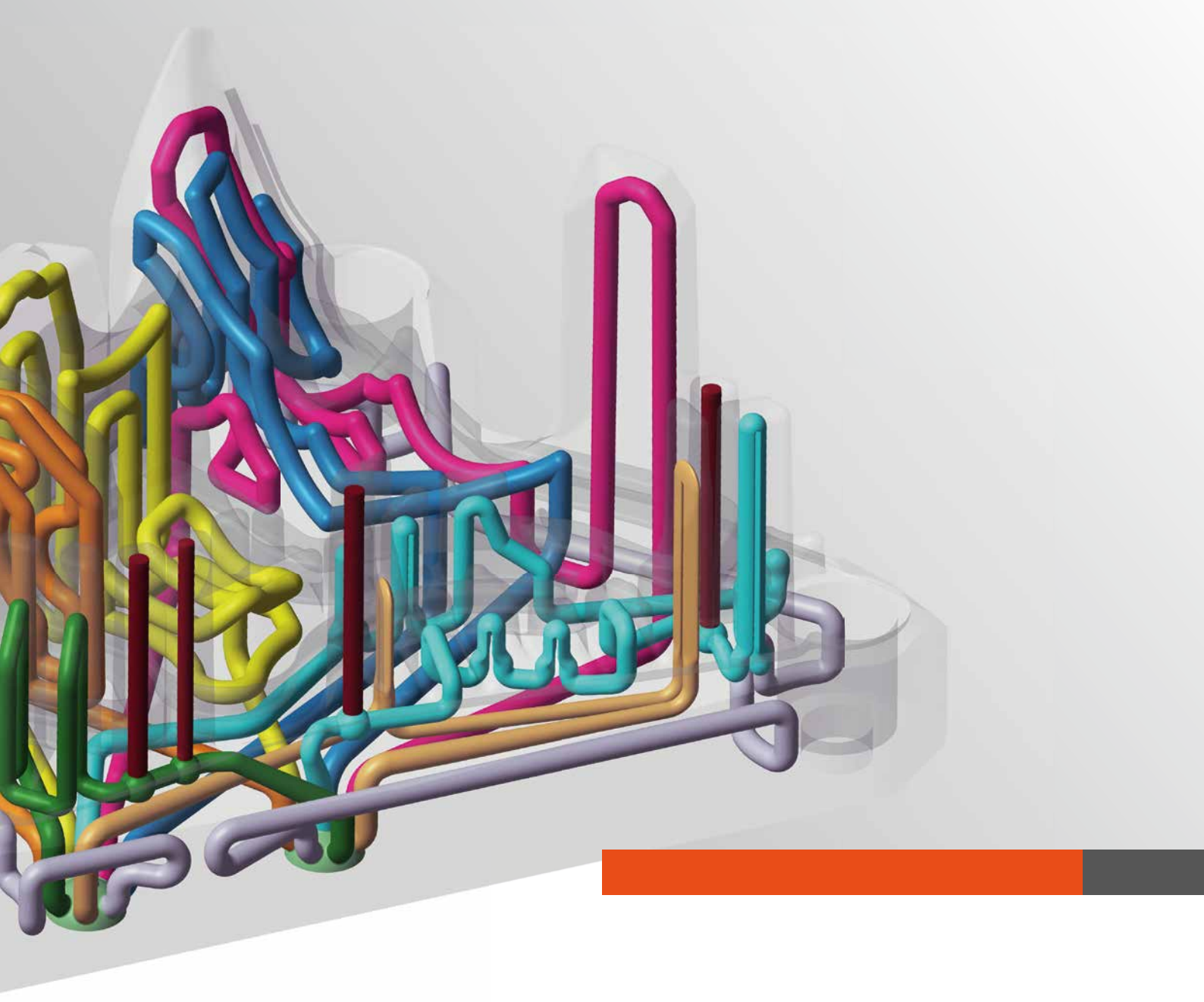


iq temp

Intelligence + quality for moulds and dies

CONFORMAL COOLING PAR EXCELLENCE

www.iqtemp.com

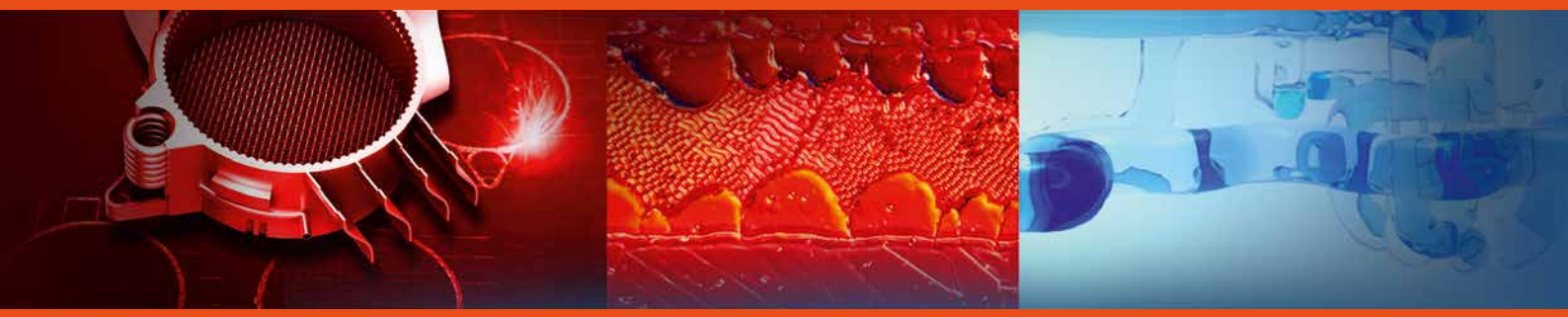
A brand of Listemann Technology AG
and Renishaw GmbH

