



CREATIVE SOLUTIONS IN



DRYING TECHNOLOGY



Expertise and Customer Focus Service

For over 50 years Imtech DryGenic (former Kathabar Systems Europe) has manufactured dehumidification systems and is recognized globally for expertise, quality, service and in providing innovative solutions for complex dehumidification processes. Imtech DryGenic is a division of Imtech with 14,000 employees and an annual turnover of more than 2 billion euro.



World Leader in liquid desiccant dehumidification

Any manufacturing or processing operation, which is humidity, temperature or micro-organism sensitive, is a natural application for a dehumidification system of Imtech DryGenic. Whether your space conditions are 25°C and 20% RH, or 5°C and 40% RH, or even -20°C and -40°C dew-point, a Imtech DryGenic system can provide those conditions every day. Result, a better bottom line. The Imtech DryGenic dehumidifiers come in variety of configurations depending upon air volumes, temperature range, available energy and any need for additional biocidal capacity. The systems keep the air at a constant, precise humidity regardless of weather conditions or load variations. Besides the dehumidifiers, Imtech DryGenic also manufactures and supplies complete drying tunnels, for example, practically all gelatine factories in the world are using Imtech DryGenic dehumidifiers and drying tunnels of which the first type was already built in 1961.



The Imtech DryGenic dehumidifier advantages

Eliminates airborne micro-organisms

A Imtech DryGenic system offers even more than reliable control of humidity. Up to 97% of all airborne bacteria, viruses and moulds are killed and removed as air is washed by the liquid desiccant solution. A unique benefit not available with dry desiccant dehumidifiers.

Saves energy and investment costs over other dehumidifiers

Imtech DryGenic systems are specially designed to use low levels of energy and to minimize total energy consumption. A Imtech DryGenic system delivers air directly at the required temperature and humidity regardless of air inlet conditions.



Comparison example:

dehumidifying 25.000 m³/h of air, 25 °C from 50% RH to 20% RH

	Conventional (AHU)	Imtech DryGenic
Cooling load	335 kW	150 kW
Cooling medium temperature	-5 °C	+20 °C

No deep cooling and after heating such as required in air handling units (AHU). In many cases cooling can be done by cheap media as cooling tower water, river or even well water. Using a Imtech DryGenic system for air dehumidification usually results in a substantial energy saving and in a reduction of the investment cost of the refrigeration equipment (chillers). In many cases even the refrigeration equipment can be omitted at all.



Easier to operate and maintain

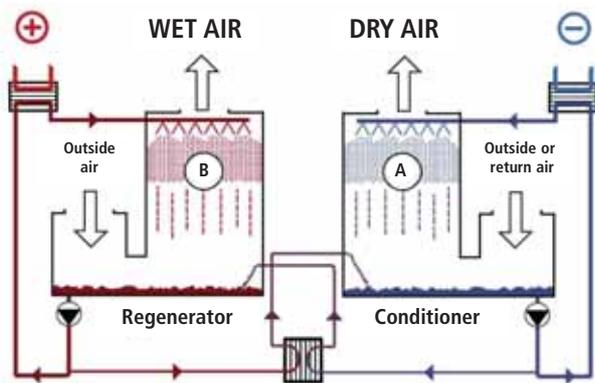
Operating a Imtech DryGenic system is less complex. Maintenance is minimal. Preventive maintenance schedules include sending a solution sample to Imtech DryGenic to verify quality and assure maximum performance. The ability to monitor and adjust the desiccant over the life of the solution is unique with Imtech DryGenic dehumidifiers.

