F (0°C). The freezing point can be modified by mixing other additives such as salt, sugar, alcohol, or ethylene glycol (anti-freeze). Crystallized water is more resistant to flow and can cause jams in everything from waterlines on exterior walls to outdoor water lines leading to ancillary buildings. Water lines used in fire suppression systems may be particularly vulnerable. Frozen water can cause pipes to burst and damage equipment. But "water-based" products are not just water. Wastewater lines need to be buried below frost lines or heated.

Oil-Based Products: Unlike water, fuel oils and lubricants tend to gel or thicken into a waxy consistency before they freeze solid. This process can begin above 32°F (0°C) and continuously thicken the colder it gets. For instance, Diesel fuel can begin to gel around -6°F (-21°C), while motor oils and hydraulic fluids experience significant viscosity increases at temperatures well above their freezing points, impacting machinery performance. Motor oil is particularly sensitive to cold temperatures with some manufacturers recommending a lower viscosity 5W-30 or full synthetic to ensure the best performance.

Chemical and Other Liquids: Many chemicals, gases, and specialized fluids have unique freezing points that will affect performance. For example, Diesel Exhaust Fluid (DEF) freezes at 12.2°F (-11°C). Cutting fluids, paints, solvents, resins, pastes, and other liquids have specific storage temperatures. Below these limits the properties of the materials will change and it may not be suitable for their intended use.

COMMON EQUIPMENT REQUIRING FREEZE PROTECTION

- **Control Panels & Electronic Enclosures**

  Prevent condensation, maintain optimal operating temperatures for sensitive electronics, and protect against short circuiting and corrosion.

- **Pumps, Motors, & Compressors**

  Prevent lubricants and fluids from gelling, ensure easy startup, and reduce wear on components.

- **Conveyors & Material Handling Equipment**

  Prevent lubricants from thickening in bearings and gearboxes, ensuring smooth operation and preventing motor overload.

- **Hydraulic & Pneumatic Systems**

  Maintain fluid viscosity for proper pressure flow, and prevent lines from freezing.

WHY KEEP EQUIPMENT WARM?

Even if fluids within equipment don't freeze solid, low temperatures can cause a variety of problems within your operation.

Increased Viscosity: Oils, lubricants, and hydraulic fluids become thicker, leading to increased resistance, higher power consumption, and slower operations for pumps, motors, and machinery. Also consider the optimum temperatures required for the materials being processed. For instance, in cosmetic manufacturing, the temperature of components such as wax, glycerin and emulsifiers mix differently based on their viscosity. The viscosity of fuel oils impacts atomization, allowing better mixing of oil and steam. And, as we know, viscosity changes with temperature.

Condensation: Often overlooked are the impact cold temperatures can have on gases. Some processes such as semiconductor manufacturing require heated gases as part of the production process. Processes requiring steam require heated pipelines to maintain temperature and prevent condensation. Fuel gases can condense in cold weather as well. Not only does this change how the fuel will burn but can cause rust in pipelines and components. Temperature fluctuations can cause condensation inside control panels and electronic enclosures, leading to short circuits, corrosion, and malfunction.

Component Brittleness: Metals, rubbers and plastics can become brittle in extreme cold, making them more susceptible to cracking or breaking under stress. Freezing temperatures can be especially hazardous to outdoor equipment including door seals.

Battery Performance: Cold temperatures significantly reduce battery capacity and charging efficiency. Outdoor equipment may not start. The performance of electric vehicles is greatly impacted, not only taking longer to charge, but decreasing the travel distance per charge.

Sensor and Instrument Inaccuracy: Precision instruments, gauges, and sensors can provide inaccurate readings or fail entirely when operating outside their optimal temperature range. Be sure instrumentation compensates for changes in temperature and pressure.

By maintaining a consistent, warmer temperature, you can avoid these issues, ensuring your equipment operates as designed, even in the harshest winter conditions.

BRISKHEAT APPLICATION BOOK

BriskHeat's Distributors, Inside Sales Team, and Application Engineers receive inquiries year-round from customers asking for solutions based on our experience. Scan the QR code below to view BriskHeat's extensive application book online!

- **General Freeze Protection**
  - Emergency De-Icing
  - Power Plant Freeze Protection for Outdoors
  - Residential & Commercial Pipe Freeze Protection
  - Roof & Gutter Ice Dam Prevention
- **Hazardous Areas**
  - Class I Division 1 Industrial Environments Freeze Protection
  - Tanks and Vessels Freeze Protection in Hazardous Areas
- **Chemical Processing**
  - Drum and Pail Viscosity Control
  - Gas Cylinder Handling
  - IBC/Tote Tank Warming
  - Tanks and Vessels Freeze Protection

THE FOUR KEYS TO ENERGY EFFICIENT HEATING

Fall is the best time to examine your process heating systems for energy efficiency. Making improvements before the cold months is much easier and efficient. Heating is a critical factor in manufacturing and can contribute to the overall cost of operation. Insulation is an important consideration in minimizing heat loss and decreasing heating cost. Insufficient insulation can jeopardize worker safety as well as product quality. It can also increase emissions of greenhouse gases and damage temperature-sensitive equipment.