LISTEMANN
perfecting materials

RENISHAW
apply innovation™

iQtemp

Intelligence + quality for moulds and dies

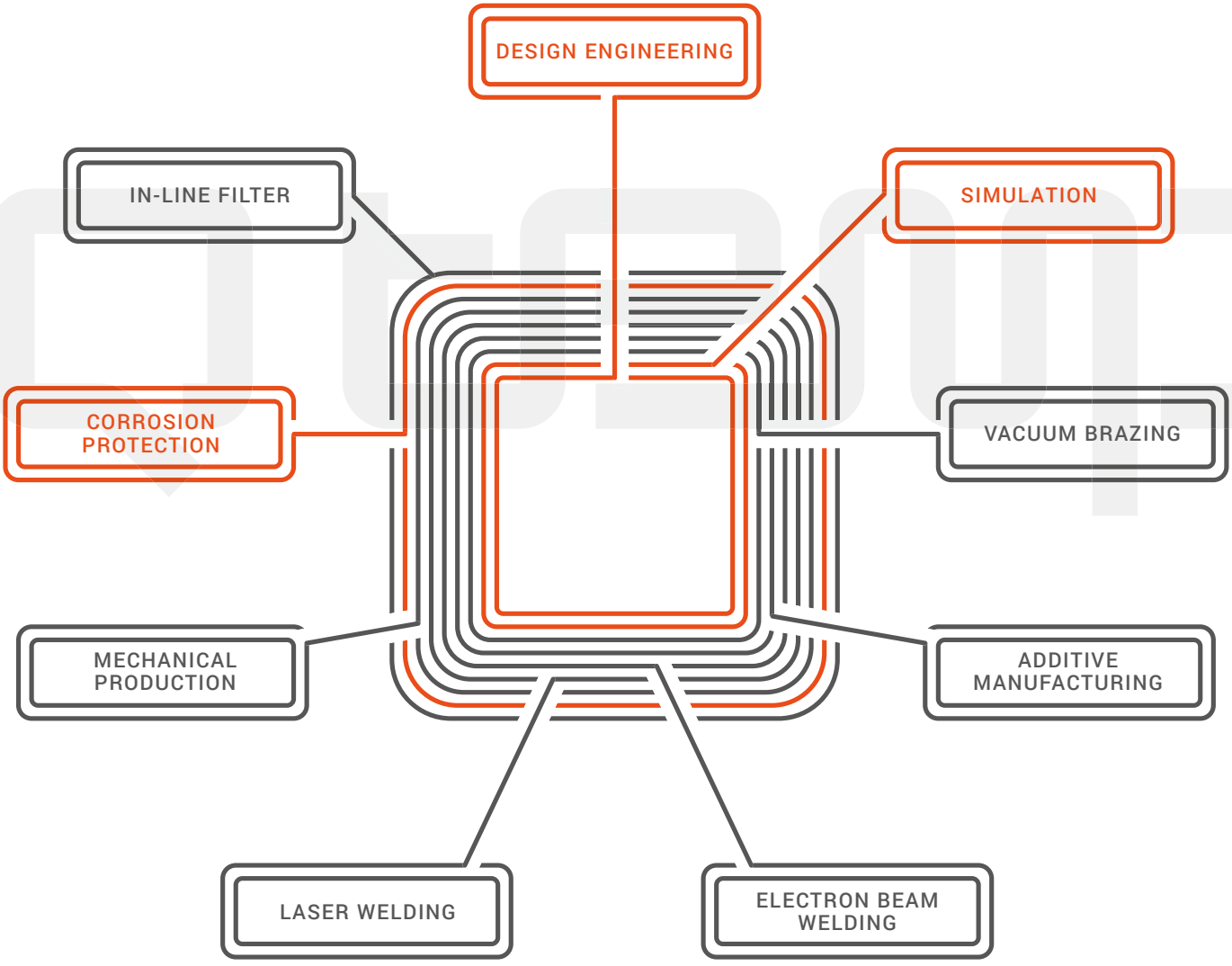


iQtemp – A brand of Listemann Technology AG and Renishaw GmbH

The key to an efficiently temperature-controlled tool lies in an intelligent technology mix of different processes. We offer trans-technological solutions individually for your mould.

For the best solution regarding temperature control, we work closely with our customers in order to get a full understanding of their exact requirements and to be able to propose the optimum solution.

WE SEE
THE BIGGER PICTURE.



The intelligent technology mix for conformal temperature control

DESIGN

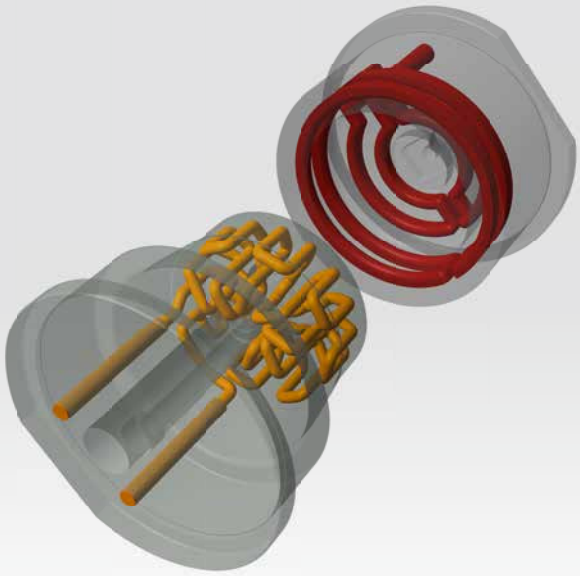
