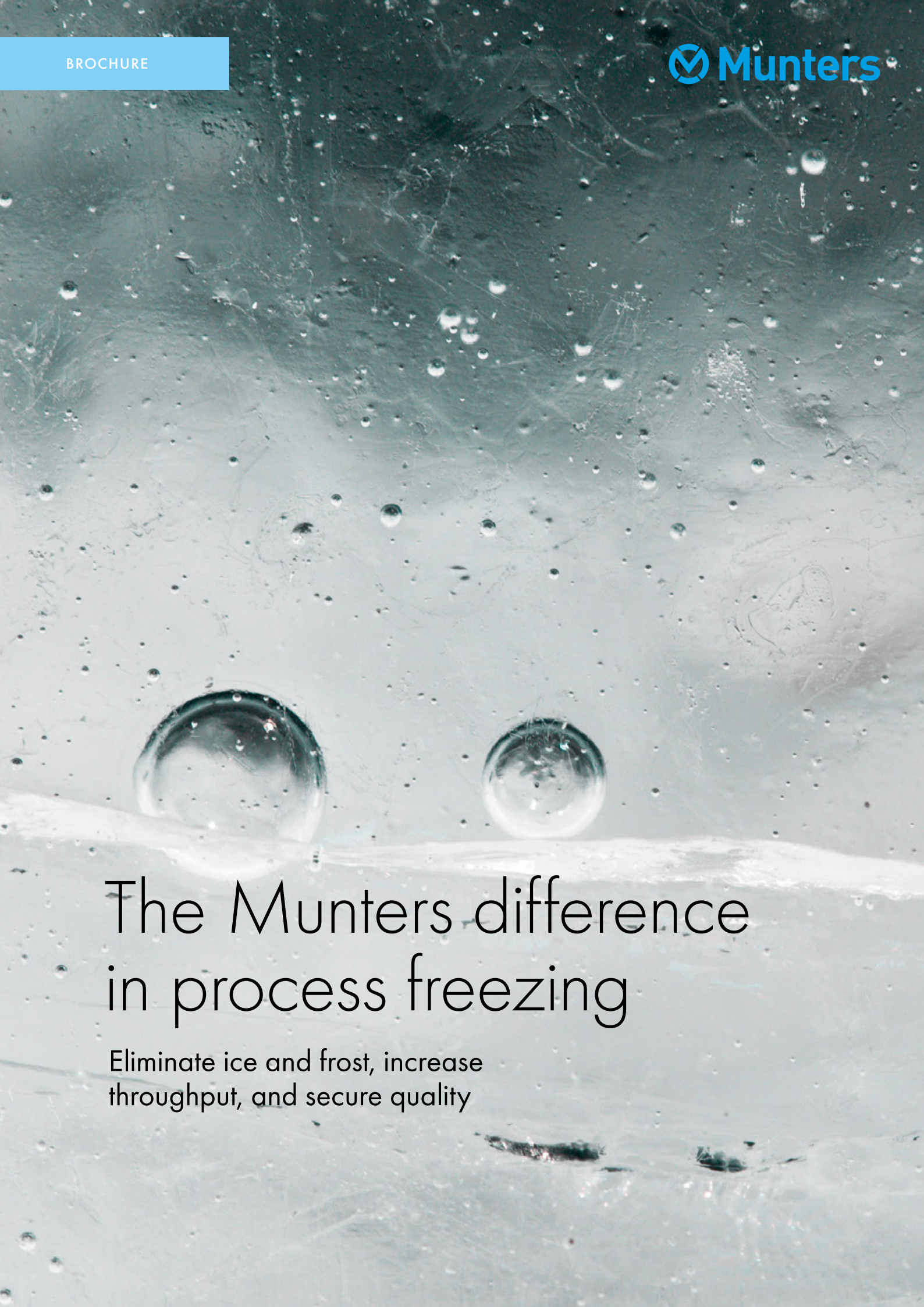
BROCHURE

Munters



The Munters difference in process freezing

Eliminate ice and frost, increase throughput, and secure quality

Humidity control helps optimize process

High volume, round-the-clock, fast-paced production systems are the norm when it comes to process freezing operations. But uncontrolled humidity in food production facilities can lead to expensive downtime when evaporators need to be defrosted and ice must be removed from conveyors, floors, and walls.

