

## Condensation-Free Mold Dehumidifier

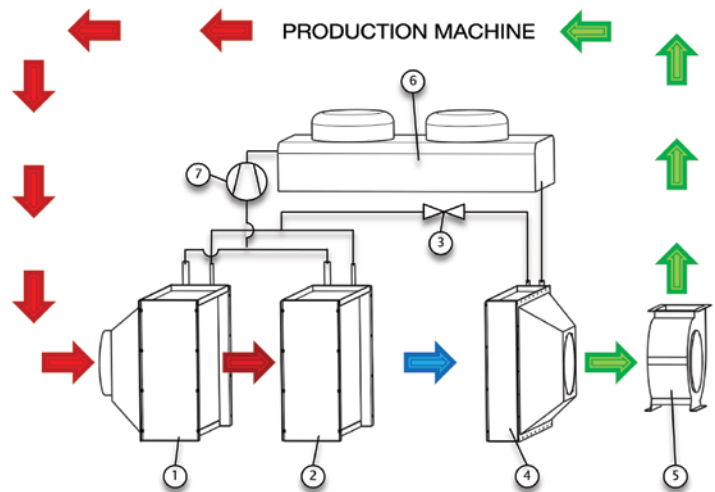
***Provides year-round, condensation-free production conditions without the need for chilled water improving product quality, shortening cycle times, and with the lowest energy consumption (saves up to 85% in energy cost).***



***Guaranteed to keep your mold dry with dewpoints of 39.2°F (4°C).***

Comet's DMS "Dry Mold System" provides a new, energy efficient approach to condensation-free mold dehumidification for injection molding, thermoforming, and blow molding applications. The DMS series is designed to be used for single production machines, or up to three units.

What differentiates the DMS from traditional cooling methods is that the DMS is not constantly dehumidifying the hot, humid ambient air. Instead, process air runs through the DMS in a closed-loop circuit. The DMS starts when moisture in the air is detected. This warm, moist air from the mold area flows into the DMS where it is dehumidified with the aid of a state-of-the-art refrigerant compressor without using any chilled water. The processed air is then returned to the mold area creating a dry environment around the mold and closing the loop. By eliminating the need for a chiller, a shorter cycle time and higher production output is achieved, and profits increase.



Warm, moist air in the mold area flows into the DMS dehumidification unit. The air is dehumidified with the help of a special refrigeration compressor without using chilled water. The processed air is then returned to the mold area again, closing the loop.

This state-of-the-art technology guarantees perfect, consistent conditions at the lowest possible energy consumption.

- |                   |             |                |
|-------------------|-------------|----------------|
| ① Evaporator      | ④ Condenser | ⑥ Condenser II |
| ② Evaporator II   | ⑤ Blower    | ⑦ Compressor   |
| ③ Expansion Valve |             |                |

***Rule of Thumb: A 34°F (1°C) increase in cooling water temperature = 2% reduction in productivity.***

Standard dehumidification systems on the market are supplied with a water pre-cooler. The DMS units do not need chilled water for pre-cooling, which automatically reduces overall investment costs. By cutting out the pre-cooler, immense costs and energy savings can be achieved. The DMS control adapts to the required cooling capacity of the ambient conditions, with the help of intelligent sensor technology. The DMS is a tailor-made system, allowing you to choose dry process air volumes from 500 to 3,500 Nm<sup>3</sup>/hr.

Installing a DMS unit is easy since the installation of insulated water pipes to and from a chilled water source is no longer necessary. The only connection is to an electrical source.

## The DMS Advantage

- Dehumidification at low temperatures without the need for chilled water – NO PRECOOLER (chiller) is required.
- State-of-the-art refrigeration technology (MPCSC - Micro Processor Controlled Segment Condensation) guarantees perfect, consistent conditions at up to 85% energy savings.
- Uniform product quality and higher production output with condensation-free production conditions.
- Higher machine efficiency through shorter cooling times.
- Suitable for single production machines (or up to three).
- Process air running in a closed-loop circuit for pre-treatment and air dehumidification with a dewpoint of 39.2°F (4°C).
- **Air-cooled version:** zero cooling water. **Water-cooled version:** works with temperatures up to 90°F (32°C).
- Air volumes from 500 m<sup>3</sup>/hr up to 3,000... guaranteed to keep your molds dry!
- Compact, can easily integrate into a manufacturing cell due to the marginal foot print it leaves, physically as well as ecologically.

## Limitations of Conventional Technology for Mold Dehumidification

### Why Does Condensation Form on Molds?

Condensation builds on a mold when the surface temperature falls below the dewpoint of the ambient air. When this occurs, the mold must be cooled using chilled water which causes the water vapor in the surrounding air to condense on the mold's surface causing it to sweat.

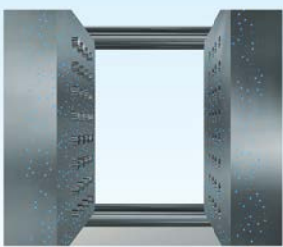
### What are the Consequences of Mold Condensation?