In a structured process, we examine the customer's requirements, work out proposals for solutions and choose the optimum process and technology with regard to quality, efficiency and costs. Our competent specialists with their material and design competence will assist you as temporary consultants for the targeted realization of your projects. This procedure has made us a sought-after partner for temperature control tasks.

SIMULATION

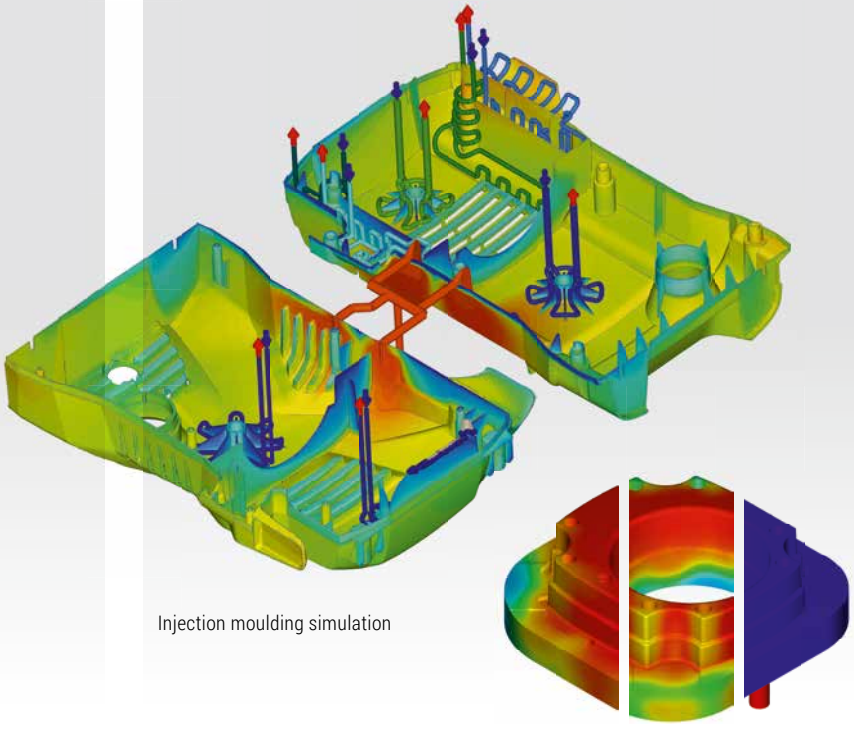
Simulation services will help you to shorten the development times of your products and optimize component and process quality with the help of improved knowledge right from the start. Every component has its own history. With many years of experience in designing and simulating mould temperature control systems, we can help you to optimize your mould inserts in a targeted way to suit your application.

