BROCHURE

Munters

Air dehumidification eliminates weather impact in the spray drying process

The perfect indoor climate, all year round

Spray drying process challenges

Spray dryer operators know how humid weather can cause problems in the spray drying process. Product sticks inside the chamber and moist powder blocks conveying lines.

Munters desiccant dehumidifiers remove humidity from the air, before it ever comes in contact with the product. You enjoy a significantly improved process, free of weather impact.

The Munters solution

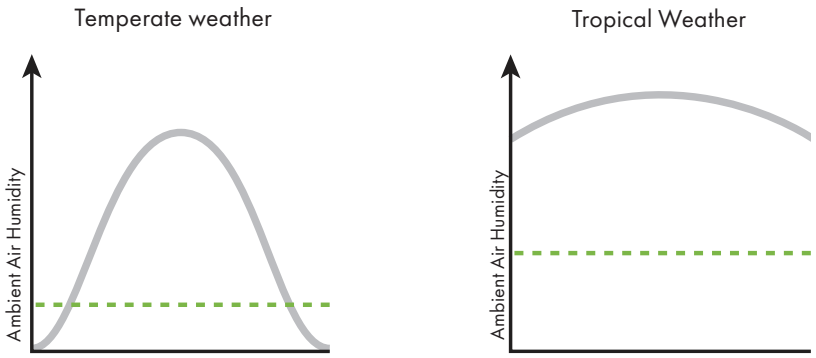
Munters dehumidifiers control and maintain low inlet air humidity in many spray drying plants all over the world. Weather no longer influences dryer performance and operators no longer need to continually adjust dryer operation to combat weather changes.

Munters creates the perfect climate for the supplying dry air no matter the season. Even in tropical climates, desiccant air dehumidification provides reliable and consistent low humidity, which improves dryer performance significantly.

Product sticking inside the spray dryer

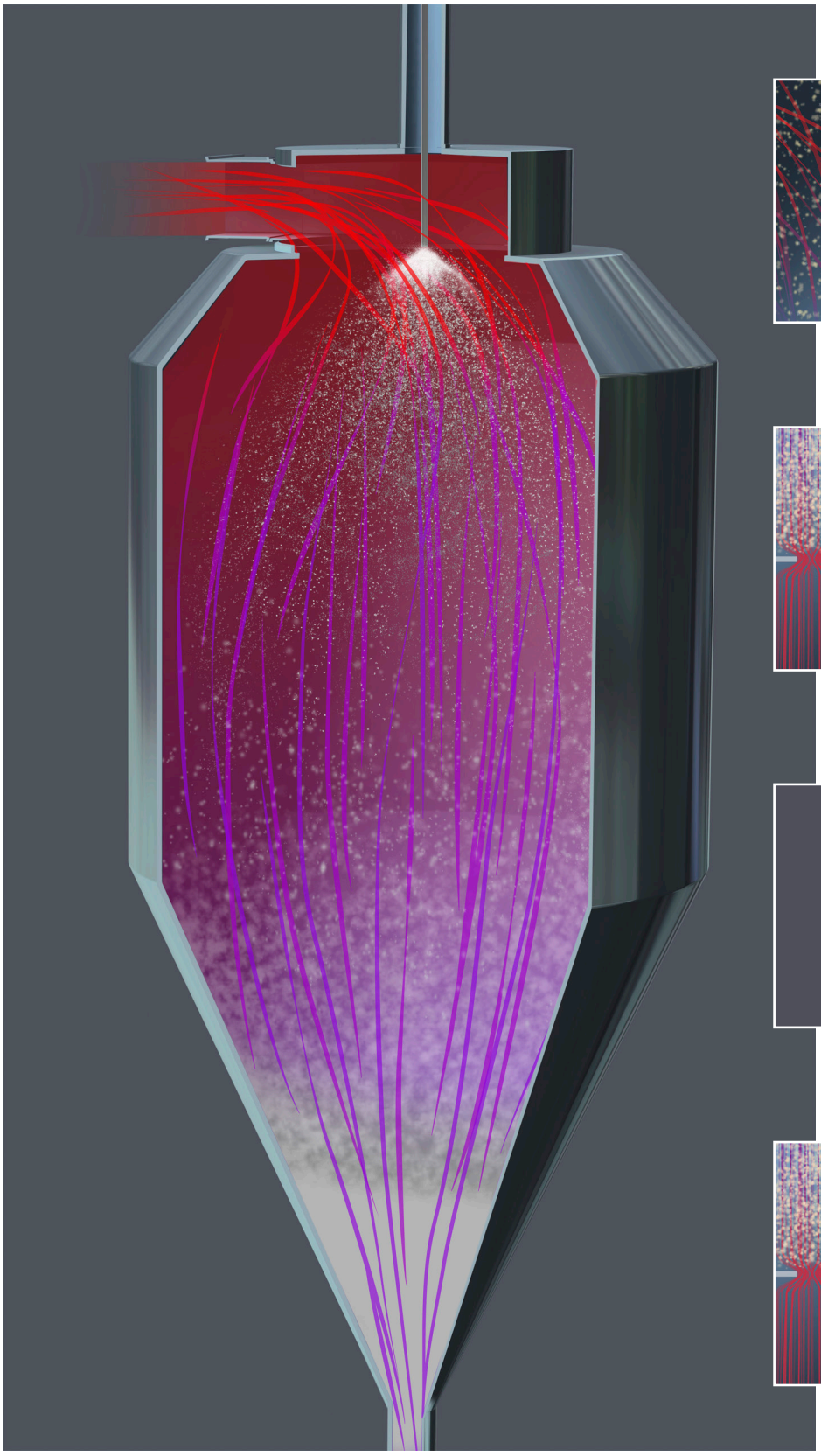
Dehumidification of dryer inlet air prevents product sticking, increases production capacity, reduces down-time, resulting in consistent high powder quality. When air temperature and humidity are high, product will stick; when either the temperature or humidity is lowered, the product will no longer stick. However, lower dryer outlet temperature causes increased product evaporation, worsening the problem.

