



Alfa Laval preserves future crop diversity

AlfaCubic air heat exchangers keep the cold

Case story

Freezing a mountain on the Arctic island of Svalbard may seem like a contradiction in terms. But that is exactly what needed to be done to ensure the survival of millions of seeds stored for posterity at the Svalbard Global Seed Vault.

Making cold even colder

Sometimes nicknamed the 'Doomsday Vault,' the Global Seed Vault is the biggest repository of seeds in the world situated 100 meters into a mountain outside Svalbard's capital Longyearbyen.

While Svalbard is an Arctic wilderness of grand proportions, it still isn't cold enough to preserve seeds for up to 1,000 years. But it is one of the coldest places that can be made even colder with the right technology.

The permafrost on Svalbard has an average temperature of -4 degrees Celsius. But a stable temperature of -18 degrees inside the Seed Vault was necessary to secure the seeds' long-term survival.

To ensure this optimum temperature, a cooling solution was supplied by Brødrene Dahl AS from Tromsø, Norway and installed by Spitzbergen VVS under contract from the Norwegian government.

AlfaCubic in the ceiling

Like an insurance policy, the Global Seed Vault preserves and protects the world's crop diversity should natural catastrophe, war or environmental damage occur. So the reliability of the equipment was of utmost importance.



Photo: Mari Tefre/Global Crop Diversity Trust

Stored for posterity. The Global Seed Vault.

The solution involves two small Alfa Laval AlfaCubic units (BL402B7) hanging from the ceiling of the seed vault, and two additional bigger units (BL503B7) that sit on the floor and act as backup. In total, the coolers have a capacity of 55 kW and use brine as a coolant.

"Our job was basically to freeze a mountain," says Jan Kristiansen at Brødrene Dahl A/S, "in order to bring down the humidity from 50 percent down to 20 percent. When we started it was basically raining inside the vault. By now we have probably frozen two meters of rock around the vault."

Fast facts:

The customer: Brødrene Dahl A/S

- Established 1917 and is today Norway's biggest piping wholesaler for many industries.
- 1,000 employees
- Sales: NOK 5.5 billion
- In the spring of 2004, Brødrene Dahl AS was bought by the French conglomerate Saint Gobain.

Challenge:

- Freeze a mountain on Svalbard down to -18 degrees Celsius to preserve seeds.

Solution:

- Four AlfaCubic, high performance cooler units with superior heat transfer values.



Photo: Mari Tefre/Global Crop Diversity Trust

Reliability of the equipment was of utmost importance.

“Given the extreme Arctic conditions, we needed high-quality products with optimal functionality,” says Kristiansen. “This is the first solution that we have worked with that was to be installed and operated inside a mountain, which in itself places special demands on the products.

That is why we opted for Alfa Laval. In addition to the products, they were also able to exceed our expectations when it came to technical support like calculation software and documentation. Competitors didn’t have half of that.”

A step ahead

Alfa Laval's equipment had very efficient cooling surface and heat transfer capabilities. Availability and the ability to meet tight deadlines were also important factors when choosing supplier.

“Alfa Laval equipment fulfilled all of our technical specifications for the Seed Vault,” says Kristiansen. “Their documentation is fantastic.”

Brødrene Dahl's Seed Vault deal with Alfa Laval was followed by another big project to supply coolers and heat exchangers to a solar power panel producer in western Norway.



Photo: Mari Tefre/Global Crop Diversity Trust

About the AlfaCubic:

The air heat exchanger at the core of the AlfaCubic cooler units consists of tubes fitted with special corrugated fins. These significantly increase the turbulence in the flow of air that passes between the tubes. This in turn increases the heat transfer area, and results in greater efficiency.

The cooling fluid passes through the tubes and cools the air passing over them. The tubes are grooved to increase turbulence in the refrigerant flow, which makes heat transfer even more efficient as well as reducing any likelihood of clogging. It also means that only a relatively small refrigerant charge is needed to achieve any specific cooling effect.



Mari Tefre/Global Crop Diversity Trust

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How to contact Alfa Laval

Up-to-date Alfa Laval contact details for all countries are always available on our website at www.alfalaval.com.