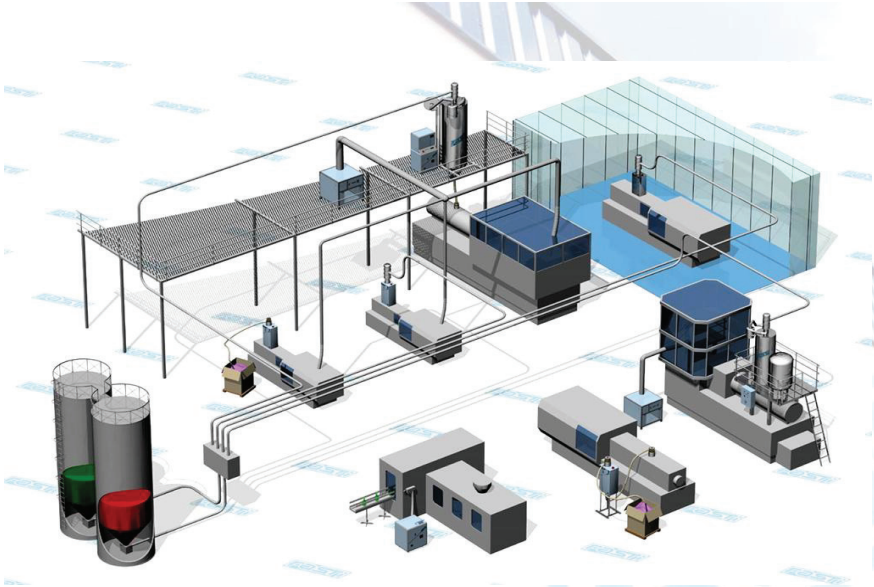
The Advantage of Blue Air Systems

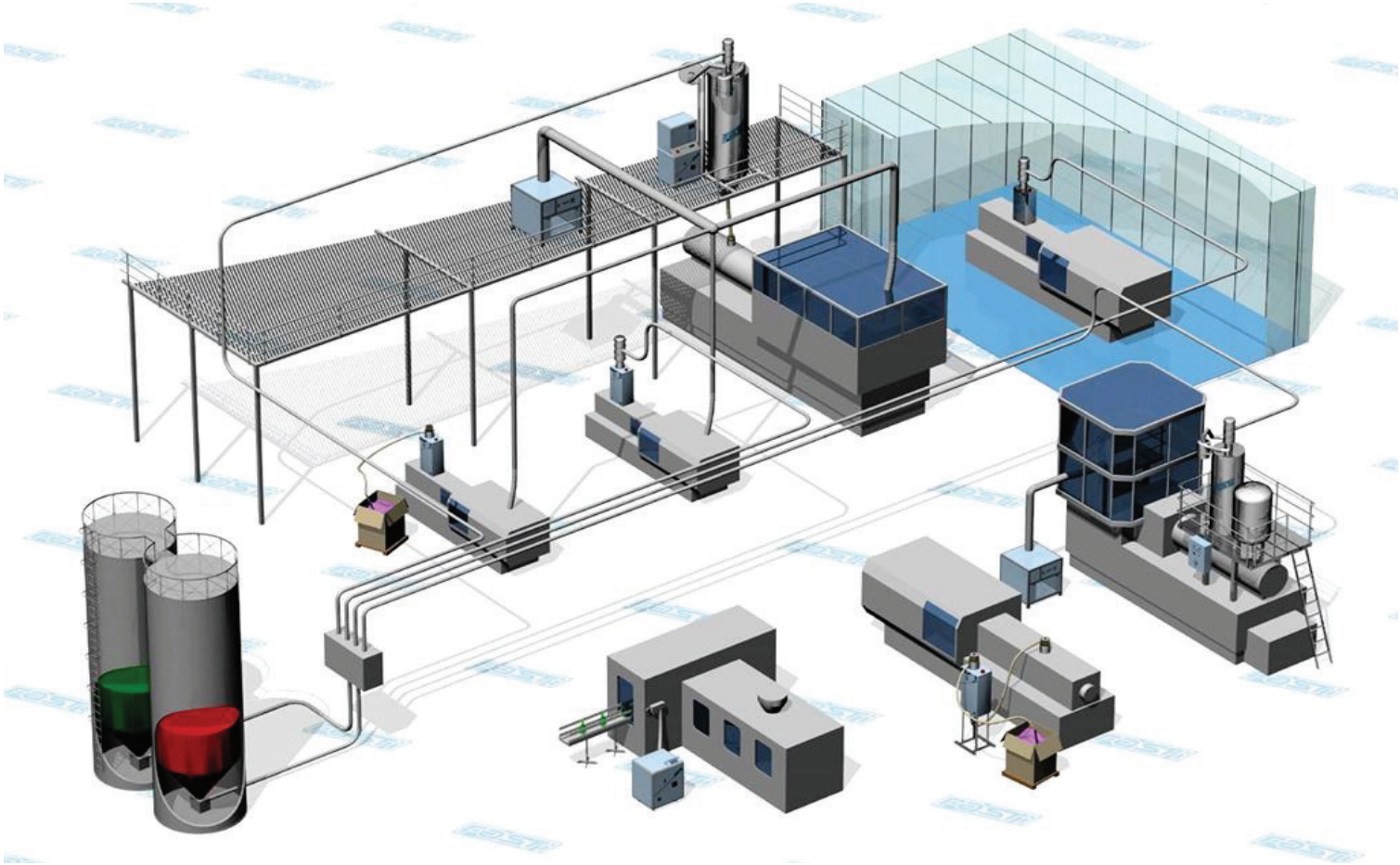


BLUE AIR SYSTEMS, an Austrian-based company, founded in 2010, located in Kundl/Tirol with 20 years of experience supplies the plastics industry with innovative technology. Core subject is climate technology with solutions for extremely dry air for energy efficient processing in the plastics industry.