One: Knowledge of your system requirements. Where does your system require heating or cooling for a process or product? What is the target temperature and what is the acceptable variation? What is the criticality of maintaining the acceptable range? Use this information to determine the correct heater, temperature controller and insulation.

Two: Examining potential sources of heat loss. The two most common causes of heat loss are conduction and convection. Conduction is the physical transfer of heat from a hot mass to one that is cooler. An example is heated gas in a pipe, which can lose heat to a pipe stand. Convection heat loss happens through air. When an oven has a gap in the wall allowing heat to escape, this is an example of convection heat loss.

Three: Selection of insulating material. Insulation is rated by a physical property of thermal conductivity. The lower the number, the lower the heat loss. Be sure the material is appropriate for the exposure temperature and environment where it will be used. If moisture is present, use materials that will not be damaged by exposure.

Four: Proper installation techniques. Heat transfer is optimized by the heater being in direct contact with the surface to be heated. Pressure sensitive adhesives, high-temperature adhesive tape, RTV or heat conductive putty focus energy where it's needed. Proper installation of insulation is also important. Avoid gaps to reduce heat loss. Fiber materials should be covered to reduce airborne particles. Use more durable materials where there is risk of damage.

TIPS FOR ENERGY EFFICIENT HEATING

1. Use a pyrometer to scan production areas. Address areas that are excessively hot or cold compared to ambient needs, as they indicate inefficiency.
2. Improve heating and cooling efficiency by using appropriate insulation.
3. If insulation feels very warm, it's likely insufficient; increase thickness as needed.
4. Utilize recuperators or heat exchangers to repurpose waste heat from one process to another.
5. Use ambient temperature controllers or Thermo-Cubes with heat trace systems to minimize energy consumption.

TIPS FOR REDUCING ENERGY COSTS

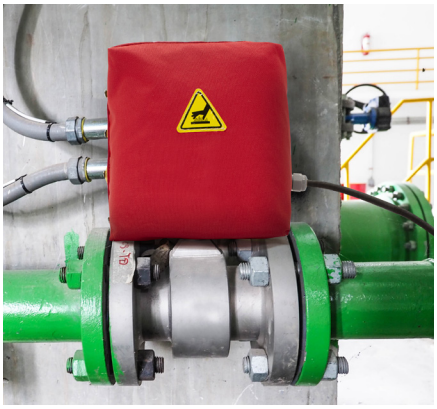
1. Establish a specific temperature range to be maintained. For freeze protection, heat below 37°F (3°C), but avoid heating above 45°F (7°C). Temperatures may very based on safety margins or materials.
2. Maintain office and production areas at lower temperature in winter. Unoccupied areas generally don't require heating above 60°F (15°C).
3. Ensure windows are sealed to prevent air leaks, and consider applying film to buffer cold air.
4. Only heat or cool storage areas if extreme temperatures pose a risk of material damage or facility damage (e.g., burst pipes).

COMMON FREEZE PROTECTION APPLICATIONS

HEAT TRACE FOR PIPES

Whether you're in need of a hard-wired heat trace system for your pipe set-up or a plug-and-play solution that is ready to install, BriskHeat provides self-regulating heat trace for a variety of environments, including ordinary, hazardous, and wet-area locations.

Essential for safeguarding critical pipelines and process lines from freezing, BriskHeat's heat trace solutions deliver consistent warmth directly to the pipe. Whether preventing freeze-ups in water lines or maintaining viscosity in chemical processes, heat trace ensures uninterrupted flow and prevents costly damage in exposed environments.



VALVE, GAUGE, & CONDUIT PROTECTION

Valves and instrumentation are particularly vulnerable to cold. BriskHeat offers comprehensive protection through heating tapes, specialized insulation and heated jackets, ensuring optimal performance. Solutions range from our easy-to-install INSUL-LOCK Pipe Insulation to our pre-engineered Wintershield and custom-designed heated jackets, all tailored to prevent freezing and maintain critical components.

LARGE TANK/VESSEL HEATING SYSTEMS

For large-scale industrial containers like hoppers, tanks, and vessels, maintaining precise temperatures is vital for material flow and integrity. BriskHeat's robust silicone heating blankets are ideal for these applications, providing uniform, efficient heat across vast surfaces to prevent freezing, control viscosity, and ensure smooth material discharge.

ROOF & GUTTER HEAT TRACE

Protect your building's structural integrity from the damaging effects of winter with BriskHeat's roof and gutter heat trace systems. These self-regulating cables efficiently melt snow and ice from eaves, gutters, and downspouts, preventing destructive ice dams and ensuring proper drainage to safeguard your roof, gutters, and foundation.

RECOMMENDED SOLUTIONS FOR PIPE LINES & VALVES

Pipe lines and valves are particularly vulnerable to freezing, which can lead to costly damage and operational downtime. Identifying critical areas and applying the right heating solutions is essential.

SELF-REGULATING HEAT TRACE

Self-regulating cable or heat trace is well suited to cold weather conditions as it automatically adjusts heat output based on surface temperature. It is also safe to overlap and can be cut-to-length and terminated in the field. Cable is available in different wattages depending on the severity of the temperatures and heating requirements of the application. SLCBL is abailable in 3, 5, 8, 10, and 12 watts/foot. There are three types of outer jackets used for different applications.