Desiccant dehumidification removes moisture from the air before it can form into frost and ice on equipment. With ice build-up and defrost cycles significantly reduced, process freezing operations can run smoothly at maximum capacity – throughout the entire year.

Desiccant dehumidification for blast and spiral freezers

A blast or spiral freezer is a critical component in most frozen food production processes. One of the greatest challenges manufacturers face is frost build-up in freezer units and evaporator coils. But when a Munters desiccant dehumidification system delivers dry air to blast and spiral freezers manufacturers get the following benefits:

- Improved freezer cooling performance – less or no ice or frost means less or no defrost cycles.
- Higher cooling capacity – frost-free evaporator coils offer consistent and better product flow through the freezer since cooling coils are more efficient.
- Better product quality – frost-free freezer inlets, outlets, and conveyors will not damage product and conveyors don´t malfunction due to frost build-up.
- Improved productivity – staff don´t have to manually remove frost and there´s no longer a need for total defrost shutdowns
- Significantly reduced staff injuries - falls and slips are no longer a worry since there´s no more frost or ice.

Munters MX2

Munters DSS Pro

Moisture infiltration and dew point control

The two most important factors in food freezer design are moisture infiltration and control dew point.

If the installation is already in place, the designer must simply take surface temperature readings on the walls, floor, and conveyor supports to ensure ice formation is kept to a minimum. The control dew point will be slightly below that surface temperature.

Sometimes temperatures are so low that it wouldn´t be practical to maintain a dew point low enough to prevent all ice formation. It may be necessary to determine what temperature makes the most economic sense and accept minimal ice formation.

The lower the dew point, the more efficient the refrigeration system becomes, which means less frost on ceilings and conveyors. By removing moisture at its source – before entering the cold space – the system operates more efficiently.

Determine moisture loads

Moisture loads come from air getting by doors and conveyor openings, and product evaporation.

Infiltration air – Factory or outdoor air entering the space has the highest moisture load. Air enters when a door is opened, or continuously flows through openings around conveyors. No matter how it gets in, it´s important to reduce this load to a minimum with entry tunnels and vestibules. Any door openings inside the freezer should also be kept to a minimum.

Product moisture – Product water vapor is easy to calculate by simply weighing the product entering and exiting the freezer. The difference in weight is largely moisture. If the product is wrapped before freezing, this load will be close to zero.

The Munters Solution

Munters dehumidifiers have a desiccant wheel that rotates slowly between two primary airstreams, process, and reactivation. In the process airstream water vapor is removed as it passes through the desiccant wheel. This dehumidified air is then delivered to a manufacturing process or space. The wheel then rotates into the reactivation sector where a heated airstream is passed through the wheel. The desiccant wheel releases the water vapor to this airstream.

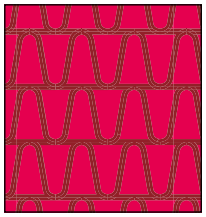
The desiccant process becomes more efficient as air temperature decreases. Munters dehumidification solutions can produce air dew points of -34°C and lower so you can have dry, wintertime moisture conditions, even in the summer.

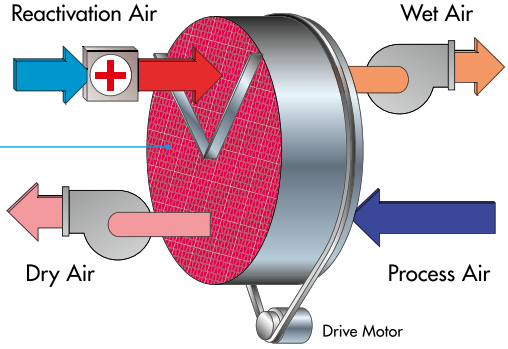
Since the Munters dehumidification unit removes moisture from the air to levels below the evaporator's temperature, moisture no longer freezes on cold surfaces and refrigeration equipment operates more efficiently, with fewer evaporator defrost cycles, fewer conveyor jams due to ice build-up and safer, less slippery floors.

Munters has spent decades improving and optimizing the desiccant dehumidification process including patenting technologies like PowerPurge®, which reduces energy consumption by up to 30%.

