

Nitrogen Supervisory Gas for Controlling Ice Plugs in Cold Storage Applications

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Cold Storage applications have distinct problems that require designers to provide alternative designs in freezing conditions. The most common and largest concern is the development of ice plugs. Ice plugs are blockages in the piping network caused by trapped water and the addition of condensation from an air compressor. Ice plugs in sprinkler systems can restrict or completely block the flow of water to a sprinkler. In some cases, ice plugs can also damage the pipe and cause leaks.

Traditionally, the use of a regenerative desiccant dryer has been used to combat the addition of condensate. FM Global recommends the dew point of the air be 20°F below the temperature of the freezer. A normal desiccant dryer provides a dew point of -40°F to achieve this requirement. While desiccant dryers are effective, there are some drawbacks to the technology.

The use of a nitrogen generator for controlling ice plugs provides many additional benefits over a desiccant dryer.

- The nitrogen produced by a nitrogen generator has a much lower dew point of -70°F, easily meeting the FM requirements.
- The nitrogen generator offers the benefit of corrosion controller by eliminating the majority of the oxygen and extending the life of the fire sprinkler system on average by 5.3 times that of an air compressor. A dryer does not offer this corrosion resistance.
- The nitrogen generator has less maintenance. For desiccant dryers, not only do the coalescing filters need to be changed annually, but the desiccant needs to be changed every 3 years. This can cost thousands of dollars and is time consuming. The nitrogen membrane, on the other hand, has an expected life of up to 20 years.
- A single desiccant dryer is not recommended to feed more than 3 sprinkler systems; a nitrogen generator system does not have this limitation.
- A desiccant dryer requires the contractor to open the inspection port and allow the system to run for 24 hours to remove the wet air. The purge process on a nitrogen generator can be completely automatic.
- The Potter IntelliPurge® purging device constantly monitors the purity of the nitrogen gas, ensuring that ice plugs are not forming. It can even send an alert if the purity drops.

In summary, the use of a nitrogen generator to prevent ice plugs in freezer applications offers significant benefits over the traditional use of a desiccant dryer.