- "B" has a tinned braided outer jacket that is best suited for dry environments.
- "BP" has a thermoplastic elastomer over jacket required for wet areas.
- "BF" has a fluoropolymer over jacket which is required for areas where caustic chemicals are present.

STANDARD SPOOL LENGTHS: 50 ft, 125 ft, 150 ft, 250 ft, 500 ft, 1000 ft (15 m, 38 m, 46 m, 76 m, 152 m). For orders greater than 10,000 ft (3,048 m), call for pricing.

OUTER JACKET	PART NO. 120 VAC	WATTS/FT (WATTS/M)
TINNED COPPER BRAID	SLCBL3120B	3 (10)
	SLCBL5120B	5 (16)
	SLCBL8120B	8 (26)
	SLCBL10120B	10 (33)
	SLCBL12120B	12 (40)
THERMOPLASTIC ELASTOMER	SLCBL3120BP	3 (10)
	SLCBL5120BP	5 (16)
	SLCBL8120BP	8 (26)
	SLCBL10120BP	10 (33)
	SLCBL12120BP	12 (40)
FLUOROPOLYMER	SLCBL3120BF	3 (10)
	SLCBL5120BF	5 (16)
	SLCBL8120BF	8 (26)
	SLCBL10120BF	10 (33)
	SLCBL12120BF	12 (40)

TIP: Orders over 100 feet eliminate cutting fees.

RECOMMENDED SOLUTIONS FOR PIPE LINES & VALVES, CONT'D

INSUL-LOCK

CUSTOM CLOTH INSULATORS

PIPE INSULATION

Essential for enhancing the efficiency of heating cables and preventing heat loss, pipe insulation creates a thermal barrier around pipes. This reduces energy consumption by trapping heat, ensuring your heating solutions work optimally to prevent freezing.

RECOMMENDED OPTIONS:

- INSUL-LOCK: environmentally-friendly, CFC-free, flexible elastomeric thermal insulation. The double seal reduces air infiltration and is non-porous, fiber-free and resistant to mold growth. Can be used with both heating cables and tapes.
- Custom Cloth Insulators: a durable and reusable solution with its easy hook & loop fasteners. Can be used with both heating cables and tapes.

HEAT TRACE ACCESSORIES

Connection, termination, and end seal kits are crucial for the safe and proper installation of heat trace systems, these accessories ensure system integrity. BriskHeat connection and termination kits provide secure electrical connections and seals, while specialized tapes firmly attach heating cables to pipes for consistent heat transfer.

RECOMMENDED OPTIONS:

- PTBS-GET: Power Connection Kit with Multiple Entries
- JHE-GET: Low Profile End Seal Kit
- JHS-GET: Low Profile Splice Connection Kit
- JHT-GET: Low Profile Tee Connection Kit
- JHE-LG/LR-GET: LED Monitor Light with End Seal Kit
- AAT260: Aluminum Tape 2 in x 180 ft (51 mm x 55 m)

WINTERSHIELD™

BriskHeat's Wintershield provided a pocket of warmth to protect devices like pipes, valves, pumps, and instrumentation against extreme cold. With lace-up openings on three sides, this shield is easy to install.

RECOMMENDED OPTION:

- WSP-Series: Wintershield can be made in 120V or 240V in either a standard or large size. Available in custom shapes and sizes.

RECOMMENDED SOLUTIONS FOR CONTAINERS

Containers such as drums, pails, tote tank/IBCs, and gas cylinders contain materials that either freeze or need a specific flow rate to maximize production. Utilizing a portable plug-and-play electrical surface heater on the container prior to and during production is a cost-effective and simple way to thaw and improve the flow rate of the material within the container.

SILICONE DRUM AND PAIL HEATERS

Silicone Band Drum Heaters are highly flexible heaters designed as individual bands that wrap directly around the circumference of a drum or pail. They provide concentrated, direct heat to the container wall, making them ideal for spot heating or when multiple bands are needed to achieve specific heating zones for viscosity control and freeze protection.

RECOMMENDED OPTIONS:

- Econo-Series: Great all-purpose choice that is economical, moisture & chemical resistant and long lasting.
- DHCS/DHCH/DPCS/DPCH Series: Heavy-Duty and Extra-Heavy-Duty Silicone Rubber Band Heaters for extra strength and durability.

Both options include built-in adjustable thermostat control. BriskHeat's 120V models include standard 3-prong (NEMA 5-15) grounded plugs.

FULL COVERAGE DRUM HEATERS

Full coverage drum heaters offer superior heat efficiency and uniformity, these insulated cloth heaters fully envelop the drum. Their complete coverage and integrated insulation provide faster heat-up times and maintain consistent temperatures across the entire container, making them ideal for sensitive materials, energy savings, and comprehensive freeze protection.

BriskHeat provides full coverage drum heating options for ordinary, wet, and hazardous locations.

RECOMMENDED OPTIONS:

- FGDH/FGPDH/FGDI-Series: Fully insulated and provide more wattage for faster and more energy-efficient heat-ups. Heaters include built-in digital temperature controllers. 120V models include standard 3-prong (NEMA 5-15) grounded plugs.
- WEX-Series: ATEX-rated full-coverage drum heaters for hazardous locations.