Dewpoint is a measure of how saturated the air is with water vapor. If the amount of water vapor in the air stays the same, but the temperature decreases, the relative humidity will increase because the colder air cannot hold as much water vapor. It's the same thing that happens when you have a cold glass with some kind of beverage inside and let it sit for a while – what happens to the outside of the glass is that condensation forms.



**Dewpoint in the air consists of ambient temperature and relative humidity.**

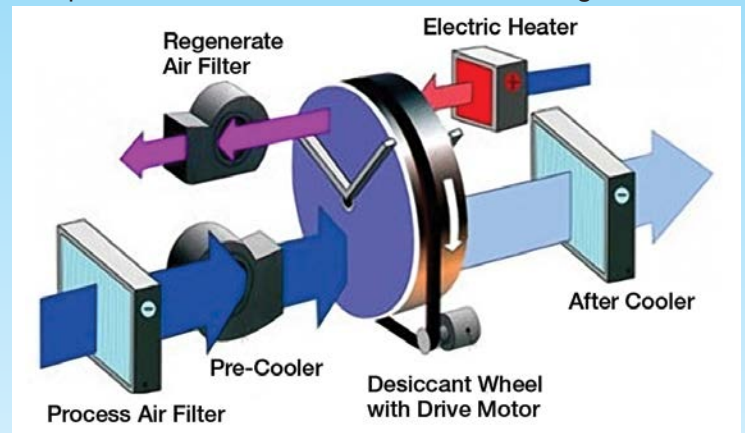
### Why do Plastics Processors Need to Worry About Condensation?



Condensation on a mold leads to possible water marks on the final product causing rejects or low product quality. Even moisture levels of 0.07% can cause cosmetic problems known as splay or silver streaking, an indicator that the material being molded contains too much moisture.

### What are the Limitations of Conventional Technology for Mold Dehumidification?

A popular way of drying air for mold dehumidification is with the adsorption system. This technology uses a desiccant wheel for dehumidification and utilizes a high amount of energy, high consumption of cooling water, as well as high maintenance costs. Increases in energy costs occur because large regeneration heaters, ventilators, motors, and pre- and after-coolers are needed for chilling the water.

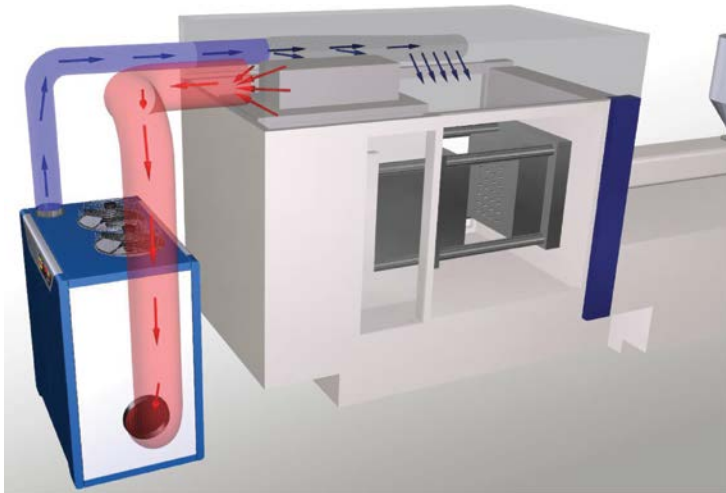


Mold dehumidification with condensation technology, uses a refrigerant system, and is an alternative to the desiccant drying. However, the disadvantages of all dehumidifiers, whether they operate on the basis of adsorption or condensation drying, is that relatively large cooling loads are needed to pre-cool the ambient air and, in many cases, the chilled water capacity of the facility is not sufficient to supply the necessary cooling load of chilled water. The molder then needs to add in the cost of a new chiller, or the extension of the existing chiller system, into its final investment calculation.

## A New Approach to Mold Dehumidification Technology

### Closed Loop Technology

Comet's DMS units are made of high quality, perfectly balanced components to allow optimal energy-saving mold dehumidification. The DMS unit cools and dehumidifies the air in a two-step refrigerant unit using MPCSC technology (Micro Processor Controlled Segment Condensation). The processed air runs in a closed-loop, returning to the DMS unit for pretreatment and air dehumidification under 40°F dewpoint. The processed air is dried by simulating a cold object inside the DMS (similar to the mold) allowing moisture in the air to condensate in an enclosed environment inside the DMS unit, *before* it ever reaches the mold.



Comet's DMS unit does not need chilled water for pre-cooling, automatically reducing overall investment costs. Its state-of-the-art refrigerant compressor automatically reduces the needed cooling capacity as soon as moisture in the air is detected. Thus, only using electricity for the actual cooling need of the refrigerant system. By cutting the need for a pre-cooler, immense cost and energy savings can be achieved.