Peripheral equipment for the plastics processing industry
DRYING AND COOLING

Blue Air
SYSTEMS

Solutions for Plastics Processing



Solutions for Plastics Processing

Drying

Drying Resin
Mold Area Dehumidification



Cooling

Internal Product Cooling
Water Chiller



Handling

Conveying
Dosing & Mixing



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Internal Product Cooling CAC

Extrusion Blow Molding with Chilled Compressed Air

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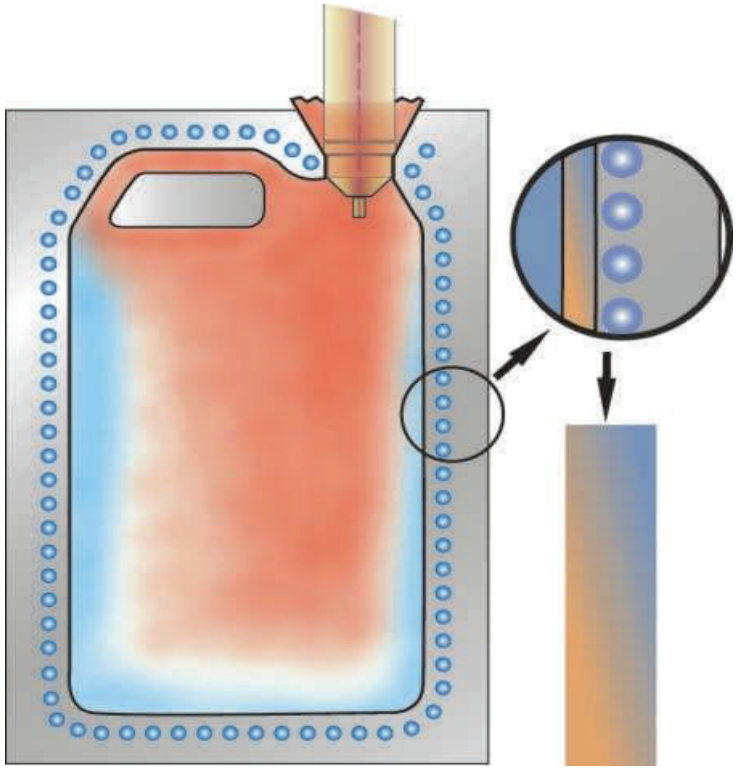
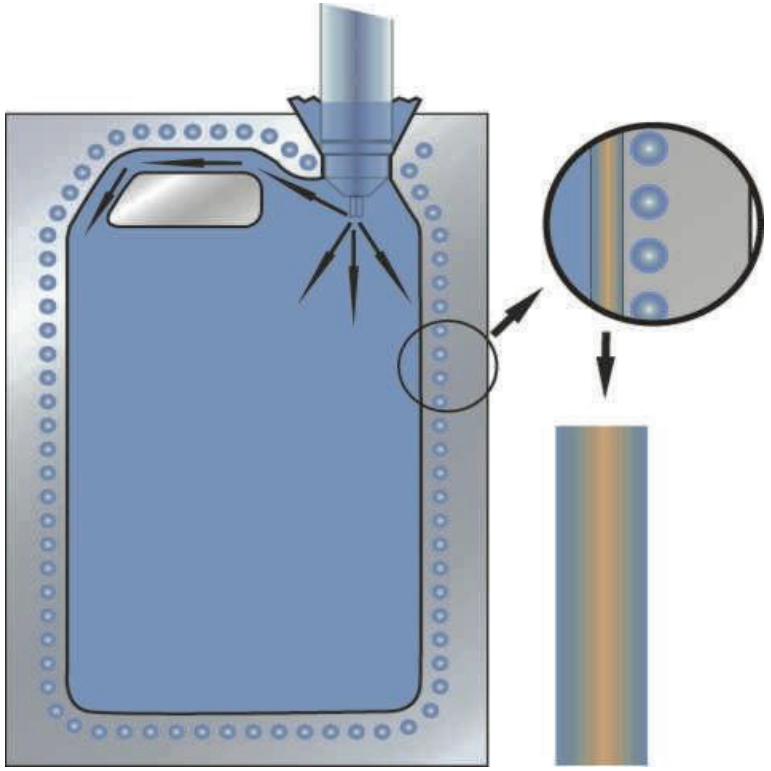
Internal Product Cooling CAC

Extrusion Blow Molding with Chilled Compressed Air



Blowing process with **normal air**



Blowing process with **chilled compressed air**

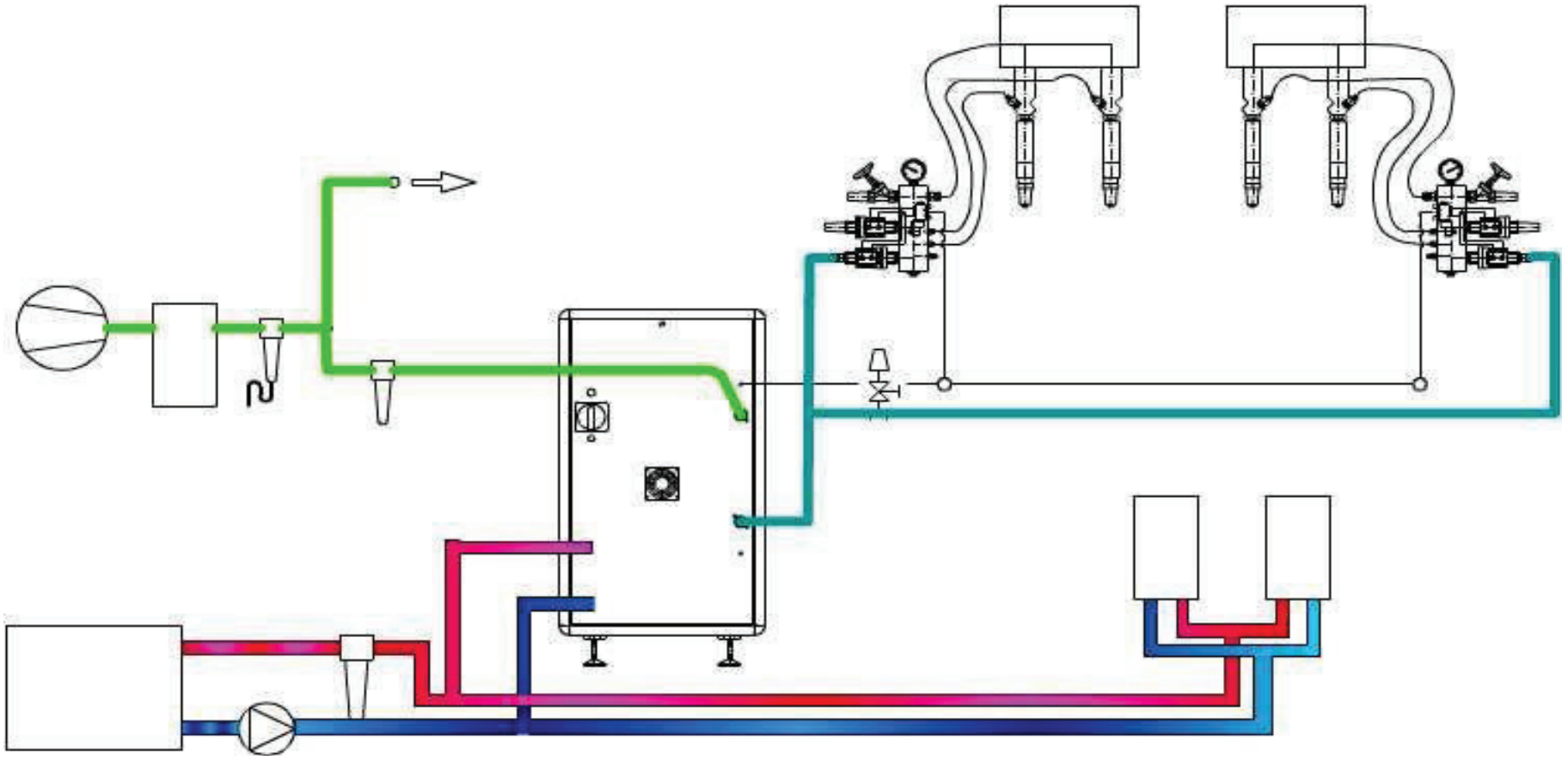
Internal Product Cooling CAC

Advantages of the CAC-System

- Quality increases due to specific and intensive heat removal from the inside
- Production increases up to 50% (depending on the product)
- Quick return on investment between 1 month and 1 year
- Suitable for virtually all blow molding machines
- Low energy consumption and maitenance expenses
- Easy integration with fully automatic operation
- CFC - free system