RECOMMENDED SOLUTIONS FOR CONTAINERS, CONT'D

IBC/TOTE TANK HEATERS

Specifically designed for Intermediate Bulk Containers (IBCs) or tote tanks, these large, durable heaters wrap around the entire container to provide uniform heating. They are crucial for preventing freezing, maintaining viscosity, and ensuring the easy flow of temperature-sensitive materials stored in IBCs, streamlining handling and production processes.

RECOMMENDED OPTIONS:

- TOTE-Series: Fully insulated blanket heater wraps around the tote tank without contaminating or scorching your product. Adjustable straps allow it to fit multiple container widths. Includes dual adjustable thermostat control: 50°F to 160°F (10°C to 71°C).
- TOTEW/TOTEWI-Series: Water-resistant, IP54 rated, full-coverage IBC/Tote Tank heaters and insulators suitable for use in outdoor/indoor and washdown environments. Includes digital controller.
- WEX-Series: ATEX-rated wraparound tote tank heaters for hazardous locations.
- TTH-Series: Silicone Rubber IBC/Tote Tank heater that installs underneath the plastic bladder for direct surface contact. For added efficiency pair this with our wraparound insulators.

GAS CYLINDER HEATERS

Designed specifically for gas cylinders such as propane, nitrogen, or other industrial gases, these heaters ensure consistent gas pressure and flow by maintaining optimal temperatures. They are essential in cold environments to prevent pressure drops due to slow vaporization, ensuring a continuous and efficient supply of gas for various applications.

RECOMMENDED OPTIONS:

- GCW Series: For ordinary locations, these heaters provide a 2 inch (50mm) thick insulation and self-regulating heating element. No extra temperature control necessary. 120V model includes standard 3-prong (NEMA 5-15) grounded plug.
- HCW-Series: For Class I, Division I Hazardous Areas.
- WEX-Series: For ATEX Hazardous-area locations.

RECOMMENDED SOLUTIONS FOR LARGE TANKS, VESSELS, & HOPPERS

For large-scale storage and processing, freezing or increased viscosity within tanks, vessels, and hoppers can lead to severe operational disruptions and significant financial loss. Protecting these crucial assets prevents product solidification, ensures consistent material flow, avoids costly downtime, and safeguards the integrity of the containers. All are vital for maintaining continuous production and efficiency in cold climates.

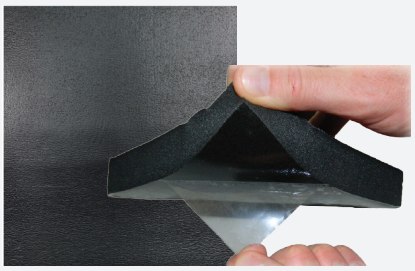
SILICONE HEATING BLANKETS

BriskHeat's versatile heating blankets provide efficient, uniform heating for these large surfaces, offering robust freeze protection and process temperature maintenance without requiring extensive hard wiring.

These blankets offer moisture, chemical, and radiation resistant solutions, with industrial strength pressure-sensitive adhesive backing options.

RECOMMENDED OPTIONS:

- SRL/SRP/SRW Series: Silicone rubber heating blankets made for metal or plastic surfaces
- SRL/SRP/SRM/ADJ-Series: Silicone rubber heating blankets with built-in temperature control for plug-and-play operation.



INSUL-EZ

Insul-EZ is an adhesive backed foam sheet of insulation which helps to ensure optimum thermal efficiency while protecting your heater. Ideal for insulating tanks, vessels, cabinets, enclosures, hoppers, silos, conveyors, and vats to reduce heat loss. Moisture, mold, and mildew-resistant antimicrobial foam. Maximum temperature 220°F (104°C).

RECOMMENDED OPTION:

- INSULEZ48: 0.75 inches thick, 48 in x 48 in (122 cm x 122 cm) sheet peel and stick insulation.

CUSTOM SILICONE BLANKETS

In need of a custom-designed silicone blanket?

BriskHeat can work with you and your team to manufacture silicone rubber heating blankets of any shape and size to fit your heating needs.

RECOMMENDED SOLUTIONS
ROOF & GUTTER DE-ICING

When gutters and downspouts freeze, major damage can occur to your building's roof and facade.

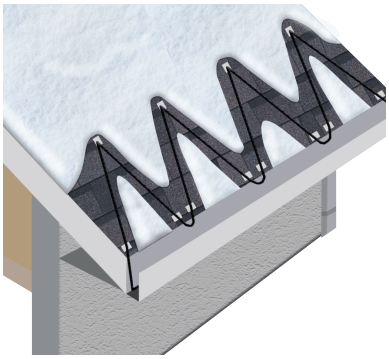
SPEEDTRACE ROOF & GUTTER KITS

BriskHeat's SpeedTrace Roof & Gutter De-Icing Kits are designed to prevent the formation of ice dams and icicles on rooftops by using an electric self-regulating heating cable system. The heating cable melts excessive ice and snow from the roof, gutters, and downspouts to ensure proper draining.