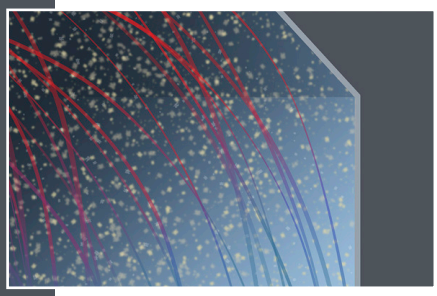
Operators are then forced to decrease dryer feed flow in order to reduce product evaporation, which stops the sticking, but reduces capacity. Each time ambient humidity increases, dryer capacity goes down again.



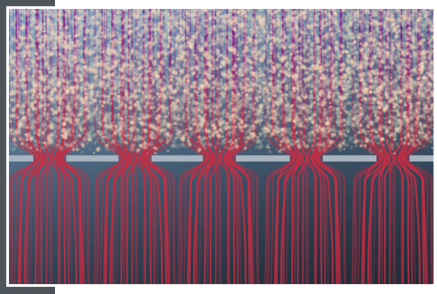
With Munters desiccant dehumidification, ambient weather changes are no longer an issue; dryer inlet air is maintained at a constant low humidity, yielding consistent and high dryer capacity year-round.

Munters dry air improves spray dryer performance

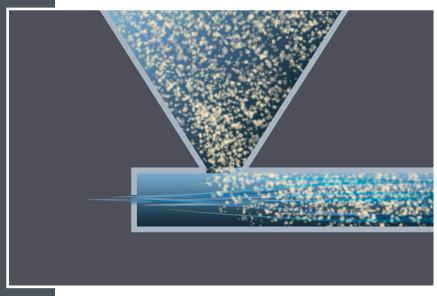




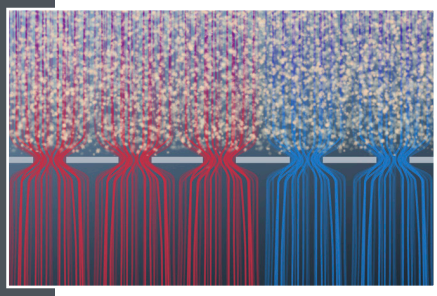
Low air humidity inside the spray dryer prevents powder from sticking to dryer surfaces.



