

Better, faster, longer lasting:
Quality and productivity in confectionery
production



Dry air for confectionery products

Confectionery products are sensitive products: hard candies, biscuits, chocolates, jellied items, sugar coated drops or tablets, sugar and popcorn often lose quality and shelf life when they come into contact with air humidity that is too high. They can stick together, become moldy and break apart. Machines and pipes become clogged and production, transport and storage are impeded. This is a cost and time-intensive situation that can be avoided.

Solution: Munters Dehumidification
The most effective way to protect raw materials and products during production, storage and transport is to control environmental conditions. The central element is the continuous regulation

and monitoring of air humidity during all production processes, from raw material to end product and at every time of the day and season of the year. For this reason, Munters offers its clients custom-designed air dehumidification solutions for every single area of production. Whether silo or production facility, warehouse or transport, air humidity is consistently and precisely coordinated with the product and the situation. This coordination not only secures high product quality and long shelf life but also ensures considerable cost savings and production increases.

High quality, long shelf life and appetizing product appearance guarantee client satisfaction and thereby client loyalty.

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Secure transport of raw materials, dry storage

Raw materials: Transport and silo storage



Products	Situation	Solution
<p>Hygroscopic (products that absorb moisture) bulk solids such as:</p> <ul style="list-style-type: none"> • Sugar • Flour • Cocoa powder • Starches • Powdered milk • Fruit powder • etc. <p>as well as</p> <ul style="list-style-type: none"> • Starch syrup (glucose) • etc. 	<p>Transport and storage of sensitive raw materials</p> <p>Dampening of products through transport system air</p> <p>Transport of high air humidity with product into the silo</p> <p>Danger of condensation on silo walls due to:</p> <ul style="list-style-type: none"> • Air introduced through transport air • Emissions from product dampness • Influx of 'breathing air' via ventilation upon emptying • Consequences of condensation of air humidity upon cooling (e.g. at night) • Product clumping / caking • Propagation (of infectious micro-organisms) at increased temperatures • No complete emptying possible • Pourability is lost 	<p>Pre-drying of transport system air upon storage</p> <p>Silo header dehumidification via the transport line</p> <p>Circulating air dehumidification (glucose silo) in the silo header</p> <p>Transport for subsequent processing in dry air</p>

Benefits
<ul style="list-style-type: none"> • Dry, pourable product • Product quality remains intact • Clean silos • Less difficult, faster transport • Reduced cleaning requirements, therefore reduced costs • Hygienic storage and transport

Increased Productivity and Quality

Process system area: Cooling tunnel



Products

Chocolate items such as:

- Pralines
- Chocolate biscuits

Hard candies

Hard cream candies

etc.

Situation

Cooling warm products until crystallized / solidified (e.g. chocolate or coatings) by means of cold air

From condensation freezing on the cold cooling components through the influx of humid ambient air. A decrease in available cooling performance is the consequence.

Condensation on the product while in the tunnel and after exiting the tunnel causes insufficient crystallization of the chocolate and thereby:

- Spotted product surface (sugar dissolves proportionately)
- Decrease of product quality with high level of waste
- High defrosting intervals
- High cleaning requirements

Solution

Partial pre-drying of cooling air with pressurized air in section below the dew point of the cooling components

Keeping cold product dry by dehumidifying the ambient air below the product dew point

Benefits

- Consistent, lasting high quality in every season
- Year-round continuous production
- Better surface quality
- Consistent cooling performance
- Longer cooling cycle
- Increased productivity, higher throughput through lower cooling temperatures
- Significantly less waste
- Shorter tunnel is possible, thereby lower investment costs
- Reduced cleaning costs
- Hygienic production conditions without micro-organism growth

Process system area: Tablet pan



Products

All hygroscopic materials with sugar, such as:

- Chocolate centers
- Chewing gum
- Chocolate coating with filling
- etc.

Situation

Coating the product

If the ambient air is too humid, an even coating is impossible.

Temperature-sensitive products must be coated cool.

If the relative humidity is too high:

- Product quality suffers
- Coating takes too long
- Product does not harden quickly enough
- Surface dissolves and the product can stick
- Coating can crack

Solution

Pre-drying the coating supply air

Benefits

- Year-round continuous production
- Consistently high product quality
- Higher productivity
- Shorter coating times and thereby lower investment requirements
- Products are 'pourable' and evenly hardened
- Less waste

Increased Productivity and Quality

Process system area: Drying chamber / tunnel



Products	Situation	Solution	Benefits
Jellied items Gumdrops Etc.	Drying the product Problems through air humidity that is too high: <ul style="list-style-type: none"> • Products do not dry evenly • Karyolymph (inherent humidity) cannot move from the jelly item to the surface (skin formation) • Corn starch absorbs additional humidity from the ambient air • Product does not develop a smooth surface if the powdered starch (corn starch) is not dry 	Proportionate pre-drying of the circulating air before injecting into the drying range Even circulation of drying air	<ul style="list-style-type: none"> • Year-round continuous production • Higher product throughput • Consistent high product quality in every season of the year • Shorter drying times • Clean separation of product and powdered starch • Additional drying of powdered starch can be omitted • Cost reduction through reuse of dry powdered starch • Fewer cleaning requirements

Process system area: Pralines



Products	Situation	Solution	Benefits
Pralines	Manufacture of chocolate coatings e.g. with cooled stamp stencils Condensation and ice formation on stamps, through which: <ul style="list-style-type: none"> • Chocolate cannot crystallize evenly • Product sticks to the stamp • Uneven casing thinness • Decreased quality • Higher cleaning requirements • Lowered throughput 	Product shaping in dry air with a dew point below the stamp temperature Dry air veil over the work area of the machine	<ul style="list-style-type: none"> • Year-round continuous production • Consistently high product quality in every season of the year • High productivity • Smooth product surface • Consistent color without spots • Clean stamp • Fewer cleaning requirements