KIT INCLUDES:

- SpeedTrace Roof & Gutter Heating Cable (pre-assembled with power plug)
- Heavy-Duty Roof Clips
- Downspout Hanger Brackets
- UV Resistant Cable Ties

PART NO. 110-120VAC	PART NO. 208-277VAC	CABLE LENGTH FT(M)	ROOF CLIPS	DOWNSPOUT HANGERS	CABLE TIES	CAUTION LABELS
FFRG15-50	FFRG25-50	50 (15.2)	30	2	15	2
FFRG15-75	FFRG25-75	75 (22.8)	50	4	20	2
FFRG15-75	FFRG25-75	100 (30.4)	60	4	25	2
FFRG15-75	FFRG25-75	125 (38.1)	80	4	30	2
FFRG15-75	FFRG25-75	150 (45.7)	100	6	40	2



MEASURING HEATING CABLE LENGTH FOR ROOF & GUTTER DE-ICING

Use the equation below to calculate heating cable length:
Cable Required for Roof = (RxM) + G + D

(R) roof edge linear length, (M) multiplier from table below, (G) gutter length, (D) downspout length (x2 if heating cable returns back to gutter)

ROOF OVERHANG (EAVE/SOFFIT)	STANDARD ROOF	STANDING SEAM ROOF, 18 IN (45 CM) SEAM	STANDING SEAM ROOF, 24 IN (60 CM) SEAM
None	2.0	2.5	2.0
12 in (30 cm)	2.5	2.8	2.4
24 in (60 cm)	3.0	3.6	2.9
36 in (90 cm)	4.0	4.3	3.6

RECOMMENDED SOLUTIONS FOR EMERGENCY DE-ICING/BACKUP HEATERS

Having versatile, multi-purpose heaters readily available is crucial for quick response during unexpected freeze events or emergency de-icing. Flexible heating tapes are invaluable for rapidly thawing frozen pipes and valves, while enclosure heaters are essential for protecting sensitive electronics and controls from condensation and extreme cold, ensuring critical systems remain operational throughout the winter.

XtremeFLEX® HEATING TAPES WITH ADJUSTABLE THERMOSTAT

It is always a good idea to have a few flexible multi-purpose heaters on hand in the event of an emergency de-icing. XtremeFlex heating tapes with built-in adjustable temperature controls are ideal to prevent freezing or to thaw frozen valves, pipes, and many other objects.

Unlike blow torches or heat guns, these heaters are safe, make direct contact with the object to be heated, and are moisture and chemical resistant. With proper installation of the thermostat, these tapes can be ran unsupervised. These tapes are available in 120V or 240V, in a variety of lengths and widths.

TIPS:

- Have at least one of each size on hand so that you have the correct size when you need it! Shorter lengths are typically used for for valves, bearings, pumps, and actuators. Longer lengths are typically used for pipe runs.
- When estimating heating tape lengths, keep in mind that the heating tape cannot be overlapped upon itself as this will cause damage to the heater.

RECOMMENDED OPTIONS:

- MSTAT-Series: Up to 160°F (71°C)
- HSTAT-Series: Up to 425°F (218°C)

ENCLOSURE HEATERS

BriskHeat Silicone Rubber Enclosure Heaters (TSREH) prevent condensation or freezing of electronics inside enclosures and panels. Available in a variety of configuration options, built with or without built-in thermostat controls. Moisture, chemical, and radiation resistant.

RECOMMENDED OPTION:

- TSREH-Series: Heater vulcanized to an aluminum plate for easy installation.

ADDITIONAL RECOMMENDED SOLUTIONS FOR FREEZE PROTECTION

SPEEDTRACE SELF-REGULATING HEATING CABLE

SpeedTrace heating cables are ideal solutions for easy-to-install pipe freeze protection and safe thawing of metal and plastic pipe & valve assemblies. They may be used on metal and plastic pipes. No temperature control is required although BriskHeat does recommend pairing this with the THERMO-CUBE, a temperature controlled outlet adapter.

The perfect plug-and-play option that is easy to install with choice of pre-assembled plug. These cables are safe to overlap and insulate. Suitable for extreme cold conditions as low as -40°F (-40°C).

RECOMMENDED OPTIONS:

- FFSL-Series: 5 watts/ft (16 watts/m) at 50°F (10°C) self-regulating heating cable.
- FFSL8-Series: 8 watts/ft (26/watts/m) at 50°F (10°C) self-regulating heating cable.

CRANKCASE HEATERS

Designed to protect compressors in cold conditions, crankcase heaters prevent refrigerant migration and condensation into the lubricating oil. By maintaining optimal oil temperature, they ensure proper lubrication at startup, prevent costly damage, and extend the lifespan of HVACR and refrigeration equipment. This heater is moisture-proof, corrosion-resistant, and grounded for safety.

RECOMMENDED OPTION:

- CCH-Series: Band-style crankcase heater, provides flexibility and ease of installation.

HOTBELT™ WRAPAROUND REFRIGERANT JUG WARMER

The BriskHeat HotBelt is a specialized wraparound warmer for refrigerant jugs and small gas cylinders. It enhances cold-weather performance by increasing the vaporization rate and maintaining optimal pressure, leading to faster, more efficient charging of HVACR systems.

RECOMMENDED OPTION:

- HB-Series: The HotBelt series comes with built-in preset thermostats for easy plug-and-play use and are grounded for safety. Safe for use with R-410A, R-407C, R134a, R-22, and more.