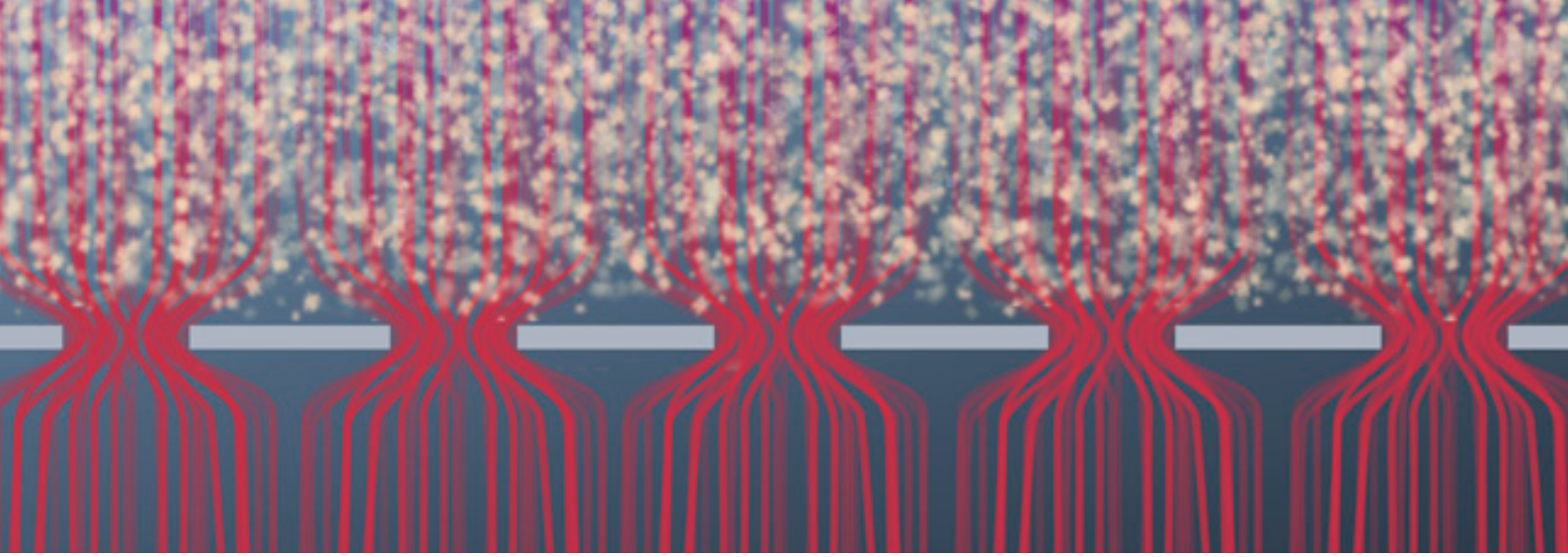
Low air humidity improves powder secondary drying and powder conditioning without sticking.



Dehumidification of cooling and conveying air prevents hygroscopic powder from regaining water during conveying. Powder clogging and blocking of conveying lines stop.



Dehumidification of cooling air allows for sufficient cooling capacity and prevents hygroscopic powder from regaining water during cooling.



Stop sticking

Dehumidification of the dryer inlet air provides constant low humidity throughout the drying process, preventing sticking. Air dehumidification increases dryer capacity on humid days, 24 hours a day, seven days a week, no matter the ambient weather. The more difficult the product is to dry, the more capacity gained, and capacity can easily increase by 20% - 50% for many products.

Munters improves spray dryer performance

The term "spray dryer" covers a multitude of different dryer models and how they operate. Each specific operation depends on product treated, required final powder properties and available equipment. The liquid feed to the spray dryer is prepared upstream of the spray drying process.

After spray drying, the powder either leaves the drying chamber together with the drying air for further downstream separation, or the powder continues to one of the next steps, and the air exits the drying chamber through ducts for downstream particle separation.

Munters dry air improves cooling processes

Some spray dried powders must be cooled before conveying and packing with ambient air cooled with chilled water. The air then simultaneously dehumidifies, and then passes through a de-mister and re-heater before being used for powder cooling.

Low air humidity from a desiccant process allows low final powder temperature and low powder moisture content which cannot otherwise be achieved with chilled water alone.

Improved hygiene

Munters desiccant air dehumidification process eliminates all condensation risk within the product environment and, as a result, eliminates risk of microbial growth inside the powder sections of the plant.