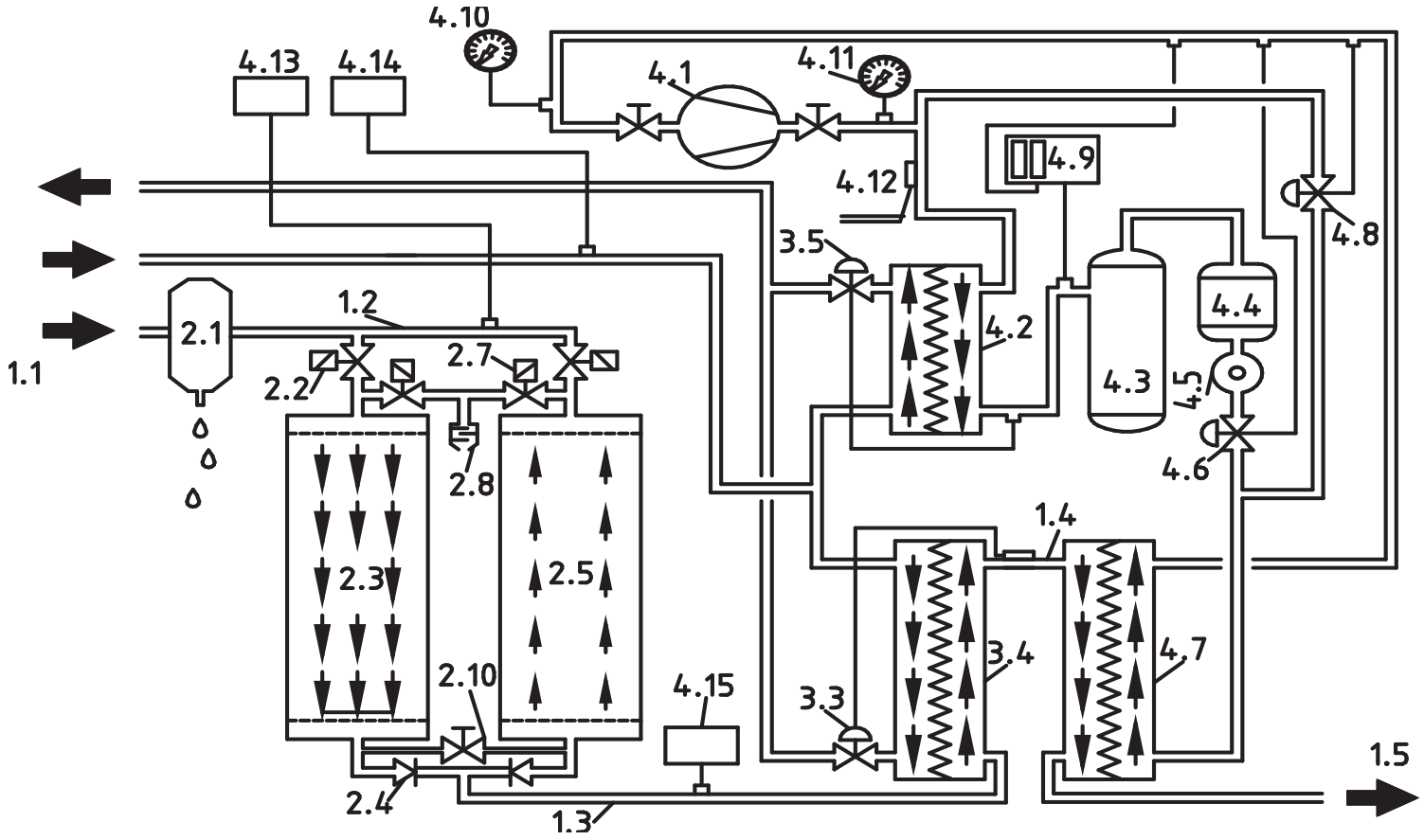
Internal Product Cooling CAC

Operating Principle



Internal Product Cooling CAC

Operating Principle



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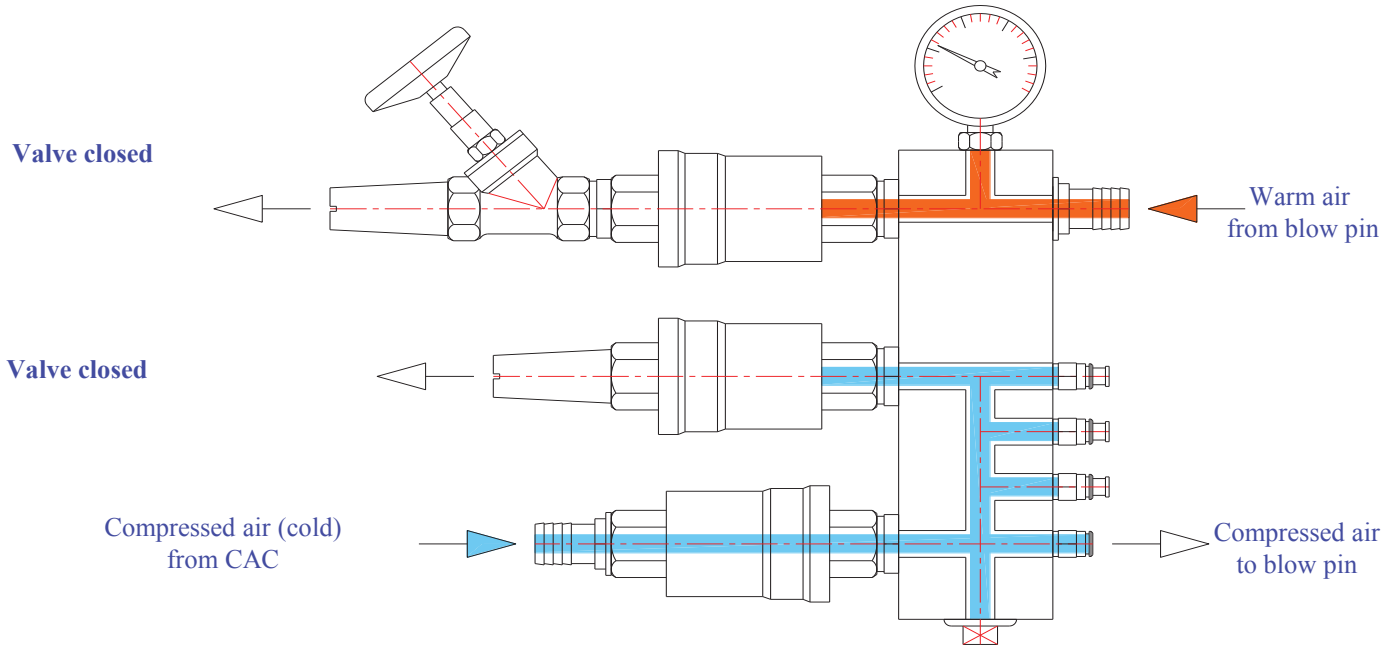
Internal Product Cooling CAC

