

# INDUSTRY & APPLICATION GUIDE



APPLICATIONS



INDUSTRIES



PRODUCTS



Your Perfect Climate

# CPD SEMINARS FOR DEHUMIDIFICATION



## CONTINUED PROFESSIONAL DEVELOPMENT (CPD)

Munters CPD seminar gives a comprehensive introduction to humidity theory and dehumidification. Learn about the impact of moisture, combatting seasonal fluctuations and how to achieve the most cost-effective and energy efficient climate control solution for you or your customer.



## SEMINAR CONTENT

Held at the delegates own premises, the seminar lasts approx 1 hour and covers the following areas:

- Dehumidification theory
- Methods of dehumidification and its benefits
- Introduction to the psychrometric chart
- Energy saving technology and applications
- Dehumidification in industry



## FORMAT & BOOKING

Suitable for consultants, architects, specifiers, installers, & industry professionals alike, this 1 hour seminar is approved by the Chartered Institute of Building Services Engineers (CIBSE) and is equivalent to 1 hour of CPD learning. Delivered by Munters expert engineers and held at participants' own premises, it will even include a FREE LUNCH!

## BOOK YOUR SEMINAR TODAY!

01480 432243 [info@munters.co.uk](mailto:info@munters.co.uk) [munters.com/ukseminars](http://munters.com/ukseminars)



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## APPLICATIONS

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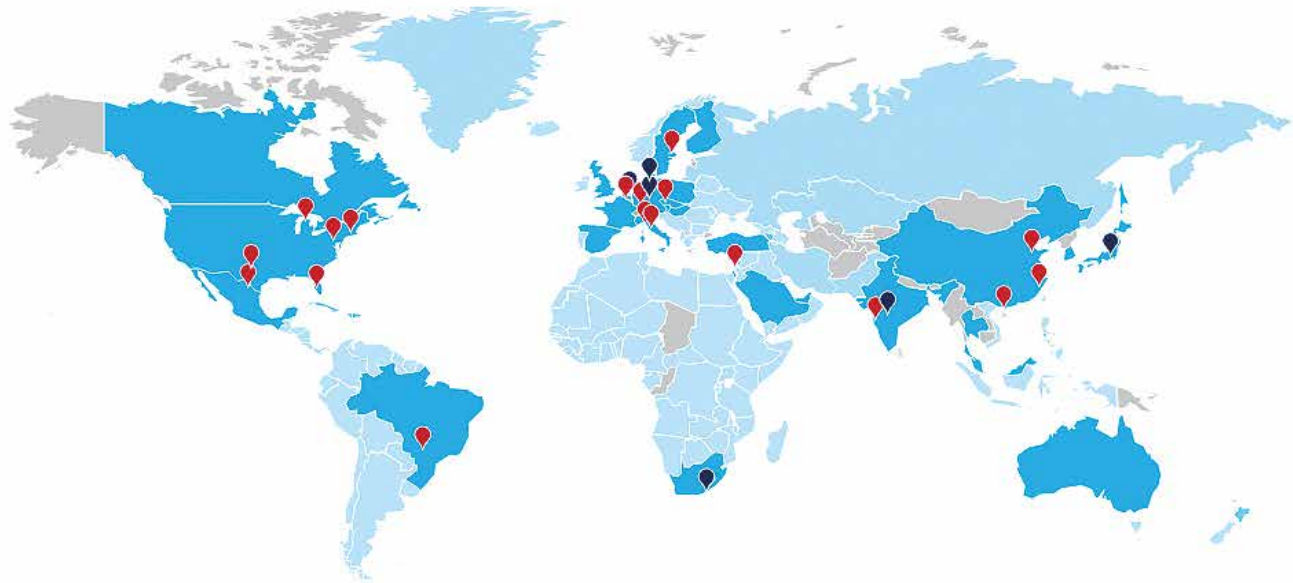
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# The world's climate control experts



Manufacturing plants: 18



Logistic and assembly hubs: 6



Sales and service offices: 55



Countries covered remotely by  
Munters or by partners: ~ 60

Headquarters:

Brentford, UK and Kista, Sweden



## ABOUT MUNTERS

Munters is a global leader in energy efficient climate control solutions. Using innovative technologies, Munters creates the perfect climate for customers in a wide range of industries, the largest being the food, pharmaceutical and data centre sectors. Munters has been defining the future of air treatment since 1955.

### VISION

Your Perfect Climate

### MISSION

Munters' mission is to be a globally leading supplier of energy efficient solutions for air treatment and climate control technologies.

### GO FIGURE

- 60+ Years of innovation
- 7 billion SEK in annual Net Sales
- 3,900 Employees (including temporary workers)
- 18 Manufacturing plants
- 6 Logistics and assembly hubs
- 55 Offices in more than 30 countries



## YOUR PERFECT CLIMATE FOR ENERGY EFFICIENCY

Munters constantly innovates bringing you more energy-efficient solutions and services that enhance your company's environmental profile and profitability.

Controlled, predictable and consistent humidity and temperature has immense commercial implications for our clients. In a wide range of industries and applications, we provide stable environments with a lower overall energy consumption compared to other technologies. Extended life expectancy of equipment and assets reduces both total cost of ownership for our clients as well as carbon footprint for the environment.

- ENERGY SAVINGS

With Munters energy-efficient solutions, **data centres** realise energy savings of up to 65%

- CUT ENERGY CONSUMPTION

Energy-efficient refrigerated display cases in **supermarkets** cut energy consumption by up to 40%

- ENERGY SAVINGS

A major **pharmaceutical** company reduces energy consumption for antibiotics production by 25%



## DRIVING FORCES

Munters benefits from a number of global driving forces and trends from energy and resource efficiency to increased digitalisation.