ENGINEERING

From the idea to the serial component



Highly efficient moulds thanks to an intelligent technology mix



Injection moulding simulation

CFD simulation – heat exchange process

OUR PERFORMANCE RANGE:

- **Design of the optimized and balanced temperature control**
- **Generation of 3D data for temperature control**
- **Preparation of production drawings for the semi-finished products with dimensions and tolerances (blank parts for brazing, hybrids)**

OUR PERFORMANCE RANGE:

- **Injection moulding simulation**
- **CFD simulation (flow, flow rate, heat exchange)**
- **Simulation of highly efficient variothermal temperature control**
- **Structure analysis FEM**

VACUUM BRAZING

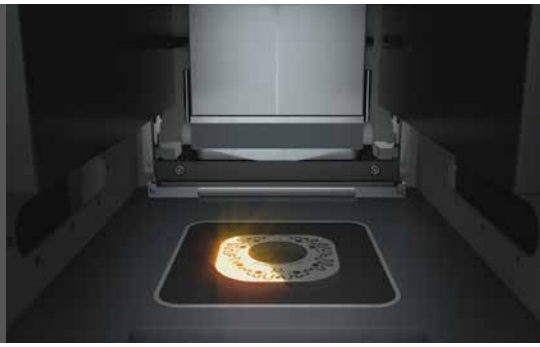
Vacuum brazing is a joining technology which allows high-strength bonding of homogenous and heterogeneous materials. The engineer takes advantage of it:
the mould inserts are divided into components, cooling channels can easily be manufactured and the whole is joined by vacuum brazing to form a high-strength and compact insert.
Upon demand, we can manufacture the semi-finished parts (blanks) for vacuum brazing.