Munters Honeycombe® Wheel Technology

Patented HoneyCombe® wheel design provides a vast surface area for desiccant





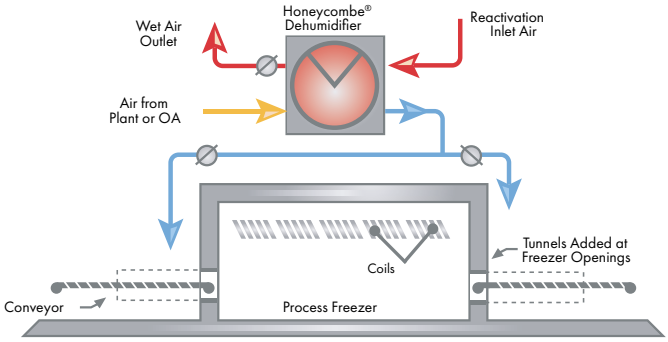


Figure 1. Makeup air system with tunnels

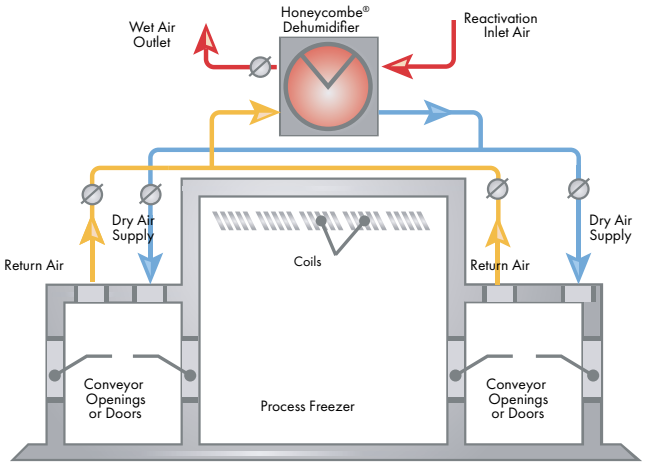


Figure 2. Air system with vestibule

Process freezer types

No vestibule *(figure 1)* – Usually a spiral freezer or blast freezer is built without a vestibule. While vestibules are often impossible to install, due to lack of space, conveyor tunnels help mitigate icing inside the freezer.

Air is taken from the ambient plant (or outside air if the plant has negative pressure), processed through the dehumidifier and supplied to the conveyor tunnels. This air should be enough to maintain a minimum of 0.508 m/s air velocity for the conveyor openings.

Vestibule system *(figure 2)* – The vestibule system may be all that´s needed to minimize moisture in the process freezer if space allows. It´s low cost and simple to install.

Air is taken from the vestibule, processed through the dehumidifier and returned to the vestibule area, just in front of the freezer conveyor entrance. The only air that gets into the freezer is dry air with a moisture level below the temperature of the evaporators. The dehumidifier can be switched on by a conde nsation controller, set to maintain the air at a specific dew point.

Conventional systems can´t remove moisture efficiently

Process freezing systems are designed to remove sensible heat from a product rapidly and efficiently. However, they are not designed to efficiently remove latent heat/moisture from the air inside the freezing chamber.

While cooling coils can be automatically defrosted, ice on conveyors and floors must be manually removed, causing production to slow down or stop. Coil defrosting also adds a heat load to the freezer and puts the coil offline, which reduces the freeze´s ability to keep temperatures cold.

The cooling capacity of the evaporator coil is also significantly reduced since the coil builds up frost, so product cooling is reduced. This means that product cooling rates can vary with coil frost, yielding uneven production quality and throughput. For some freezers, defrost cycles causes production to stop or slow down, causing expensive and unnecessary delays.

To reduce icing, the moisture in the air must be reduced. Refrigeration systems lack the cooling capacity to produce low air dew points when humidity is high. The coils freeze with condensed moisture before a low dew point can be achieved. And when you use an evaporator coil to remove moisture, it discharges air at saturation, which means that it cannot absorb any additional product or infiltration moisture.

Munters Services – With you all the way

With Munters as your service partner, your air treatment equipment will receive the attention, care and maintenance needed to reach its maximum life expectancy. Throughout each phase of the equipment life cycle, the knowledge and expertise of Munters Services will insure optimal operation, minimum energy consumption, and extension of the life of your investment.

Our range of services available through our global network of Munters Services Engineers and Technicians include:

- Comprehensive installation and start-up services
- PrimaCaire™ (extended warranty) agreement
- Flexible ServiceCaire™ maintenance agreements to fit your specific needs
- Performance checks and optimization
- Numerous upgrade options for substantial energy savings and improved performance

Being a global provider of air treatment solutions means our product and service portfolio may vary depending on climate conditions, regional demand, applications and industries.

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