- Energy and Resource Efficiency  
On the whole, Munters has the most energy-efficient solutions on the market
- Sustainability – an integrated part of our business  
Munters offers solutions that in general strengthen our customers' sustainability profile
- Strict Regulations  
Munters has many solutions to meet customers' needs for complying with new regulations
- Strict Requirements for Production Environments  
Munters offers exact control of climate, which meets our customers' requirements for better control of their environment
- Increased digitalisation  
Munters benefits from digitalisation through increased demand in certain customer segments but also by being able to strengthen our offering using digital solutions





## GLOBAL SERVICE SOLUTIONS

Munters Global Service is dedicated to helping our customers optimise the value of their equipment through planned maintenance and upgrade programs.

Drawing from over 60 years of experience, Munters has developed customisable service programs that extend the life of your equipment, optimise its performance, and ensure continuous operation while saving energy.

- Installation Support & Assembly Supervision
- Startup Services & Guaranteed Performance
- Maintenance, PrimaCaire® and ServiceCaire®
- Performance Test & Inspection
- Reconditioning and Repairs
- Training Services
- Spare Parts
- Upgrades including EC Plug Fans
- Rental Solutions



EC Plug Fan for AHU's  
& dehumidifiers



# APPLICATIONS

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## APPLICATIONS: How to prevent/reduce



### Bacterial growth/mould/fungus

Moist air which is laden with bacteria can increase the potential for contamination in production and storage. Having a Relative Humidity level too high is the cause of many problems in our daily life. There are many kinds of mould and they grow at different humidity levels, but once conditions reach 70% there is a rapid increase in growth.

From raw materials, production, packaging through transport and storage. All products and buildings are affected by high relative humidity. By controlling this using dehumidification, the product's lifetime and quality can be significantly improved.

### Proven applications

- Museums and libraries
- Archives
- Leisure



### Chemical reaction

Moisture or water vapour is one of the components which can cause an undesired chemical reaction.

For instance, Lithium (used in the production of Lithium batteries) will react violently with water vapour. This is why production of Lithium batteries can only be done in an extremely dry (dehumidified) area.

Also explosives and propellants are known to be sensitive to chemical reactions with moisture. Controlling humidity using dehumidification will prevent undesired reactions might lead to an unstable product (danger of explosion) or the forming of unwanted and dangerous chemical compounds (for instance hydrogen gas).

### Proven applications

- Ammunition storage
- Manufacture of lithium batteries
- Semi-conductors
- Film storage

## APPLICATIONS: How to prevent/reduce



### Condensation

When water evaporates it becomes water vapour. When this comes into contact with cool surfaces, condensation forms and could drip onto walls, ceilings and products. As moist air condenses onto surfaces the potential for product contamination increases and a decrease in safety and quality occurs.

Dehumidification systems create low humidity atmospheres to prevent this contamination and to reduce the medium for mould and microbe formation. Using a Munters condensation control dehumidifier means decreased product spoilage, a reduction in corrosion and building fabric deterioration.

### Proven applications

- Cold & chill stores
- Free flowing powders
- Food processing
- Pharmaceutical processing
- Ice rinks and sports halls
- Water treatment works



### Corrosion

Corrosion, or the oxidation of metal, is heavily influenced by the presence of moisture in the air. A high relative humidity causes a thin layer of water vapor molecules to settle on the surface of the metal.

Dehumidification can lower relative humidity to 45-50% without any problem, stopping corrosion. This will dramatically reduce damage and maintenance costs.

Dehumidification techniques to prevent corrosion are used in many ways, such as protection of defence equipment, bridge construction, electronic and semi-conductor manufacturing, for the storage of parts in the automotive industry and in water works.

### Proven applications

- Museums & Archives
- Steel storage
- Military equipment & vehicles
- Leisure
- Suspension bridges
- Water treatment works

## APPLICATIONS: How to prevent/reduce



### Ice Build Up

Ice and frost build up effects productivity, quality and safety.

Munters IceDry™ is a specially designed dehumidifier that is installed inside the cold store to target moisture at source. This prevents ice forming on walls, floors and ceilings, and is proven to significantly improve safety by reducing the risk of slippages for staff and forklifts. The improved climate conditions also enhance the efficiency of evaporators and freezer equipment by preventing ice occurring, ensuring better performance, reducing defrost cycles and saving on maintenance costs.

Eliminating fog and mist inside cold stores will improve visibility and safety.

### Proven applications

- Cold stores
- Freezers / Spiral freezers



### Moisture Absorption

The climate needs to be strictly controlled during production, packing and storing of hygroscopic products.

Moisture absorption can disturb the precise function of a final product, just as the shelf life is affected if the product takes up moisture during production. Some products need to be produced and packed in environments with relative humidity levels below 25%RH.

The Munters dry air system is the simplest, most precise way of achieving and controlling the accurate humidity conditions required.

### Proven applications

- Manufacture and packing of hygroscopic materials
- Pneumatic conveying
- Silos
- Tableting
- Timber and paper storage

## APPLICATIONS: How to prevent/reduce



### Mechanical properties

Materials are in balance with their surroundings. In wet climates materials will take up more moisture from the air, in dry climates the opposite. In some cases this can influence the mechanical properties of materials.

- Paper that is too wet will not be straight anymore. It could cause photocopiers to jam
- Some types of moisture sensitive glue will loose their bonding power
- Nylon will absorb so much moisture that it influences the size and tolerance of the product.

### Proven applications

- Manufacture and packing of hygroscopic materials
- Pneumatic conveying
- Silos
- Tableting
- Timber and paper storage



### Product Caking / Sticking

Many powders and products attract and retain moisture. This can lead to a reduction in product quality and make it difficult to pack and transport products. When these products are stored in silos or bins, or transported in pneumatic conveying systems, moisture can cause these ingredients to stick to silo walls and cause blockages. Lower productivity, higher production costs and reduced product quality are the results of these problems.

Dehumidification is a simple and effective way to prevent condensation, sticking or lumping. This translates into higher productivity, lower production costs, lower down time, better hygiene and a higher product quality. Hammer rash in silos can also be prevented.

