

Internal Air Cooler for Blow Molded Parts

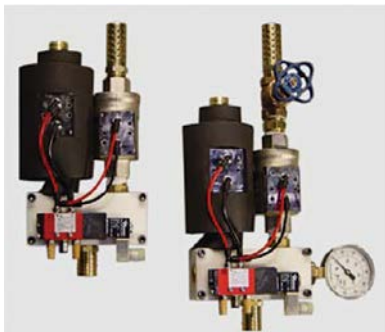
Improves blow molded product quality and consistency by internally cooling with chilled compressed air to increase profits and productivity.

Cooling time is the longest, most critical part of the total cycle time. Cooling is often extended to get the heat from the part all the way through the wall to the mold, and a difference in the temperature should always be expected. Extending the cooling time slows production and shrinks the profit.

Comet's compact, low cost BMB (Blow Molding Booster*) is a simple water-cooled air chiller designed to speed up the internal cooling of the product during the blowing process. Its constant temperature control system is perfect for cooling applications like small, thin-walled bottles. The BMB supplies cool air from 34° to 41°F (1° to 5°C) to a blow molding machine, and replaces regular blown air with chilled, compressed air to reduce material stress and distortion by as much as 35% during the cooling cycle.

When cooling time shrinks, cycle time lowers, mold stress and crystallization rates reduce, and profits soar!

The BMB is normally installed on top of the blow molding machine, thus saving floor space. It requires no maintenance and can handle any quality of compressed air. The integrated refrigeration circuit requires a chilled water supply with a temperature less than 68°F (20°C). The air outlet temperature is designed to be above 32°F (0°C) to avoid freezing the moisture condensation from the compressed air inside the heat exchanger (evaporator) of the unit.



Blow Valve Blocks are specially designed for compressed air at low temperatures.



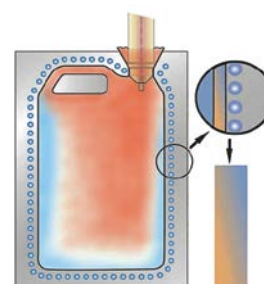
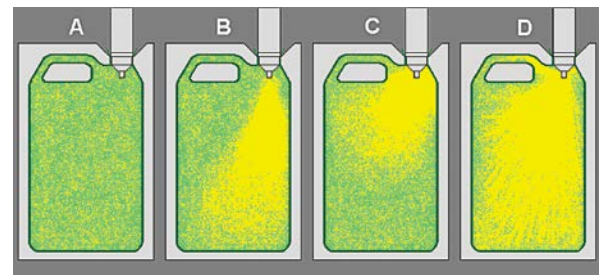
Air-Cooled Blow Pins and Blow Needles can handle almost every blow molded application.

The BMB unit is used in conjunction with tailor-made blow pins and blow needles to recirculate the blown air. Special blow valve blocks control blowing and deliver the chilled process air to the blow molding machine.

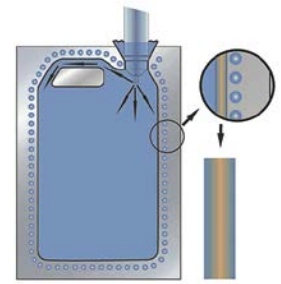


Two size units, both maintenance free, are available to handle varying air flow rates

The illustration below shows the importance of the blow valve blocks and the blow pin design on air distribution inside blow molded products. Example (A) shows little or no air exchange. (B) and (C) show uneven distribution. The illustration (D) shows perfect air exchange and perfect air distribution.



Blowing process with normal air



Blowing process with chilled, compressed air

* The BMB does not include a desiccant dryer.

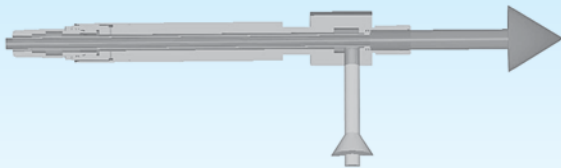
The BMB Advantage

- Simple, easy to install and operate, increases production from 15% to 35%.
- Suitable for virtually all extrusion blow molding machines.
- Compact, normally installed on top of the blow molding machine, thus saving factory floor space.
- Quick return on investment (15 - 30 days).
- Maintenance free, no spare parts inventory required.
- Removes heat from the inner surface of the product reducing material stress while cutting cooling and cycle time.
- Capable of handling any quality of compressed air.
- Low energy consumption, CFC-free, ozone friendly.
- Less product distortion due to lower crystallization rates which may enable you to save up to 10% in raw materials.
- Maintains a compressed air supply temperature no higher than 41°F (5°C) for the blow molding process.
- Simple blow pin and blow needle designs.
- Many different valve configurations available to handle any blow molding application.