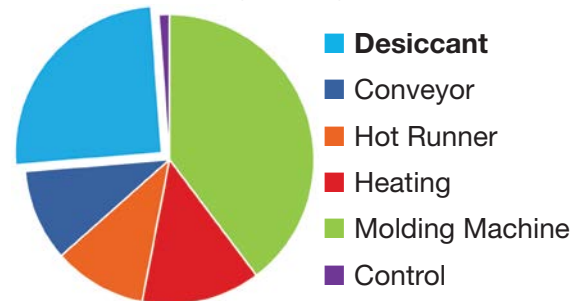
### Advantages of Closed-Loop Technology

- Dewpoints range from 34° to 43°F (1° to 6°C).
- Cooling water is not necessary so there is no need for a chiller to operate continuously.
- Minimum maintenance requirements.
- Automatic power adjustment.
- More than 80% energy savings

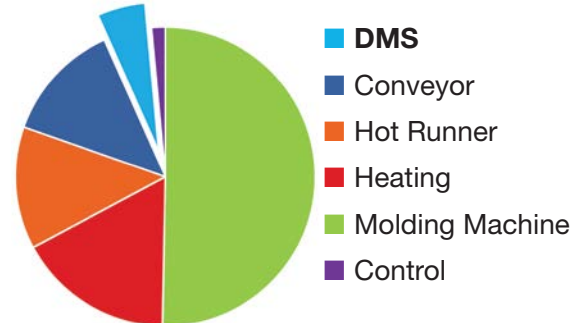
### Mold Drying with the DMS = Double Cost Savings!

The DMS's only connection is to an electrical source, so installing insulated water pipes to and from the chilled water source are no longer required. And, because the DMS has intelligent sensor technology, it adapts to the required cooling capacity of the ambient conditions. There is no additional investment for a chilled water supply. *The benefit is double cost savings, once with the initial investment and a second time during operation.*

### Desiccant Energy Usage



### DMS Energy Usage



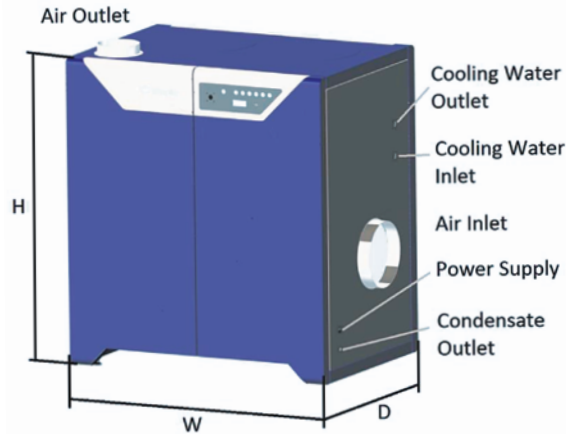
### Sophisticated Areas of Application

The DMS units are designed for all applications where sophisticated, high-performance molds are cooled with chilled water and are located in areas where moisture in the air can condensate on the mold. So, generally speaking, all injection molding, extrusion blow molding, and thermoforming systems. Core areas in the plastics industry are packaging systems such as caps and PET preforms, as short cycle times and high production outputs require chilled water.

### Easy Installation

Installation of the DMS is easy. All you need is to connect it to an electrical supply no longer requiring installation of insulated water pipes to and from the chilled water source.

DMS units are used for injection and blow molding machines – available in standard sizes from 500 to 2,500 m<sup>3</sup>/h nominal process airflow.



## Specifications

Model		DMS-05	DMS-10	DMS-15	DMS-20	DMS-25
<b>Nominal Process Airflow (Nm<sup>3</sup>/hr)</b>		500	1000	1500	2000	2500
<b>Fuse Protected Power (kW)</b>		5.8	6	7.7	8.5	10.6
<b>Average Power Consumption (kW)</b>		1.5	1.7	2.3	2.7	3.2
<b>Max. Cooling Load (kW)</b>		6.3	10.4	13.5	16.8	19.2
<b>Cooling Water Load</b>	(l/min)	6.4	10.6	13.8	17.2	19.6
	(Water 61°F / 16°C)	(lb/min)	14.1	23.4	30.4	37.9
<b>Cooling Water Load</b>	(l/min)	25.8	42.6	55.2	68.7	78.6
	(Water 86°F / 30°C)	(lb/min)	56.9	93.9	121.7	151.5
<b>Connections</b>						
<b>Air Inlet Ø Nominal Size</b>	(mm)	315	315	315	400	400
	(in)	12.4	12.4	12.4	15.7	15.7
<b>Air Outlet Ø Nominal Size</b>	(mm)	200	200	200	315	315
	(in)	7.9	7.9	7.9	12.4	12.4
<b>Condensate Outlet Hose ID Ø</b>	(mm)	6	6	6	6	6
	(in)	.24	.24	.24	.24	.24
<b>Chilled Water Inlet &amp; Outlet Ø Nominal Size</b>		G 1"	G 1"	G 1"	G 1"	G 1"
<b>Dimensions</b>						
<b>Width</b>	(mm)	1325	1325	1325	1525	1525
	(in)	52.2	52.2	52.2	60	60
<b>Depth</b>	(mm)	949	949	949	1209	1209
	(in)	37.4	37.4	37.4	47.6	47.6
<b>Height</b>	(mm)	1587	1587	1587	1801	1801
	(in)	62.5	62.5	62.5	70.9	70.9
<b>Weight</b>	(kg)	480	500	510	540	550
	(lbs)	1058	1102	1124	1190	1212

We reserve the right to change specifications without prior notice.