Blowing Valve Block

Internal Product Cooling CAC

Pressurising and Continuous Blowing („D“)

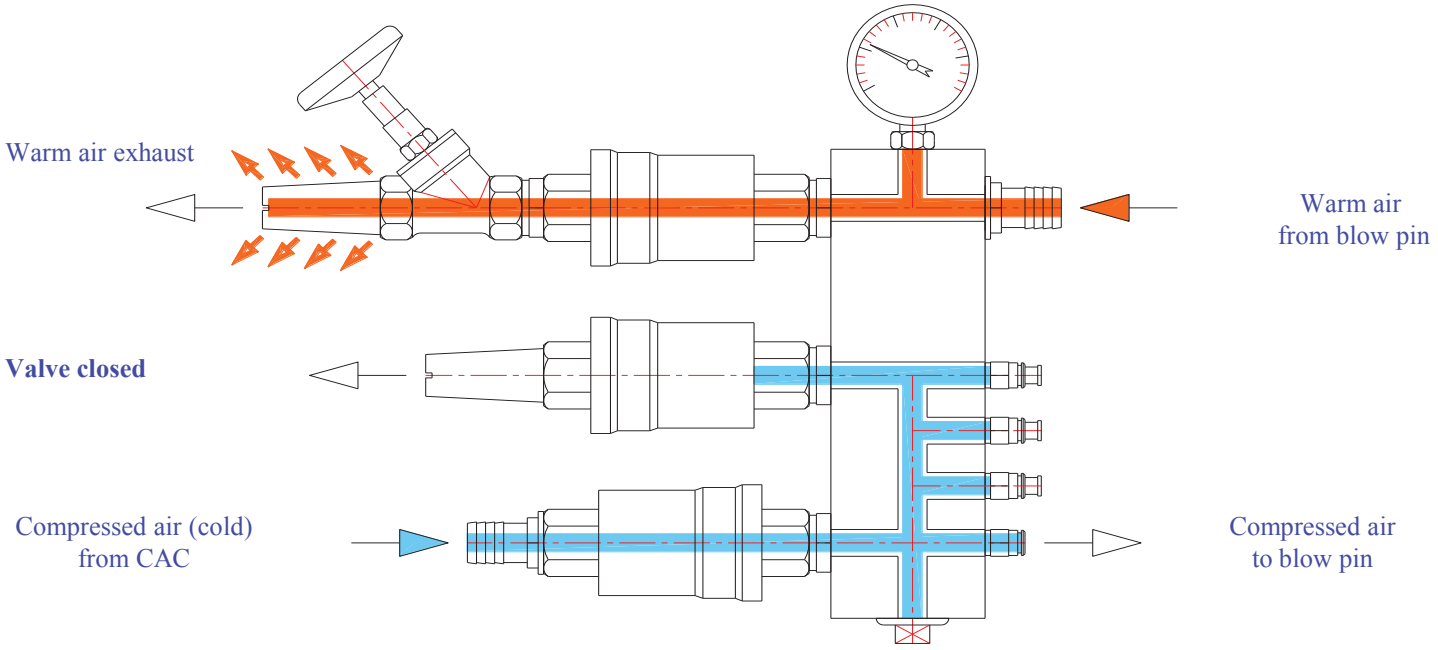
Step 1: Cold compressed air is inflating the product



Internal Product Cooling CAC

Pressurising and Continuous Blowing („D“)

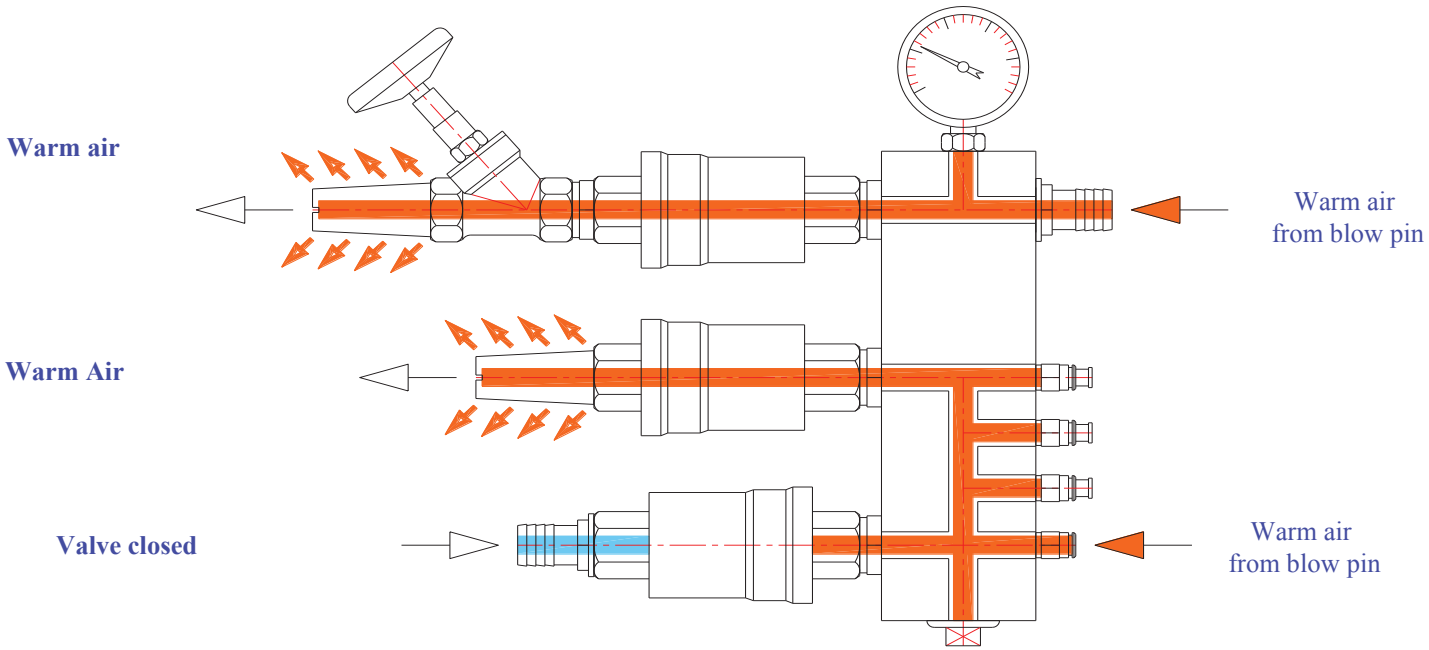
Step 2: Cold compressed air is flushing the product