### Proven applications

- Materials handling
- Conveying
- Packing
- Silos
- Food powders
- Pharmaceuticals
- Chemicals

## APPLICATIONS: How to optimise



### Close Control

Munters provide complete packaged climate control solutions, providing precise humidity and temperature control with varying levels of filtration

The combination of desiccant and cooling work in harmony together with accurate controls.

### Proven applications

- Archives
- Test Chambers
- Pharmaceuticals (Active Pharmaceutical Ingredients - API)



### Conveying lines

When hygroscopic ingredients and powders absorb moisture they become sticky and build up inside the conveying lines. The resulting flow problems slow the process, create hygiene concerns and eventually cause costly downtime.

Pre-drying the air using a Munters dehumidifier ensures that the products are transported in a dry environment. The result is quick and continuous problem-free conveying with no unscheduled production stops.

### Proven Applications

- Chemicals
- Food
- Pharmaceuticals
- Packing
- Weighing
- Cooling tunnels

## APPLICATIONS: How to optimise



### Product Coating

Coating processes can be shortened and made more consistent by adding dry air. Regardless of the season, climate conditions in coaters will be stable all year round thereby securing optimal conditions. Productivity increases and energy costs may be cut. The risk of contamination of the conditioning system by any wet return air would be eliminated by using a Munters desiccant dehumidification system.

- Year-round consistent production
- Production increase of 15-20%
- Shorter drying times
- Easier to comply with GMP regulations

### Proven Applications

- Confectionery
- Tableting



### Product Drying

The most common method for product drying is to introduce hot air, thus evaporating the moisture contained within the product. However this is not ideal as the increase in heat and humidity increases the risk of mould and fungus growth. This in turn can cause corrosion to machinery and the extra heat can damage the product being dried.

By using Munters dehumifiers the conditions can be kept constant to prevent these destructive conditions from occurring.

### Proven Applications

- Food
- Pharmaceutical products
- Chemical
- Film



## APPLICATIONS: How to optimise



### Spray Drying

Spray drying is common practice all over the world for a variety of products. In hot and humid conditions, the spray drying process is susceptible to seasonal fluctuations. Changes in the ambient weather influence the conditions of the inlet air to the drying process and the consequences are low drying capacity, heavy process fluctuations and difficulties in drying the more sensitive products.

Dehumidification creates consistent air conditions all year round. This makes the spray drying process easier to control, protecting product quality, and avoiding product sticking. Powder loss is reduced and plant downtime is kept to a minimum.

### Proven applications

- Food e.g. dairy powders
- Pharmaceutical
- Chemical



### Waste Heat

Utilise heat generated from sources such as CHP. This can come in the form of low pressure hot water (LPHW), typically 85°C.

Heat utilised to reactivate climate control systems delivers conditioned air year round into desired areas. Results include lower energy costs by improved efficiency and reduced chiller load.

### Proven applications

- Various applications

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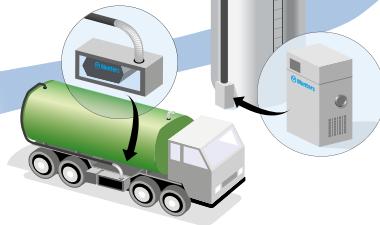
## YOUR PERFECT CLIMATE FOR THE FOOD INDUSTRY

From farm to fork, Munters climate control solutions are used throughout the food supply chain to:

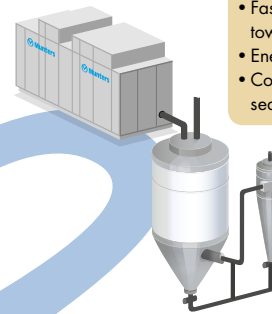
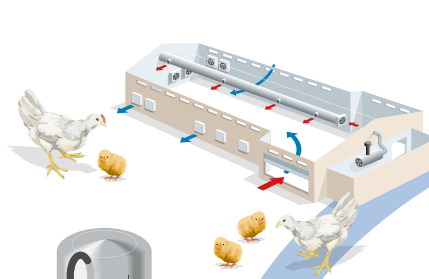
- Optimise product quality
- Increase production efficiency
- Improve safety & hygiene
- Reduce wastage
- Save energy

**Silos & Conveying**

- Prevent condensation
- Stop sticking/caking
- Improve powder flow
- Reduce cleaning



Dairy Processing



### Drying

- Faster drying in spray towers & fluid beds
- Energy saving up to 25%
- Consistent conditions - no seasonal fluctuations



