HoneyCombe® Wheels
Desiccant and VOC Abatement Options
Today, high performance commercial and industrial dehumidifiers employ desiccant wheel technology. This simple and effective technology was first pioneered by Munters more than 60 years ago by Swedish scientist, Carl Munters in conjunction with the American founder of Caragas Inc., Commander Oliver Colin. At that time, desiccant HoneyCombe® rotors had been developed for dehumidifiers on cargo ships to keep goods dry. After decades of research and development, HoneyCombe® rotors have been greatly advanced today. Thousands of applications benefit from this technology. Working closely with Munters engineers, customers optimize performance of their humidity control units while minimizing operating expenses in a broad range of applications. Munters seven HoneyCombe® rotor options provide the widest range of dehumidification and VOC abatement available today.

Titanium Silica Gel

- Strong and corrosion resistant
- Efficient at high temperatures and pressure
- Non-flammable
- Non-toxic
- Stabilized at any humidity level

Lithium Chloride

- Efficient at high temperatures and pressure
- Non-corrosive
- Non-toxic
- Non-flammable
- Stabilized at any humidity level

Lithium propionate

- Efficient at high temperatures and pressure
- Non-corrosive
- Non-toxic
- Non-flammable
- Stabilized at any humidity level

Hydrophobic Zeolites

- Efficient at high temperatures and pressure
- Non-corrosive
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How does it work?

The operation of a HoneyCombe® dehumidifier is based on the principle of sorption. Sorption is the adsorption or absorption process by which a desiccant removes water vapor directly from the airstream. When the air to be dehumidified passes through the HoneyCombe® rotor, the desiccant removes the water vapor directly from the air and holds it while the wheel rotates. As the moisture laden desiccant passes through the reactivation sector, the water vapor is transferred to a heated air stream, which dries the adsorbed moisture. The process is continuous, allowing for uninterrupted dehumidification. See Figure 1.

Zeolite Systems

Solid laden air is drawn through the HoneyCombe® rotor where VOCs are removed from the airstream by adsorption onto the hydrophobic zeolite. After passing through the rotor, the cleaned air is discharged into the atmosphere. The rotor turns continuously (1-6 rotations per hour) transporting adsorbed VOCs into a regeneration sector. There, the VOCs are removed by a small heated airstream. The regenerated zeolite is then rotated back into the process airstream. The concentrate is typically sent to a small oxidizer where the VOCs are released to water vapor and CO₂. Heat exchangers are used to pre-heat the regenerate airstream to minimize the required heat needed to desorb the rotor and create additional fuel efficiency.

**Hydrophobic Zeolites**

Munters proprietary zeolite provides several characteristics that are ideal for VOC abatement.

- **Hydrophobic properties** – Munters’ zeolite is made hydrophobic using a chemical process that converts the aluminum in the crystal with silicates. Since it repels water, it is unlike any other zeolite, synthetic or natural. The zeolite can use all of its pores to attract and hold VOC molecules from an airstream.
- **Stability** – The hydrophobic zeolite does not react with organic materials, exhibits catalytic properties or undergoes any chemical or physical changes during the adsorption process.
- **Non-flammable** – As an inert and stable inorganic crystal, it allows for the use of high temperatures for desorption of high boiling compounds and eliminates the safety risk associated with organic zeolites.
- **Pore sizes** – Zeolite pore size determines which molecules the zeolite will attract. Munters uses proprietary nanopore technology with poresize to cover a wide range of organic solvents (VOCs).
- **Adaptive capacity** – At low inlet VOC concentrations, zeolites have a higher capacity to adsorb VOCs than conventional technologies. At high relative humidities, zeolites absorb less water from carbon lessening more sites for adsorption of organic molecules.

*Molecular Sieve: A zeolite molecular sieve is a crystalline material of aluminum silicate which is capable of separating molecules of different sizes. Small molecules, such as water molecules, are adsorbed, while large molecules pass through.

**Non-overloading desiccant: Because GTR silica gel is a solid, insoluble desiccant, it is not possible to "wash out" the desiccant from the wheel. This means no special precautions are required even when it is exposed to air at 100% relative humidity.

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Munters Service and Support

Munters' nationwide service organization of factory-trained technicians can provide the most current technical information, complete maintenance recommendations and comprehensive troubleshooting if required. They are supported by a full line of in-stock replacement parts.

Regardless of industry or business type, Munters' customers need a service solution that keeps their operation running as required at all times and at the lowest operating cost. That is why Munters offers a range of services and maintenance programs designed to meet the diverse needs of all customers.

Comprehensive Warranties

Munters provides a five-year performance warranty on every desiccant wheel sold and will repair or replace the rotor at no cost, should structural defects occur within five years. Service agreements provide for regular factory maintenance and inspection of wheels and other dehumidifier components.

Customers on a contracted service program receive discounted parts and labor, along with performance evaluations to ensure their Munters equipment is achieving maximum performance.

Cleaning and Maintenance

Munters rotors may be readily cleaned when they are installed in an application producing high concentrations of dust or other contaminants. However, the counterflow operation of the wheel in many cases provides self-cleaning. All Munters dehumidifiers are offered with filters, further limiting the effect of airborne particles. Should dust collect on the face of the wheel, it may be simply vacuumed away. In extreme cases where sticky particles such as soot, oil or fertilizer do attach to the media, the wheels are commonly cleaned by washing with water. However, before washing a wheel, it is strongly advised that operators discuss with Munters’ Service how to best preserve the desiccant for long life and maximum benefit.

American Made Under ISO 9001:2008 Certification

Munters produces rotors at manufacturing facilities in Sweden and U.S. under ISO 9001:2008 certification. Munters sets the world’s standards for rotor production and is the only producer of both desiccant wheels and dehumidification systems in America.

All Munters rotors are made of a non-metallic, ceramic composite. They are engineered to provide superior strength and durability, and to be impervious to water. Munters wheels are characterized by smooth, regular surfaces with even desiccant dispersion throughout the HoneyCombe® structure and strong, accurately machined wheel casings. Munters’ unique manufacturing processes ensure that the desiccant is an integral part of the HoneyCombe® structure. Unlike some competitive rotors, all structural fibers are at least five microns in diameter and therefore, not breathable. See Figure 2. For added safety, HoneyCombe® wheels are designed to not emit smoke or support fire if accidentally exposed to high temperatures or flame.