BMB (Blow Molding Booster)... How it Works.

The BMB (Blow Molding Booster) is a compressed air, water cooled chiller with a constant temperature control system for blow molding applications that will internally cool the part.

The BMB continuously removes hot air while simultaneously introducing cold air into the part. This process of cycling the air is achieved by using air-cooled blow pins which can be easily engineered for the specific machine and application. The pin consists of a central exhaust pipe that pulls hot air out of a product and a fitting which sends cold air into the product around the outside of the exhaust pipe. In addition, small channels externally send air around the circumference of the blow pin at the cooling sleeve to cool the flashing.



Recirculating Blow Pin

The Three Stage Process

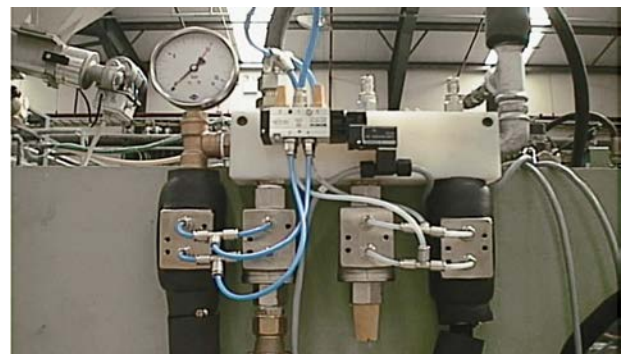
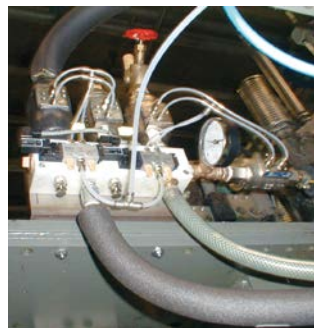
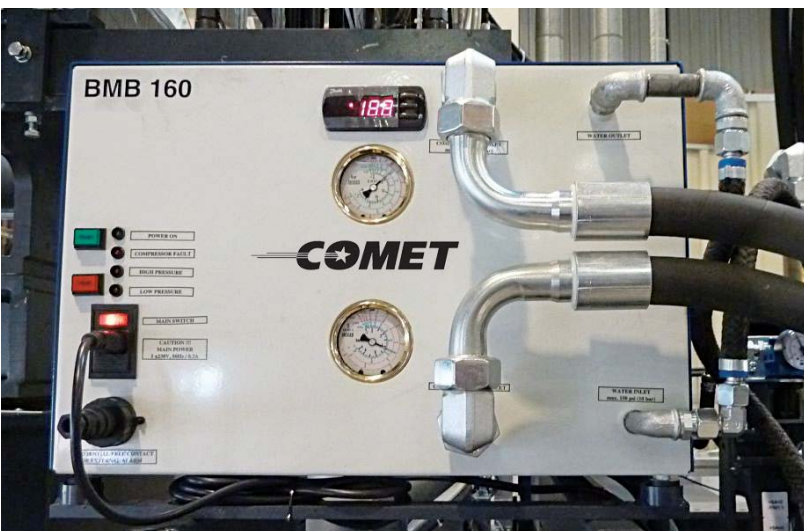
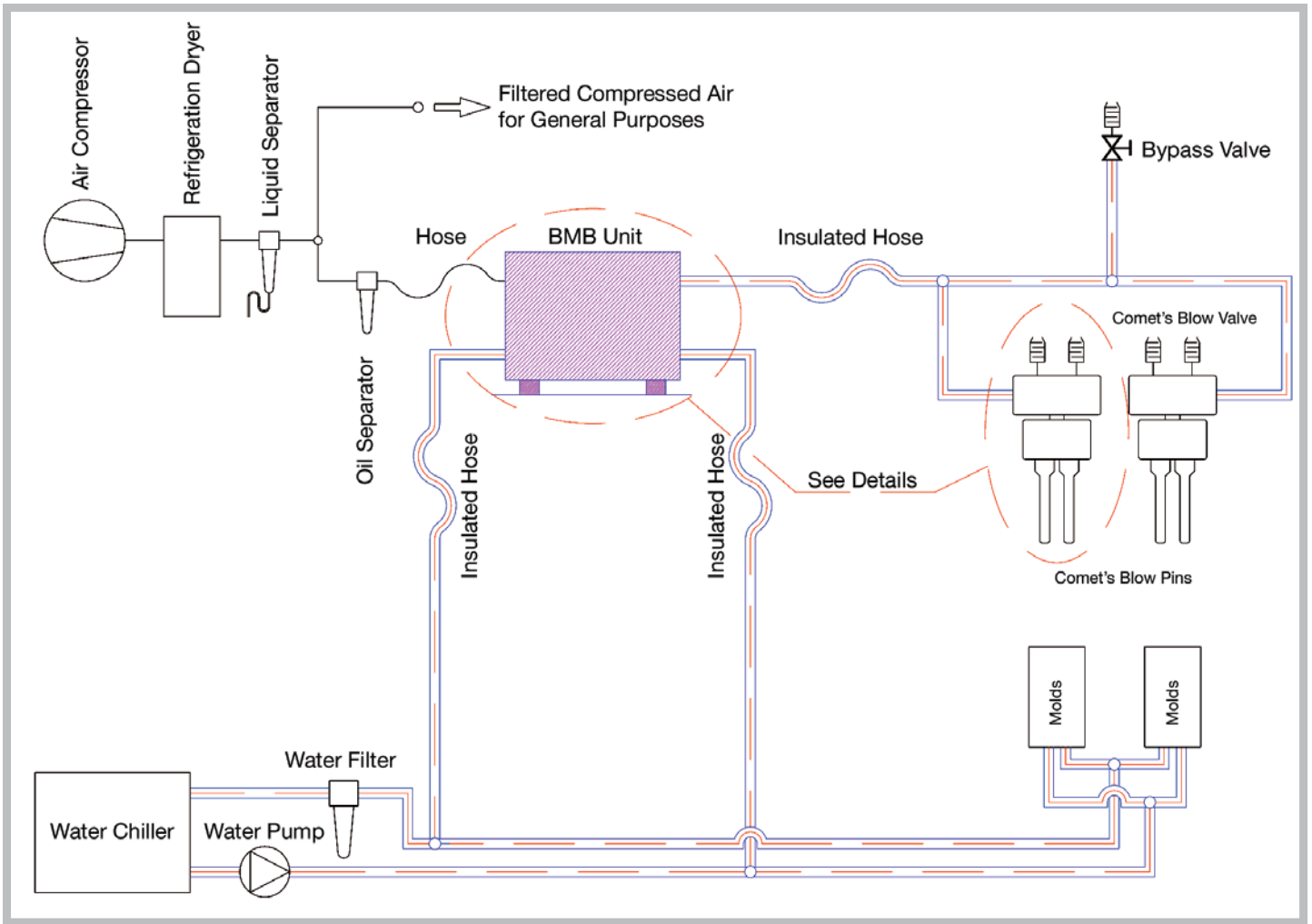
1. The pre-blow phase uses chilled air through both blow pin channels to inflate the parison inside the mold as quickly as possible, while the blow pin