Internal Product Cooling CAC

Pressurising and Continuous Blowing („D“)

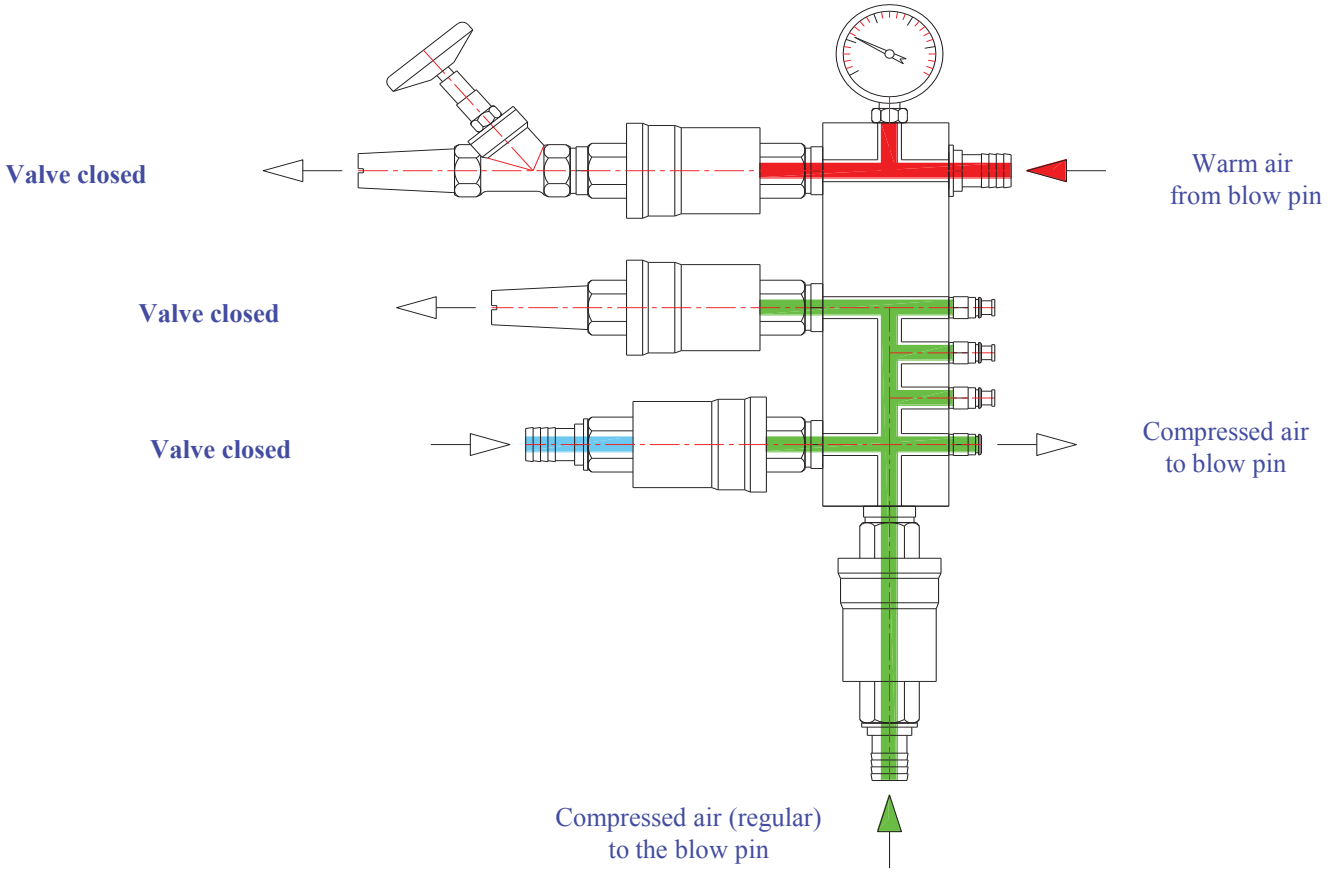
Step 3: Warm air exhaust over both silencers



Internal Product Cooling CAC

Pre-blowing with Compressed Air („V“)

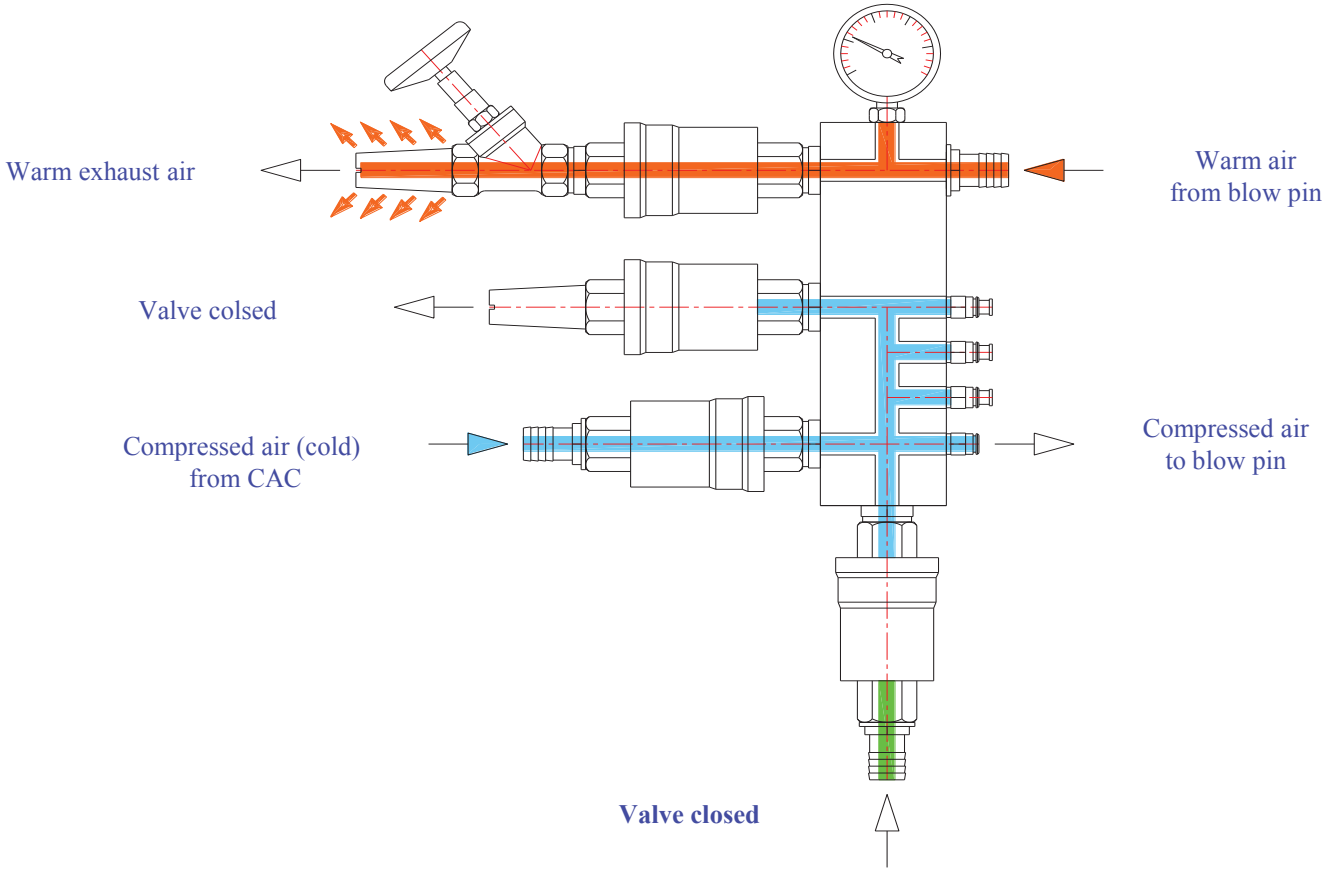
Step 1: Regular compressed air ist inflating the product



