



Press Release
SINGLE at Fakuma 2009: Hall A3, Stand 3102

Alternating temperature control for better-quality injection moulded parts

SINGLE presents ATT: The versatile, active system for variotherm mould temperature control

Alternating Temperature Technology (ATT) offered by SINGLE Temperiertechnik GmbH of Hochdorf/Germany is a system solution for particularly efficient, variotherm liquid temperature control of injection and compression moulds. The versatile, active and complete system is comprised of one customized temperature control system, specially designed cavity inserts and mould components with near-surface cooling/heating channels.

In addition to EcoTemp, the passive mould temperature control system, SINGLE offers Alternating Temperature Technology (ATT) as an active system solution for variotherm liquid temperature control of injection and compression moulds. An active system, ATT alternates the flow of hot and cold transfer media through near-surface cooling/heating channels of injection moulds. ATT is comprised of the customized STWS alternating temperature system and tailor-made cavity inserts and mould components.

ATT is designed for actively carrying out alternating cooling and heating processes. Hence, temperature deviations of more than 100°C / 210°F can be achieved in cavity inserts, which can be used for handling challenging sections, or in complete small moulds. SINGLE's STWS alternating temperature system which is used in conjunction with ATT, operates with two separate circuits that each contain one heat transfer medium with a different temperature.

Moulds using ATT should have a low mass, provide good thermal conductivity and ensure an effective heat transfer to the cavity, in order to promote a fast temperature change. Hence, ATT is ideally used with mould inserts made from stainless steel or hot worked steel with contour-aligned heating/cooling channels. During Lasercusing, these inserts or components are built up layer by layer from steel powder using data supplied by a 3D-CAD volume model. Lasercusing is also a highly-precise as well as time- and cost-efficient direct method of manufacturing cooling inserts with extremely complex geometries.

ATT live at Fakuma 2009

ATT can be viewed in live operation at the SINGLE stand at the Fakuma 2009 trade show. An Arburg Golden Edition 320 injection moulding machine with a clamping force of 500 kN will be producing a polycarbonate magnifier. This thick-walled moulded part is a perfect example of the benefits of variotherm mould temperature control: during injection, the cavity wall retains its heat in order to ensure a high accuracy of reproduction of surface detail. The cavity is

then cooled to low temperatures, which reduces cycle times to a minimum. The inserts of the demonstration mould manufactured by Sauer Products, Dieburg/Germany are designed with contour-aligned heating/cooling channels for highly effective heating/cooling of the cavity wall. SINGLE's STWS 200 alternating temperature system with 36 kW heating capacity and a SKL 23-L cooling system alternates the flow of hot and cold transfer media through mould heating/cooling channels.

Background: Variotherm mould temperature control

“Dynamic”, “cyclic” or “variotherm mould temperature control technology” is increasingly used for improving the quality of injection moulded parts. It is an attractive option for plastic processors because it heightens the accuracy of reproduction of surface detail in injection moulded parts, dimensional stability and consistency as well as shortening cycle times.

Variotherm mould temperature control involves heating the cavity wall prior to injection of the melt to a temperature that exceeds the glass transition temperature of the melt. Mould cooling starts as soon as the cavity has been filled and lasts until the part has reached the required temperature for demoulding. Active systems such as ATT by SINGLE ensure that warm and cold transfer media are passed through the cooling/heating channels in alternation. In contrast, EcoTemp interrupts mould cooling during the injection phase to allow the mould cavity wall to heat up.

Benefits of variotherm mould temperature control

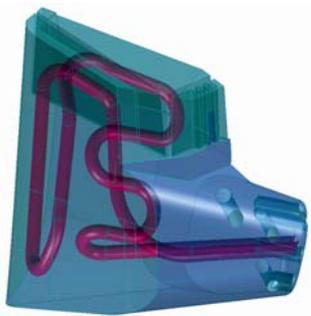
Variotherm mould temperature control improves the process, the surface of the moulded parts, their strength as well as the cost-efficiency of their production and provides a range of benefits:

- longer holding pressure even in areas that are away from the gate, which helps reduce injection pressure and clamping force,
- less internal stress during moulding of optical components,
- better surface properties such as self-cleaning or antireflection coatings, microstructures and nanostructures and smoother surfaces as well as high-grade glossy surfaces with piano finish,
- more homogenous orientation of glass-fibers in industrial components
- longer welding time for melt front and fewer weld lines,
- lower risk of warpage caused by shrinkage and better dimensional stability and consistency of injection moulded parts,
- shorter cycle times thanks to longer wall contact of melt agglomerations with the result of a more intense cooling action.



The alternating temperature system STWS made by SINGLE with a valve station for ATT variotherm mould temperature control

*Photo by: SINGLE
Temperiertechnik GmbH,
Hochdorf/Germany*



Lasercusing allows the contour-aligned arrangement of heating/cooling channels in mould inserts for ATT

*Photo by: Sauer & Sohn KG,
Dieburg/Germany*

SINGLE in profile

SINGLE has been developing, producing and selling high-performance temperature control systems for more than 40 years. The company's product portfolio consists of water and oil-operated, high-quality temperature control systems, heat transfer units, water-to-water chillers, as well as customized solutions. SINGLE uses only high-quality components and materials. Long-standing customers testify to the ease-of-use and the reliable operation of SINGLE systems even under a high workload.

In addition to plastics processors and manufacturers of plastics processing machines, SINGLE caters to customers in the chemical and pharmaceutical industry as well as to the metal plating industry, the food production segment and is used for test bench technology and many more applications.

A network of regional sales partners and service points as well as a subsidiary in the US are the cornerstones of SINGLE's international presence. Services and after-sales support on all temperature-control related problems, commissioning, on- and off-site training complete SINGLE's portfolio. SINGLE is certified to EN ISO 9001:2000, has technology and manufacturer certifications that meet the European Pressure Equipment Directive (PED) and complies with standards such as UL and regional directives to CSA and GOST.

The company, which employs about 110 people, has been a member of Looser Holding AG of Arbon/Switzerland since 2006.

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