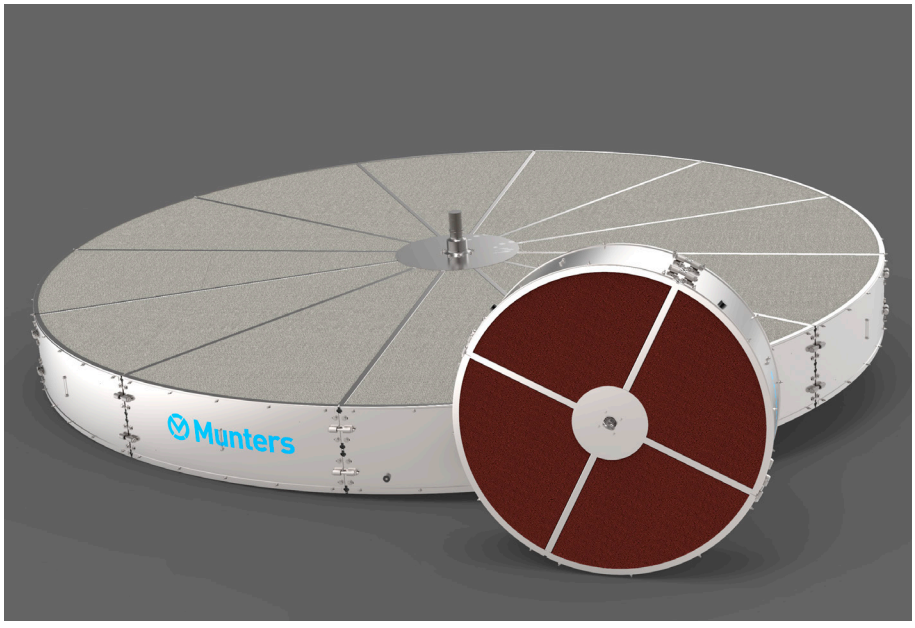
Almost too good to be true

Just over a decade ago, the infant formula industry began installing desiccant dehumidifiers to treat all incoming air to the spray dryer. Before this, the drying industry understood desiccant dehumidification would improve final powder cooling and conveying, but the many benefits to the drying process itself were then, unexplored.

Thanks to the development of the highly efficient Munters Quantum rotor, it is now possible to significantly improve dryer performance and production capacity, while at the same time reducing investment and operation costs.

In the spray drying industry, Munters dehumidification solutions are fully integrated with the drying process and heat recuperation programs. In fact, development of our dehumidification solutions is conducted in close partnership with customers to assure the most optimal solution for each individual project.

Munters dehumidifiers are ideal for both new and retrofit projects. Due to increased dry air capacity, smaller units can often meet required supply air specifications, resulting in investment and building cost savings. For existing air handling systems, Munters dehumidifiers can be installed without major changes to other parts of the dryer.



Munters Quantum Rotor is specially designed to achieve performance on warm, moist airstreams. The Quantum desiccant provides exceptional and consistent moisture removal without the need for pre-cooling. Munters Quantum Rotor consists of a desiccant with a very large surface area, and a very high adsorption capacity. This makes it possible to, for example, dehumidify from 14 g/kg to 2 g/kg in just one step without the need for ice water pre-cooling.

Two large, stainless-steel dehumidifiers installed in front of a spray dryer for dehumidification of all inlet air to 2g/kg.

Improved energy utilization

During the dehumidification process, water is removed from the process airstream when it is adsorbed in the Quantum media. Now, when this airstream enters the spray dryer, it has a greater capacity to carry water away from the product. The adsorption process also raises airstream temperature, greatly reducing the amount of energy needed to warm the airstream to desirable operating specifications.

Compared to a chilled water dehumidification system, the Munters system does not require energy to cool and condense water from the airstream. Nor does it need additional energy to warm the airstream from colder temperatures. This leads to a process with higher capacity, stability and lower energy consumption.

Reduced CO_2 footprint

The industry faces increasingly strict requirements to reduce carbon dioxide emissions from production. The reduced energy consumption related to air dehumidification reduces overall spray drying plant emissions and aids in improving the climate-friendly production profile. The dehumidifier uses heat from any source and easily integrates with heat recovery programs.

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.

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.

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

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

BR-SPRAY DRYING-202109-EN

Find your nearest Munters office at **www.munters.com**