



### How to Minimize Freeze Damage

- Analyze your exposure
- Assess building condition
- Revise heating plan
- Monitor temperatures
- Drain pipes in non-heated areas
- Plan for heating system failure and/or extreme weather

# Minimizing Freeze Damage

Cold weather and freezing conditions represent a significant exposure. If not properly protected against, even minor freeze events like a single broken water pipe can cause extensive damage and business interruption. In addition, an event impacting the fire protection system could leave your facility more susceptible to a severe fire loss.

The type of freeze-related incident you are likely to see depends on your location. In areas where freezing conditions are typical, damage is most commonly caused by changes at a facility such as having open or broken windows, new exterior wall penetrations, not replacing insulation after repairs or changes in the heating plan / system.

In areas where freeze conditions are not typical or even not expected at all, damage can be particularly widespread, based on a lack of awareness of the exposures and lack of emergency planning in the event of an unusual or unexpected freeze event.



Awareness of your site-specific freeze exposure and potential impact to your operations is the first step in proper protection.

### Hazard Analysis / Planning

- Identify equipment, process and piping systems that contain water or other liquids that could freeze. Consideration should also be given to air instrumentation lines where freezing condensation could rupture the line or impact operations.
- Develop a plan to ensure these areas have proper heat, insulation, heat tracing, or that systems are completely drained to reduce potential for freeze damage.

### Building Condition

- Verify building envelope is in good condition, paying particular attention to doors, windows or other exterior openings. Close any unnecessary openings.
- Inspect and make repairs to insulation.
- Inspect roof drainage systems and gutters and keep them free of ice build-up.

### Heating Plan

- Design heating and insulation systems to maintain a minimum of 40°F (4.4°C), including any remote or concealed spaces that have freeze exposure (e.g. attics, concealed spaces and corners).
- Identify any concealed spaces that may contain piping systems that may be more difficult to heat. Consider providing temporary interior openings to allow heat to reach these areas.
- Perform routine maintenance and verify operation of all heating systems.
- Consider heat tracing and insulation on any piping that may be more susceptible to freezing. Any existing heat tracing should be verified to ensure proper working condition.

**NOTE -** *If portable heaters are to be used or provided for emergency response, they should be in good working condition, operated to manufacturer's specifications, have appropriate safety interlocks, be appropriately fueled, and properly ventilated.*

### Monitoring

- Locate thermometers in harder to heat areas containing critical equipment / piping. Consideration should be given to monitoring building temperature if facility is to be left unattended.

### Inadequate / Non-Heated Area –not heated above 40°F (4.4°C)

- Drain all equipment that has water or is susceptible to condensation or freezing. Proper piping pitch and low point drains will be required to ensure complete drainage.

### Supplies / Materials

Inventory emergency supplies including:

- Antifreeze materials.
- Approved portable heaters.
- Tarpaulins for windbreaks.
- Ice control products.

### Emergency Planning

Develop an emergency plan in case of complete power and/ or heat loss or unusually cold conditions, which may have the potential to overtax existing heating plan. Consideration should be given to providing an emergency back-up heating plan and emergency drainage of key equipment and piping.

**A minimum temperature of 40°F (4.4°C) is required in ALL areas subject to freezing. Consideration must be given to the location of the thermostats. If thermostats are located in warmer areas, they may need to be set higher to ensure minimum acceptable temperature is also maintained for all remote or concealed spaces. Thermometers or low temperature detection should be considered to help ensure proper heating in all areas. Infrared imaging can also be used to help identify areas with significant heat loss.**



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