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How the Imtech DryGenic systems operates

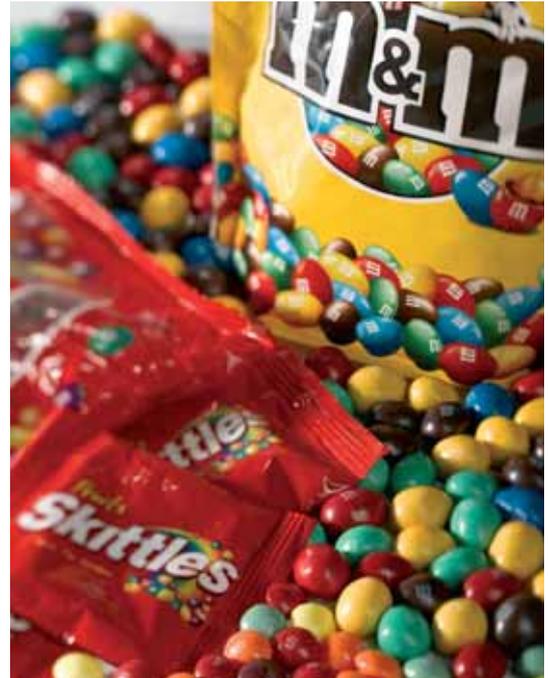
Salt is a hygroscopic substance, even dissolved in water it is able to absorb moisture from the air. All the systems of Imtech DryGenic are based on this principle. The highly stable, non-toxic salt solution, which is used, is called DrySol. The amount of moisture the DrySol removes from the air is directly related to the concentration and temperature of the solution. Lowering the solution temperature produces dryer air as does increasing the solution concentration.



WORKING PRINCIPLE

Conditioner (dehumidifier)

The hygroscopic salt solution (DrySol) is pumped around and sprayed into dehumidifier (A). Humid air (from outside or recycled air) passes into the dehumidifier. This air comes into close contact with the hygroscopic DrySol solution spray, which absorbs the moisture present in the air. Dry air leaves the top of the unit. The DrySol solution including the absorbed moisture collects in the lower part of the unit. By subsequently cooling the salt solution, the air is cooled and dried simultaneously. Drip catchers at the air outlet of the dehumidifier ensure that the air stream does not contain any salt solution particles.



Regenerator

To ensure a stable concentration of salt in the dehumidifier, the absorbed moisture has to be evaporated. Therefore, part of the (diluted) DrySol solution is pumped to 'regenerator' (B). Here the DrySol solution is pumped and sprayed around again. At the regeneration side, water is evaporated by heating the salt solution. A minor secondary air stream, passing through the regenerator, absorbs this moisture and takes it outside. The concentrated DrySol solution returns to the dehumidifier. The process flow diagram shows that the 'cold' (diluted) DrySol solution from the dehumidifier meets the 'warm' DrySol solution in the regenerator.

A heat exchanger placed between these flows will preheat the 'cold' solution before it enters the regenerator. The 'warm' solution will give off heat, and will thus cool down before it is used in the dehumidifier again.

Operating advantages over dry desiccant dehumidification

Since the conditioner and regenerator units are separate and independent of each other, regeneration can be accomplished without any cross leakage of the air streams. Moist air from the regenerator cannot leak into the conditioner air stream. The only connections between the conditioner and regenerator are small pipes that circulate the DrySol solution. These two units, therefore, can be located remote from one another, which provides design flexibility, contributes to space savings and lower installation costs. Several conditioners can be used with one central regenerator.

Performance Benefits

- Precise humidity control
- Simultaneous air cooling and drying
- Bacteria free air
- Frost free cooling
- High reliability
- Stable, long-lasting desiccant
- High efficiency
- Integrates well cogeneration
- Energy savings
- Improves air system sanitation
- Corrosion-proof construction
- Low maintenance, long life

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Equipment – models and sizes

Imtech DryGenic has a wide variety of possible equipment models and sizes. From standard systems (the Polykath dehumidifier) to custom-made systems (the DryPac dehumidifier). Besides the dehumidifier, Imtech DryGenic manufactures and supplies complete drying tunnels.