Internal Product Cooling CAC

Pre-blowing with Compressed Air („V“)

Step 2: Cold compressed air is flushing the product



Internal Product Cooling CAC

Blow Pins

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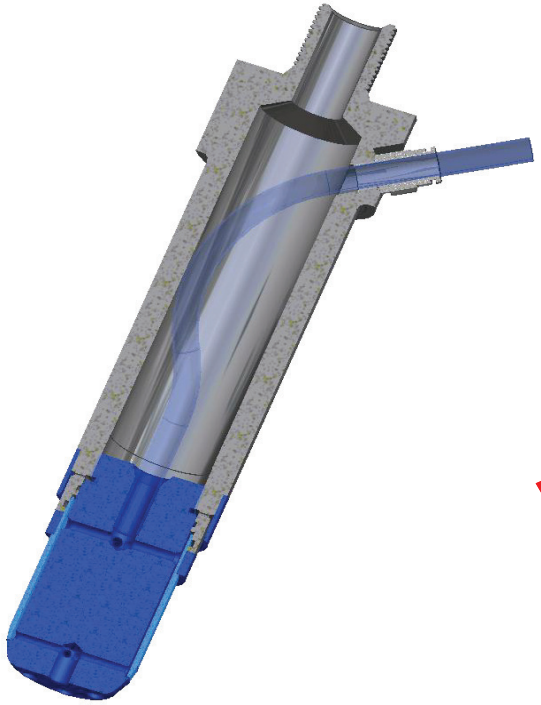
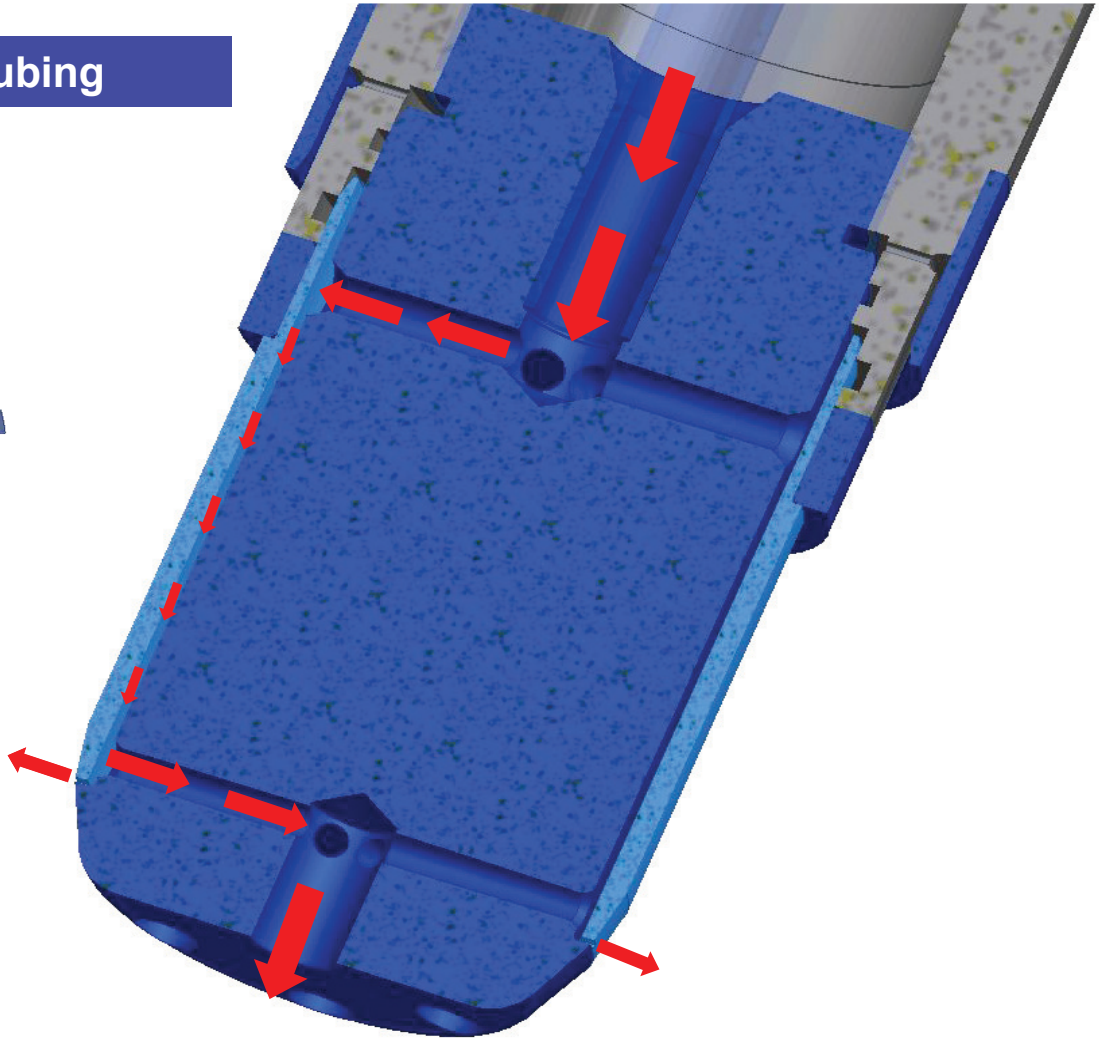
Internal Product Cooling CAC