### Sorting/Weighing/Mixing

- Less blocking in machinery caused by condensation, ice

Confectionery

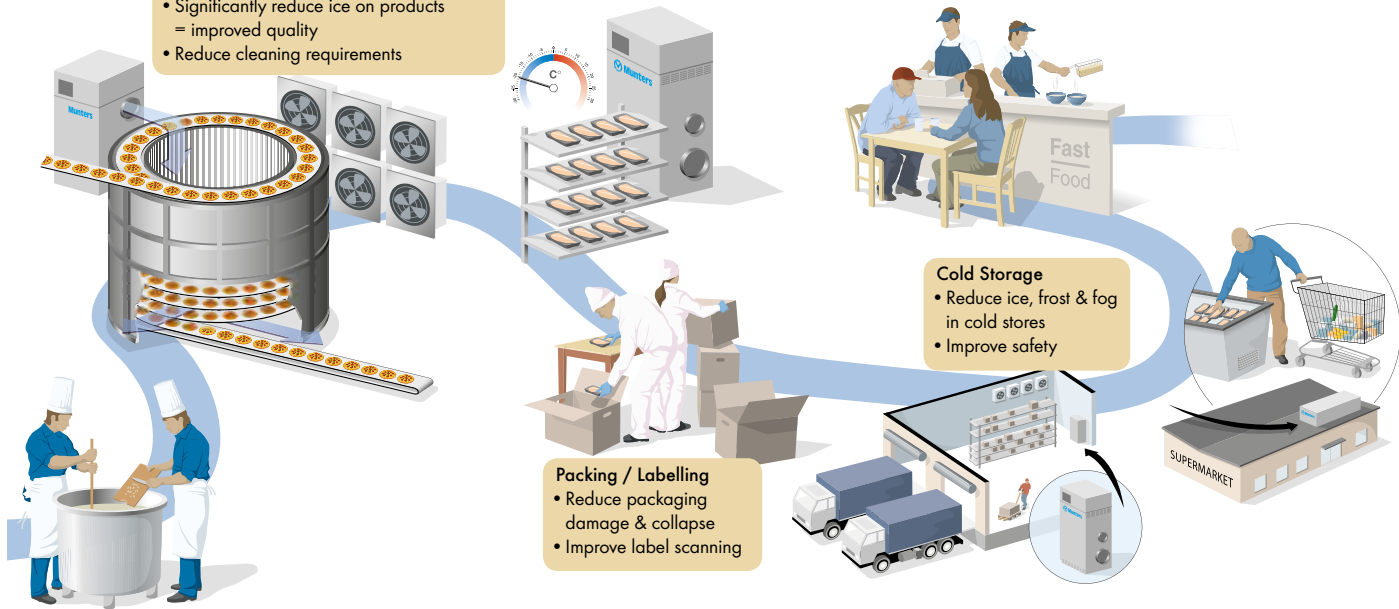
Breweries

Bread



### Freezing and Cold Storage

- Significantly reduce ice in spiral freezers & cooling tunnels
- Significantly reduce ice on products = improved quality
- Reduce cleaning requirements



Meat/Fish/Poultry Processing

Meat Maturation (Drying Rooms)

Fruit & Vegetables



## YOUR PERFECT CLIMATE FOR THE PHARMACEUTICAL INDUSTRY

Climate control is an important factor for reliable and predictable pharmaceutical production. From R&D labs to bulk production, Munters systems can:

- Stabilise conditions year round
- Improve weighing & dosing operations (by controlling moisture content of ingredients)
- Reduce effects of moisture in formulations
- Ensure GMP / SOP Compliance
- Increase production capacity
- Ensure resilience and uptime

### Silos & Conveying

- Prevent condensation that causes sticking
- Improve powder flow
- Reduce cleaning

Powders, Granulates, Tablets & Capsules

### Clean Rooms & R&D

- Stable, year round conditions
- Reduce waste

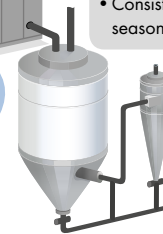


Effervescent



### Drying

- Faster drying in spray towers & fluid beds
- Energy saving up to 25%
- Consistent conditions - no seasonal fluctuations



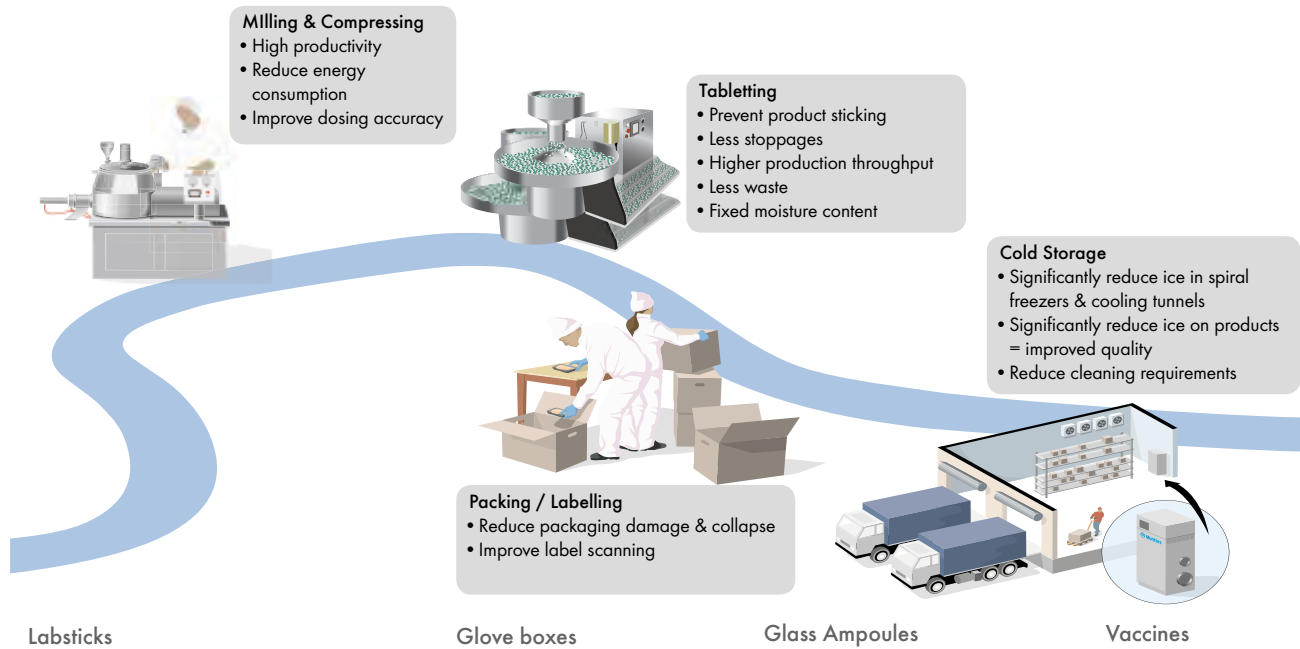
### Sorting/Weighing/Mixing

- Less blocking in machinery caused by condensation
- Ensure consistent moisture content for accurate weighing



R&D, Laboratories & Clean Rooms





# INDUSTRIES



## Archives

High and uncontrolled relative humidity causes damage to most materials. Archive stores contain a range of materials from documents, artifacts and textiles through to military archives and magazines holding ammunition and weapons.