The Polykath dehumidifier – the standard system

The Polykath dehumidification system is specially developed to serve the changing needs of industrial, institutional and commercial users. The conditioner and regenerator are built on one sump and, together with the pumps, plate and frame heat exchangers and DrySol piping, built on one frame with fixed dimensions. This means that a Polykath system is easy to install. The Polykath unit is available in four sizes: Small, Medium, Big and XL.

Air volumes	4.650 - 18.000 m ³ /h;
Moisture removal	57 - 216 kg/h.

Benefits/figures for the Polykath dehumidifier – the standard system:

- cooling and heating takes place outside the unit;
- uses relatively cheap coolants, like well water, river and cooling tower water;
- corrosion-proof, units mainly made of polypropylene;
- microbiological decontamination;
- compactly built;
- fixed dimensions;
- competitive costs;
- easy to engineer;
- minimal maintenance;
- easy to relocate;
- operates as a humidifier too;
- very long life span;
- standard system, available in four sizes;
- low running costs;
- easy to integrate.

The DryPac dehumidifier – the custom-made system

The DryPac dehumidification systems are specially designed to use low levels of energy and to minimize total energy consumption. The DryPac can handle target volumes of air. The latest designs are constructed of corrosion-proof material and have incorporated the latest advances in heat and mass transfer technology. Its simplicity and choice of materials of construction make the DryPac a reliable air dehumidifier with a long life span.

Large air volumes	up to 140.000 m ³ /h;
Moisture removal	up to 2.000 kg/h.



The Polykath dehumidifier



The DryPac dehumidifier

Benefits/figures for the DryPac dehumidifier – the custom-made system:

- cooling and heating takes place outside the unit;
- uses relatively cheap coolants, like well water, river and cooling tower water;
- units made of industrial heavy duty plastic;
- vertical air flows (VPT), counter current flow (air-DrySol); so very good performance;
- or horizontal air flows (HPT);
- several conditioners can be used with one central regenerator;
- high efficiency;
- custom-made system;
- operates as a humidifier too;
- energy savings;
- microbiological decontamination;
- performance reliability;
- precise humidity and temperature control;
- low running costs;
- very long life span.



Drying tunnel

We also have erection supervisors and commissioning engineers available for our worldwide customers to assist them with the start-up and training of their work force. If so required Imtech DryGenic can also supply other elements of a gelatine production line.

Drying tunnels

The drying tunnels are designed to provide commercial production of many high quality products. High production, quality construction and low energy consumption gives operators of the tunnel a clear and measurable advantage over their competitors. Imtech DryGenic drying tunnels are ideal for drying a wide range of products.

Kontinuierliche Gelatinetrocknungslinien

Practically all gelatine factories in the world are using Imtech DryGenic gelatine drying tunnels. Imtech DryGenic systems help gelatine industries to produce better quality products in an almost germfree, ultra clean and controlled temperature/humidity environment while minimising utility usage and maximizing production rates. The knowledge gathered by Imtech DryGenic in this part of business is not only based on joint ventures with gelatine manufacturers on "standard" gelatine, like hide, pigskin and bone, but also experience has been built with raw materials as fish, ossein, chrome-based hide and carrageenan. Imtech DryGenic systems continues to provide many benefits for industry controlling temperature and humidity regardless of outside air conditions. Today these systems are widely used and 60-70% of all gelatine, 240.000 T/Y, produced in the world is dried by Imtech DryGenic.





Applications

Any manufacturing or processing operation, which is humidity, temperature or micro-organism sensitive, is a natural application for a Imtech DryGenic system. Pharmaceutical, food, meat, gelatine, electronic, steel and film industry are among other things ideal application areas where the dehumidification systems provide optimum conditions continuously day in and out.