Blow Pin: Blow Air Tubing





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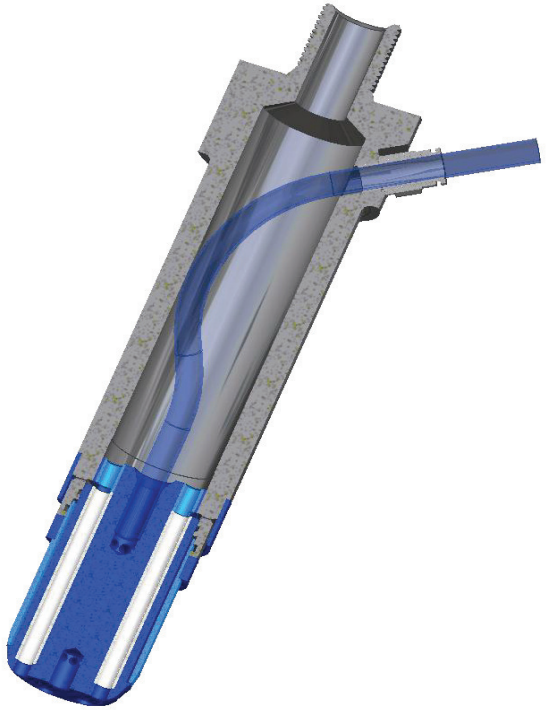
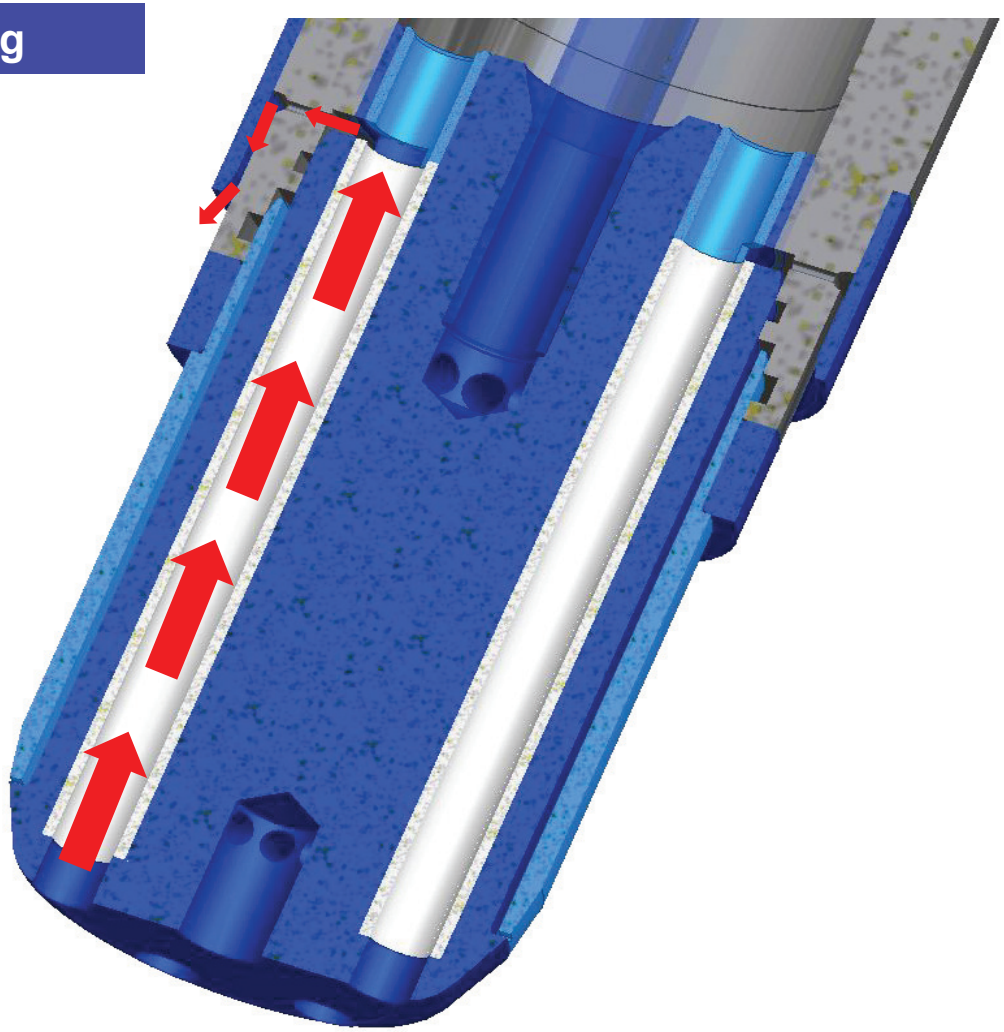
Internal Product Cooling CAC

Blow Pin: Exhaust Air Tubing





Internal Product Cooling CAC

Examples

Container for cosmetic lotion:

Weight: 33 g	Compressed air consumption: 40 m³/h
Volume: 0,45l	Compressed air temperature: -28°C
Material: HDPE	Cycle time: 19,6 sec.
Cycle time: 12,6 sec.	Cycle time reduction: 16%

Production increase: 19%

Container for dish washing liquid:

Weight: 55 g	Compressed air consumption : 85 m³/h
Volume: 0,9l	Compressed air temperature : -28°C
Material: HDPE	Cycle time : 10,8 sec.
Cycle time: 13,2 sec.	Cycle time reduction : 18,2%

Production increase: 22,2%

Amortization time for the CAC-unit: 93 days

Country: USA
Machine: Battenfeld
Compressed air pressure: 7 bar
Cooling water temperature: 9°C
Compressed air temperature: 28°C
Blowing method: Continuous blowing
CAC-model: CAC 180
Number of blow molding machines: 2
Number of blow stations: 2
Number cavities/station: 3

Internal Product Cooling CAC

Examples

Container for chemical substances:

Weight: 450 g	Compressed air consumption: 107 m³/h
Volume: 10 l	Compressed air temperature: -31°C
Material: HDPE	Cycle time: 16,2 sec.
Cycle time: 22,2 sec.	Cycle time reduction: 27,4%

Production increase: 37,7%

Amortization time for the CAC-unit: 58 days

Country: Germany
Machine: Kautex
Compressed air pressure: 8 bar
Cooling water temperature: 8°C
Compressed air temperature : 30°C
Blowing method: Stagnant air
CAC-model: CAC 120
Number of blow molding machines: 1
Number of blow stations: 1
Number of cavities/station: 1

Internal Product Cooling CAC

Examples

Container for bath lotion:

Weight: 54 g	Compressed air consumption: 61 m³/h
Volume: 0,57l	Compressed air temperature: -29°C
Material: HDPE	Cycle time: 9,7 sec.
Cycle time: 12,4 sec.	Cycle time reduction: 27%

Production increase: 27%

Container for liquid cleaner:

