

Reducing downtime, one freeze at a time



Close-up of a four-inch ice plug under 200 psi.

A new B.C. company is keeping pipe systems running for longer periods of time. Pipe freezing is usually associated with leaks and water damage, but it is also a specialised procedure carried out to enable repairs to be made to pipe systems. A section of pipe is frozen, using a refrigerant, thus creating a freeze plug within the pipe so that work can be carried out downstream without the need to drain the system. Typically the pipe is frozen, necessary work is carried out and the system is back up and running within a couple of hours.

Draining pipes can result in a number of problems:

- Time needed to drain down
- Large quantities of water and/or chemicals wasted into the city sewer
- Replacing chemicals can be costly
- Time needed to refill the system
- Time needed to purge system of air
- Time may be needed to rebalance old heating/cooling equipment
- During work the facility is without fire protection/heating/cooling/water for an extended period of time
- New leaks and problems may appear when re-pressurizing systems
- Municipalities are increasingly vigilant when it comes to buildings that are draining toxic chemicals into the environment (compliance with by-laws)



Nitro Pipe freeze in progress.

- Need to have access to entire building during refill of system

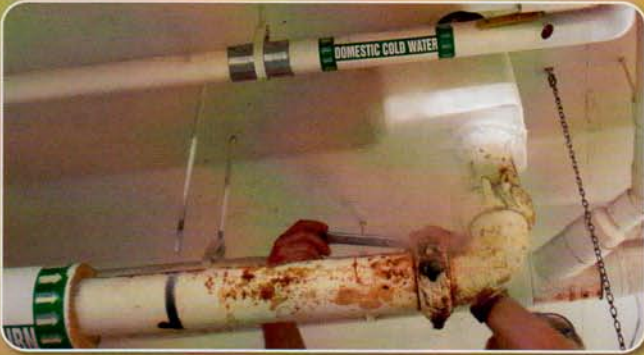
These issues can be almost completely eliminated through the use of pipe freezing. In most cases, the system will be offline for a few hours or less, depending on the size of the pipe. In the case where a branch line can be isolated with a freeze plug (to install a new valve, for example), the main line can be left running with no interruption of service to the building.

"We regularly freeze pipes in shopping malls and large buildings, where there is no disruption of service at all to the rest of the facility," says Matt Farrell of Nitro Pipe Freeze Inc. When the work has been completed, the ice plug is defrosted within minutes and the flow is returned to the system.

This style of pipe freezing is industry-proven and has been used in Europe and around the world for more than 30 years. Utilizing liquid nitrogen, a small section of pipe is frozen to form a de-facto shut-off valve. The ice is stress-free, and with no outward expansion, there is no pressure on the pipe. As a result, even plastic pipes can be isolated in this way.

Other freezing systems are widely used in Canada on smaller pipes using liquid CO₂ or mechanical refrigerant machines. These systems are not effective at isolating pipes over two inches in diameter or pipes of any size containing glycol and other chemicals.

Replacing a Victaulic 90-Chilled water system.



Some of Nitro's clients include:

Vancouver General Hospital; Burnaby School District; YVR; University of British Columbia; Vancouver Community College; Fairmont Hotels; Sheraton Hotels; Vancouver Convention Centre; Eagle Ridge Hospital; Metrotown Mall; Pacific Mall; Oakridge Mall; Richmond Mall; multiple trade contractors (fire protection, HVAC and plumbing) and more.

"Most of the kits on the market can get the pipe down to around -50°C at best. That is not cold enough to handle the larger jobs or pipes containing any additives. Our system gets down to -196°C and we are often asked to freeze lines containing anti-freeze," Farrell says.

"We recently froze several eight- and 10-inch steel pipes at Richmond's Olympic Oval. The calcium chloride solution contained in the pipe protected it down to -25°C," he states.

Many older buildings do not have shut-off valves to individual suites or fixtures or they may be corroded. Nitro can freeze pipes from half-inch diameter up to 12-inch. "Every day brings something new," Farrell says. "We have been asked to freeze everything from ski-jumps at Cypress

Mountain for VANOC during the Games, to dog semen for a veterinary clinic! At the moment, we are just focusing on pipes!"

Matt Farrell is the operator of Nitro Pipe Freeze. A qualified plumber from the U.K., he has been living in Vancouver for four years and started Nitro at the end of 2009. Nitro Pipe Freeze Inc. is based in Yaletown, Vancouver and services the Lower Mainland and British Columbia. For further information, please contact Matt Farrell at Nitro Pipe Freeze Inc.:

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