Optimizing finishing processes

Process system area: Packaging



Products	Situation	Solution	Benefits
<p>All sweets such as:</p> <ul style="list-style-type: none"> • Pralines • Biscuits • Hard candies • Lollipops • Popcorn • Etc. 	<p>Packaging in bags, sachets or individual wrappers</p> <p>Dissolution of the surface due to air humidity that is too high; products stick to each other and/or to the packaging, thereby:</p> <ul style="list-style-type: none"> • Reduced pourability with 'clumping' • More difficult removal from the packaging / wrapper • Product clings to the packaging machinery • Increased cleaning requirements • Lowered throughput • Increased waste 	<p>Dehumidification of the ambient air (entire space) or development of a dry air veil over the packaging area of each individual machine.</p>	<ul style="list-style-type: none"> • Year-round continuous production • High quality is ensured • Longer product shelf life • Easy removal of dry products from the packaging • Clean machines • Higher throughput

Secure product storage

Storage Area: Cooling Space < 10°C



Products	Situation	Solution	Benefits
<p>Raw materials</p> <p>Half finished products</p> <p>Finished products</p> <p>Seasonal items (e.g. Easter, Christmas)</p>	<p>Constant storage temperature and storage humidity (RH) in every season of the year</p> <p>Results of fluctuating temperature and humidity values:</p> <ul style="list-style-type: none"> • Products can melt (and melt together) • Color change on the surface (appearance) • Crystalline structure can change • No optimal usage of air conditioning in winter (no dehumidification) • Higher energy expenditure 	<p>Parallel operation of an air dehumidifier, separate from temperature control</p> <p>Proportionate pre-drying of the ambient air before it enters the central air conditioning unit</p>	<ul style="list-style-type: none"> • High value product quality is ensured • Long shelf life, good appearance • Dry cooling components without white frost build-up • Optimum usage of installed cooling performance • Lower energy costs for the cooling system • Reduced service and maintenance costs

Secure product storage

Storage Area: Deep Freeze Storage, appr. -20°C



Products	Situation	Solution	Benefits
<p>Ice cream</p> <p>Ice cream-based and/or chilled confectionery</p> <p>Etc.</p>	<p>Storage of deep frozen products under constant conditions</p> <p>With penetration from moist ambient air and outside air, as well as product moisture from packaging, the result is white frost or ice formation:</p> <ul style="list-style-type: none"> • on the product • on the cooling components • on the floor • on doors and curtains • on automatic transport units • on electronic production management systems 	<p>Dehumidify the air</p> <ul style="list-style-type: none"> • in the anteroom • in the vents • in the cooling room • as an air veil in the gate area 	<ul style="list-style-type: none"> • White frost-free products (quality assurance) • Secure registration (barcode) • Strong and stable packaging • White frost-free transport units • Disturbance-free electronic production management systems • Ice-free and functional doors and curtains • Ice-free cooling components • Fewer defrosting intervals • Fewer cleaning requirements • More energy for cooling • Higher accident protection

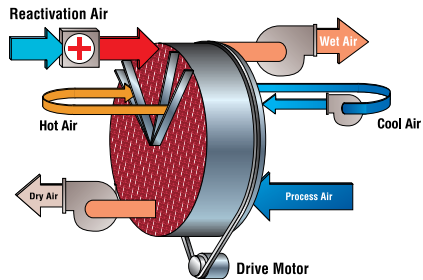
Air dehumidification the Munters way

To ensure disturbance-free production during the entire year Munters has developed solutions for all production areas, from single machines to complete air dehumidification systems.

sorption rotor: the process air to be dehumidified flows through the rotor and then leaves the dehumidifier as dry air. In the reactivation section ambient air is heated and passed through the rotor to remove the moisture absorbed in the process side of the desiccant rotor. A third recirculating airstream called PowerPurge™ is used to reduce energy requirements and improve desiccant performance.

Sorption and desorption follow each other continuously, so that dry air is always available for production and always with consistent quality, independent of current ambient air conditions.

Sorption air dehumidifiers work at every temperature without freezing problems.



Central to the generation of dry air is the adsorption rotor, developed by Munters. Two completely separate air streams are guided through this ad-

Even at low temperatures, the sorption system achieves very high dehumidification performance and costs less to power than any other technology.

The use of Munters air dehumidification systems prevents quality losses and production disturbances caused by high air humidity in the entire production area.

Our competence is your advantage!

Control of the relative and absolute air humidity for efficient and secure environmental conditions:

- For transport and storage of sensitive raw materials and products
- In the most diverse production processes
- In cool and deep-freeze facilities

- All the way through the phases of production to the storage of end products

Contact us – we will be happy to advise you!



Munters has developed individually conceptualized solutions for all production areas, from single machines to complete air dehumidification systems, in order to ensure disturbance-free production during the entire year.

Munters is the world leader in humidity control with services and products for dehumidification, water and fire damage restoration, humidification and air cooling. Customers are served in a wide range of segments including food, pharmaceutical, insurance, utilities, and electronics industries. Manufacturing and sales are carried out via the Group's own companies in 30 countries. The Group has approximately 3,900 employees and net sales of USD 830 million. The Munters share is listed in the MidCap segment on the OMX Nordic Exchange. For more information see www.munters.us.



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