Weight: 32 g	Compressed air consumption : 33 m³/h
Volume: 0,3l	Compressed air temperature : -29°C
Material: HDPE	Cycle time : 9,5 Sek.
Cycle time: 11,8 sec.	Cycle time reduction : 19,5%

Production increase: 24,2%

Amortization time for the CAC-unit: 77 days

Country: England
Machine: Bekum
Compressed air pressure: 8 bar
Cooling water temperature: 9°C
Compressed air temperature: 34°C
Blowing method: Stagnant air
CAC-model: CAC 120
Number of blow molding machines: 2
Number of blow stations: 2
Number of cavities/station: 3

: 3

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Internal Product Cooling CAC

500ml / PE / 39g
Production increase: 20%

500ml / PE / 42g
Production increase: 22%

800ml / PE / 48g
Production increase: 20%

500ml / PE / 28g
Production increase: 17%

1000ml / PE / 75g
exchange for liquid gas

1000ml / PE / 69g
Production increase: 15%

1000ml / PE / 100g
Production increase: 25%

1000ml / PE / 50g
Production increase: 26%

500ml / PE / 33g
Production increase: 18%

750ml / PE / 41g
Production increase: 20%

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Internal Product Cooling CAC

2000ml / PE / 84g
Production increase: 25%

2000ml / PE / 94g
Production increase: 28%

1000ml / PE / 39g
Production increase: 18%

2000ml / PE / 57g
Production increase: 26%

3000ml / PE / 70g
Production increase : 20%

10000ml / PE / 400g
In exchange for liquid gas

5000ml / PE / 142g
Production increase : 22%

5000ml / PE / 129g
Production increase : 20%

300ml / PE / 32g
Production increase : 18%

400ml / PE / 80g
Production increase : 25%

Blue Air
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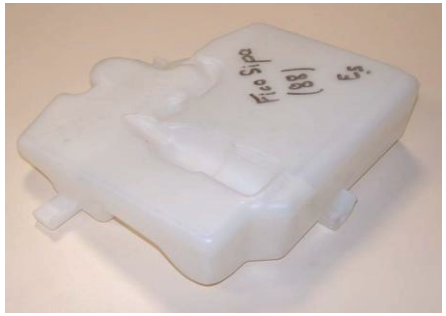
Internal Product Cooling CAC



3500ml / HDPE / 450g
Production increase: 38%

1598ml / HDPE / 250g
Production increase: 24%

1341ml / HDPE / 220g
Production increase: 22%

150l / HDPE / 8,5kg
Production increase: 54%

200l / HDPE / 11kg
Production increase: 62%

2100ml / PE / 225g
Production increase: 19%

2500ml / PE / 240g
Production increase : 21%

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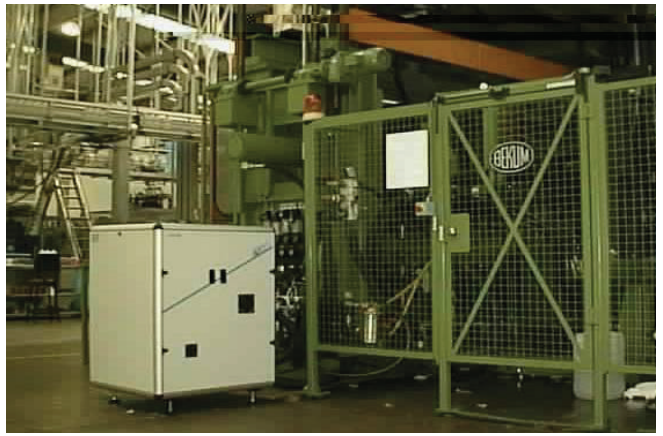
Internal Product Cooling CAC

Reference



Blue Air SYSTEMS

Internal Product Cooling CAC

Compressed Air Chiller - CAC

Type		CAC-120 SA	CAC-180 SA	CAC-240 SA	CAC-360 SA		
Nominal air flow	Nm3/h [cfm]	120 [70]	180 [105]	240 [140]	360 [210]	540 [315]	720 [420]
Minimal air flow*	Nm3/h [cfm]	80 [47]	120 [70]	160 [94]	240 [140]	360 [210]	480 [280]
Max. operating pressure**	bar [psi]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]	10 [145]
Power consumption***	kW [HP]	2.2 [3.0]	3.0 [4.0]	4.5 [6.1]	6.1 [7.9]	8.5 [11.4]	10 [13.6]
Required cooling capacity****	kW [US tons]	5.0 [1.4]	7.6 [2.2]	10.1 [2.9]	15.2 [4.3]	23.0 [6.6]	30.4 [8.7]
Compressed air outlet temperature	°C [°F]	-35 [-31]	-35 [-31]	-35 [-31]	-35 [-31]	-35 [-31]	-35 [-31]
Compressed air inlet [AI]		G 1"	G 1"	G 1"	G 1 ½"	G 1 ½"	G 2"
Compressed air outlet [AO]		G 1"	G 1"	G 1"	G 1 ½"	G 1 ½"	G 2"
Chilled water inlet [WI]		G ½"	G ½"	G ½"	G ½"	G ½"	G ¾"
Chilled water outlet [WO]		G ½"	G ½"	G ½"	G ½"	G ½"	G ¾"
Width [B]	mm [inch]	870 [34 ¼]	870 [34 ¼]	870 [34 ¼]	1330 [52 ⅜]	1330 [52 ⅜]	1280 [50 ¾]
Depth [T]	mm [inch]	750 [29 ½]	750 [29 ½]	750 [29 ½]	860 [33 ⅞]	860 [33 ⅞]	1280 [50 ¾]
Height [H]	mm [inch]	1160 [45 ⅔]	1160 [45 ⅔]	1400 [55 ⅛]	1500 [59]	1900 [77 ⅞]	1900 [77 ⅞]
Weight	kg [lbs]	277 [610]	344 [760]	454 [1000]	580 [1280]	900 [1985]	1200 [2660]

* Adjustment by service technician necessary, ** Special models to 15 bar [218 psi] on request, *** Electrical power consumption ist based on a standard voltage of 3x400V, 50Hz, **** Chilled water load based on air inlet temperature of 35°C [95°F]

- Required compressed air quality: ISO 8573.1
- Residual oil: (Kl. 1) 0.01 mg/m³
- Residual moisture: (Kl. 5) 7°C [45°F] pressure dew point
- Residual dust: (Kl. 2) 1 μm or 1mg/m³
- Chilled water pressure drop: 2 bar [29 psi]
- Chilled water pressure: min. 2 bar [29 psi], max. 10 bar [145 psi]
- Air pressure: 6 bar [87 psi] - 15 bar [218 psi]
- Chilled water temperature: max. 15°C [59°F], min. 2°C [36°F]
- Standard voltages: 3x400V, 50 Hz - 3x460V, 60 HZ (other voltages upon request)