Market Application

Benefits

Baking

Enrobing
Product Cooling
Product Storage

Humidity control
Frost free cooling
Controls bacteria

Cereals

Coatings
Conveying
Cooling
Packaging

Eliminates agglomeration
Allows continuous production
Improves drying

Beverages

Freeze drying
Instant Tea Packaging
Instant Soup Blending
Packaging
Citric Acid

Eliminates product moisture regain
Controls humidity for continuous operation

Snack Foods

Coating Reels
Tunnel Drying
Packaging

Drying of heat sensitive products
Eliminates agglomeration
Controls humidity for continuous operation

Candy, Confectionery

Forming
Panning
Depositing Tunnels
Cooling Tunnels
Packaging
Storage/Warehousing
Cocoa
Bar/Granola Products

Bacteria-free air
Improves product quality
Easier conveying
Improves shelf life
Improves sanitation
Frost free operation

Sugar

Pulverising
Conveying
Bin Conditioning
Storage

Improves product quality
Low cost humidity control
Insures product flow

Meat and Poultry

Dry Sausage
Slicing Rooms
Cutting Rooms
Casings
Gelatine

Controls mould and bacteria
Allows flexible drying cycle
Handles multiple drying rooms
Improves shelf life
Energy savings Vs refrigeration

Dairy

Spray Drying
Cheese Drying
Sterile Drying
Packaging
Storage

Controls bacteria
Prevents condensation
Allows heat sensitive drying

Vegetables

Processing
Dehydration
Packaging

Improves product quality
Makes for easier conveying

Breweries

Yeast Rooms
Fermentation
Kegging areas
Storage
Frost free operation

Bacteria-free operation
Prevents mould growth
Floors dry quickly
Reduce maintenance costs

Warehousing

Candy
Freezer

Reduces fog and ice
Improves safety Longer storage life

Pharmaceutical

Hard shell Capsules
Soft shell Capsules
Tablet Compression
Pan Coating
Parental
Sterile Filling
Clean Rooms
Spray Drying
Powder Drying

Bacteria control
Temperature, humidity and bacteria control
Refrigeration savings





Biotechnology

Clean Rooms Sterile air
Processing Operations Condensation control
Cold Rooms Cold, dry air

Chemicals Technology

Fertilizers
Dry air without refrigeration
Hygroscopic Powders Prevents product agglomeration
Plastic Resin Grinding Efficient processing
Nylon Spinning

Hospitals

Surgery Rooms Enables surgeries with humidity control
Recovery Rooms Bacteria control
Intensive Care Units Improves air quality
Critical Care Units Controls humidity

Electronics

Microelectronics Condensation control
Circuit Boards Eliminates special low temperature refrigeration system
Semiconductors Sterile air
Clean Rooms

Plastic Molding

Blow Molding Prevents condensation
Injection Molding Decreases cycle time
Improves part quality
Lower reject rate
Increases equipment life

Windshield Glass Laminating

Windshield Glass Low dew-point control butylene film
Clean room conditions

Film/Photo

Emulsions Low dew-point for heat sensitive drying
Film and Papers Controls variable dew-point to meet process demand very precise dew-point control

Steel

Coil Cooling Eliminates corrosion of annealed coils
Blast Furnaces Improves blast furnace operation

Investment Casting

Aerospace Improves drying operations
Turbine Blades Cycle time reduction
Golf Club Heads Improves part quality
Costs saving vs. refrigeration Reduces rejects

Water Works

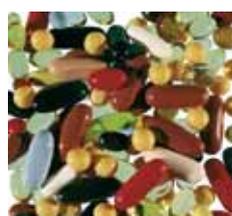
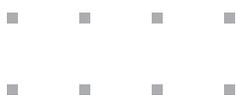
Pipe Galleries Prevents condensation
Pumping Stations Stops rusting and deterioration
Extends life of painted pipes Longer control & valve life
Works directly on water temperature
No need to insulate pipes

Miscellaneous

Candle Making Cycle time reduction
Paint Balls Improves drying
Research Facilities Soft shell capsule benefits
Tanker Coating Duplicates any temperature and humidity required
Condensation control

Comfort

Auditoriums Efficient gas cooling
Schools Reduces load on air conditioning
Office Buildings Prevents condensation on radiant ceilings
Museums Improve IAQ
Archive Storage
Libraries
Hospitals





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