GENERAL CHECKLIST

Regularly checking your facility and systems for efficiency and safety before winter is always a good idea. Planning ahead is key to preventing freeze damage and ensuring safety. Below are general checklists to help improve your freeze protection.

Please note these are not all-inclusive, and BriskHeat recommend consulting a trained professional to review your corporate policies and local/national codes prior to implementing your plan.

	GENERAL PREPARATION STEPS	ASSIGNED TO	COMPLETE DATE	SIGN-OFF
SYSTEM & EQUIPMENT READINESS	Clean and functionally test all heating systems. Apply heat to susceptible areas.			
	Inspect, test, and stage portable auxiliary heaters.			
	Surface Heaters (tapes, cables, drum/tote heaters): Inspect condition, verify operation and temperature settings. Test ground-fault protection and replace as needed. *Tip: Check power cords for damaged insulation or loose connections to prevent sparks or injury.*			
WATER & FLUID SYSTEMS	**Main Water Supply:** Identify and test main water supply shut-off valves for each facility. Ensure accessibility for emergency personnel. Apply heat to prone areas.			
	Wet-Pipe Sprinkler System: Inspect for areas prone to freezing and apply heat as needed.			
	Antifreeze Levels: Check and fill antifreeze in cooling systems as necessary.			
	Seasonal Cooling Systems: Drain and remove water unless protected by heating tapes or antifreeze.			
	Water & Air Lines: Inspect and identify all remaining water and air lines subject to freezing. Install appropriate heat and insulation. *Tip: Pay special attention to valves, as they are major choke points prone to damage.*			
HVAC & SPECIALIZED SYSTEMS	**HVAC Controls:** Protect HVAC power and temperature controls from inadvertent deactivation.			
	Cooling Towe Lines (Heat Trace): Inspect, test, and repair heat trace heating cable on cooling tower supply and return lines. Apply heat to susceptible areas.			
	Steam Systems: Perform blowdowns on drip legs, clean strainers, and test temperature sensing devices for control valve/damper actuation. Check steam traps, actuators, and controllers. Verify vacuum breakers are installed and working on all preheat/heating coils exposed to freezing.			
	Ventilation Systems: Test and calibrate all temperature sensing devices; check operation of valves, dampers, linkages, actuators, and controllers.			

GENERAL CHECKLIST, CONT'D

	GENERAL PREPARATION STEPS	ASSIGNED TO	COMPLETE DATE	SIGN-OFF
INSULATION & STRUCTURE	**Insulation:** Inspect insulation on all piping and vessels for damage or exposed areas. Add or replace insulation as needed.			
	Facility Structure: Inspect doors, windows, and exterior walls for cold air infiltration. Repair or insulate to reduce susceptible areas.			
MATERIAL & EQUIPMENT	**Freeze-Susceptible Materials (Storage):** Identify materials prone to freeze damage in outdoor or unheated storage areas. Plan for easy heating/thawing to maintain production.			
	Control Panels & Electronics: Identify control panels and electronics devices susceptible to condensation. Install enclosure heaters to prevent short circuits and corrosion.			
SAFETY & PLANNING	**Icy Conditions (Personal Safety):** Identify slip-risk areas due to ice. Develop a slip prevention plan and apply heat to susceptible areas.			
	Emergency Preparedness: Have a plan to remove temporary de-icing heaters after cold season.			
	HVAC Problem Reporting: Institute a facility-wide awareness plan for reporting suspected HVAC issues during warm weather.			
HAZARDOUS MATERIALS	Ensure that all containers used for hazardous or toxic materials are properly stored, and inspect them for deterioration prior to handling. If containers become brittle (due to the combination of chemical attack, freezing temperatures, and ultraviolet light), they may break when moved.			
	Liquids should not be permitted to remain in unheated process lines during periods when production has been stopped. All lines should be drained and purged to prevent future line breakage due to freezing temperatures.			
	Ensure that piping, tanks, and valves in systems that carry hazardous or toxic substances are properly insulated.			

TESTING & INSPECTION LOG FOR HEATING CABLE

INSTRUCTIONS:

1. **One Sheet Per Circuit:** This inspection form allows for up to five inspections to be compared to an individual circuit.
2. **Maintenance Check Frequency:**
   Freeze Protection Circuits: Prior to the first freeze
   Temperature Maintenance Circuits: At least twice per year

CIRCUIT NUMBER	
HEATER TYPE	
CIRCUIT LENGTH	

PERIODIC INSPECTION RECORD FORM

MAINTENANCE CHECK DATE (MONTH/YEAR)		MM/YY	MM/YY	MM/YY	MM/YY	MM/YY
Visual inspection inside connection box for corrosion, moisture, etc.	Initial					
Damage or cracks (leaks) in insulation seals at valves, hangers, pumps, etc.	Initial					
Heating cable properly connected and grounded; heating cable and connections insulated from connection box.	Initial					
Thermostat checked for moisture, corrosion, setpoint, switch operation, and sensor damage.	Setpoint Initial					
Megger tests performed at power connection with both bus wires disconnected from power wiring.	Reading Initial					
Circuit voltage at power connection.	Reading					
Circuit amperage after 5 minutes.	Reading					
Pipe temperature at time amps were measured.	Reading					
Watts/ft	Watts/Ft. Initial					
All connections, boxes, and thermostats have been resealed.	Initial					
End seals, covered splices, and tees marked on insulation cladding.	Initial					

HEATING CABLE INSULATION RESISTANCE TEST

The insulation resistance test is used to check for damage to extruded jackets. Connections for the megger are made as shown in Figures 1 & 2.