Preventing corrosion, mold, mildew and/or fungus will significantly extend the life of valuable and precious assets. Preventing seasonal fluctuations in humidity will ensure requirements for **PD5454** are met, as well as removing the need for heating in some areas.

## Proven applications

- Books, documents, paper
- Seeds
- Film, tape, video
- Works of art



## Automotive

Munters provides specially engineered systems that allow the automotive industry to maintain temperature and humidity to the most precise specifications.

Complete cars, engines and parts are subjected to a large variety of testing in environmental chambers and wind tunnels. Munters enables automotive manufacturers to simulate any environmental condition, with dehumidification systems that can deliver air to ultra low dew-point conditions.

Our equipment creates the proper environment for testing, production, and transportation of automotive components such as: safety glass, air bags, tyres and plastics, along with many other products as well as preventing corrosion of machinery and stored car components.

## Proven applications

- Emissions testing
- Glass coating
- Paint application and drying
- Acoustic and test chambers
- Wind tunnels
- Laminating & moulding
- Fabrication



# INDUSTRIES



## Chemical

Chemical and fine chemical manufacturing requires a multitude of equipment to ensure quality and consistency. Unwanted moisture due to high humidity levels can create a number of problems for chemical manufacturers and the users of their products.

Munters can create the proper environment for manufacturing, packaging, transporting and storing of humidity sensitive products.

## Proven applications

- Plastics
- Film drying
- Injection moulding
- Investment casting
- Lamination of glass & plastics



## Clothes & Garment Drying / Drying Rooms

Both military and civilian drying rooms can save a lot of money by drying clothes and uniforms with desiccant dehumidification. The process uses a dehumidifier with fan to quickly and efficiently dry clothing without the need for heating or tumble drying.

Simple installation and low energy consumption, this solution also prevents wear and tear on clothing and can be used for a range of applications.

Proven to save up to 70% energy costs (compared to heating).

This solution dries faster than most other systems.

## Proven applications

- Military uniforms
- RNLI
- Outdoor Activity Centres
- Schools
- Offices
- Sports clubs
- Riding Stables
- Bicycle storage

# INDUSTRIES



## Data Centres

The Data Centre business area focuses on the growing market segment for advanced air economisers. High capacity, reliability, and energy efficiency are business critical for the customer, and the systems offered provide exact control of temperature, humidity and air quality. Alongside a range of standard units, customised solutions that meet specific requirements are configured in close collaboration with the customers. With low partial PUE results, CO2 emissions & high energy savings we have a sustainable solution for cooling your data centre.

### Solutions include:

#### Indirect Cooling

- Oasis IEC Indirect Evaporative Coolers
- Customized IEC units, for maximum flexibility
- SyCool ITC Indirect Thermosyphon Cooling
- Advanced EPX polymer heat exchanger

#### Direct Evaporative Solutions

- Evaporative Pads – GlasDek, CELdek, DataDek
- FA6 – standard “Wet Sections”
- WetDek - customized “Wet Sections”
- Standalone Humimax evaporative coolers
- Custom, large scale AHU Airside Economisers

#### Make-up Air Solutions (MUA)

- Modular MUA's, controlling humidity and filtration
- **Other Custom Solutions**
- Fluid Coolers
- Airside Economisers with Heat Wheels

[munters.com/datacentres](https://munters.com/datacentres)

Oasis IEC



SyCool ITC



GLASdek GX40



Direct FA6



## Defence

The climate in and around military and aerospace equipment, systems and components has a direct influence on the quality and condition of the items, maintenance, repair and replacement costs, and availability. Controlled Humidity Environments save on maintenance costs, as well as ensuring equipment availability is increased – a very rare combination. In addition, dry air reduces and even halts corrosion by lowering relative humidity levels to around 40-45%.

Dry air also improves the reliability of electronic systems. NFF (No Fault Found) or CND (Could Not Duplicate) occurrence reductions of 50% are not uncommon. On infrastructure as well as on items with organic material, mould and fungus growth will be halted. And in case of ammunition, degradation of chemical compounds is slowed down or even halted, optimising the safe shelf life of the items.

## Proven applications

- Ammunition storage
- Controlled humidity storage (CHE)
- Assets in storage



## Electronics - Low Dewpoint Battery Production

The manufacturing of batteries such as lithium batteries requires ultra low humidity conditions. Munters create turnkey climate controlled dry rooms which can range from small R&D facilities to large scale mass production facilities.

Each dry room is unique, and is designed to ensure optimal climate conditions as low as -40°C Dew-Point and less than 1% relative humidity.

## Proven applications

- Research & Development
- Battery Production
- Automotive - Hybrid/Electric
- Universities
- Consumer electronics
- Electric grid storage

# INDUSTRIES



## Leisure

Within the recreation and leisure industries we have proven installations in ice rinks and indoor sports halls. As these buildings are populated by varying numbers of people, and some have ice as an integral part of them, numerous problems can arise. By installing a Munters dry air system the following benefits can be seen:

- Prevention of condensation
- Prevention of corrosion
- Reduced damage to the fabric of the building
- Reduction in energy costs

## Proven applications

- Ice rinks
- Indoor tennis courts
- Sports halls



## Museums, Libraries & Galleries

Munters dehumidifiers are used worldwide to protect assets and artefacts in museums, galleries and libraries. From small cabinets and display cases through to storage and, in some cases, entire museums or libraries, Munters systems ensure consistent control of temperature and relative humidity all year round while minimising energy consumption.

Using dehumidification has the following advantages:

- indoor air quality is improved
- mould and corrosion prevention

## Proven Applications

- Fine art storage
- Historic ship preservation
- Historical buildings
- Galleries
- Museums



## Utilities, Power Generation & Mothballing

High humidity causes condensation, corrosion and rust, which in a power plant, causes problems with gas turbines, pumps, switchgears and electronics operations. This could lead to start up failures after maintenance outages, with fines for non-delivery. The dry air ensures that the power plant is protected from corrosion and stays in perfect condition. Munters dehumidification solutions keep mothballed power stations perfectly preserved, enabling quick start up from lay up/stand by.

