More efficient use of temperature control units

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Optimization of mold temperature control at MAGURA Kunststofftechnik using a manifold from Addition

4-fold distributor DN13

- Stainless steel 1.4404/316L
- Compact, one-piece design (3D-printed)
- 4 outlets G3/8" with laminar flow

The results after optimization:

Flow rate 3.7 times higher ✓

Heating power reduced by 54.8 % ✓

Temperature difference between feed and return ΔT = 1 °C ✓

Left image courtesy of MAGURA Kunststofftechnik

www.addition.am

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User feedback from MAGURA Kunststofftechnik to the manifold from Addition in detail:

Initial situation:

- Injection mold with 1 x feed and 1 x return
  Goal: Optimization of heat distribution in the mold
- Temperature control unit HB-Therm HB180Z2
  (version with 1 kW pump output; unregulated)
- Flow rate: 6.6 l/min
- Heating power: 3.1 kW
- Feed temperature water (target): 70 °C
- Return temperature: 63.4 °C
- Temperature of the cavities: 62.4 °C (FS) and 62.0 °C (MS)

$\Delta T = 6.6$ °C

Installation of the manifold from Addition:

- Directly on the temperature control unit according to the manufacturer's specifications
- Dirt trap screen in the feed to protect the flow-optimizing internal geometry
- Creation of 4 parallel individual circuits

All images courtesy of MAGURA Kunststofftechnik

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Results after optimization:

- Injection mold with 4 x feed and 4 x return
- Temperature control unit HB-Therm HB180Z2
  (version with 1 kW pump output; unregulated)
- Flow rate 24.3 l/min
- Heating power: 1.7 kW
- Feed temperature water (target): 70 °C
- Return temperature: 69 °C
- Temperature of the cavities: 62.8 °C (FS) and 62.0 °C (MS)

Flow rate 3.7 times higher ✓
Heating power reduced by 54.8 % ✓
ΔT = 1 °C ✓

Conclusion from the user's point of view:

"The processing of high-performance plastics requires maximum homogeneous heat distribution in the mold in order to ensure the required material properties of the injection-molded articles in series production. This was achieved by using the described addition manifold.

The existing pump capacity of the temperature control unit is utilized much better, flow-rate increases by a factor of almost 3.7. Due to this, the ΔT between feed and return is reduced to just 1 °C - these are almost textbook conditions. At the same time, the heating power required is reduced by almost 55 % from 3.1 kW to 1.7 kW without any negative effects on the temperatures of the cavities on the ejector and nozzle side.

If we were to repeat the same tests with a temperature control unit with a frequency-controlled pump, the power consumption of the temperature control unit could also be reduced. This aspect will be taken into account in future considerations regarding the system technology."

Dennis Beck
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