A record should be kept of the readings taken from the time the cable is first installed on the pipe. A history of the insulation resistance reading can be helpful in spotting moisture ingress into the electrical system by seeing a gradual decline in the insulation resistance or physical damage to the heating cable (sharp decline in the insulation resistance). See the previous page for sample record.

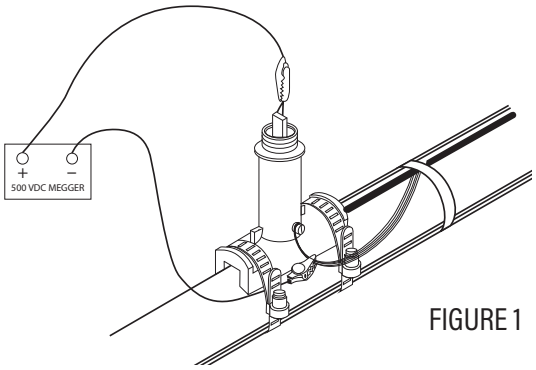


FIGURE 1

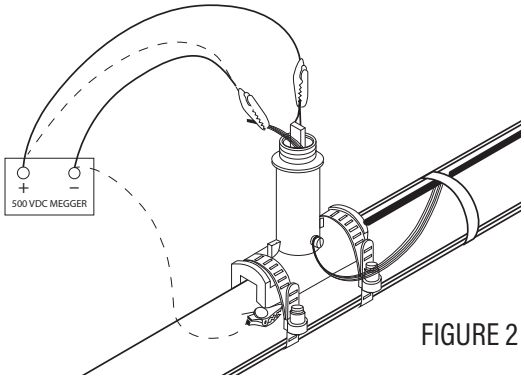


FIGURE 2

FOR HEATING CABLE WITH BRAID

Test from heating cable bus to braid.

Note: Test should use at least a 500 VDC megger. Do not use a megger with an excess of 2500 VDC. Minimum acceptable readings should be 20 megohms per circuit, regardless of length.

FOR HEATING CABLES WITH BRAID & OUTER JACKET

Test A - (solid lines) from heating cable bus wires to braid.

Test B - (dotted lines) from braid to metal pipe.

PIPE LINES & VALVES EXPOSED TO FREEZING CONDITIONS CHECKLIST

Use this checklist to identify the pipe lines and valves that need heat. Your local distributor or BriskHeat will help determine the proper type and amount of heat, insulation, and accessories necessary for your application.

PIPE/VALVE LOCATION WHERE HEAT IS NEEDED	LENGTH OF PIPE OR SIZE OF VALVES WHERE HEAT IS NEEDED	OUTSIDE DIAMETER OF OBJECT TO BE HEATED	TEMPERATURE REQUIRED	AVAILABLE VOLTAGE SUPPLY & CIRCUIT BREAKER SIZE	HAZARDOUS LOCATION? (Y/N) IF YES, CLASSIFICATION?	INSULATION IS NEEDED? (Y/N) INSULATION THICKNESS?

HEATING & FREEZE PROTECTION FOR LARGE TANKS, VESSELS, & HOPPERS CHECKLIST

Use this checklist to identify the tanks, vessels, and hoppers that are predisposed to freezing. Your local distributor or BriskHeat will help recommend exactly how much heat you need to prevent freezing or improve flow, and which style of heater, insulation, and temperature control is right for you.

VESSEL LOCATION (MAKE SPECIAL NOTE IF IT IS IN A HAZARDOUS AREA)	VESSEL TYPE (CYLINDRICAL TANK, RECTANGULAR TANK, HOPPER, ETC.)	VESSEL SIZE	VESSEL OUTER MATERIAL (METAL, PLASTIC, ETC.)	CONTENT STORED IN VESSEL	PROCESS TEMPERATURE	AVAILABLE VOLTAGE SUPPLY & CIRCUIT BREAKER SIZE