## Proven applications

- Nuclear Decommissioning
- Boiler preservation
- Turbine protection
- GCT
- Power plants
  - under operation
  - under maintenance
  - under construction



## Utilities - Wind Farms

For wind turbines, the aggressive environment in which these turbines are often sited requires special protection of the nacelle machinery and tower. Key areas of risk include water ingress through air intakes and corrosion caused by condensation. Munters is a leading supplier to many of the world's leading wind turbine manufacturers and is able to overcome both of these potentially damaging threats.

## Proven applications

Wind farms including offshore

# INDUSTRIES



## Supermarkets & Retail

Excess amounts of humid air entering a retail space can create an uncomfortable store environment. Not only does humid air make consumers and employees feel cold and clammy, but it causes the store's HVAC systems to work harder in order to reach ideal temperatures, resulting in higher energy costs. HVAC designers are faced with the challenge to meet sensible and latent cooling requirements, while reducing carbon footprint and ensuring greater energy efficiency.

For the retail industry, Munters solutions offer a more efficient, high performing HVAC system that creates a comfortable, healthy environment for working and shopping.

## Proven applications

- Supermarkets
- Distribution centres

If your industry isn't here, don't worry!

Munters expertise in tailoring solutions to our customers means we can adapt solutions to suit your needs.

We have experience in working with some unusual and interesting applications, simply contact us to see how we can help you.



Pollution control  
and VOC abatement



Humidification



Energy recovery



Mist elimination



Cooling



Heating



Building comfort



Ventilation



Dehumidification



# INDUSTRIES - HOW OUR SERVICE TEAM SUPPORT INDUSTRY

Munters equipment is supported by an expert global service network for optimal performance. Our aim is to help secure your climate, maintaining the efficiency of your equipment, ensuring uninterrupted, fault-free production.

## Installation Support & Assembly Supervision

Ensure your equipment is set up and functioning correctly, right from the start.



## Extended Warranty with PrimaCaire™

Performance checks, service reports, priority scheduling and response, spare parts and labour.



## Reconditioning & Repair

Your Munters equipment can be reconditioned or repaired onsite or at a Munters Service Centre



## Startup Services & Guaranteed Performance

Our engineers can support the startup process with a sequence of operations

## Maintenance with ServiceCaire™

Flexible options for stable operation. performance checks, onsite training, discount on parts, performance history.

## Spare Parts

Only high quality, original spare parts are used in the manufacture and maintenance of our equipment. Spares kits reduce downtime.

Future proof your business

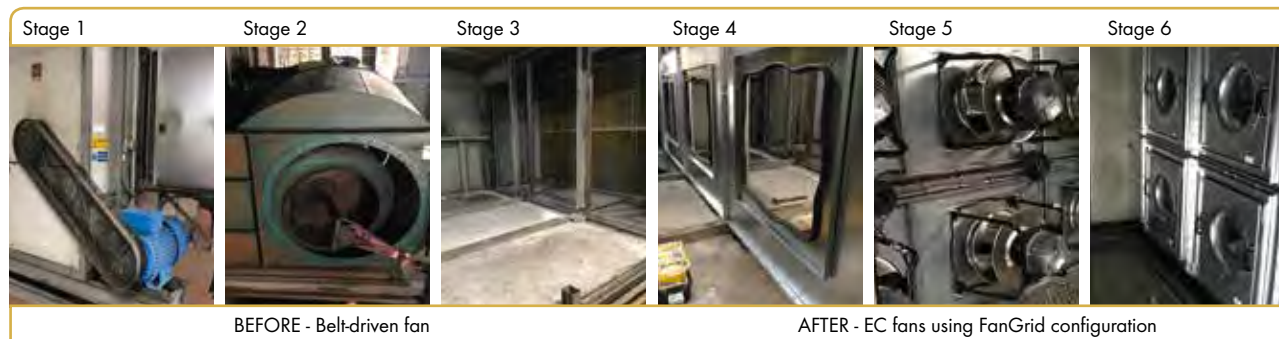
# INDUSTRIES - HOW OUR SERVICE TEAM SUPPORT INDUSTRY - ENERGY EFFICIENT UPGRADES

Upgrading AHU's with plug fans using EC motor technology can help organisations looking to save energy, lower costs or increase production while keeping existing equipment. Advantages / benefits include:

- Reduce energy consumption by up to 75%
- Reduce running costs
- Saving on labour and maintenance costs
- No more belts to change
- No more bearings to grease
- Reduce CO2 emissions - help meet targets
- Improve speed control
- Save costs by modulating fan speed
- Upgrading instead of replacing AHU's saves time, money and resources



The Installation Process - Replacing belt driven fans with EC plug fan technology



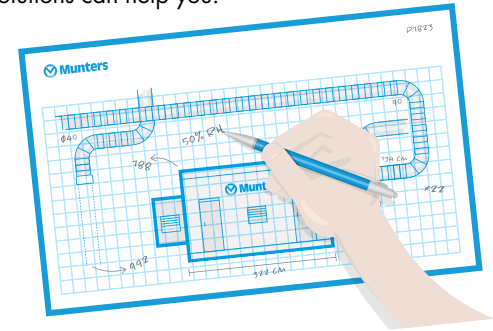
Discover more at [www.munters.com/service](http://www.munters.com/service)

# RENTAL SOLUTIONS

Short term or long term hire with option to purchase.