is entering the product finish. The high-pressure pre-blow process forms the container, forcing out ambient air between the mold and parison through the mold vents. The product is inflated and comes in contact with the water-cooled cavity surfaces, which promotes product cooling.

2. The blowing phase is used to do the actual cooling of the product with cold air. Upon inflation of the product in the pre-blow stage, only a small amount of back-pressure is required to maintain contact with the mold cavity walls. During this stage, air flow through the center channel of the blow pin is reversed, allowing hot air to escape while cold air is blown in through the outer channel. Cold air entering the container forces the cold air out the center channel. This allows the cold air to circulate instead of trapping the hot air inside the container as with a conventional process.
3. Finally, the venting stage where the air pressure is balanced between the container and the outside. At this stage, the container will have cooled sufficiently to maintain its dimensionality.

The Simple Cooling System

Air is forced into the system and cooled by cold water. The refrigerated air is then directed into the blow pin for product blowing.



Specifications

Model	Max. Air Flow Rate		Max. Air Pressure		Max. Power Consumption	Connected Load	Cooling Water Temperature		Dimensions in. / mm			Weight	
	scf/hr	Nm ³ /hr	PSI	Bar	kW	kW	Min.	Max.	Width	Height	Depth	lbs	kg
BMB-160	5,648	160	203	14	950	1,900	35.6°F	60.8°F	12 /	30 /	13½ /	99	45
BMB-320	11,200	320	203	14	4,000	5,000	2°C	16°C	315	770	345	264.5	120

We reserve the right to change specifications without prior notice.



Options

- Customizable blow pin and blow needle designs available.
- Blow valve blocks to optimize air exchange.
- Air compressor, air/oil separator, air dryer.
- Control valve for controlling bladder valve blocks.

Blow Valve Blocks are available in four sizes from 3/4" up to 2" with a low amp of 24VDC pilot valve.