PROCUREMENT LISTS FOR FREEZE PROTECTION SOLUTIONS

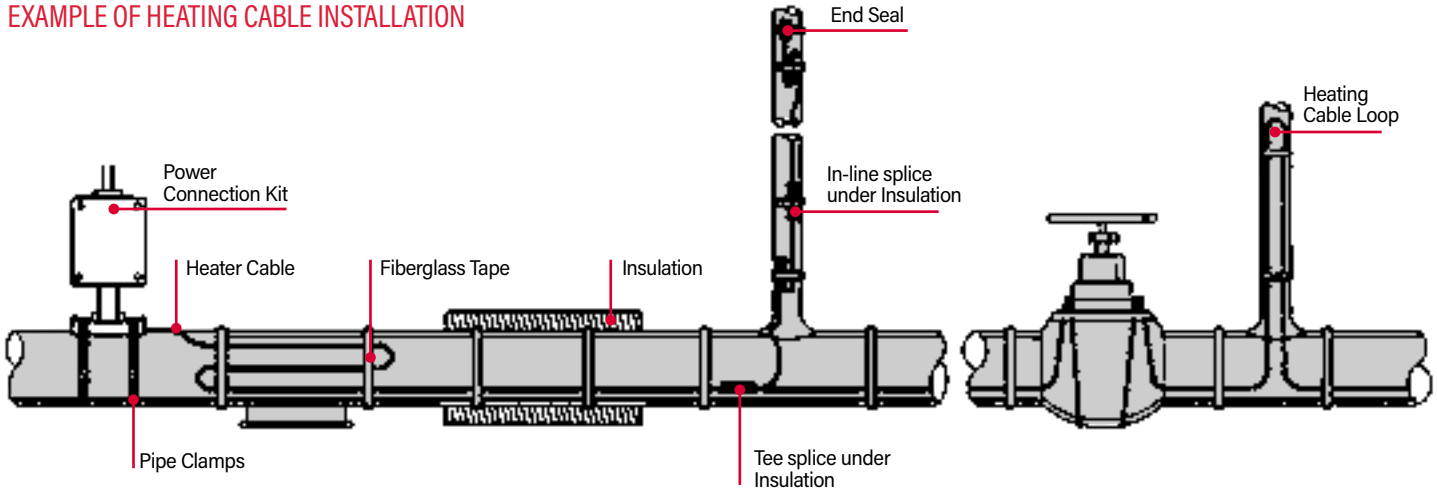
The following tables allow you to track and note freeze protection solutions that are needed to ensure your operations remain in full force during harsh, cold weather.

HEAT TRACE										
Part No.	Watt/Ft.	120/240 VAC	Jacket	50 ft (15 m)	100 ft (30 m)	125 ft (38 m)	250 ft (76 m)	500 ft (152 m)	1000 ft (305 m)	Notes:

PROCUREMENT LISTS FOR FREEZE PROTECTION SOLUTIONS, CONT'D

HEAT TRACE ACCESSORIES			
Part No.	Watt/ft	120/240 VAC	Jacket
PTBS-GET	Power Connection Kit with Multiple Entries		
PET-CA-P	Connection Kit Frog Leg Expansion Piece		
JHE-GET	Low Profile End Seal Kit		
JHS-GET	Low Profile Splice Connection Kit		
JHT-GET	Low Profile Tee Connection Kit		
JHE-LG-GET	LED Monitor Light with End Seal Kit (Green)		
JHE-LR-GET	LED Monitor Light with End Seal Kit (Red)		
SLCBLUC	Connection Kit and End Seal w/o Junction Box		
SLCBLUC-GF	Ground Fault Power Connection Kit with Plug		
SLCBLKC	Heat Shrink End Seal Kit		
SLCBLSK	Heat Shrink Splice or Tee Kit		
AAT260	Aluminum Tape 2 in Wide x 180 ft. (51 mm x 55 m)		

EXAMPLE OF HEATING CABLE INSTALLATION



PROCUREMENT LISTS FOR FREEZE PROTECTION SOLUTIONS, CONT'D

DRUMS/PAILS			
Qty. of Containers that Need Heat	Container Size (Make special note if the container will be in Hazardous Area)	Container Outer Material (Metal, Plastic, etc.)	Available Voltage Supply for Heater (120V or 240V)
	55-Gallon (208 litre) drum/barrels		
	30-Gallon (114 litre) drum/barrels		
	15 & 16-Gallon (57 &60 litre) pails		
	5-Gallon (19 litre) pails		

TIP: For faster heat-up, use multiple silicone rubber band heaters at one time or a full-coverage insulated drum heater.

IBC/TOTE TANKS					
Qty. of Tanks that Need Heat	Tank Height (Not including pallet or support stand)	Tank Length	Tank Width	Tank Outer Material (plastic, metal, etc.)	Available Voltage Supply for Heaters (120V or 240V)

GAS CYLINDERS				
Qty. of Cylinders that Need Heat	Cylinder Diameter	Cylinder Height	Hazardous Location? (Y/N) If Yes, Classification?	Available Voltage Supply for Heater (120V or 240V)

PROCUREMENT LISTS FOR FREEZE PROTECTION SOLUTIONS, CONT'D

	EMERGENCY DE-ICING/BACKUP HEATERS			
	Qty.	Product Description	Part Number (120V)	Part Number (240V)
MSTAT		MSTAT XtremeFLEX® Heating Tape with Adjustable Thermostat Controls up to 160°F (71°C)		
		MSTAT XtremeFLEX® Heating Tape with Adjustable Thermostat Controls up to 160°F (71°C)		
HSTAT		HSTAT XtremeFLEX® Heating Tape with Adjustable Thermostat Controls up to 425°F (218°C)		
		HSTAT XtremeFLEX® Heating Tape with Adjustable Thermostat Controls up to 425°F (218°C)		
TSREH		TSREH Enclosure Heaters		
		TSREH Enclosure Heaters		

	ADDITIONAL SOLUTIONS		
	Qty.	Product Description	Part Number
Crankcase Heaters		Band-Style Crankcase Heaters for HVAC/R Compressor	
		Band-Style Crankcase Heaters for HVAC/R Compressor	
HotBelt		HotBelt™ Wraparound Refrigerant Warmer	
		HotBelt™ Wraparound Refrigerant Warmer	

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