Do you need climate control solutions and equipment to respond to urgent needs, peak production demands and adverse ambient conditions on a short-term basis? Munters Rental Solutions can help you:

- Solve peaking production demands
- Perform planned maintenance or turnarounds (mothballing, sandblasting, etc.)
- Run a real-time pilot (proof of concept)
- Solve an emergency from unit breakdowns
- Solve constraints due to adverse ambient conditions and/or seasonal changes
- Extra short term capacity to support your operations.
- Urgently handle corrosion, mould or hygiene issues caused by too high humidity



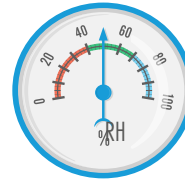
Munters Rental Solutions offers you customised climate control solutions on a flexible short-term basis. With a rental solution, you can concentrate on your daily business, while we create and maintain The Perfect Climate for you.



Original manufacturer  
knowledge



Rental of world class dehumidifiers  
and climate control equipment



All-inclusive peace of mind  
- no equipment maintenance

# ONE

ONE partner from start to finish  
- ONE point of contact

[www.munters.com/rentalsolutions](http://www.munters.com/rentalsolutions)

# TECHNOLOGY, PRODUCTS & INFORMATION

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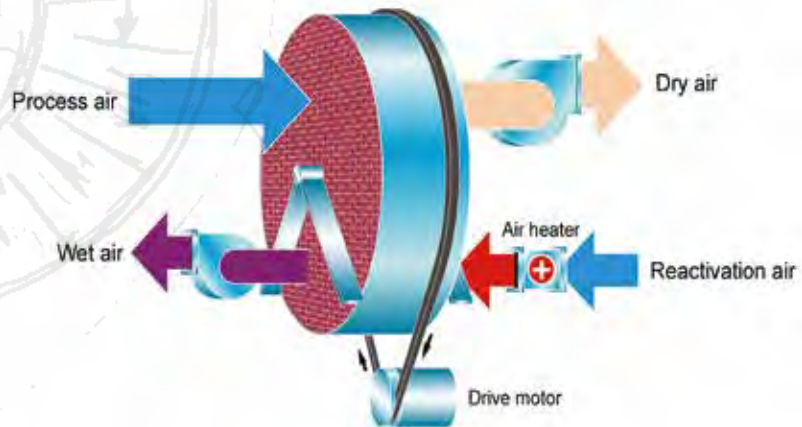


# MUNTERS DESICCANT ROTOR - THE ORIGINAL DESICCANT WHEEL PRINCIPLE

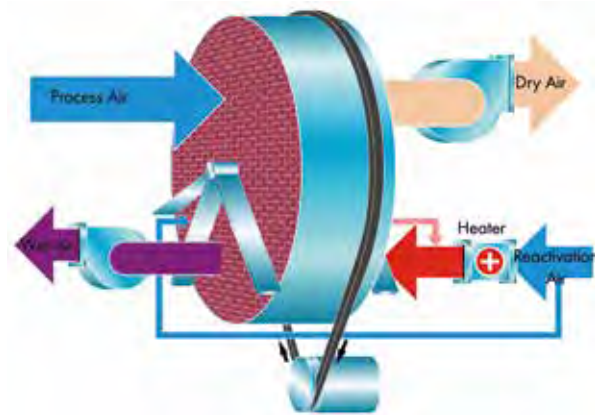
## INNOVATION AT ITS HEART

The desiccant dehumidifier prototype was created by Carl Munters in Sweden in the 1940's. The heart of the dehumidifier is the rotor which is treated with substances to retain moisture from the air that is passed through the rotor. It is made of glass fibre paper in an intricate design which contains small air ducts with a very large surface area.

When the dehumidifier is in operation, two air streams pass through two sections simultaneously. One air stream is dehumidified and the resulting dry air is then fed into the required area. The other air stream contains hot air used to dry the rotor so that it will be able to remove moisture again. This air stream is then ducted away from the dry area.



# MUNTERS DESICCANT ROTOR - ENERGY SAVING SOLUTIONS



## ENERGY RECOVERY PURGE

By adding an extra sector on the process inlet and outlet side, an external duct is used to recirculate air into the regeneration cycle after the heater. (A partial air stream is led to the regeneration air stream after the heater). Depending on air flows, unit type, application etc, the savings on energy needed for regeneration reaches up to 25 %



## POWER PURGE

By adding two sectors on each side of the rotor, positioned both before and after the regeneration sector, the energy needed for regeneration is reduced just like an eventual need of cooling of the dry air is decreased.

- A separate air stream recirculates and cools the rotor material on the process air inlet side and pre warms the rotor before it enters the regeneration sector.
- The performance of the desiccant wheel is increased by up to 30%.

# PRODUCT RANGE

## SMALL DESICCANT DEHUMIDIFIERS

Small, solid units designed for use in a range of applications such as archives, waterworks, museums, clothes drying rooms, vehicles and defence.

- Air flows range from 50m<sup>3</sup>/hr - 300m<sup>3</sup>/hr
- Light weight & robust
- Easy to service
- Portable Solutions
- Available for Rental

Products include M120, MG Series, MCS Series, MH Series, ComDry Series.



## STAND ALONE DEHUMIDIFIERS

A range of stand alone dehumidifiers designed for use in a range of applications such as food and pharmaceutical processing, manufacturing, storage, ice rinks,

- Air flows range from 180m<sup>3</sup>/hr - 15,500m<sup>3</sup>/hr
- High air flow capacity
- Minimal energy consumption
- Dehumidifiers can operate down to -20C
- Available for Rental
- Modern Climatix control systems

Products include MLT Series, ML Series, IceDry, MCD Series, MX2 Series





# PRODUCT RANGE

## CLIMATE SYSTEMS - TEMPERATURE & HUMIDITY CONTROL



Based on customers specific needs, Munters Climate systems are modular solutions that provide both temperature and humidity. Built and tested in Munters' own factories, the systems are delivered, assembled and connected on site. Suitable for a range of process applications including pharmaceutical, food, electronics, chemical and more.

