MAP – IACS

Mold Area Protection
Internal Air Cooling

world of innovation

MAP – Mold Area Protector

The **MAP** is used to prevent condensation on the mold surface. By using the **MAP**, cold water temperatures of 6 °C can be run all year round without a drop of condensation on enshrouded tools – no matter under what climatic conditions.

A **FIT** controller controls the device and monitors all processes, so the operation is easy and even errors can be easily detected and corrected.

- **Easy to operate**
  All parameters displayed for optimal process monitoring and to ease error detection.
- **Outer housing made of brushed stainless steel**
- **High quality refrigeration compressor**
- **Crane hook**
- **Pump**
  For removing the condense water from the drip pan.
- **Low maintenance**

Molded plastic products are usually cooled using cold water in the cavity of the mold. However, lowering the chilled water temperature below the dew point of the ambient air causes condensation on the mold surface. The moisture can lead to defects in the molded product and permanently damage the mold itself or drastically reduce its service life – waste and higher operating costs are the result. However, raising the chilled water temperature increases the cooling time, slows down the manufacturing process, and reduces overall productivity.

The proven **Mold Area Protection** (**MAP**) systems have been specifically designed to dehumidify molds and ensure sweat-free production throughout the year.

IACS – Internal Air Cooling System

The **Internal Air Cooling System** raises productivity by up to 200% while improving the quality of your blow-molded products by exchanging the internal cavity with cold air during the cooling phase. This reduces material stress and automatically shortens the cooling time.

BMB

Blow Molding Booster

The **BMB** is an affordable entry to internal air cooling. Although less powerful than the **BAC**, it is also less sensitive in terms of compressed air quality and completely maintenance-free. The air in the **BMB** is cooled to 1–5 °C in order to cool the inner walls of blow-molded products more evenly. The minimum expected production increases in **BMB**-assisted production will be communicated in our relevant offers!

BAC

Blow Air Chiller

The **BAC** is the top performer in internal mold cooling: powerful and equipped with the **FIT** controller to get the most out of your system. The compressed air is cooled down to -35 °C in the **BAC** – this requires good quality compressed air. A residual oil content of maximum 0.01 mg/m³ and a maximum pressure dew point of 5 °C at 7 bar are an important prerequisite to avoid problems, as oil would destroy the molecular sieve in the PAD. The adsorbent serves to lower the dew point of the compressed air far enough to prevent freezing of the moisture in the system. With optimum quality compressed air, you can take advantage of the maximum benefits of internal mold cooling!

The cooling phase is one of the most critical and at the same time one of the longest processes in blow molding.
The large temperature difference between the water cooled external side of the product and hot uncooled inside produces stress in the finished part. This reduces the overall quality and can lead to failure of leak-, strain-, and/or drop-tests.

Over many years, we worked on the design and further development of a cooling system with compressed air, the **Internal Air Cooling System** (**IACS**).

Performance data

	MAP S	MAP M	MAP L	MAP XL
Minimum air flow rate [Nm³/h]	850	1,650	2,500	3,300
Maximum air flow rate [Nm³/h]	1,250	2,500	4,200	5,800
Air outlet diameter [mm]	300	300	400	400
Chilled water load at 40 °C, 80% r.h. [kW]	42.0	83.0	142.0	201.0
Water flow rate [l/min]	60	120	204	288
Chilled water load at 35 °C, 80% r.h. [kW]	30.0	60.0	103.0	145.0
Water flow rate [l/min]	43	85	146	207
Chilled water load at 30 °C, 70% r.h. [kW]	18.3	36.3	62.2	87.8
Water flow rate [l/min]	27	54	89	126
Chilled water load at 25 °C, 60% r.h. [kW]	10.4	21.0	35.4	50.0
Water flow rate [l/min]	15	30	51	72
Chilled water load at 20 °C, 50% r.h. [kW]	7.1	14.2	24.0	34.0
Water flow rate [l/min]	10	21	35	49
Water connection [inch]	¾	1¼	1½	2
Maximum condensation water flow [l/min]	0.8	1.6	2.8	3.9
Maximum power consumption [kW]	3.2	5.0	8.5	10.0
Operating voltage [V/Hz]	3~400/50, 3~460/60			
Width [mm]	1,160	1,220	1,615	1,820
Depth [mm]	1,110	1,260	1,160	1,260
Height [mm]	1,380	1,420	1,810	2,080
Weight [kg]	550	650	950	1,110

	BMB S	BMB L	BMB XL	BAC S	BAC M	BAC L	BAC XL	BAC XXL
Minimum air flow [Nm³/h]	30	70	12	60	90	110	175	240
Maximum air flow [Nm³/h]	160	320	600	130	190	250	375	600
Air pressure rangey [bar]	6 to 15			7 to 15				
Required air quality	N/A			Dew point < 8 °C, oil 0.01 mg/m³				
Air inlet/outlet [inch]	1		1½	1	1	1½	1½	2
Maximum water flow rate [l/min]	1.9	3.8	8.0	7.2	11	14.5	21.5	85
Water pressure range [bar]	3 bis 8			3 bis 8				
Water temperature [°C]	3 bis 15			3 bis 15				
Water temperature range [inch]	½		¾	½				¾
Refrigerant	R134a			R507				
Power consumption [kW]	0.9	1.8	2.2	2.2	3.1	4.7	6.6	6.6
External fusing [A]	10	16	10[1]	10[1]	16[1]	16[1]	20[1]	20[1]
Power supply [V/Hz]	1N~230/50 2~220/60		3~400/50 3~200/50, 3~220/60, 3~480/60, 3~575/60					
Width [mm]	315		450	900				1,100
Depth [mm]	345		420	770				940
Height [mm]	770		877	1,650				1,800
Weight [kg]	60	70	90	610	660	790	870	1,120

[1] Values refer to operating voltages of 3~400 V/50 Hz and 3~460 V/60 Hz.

