



## FROZEN PIPES

***Pipe freeze is preventable.***

Pipes that are uninsulated or run through unheated spaces such as attics, crawl spaces and soffits are vulnerable to freezing when the temperature drops. When water freezes within piping, it stops water flow. The pipe then will burst downstream of the ice blockage, and between 4 and 8 gallons of water per minute will leave the pipe and flow into the surrounding area. The damage that can result can be catastrophic, with mold mitigation problems persisting for years, but measures can be taken to reduce the risk of pipe freeze.

## Frozen Pipes Safety Alert

### C&F RISK ENGINEERS UNDERSTAND YOUR BUSINESS

Since 1822, Crum & Forster has successfully anticipated what's next. Our insurance policy is our promise to help you - the policyholder - in the event of a loss. It gives you a future benefit that you can count on. But C&F offers something more. Our Risk Engineers can help your operation right now.

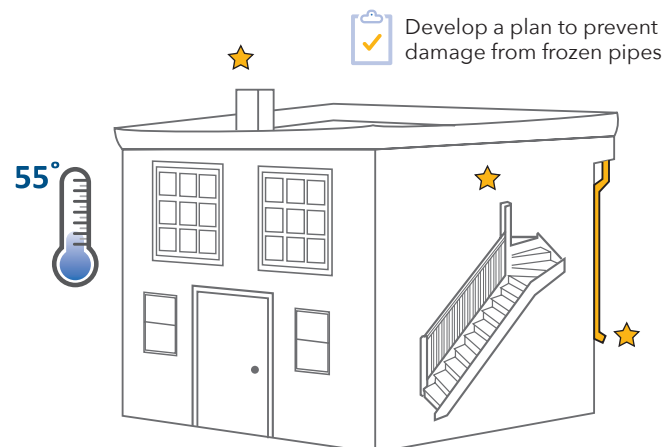
Before you ever encounter a claim, our Risk Engineers can meet you and identify actual and potential loss sources. We'll conduct a thorough study of your company that includes exposures, hazards and accident trends. Together we'll review your current loss prevention efforts, physical location, loss information and other business records to pinpoint fundamental loss causes. Then we'll create an action plan with practical recommendations to strengthen existing safety programs. We can maintain an ongoing review of it to evaluate progress and effectiveness. We can even conduct a legal exposure review of your company's agreements. Everything we do is aimed at putting into place an effective loss control strategy that works consistently over time to lower your operation's risk of loss.

Our highly specialized Risk Engineers are strategically located throughout the country and have the experience, training and professionalism to provide risk management solutions to meet your business needs and contribute to your success. They have on average more than 20 years industry experience, many with roles dedicated to safety and training. And we invest not only in our insureds, but in the industry. We are members of and participate in many state associations and regularly present at industry conventions and events. These connections and experience are invaluable, and are key in assisting you in developing and deploying a modern, up-to-date safety and training program.

Our solutions are both innovative and established. Whether it's Accident Event Recorders (AERs) to help identify vehicle accident causes and tailor safety training, digital tracking systems, or online video training to assure OSHA compliance, we bring you the latest technology. Matched with the experience of our Risk Engineers, your operation benefits from the engineering awareness built over a lifetime and cutting edge safety science.

### Some important steps that should be taken to decrease the risk of pipe freeze include:

- 1 Maintain a building temperature of at least 55 degrees as temperatures less than 55 degrees can expose pipes to the risk of freezing. Many factors can contribute to a building's temperature falling below 55 degrees, including an unplanned power outage, the loss of heating fuel or gas, and early (or late) cold snaps. An awareness of weather and fuel levels can reduce the risk of a building's temperature falling below 55 degrees, and thereby reduce the risk of pipe freeze.
- 2 Take steps to ensure consistent fuel supply. Heating fuel companies can be overburdened during times of peak use. Notification of customer fuel needs during high usage can assist suppliers in making on-time delivery of fuel so that customer facilities are not at risk of losing heat.
- 3 Identify building areas that pose a risk of pipe freeze. Any part of a building that is poorly insulated, poorly heated, or in which there is poor air circulation poses a heightened risk of pipe freeze. Often these spaces are not obvious. An understanding of a building's plumbing layout is just as important as the awareness of "dead spaces" like unheated basements, stairwells, sally ports, utility rooms, attics, and poorly insulated exterior walls. Proximity to heating is essential in avoiding pipe freeze. Commentary to the International Plumbing Code points out that "there must always be a heat source along with an appropriate insulation thickness in order to protect pipes from freezing conditions. Insulation itself (without a heat source) cannot protect a pipe from freezing; insulation only slows the rate of heat loss."



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- 4 Some plumbing fixtures are more vulnerable to freeze than others. Fire suppression systems incorporating sprinkler heads located over exterior doors can be particularly susceptible to freezing. Identify sprinkler heads that are located over exterior doors and ensure that these areas are properly insulated and adequately heated. Unheated spaces frequently feature dry pipe sprinkler systems, and for that reason these systems are usually at acute risk of freeze. Where sprinklers are required in areas that are subject to freezing, International Residential Code (IRC) Section P2904.2.3 requires dry-side wall or dry pendent sprinklers to pass through and extend from an area not subject to freezing on their way to the area be protected by the sprinkler. NFPA 13D contains requirements for insulation methods for protecting sprinkler system piping. Be sure that clapper valves and piping seals operate properly and that the air pressure is properly maintained to prevent water from prematurely entering the piping system. Also determine if the low point drains were properly evacuated after the system's last trip test.

### **Ice Dams**

An ice dam can form when as little as 2 inches of snow accumulates on a roof. It forms when snow melts on roof sections above a poorly insulated attic, and the resulting meltwater travels downward to the cold and uninsulated eaves. There the meltwater infiltrates the area between the roof edge and gutter and refreezes. The resulting ice forms a dam that prevents additional meltwater from leaving the roof, which serves only to increase the size and weight of the ice dam with every refreeze. Ice dams pose a risk of structural damage and mold and mildew contamination because the meltwater near and under the dam may flow under shingles or through small cracks or holes in roof membranes. Checking for and removing ice dams should be included in the routine winter damage prevention inspection, and if poor roof insulation is a culprit, old insulation should be removed and up-to-date insulation should be installed.

### **Snow loading and roof collapse**

Severe winters pose a risk of roof collapse. According to FEMA's "Snow Load Safety Guide" no two snow events are identical. Resulting roof loads depend on factors such as snow type, its fall rate, and whether snow has melted between storms and how much, ambient air temperature and the age and condition of the structures upon which the snow accumulates. Steps that can help to prevent roof collapse and structure damage from snow and ice loading include:

- Avoid roof top equipment and roof projections exceeding two feet in height. Roof appurtenances exceeding two feet in height cause snow drifts to accumulate. This can concentrate snow loads in confined areas of a roof surface.

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- Understand weight characteristics of common snow types and roof load bearing capacity. Understanding some simple rules of thumb can help predict when a roof is in danger of collapse. Ten inches of new snow or three inches of packed snow is equal to five pounds per square foot. The total accumulated weight of two feet of packed snow and two feet of new snow could be as high as 60 lbs per square foot of roof space, which approaches the load bearing capacity of even the best designed roof.
- Develop a Snow Event Response Plan. The plan should assign responsibilities and tasks/roles to key personnel in the event of a significant snow or ice occurrence. The plan should also include measures to ensure worker safety during snow removal work and inspections.
- Conduct a pre-season inspection to identify structural deficiencies and to determine areas where snow drifts may accumulate due to changes in roof height, parapets and roof top equipment. Be sure to identify sky lights and roof vents.

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