- Full Flexibility- full configurable
- High quality casing for hygienic demands
- Energy optimised solution
- ONE Supplier and Service partner
- Modern Climatix Control systems

Systems include ML Plus, MX2 Plus, MDU

## TURNKEY SOLUTIONS FOR TOTAL SYSTEM INTEGRATION



When system integration is paramount, Munters expertise in providing turnkey solutions ensures all systems work in harmony to deliver consistent ultra-low dewpoint conditions of < 1% relative humidity.

Examples include turnkey climate controlled dry rooms for lithium-ion battery production and research and development (R&D).

# DESIGN CAPABILITY

## DESIGN EXPERTISE

Munters uses a proprietary cloud design software tool, which has been developed from gathering precise and reliable data over many years. Benefits:

- Single tool to select different airflows and working conditions, combining heating, cooling, dehumidification and humidification.
- Most efficient solution based on local climate data energy calculation (ASHRAE)
- System sketch and components schematics for deep analysis of parts specification and performances
- Large library including units, models and supplier parts model and algorithms.
- Advance user access for simulating the system with focus on temperatures, Kwh, g/kg, kg/hr, RH and dewpoint.



## 3D MODELS

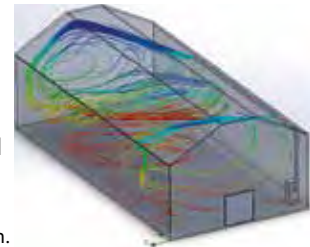
3D model of turnkey solution including environmental room, ductwork, pipework and any other services for integration with building model. BIM ready PAS 1192 framework.



## FLOW SIMULATION

Munters uses cutting edge analysis tool to perform advanced CFD for:

- Air flow distribution and characteristics. Static and dynamics pressure profile within the customer room or environment and in the distribution system.
- Thermal performance and mathematical calculation of energy losses and how to optimise the application.
- Humidity (RH and Dewpoint) geometrical profile to assure even distribution and avoid wet-spot or air-vortex.



## NOTES

[illegible]

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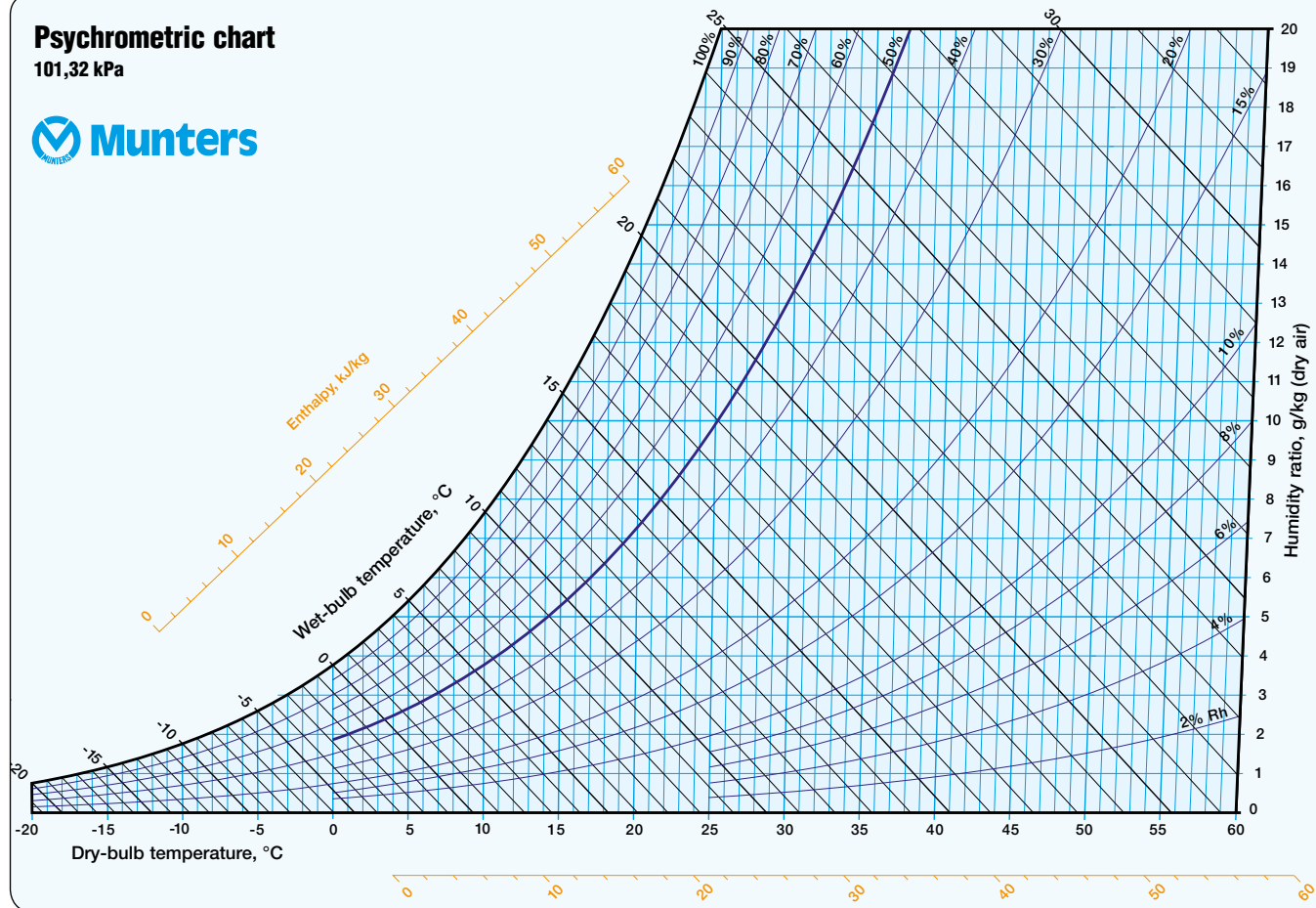
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# Psychrometric chart

101,32 kPa





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