Request form Mold Area Protection

Person to contact: _____

Company: _____

Address: _____

City: _____

ZIP / State: _____

Phone: ( ) –

Fax: ( ) –

E-Mail: _____

Date: _____

Submitted by: _____

MAP systems are designed to protect the mold of a plastic molding machine from condensation in hot and humid weather. The clamp area of the machine is be enclosed and separated from the ambient air in the plant. Filtered, dry air is ducted from the MAP-unit to the enclosed clamp area, which contains the chilled water-cooled mold. Technicians trained by Wittmann will install the enclosure. Central systems can also be designed to protect several molding machines. Wittmann will issue a quotation and stands for a condensation free production under any weather conditions with the desired chilled water temperature.
Please provide us with the information required to size the equipment and for the proper function by answering the following questions. Photographs and layout drawings can be very helpful as well.

Is the chilled water temperature raised in the summer to avoid condensation on the molds?

- O Yes
- O No

If „yes", how much of production is lost due to higher water temperature in the summer?

_____ %

Which chilled water temperature is used in summer and in winter?

_____ °C in sommer

_____ °C in winter

If „no", is there quality loss?

- O Yes
- O No

Is a central chiller used for all machines in the plant?

- O Yes
- O No

What is the water pressure?

_____ bar

What is the ideal chilled water temperature?

_____ °C

How many machines are to be protected from condensation?

_____ pcs

Please provide the following information for every machine to be protected from mold sweat in your plant.

Maschine-No: _____

- O Injection molding
- O Blow molding
- O Other: _____

Brand: _____

Model: _____

Molding cabin dimensions in cm:

Length: _____

Width: _____

Height: _____

How is the product removed from the machine?

- O By robot from the top
- O By robot from the side
- O By gravity on conveyor
- O Manual by operator
- O Other: _____

Are any fans (blowers) used inside the molding cabin for product cooling or to assist ejecting the product?

- O Yes
- O No

Is post cooling used on this machine?

- O Yes
- O No

Is the post cooling station attached to the machine?

- O Yes
- O No

If „yes", describe: _____

_____

Request form IACS Internal Air Cooling System

Person to contact: _____

Company: _____

Address: _____

City: _____

ZIP / State: _____

Phone: ( ) -

Fax: ( ) -

E-Mail: _____

Date: _____

Submitted by: _____

The Internal Air Cooling Systems are designed to improve the quality of extrusion blow molded products and increase the productivity of the molding machine. Special blow pins or blow needles and blow valve blocks designed by Wittmann are normally required to distribute the chilled air in the product during the cooling process in the mold. Wittmann will issue a quotation and stands for a production increase at the current product quality or better. Answering this questionnaire will enable us to do so. Photographs or drawings of the product can be very helpful as well. Please send us enough information to avoid misunderstandings.

Which chilled water temperature is used?

_____ °C

Is anti-freeze being used?

O Yes O No

Is a central chiller used?

O Yes O No

Water pressure at the mold?

_____ bar

Compressed air pressure at the molding machine?

_____ bar

Is the compressed air dry and free of oil?

O Yes O No

Type of molding machine:

O Continuous extrusion O Accumulator head O Recip. screw

O Other: _____

Brand: _____

Model: _____

Year built: _____

Please send the completed questionnaire along with drawings of the product as well as the blow pin to us so we may create an offer for you.

Maximum extruder capacity? kg/h

What resins are used? _____

How many mold clamps? _____

How many molds per clamp? _____

Total number of cavities? _____

Rough dimensions of the product? mm x mm x mm

Volume of the product? lit.

Net product weight? g

Product weights with flash? g

Total cycle time? s

Blowing time? s

Vent time? s

Are blow pins used?

O Yes O No

Blow pin diameter? mm

O Top blow O Bottom blow O Blowing through the head

Are blow needles used?

O Yes O No

Numbers of needles?

Size of needles? mm

What is the blowing method used to blow the product?

O Stagnant air O Interval blow O Recirculation

What is the blow valve control voltage?

O 24 V DC O 115 V AC O 230 V AC O Other: _____

Are there any parts inserted in the mold or on the blow pin prior to blowing the product?

O Yes O No

How is the product removed from the mold?

O By robot O By operator O By gravity on a conveyor

O Other method: _____

Is the product cooled in the mold only...?

O by mold and post cooling fans O by mold and post cooling device

O Other method: _____

Which parts of the product will get out of specifications or will be deformed, if the cooling time is cut shorter?

We kindly ask for your understanding that we can only start working on your request after all documents have been received!

WITTMANN Technology GmbH
Lichtblaustrasse 10
1220 Vienna | Austria
Tel.: +43 1 250 39-0
info.at@wittmann-group.com

www.wittmann-group.com

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