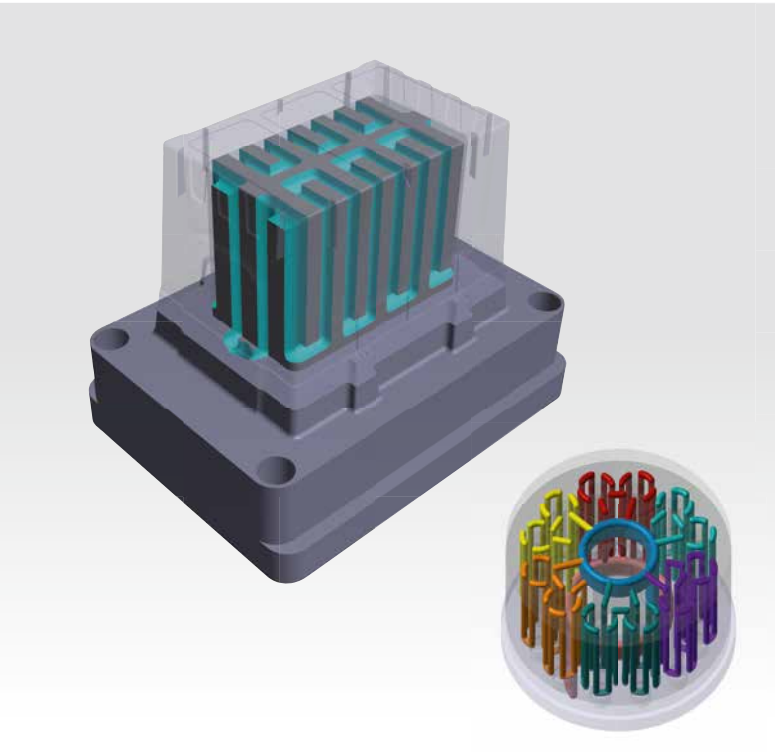
ADDITIVE MANUFACTURING

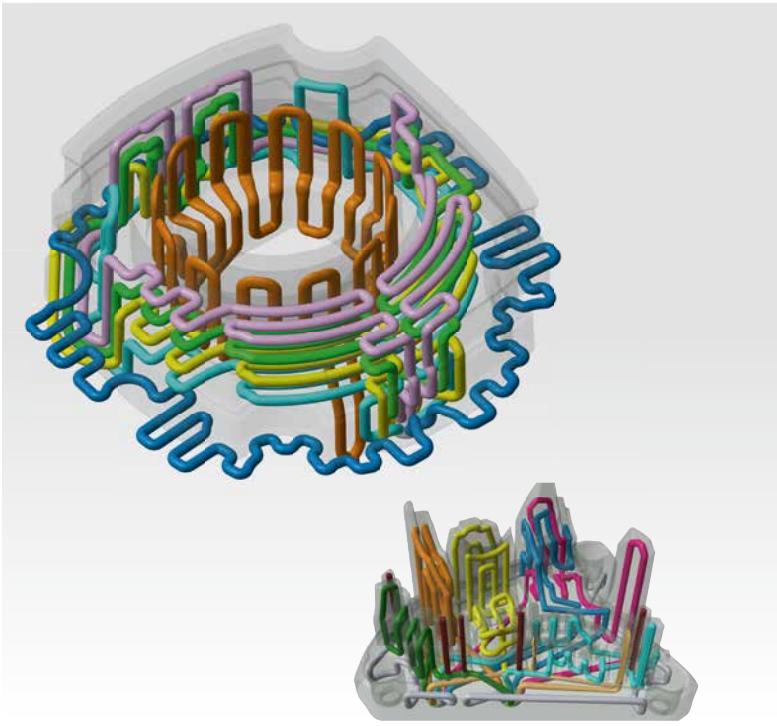
The generative manufacturing technology on metal basis offers excellent engineering freedom for complex and conformal temperature control in injection moulds and die-casting tools. Metal powder is applied on a base plate in layers of 0.04 – 0.06 mm using a special coating tool and welded homogenously by means of a laser. During this process, components are produced by melting layer by layer.
Upon demand, we can manufacture the semi-finished parts (hybrids) for the additive manufacturing.

MANUFACTURING PROCESS

Increased component quality and reduction of the production cycle times at the same time







Complex, highly efficient temperature control systems, connected in parallel, balanced and completely maintainable.

Other processes used:

ELECTRON BEAM WELDING
DIFFUSION BONDING
LASER WELDING

Our customers mainly fear that the cooling channels will become clogged by dirt particles, corrosion or contaminated water. To avoid such problems, the corrosion protection and the stainless steel filters of iQtemp have been developed.

CORROSION PROTECTION

AnoxPro

The revolution in the field of corrosion protection for conformal cooling channels

uncoated channels after a salt spray test with a duration of 230 hours (NaCl solution acc. to DIN EN ISO 9227) with massive corrosion.

coated channels after a salt spray test with a duration of 230 hours with minimum corrosion.

Up until now there were no effective treatments to guarantee corrosion protection for additively manufactured, conformal cooling channels available. The new AnoxPro coating finally offers a solution:

- Optimum protection for channels with extremely small diameters and long channel lengths
- Treatment does not affect the advantageous heat exchange effect due to typical surface roughness of additively manufactured surface structures
- Additional active corrosion protection due to metallic particles in lacquer coating
- Suitable for variothermal processes with cooling media temperatures up to 180°C

Innovative lacquer coating with active protection mechanism

The special coating mechanism of AnoxPro offers the advantage that the geometry of the cooling channels does not affect the coating thickness. The average coating thickness is 10 µm. Therefore AnoxPro can be used universally for a wide range of cooling/heating channel geometries.

Whereas up to now only passive layers had been available, the new innovative AnoxPro lacquer system contains metallic particles. These act as a sacrificial anode and hence maintain a persistent, active protection against corrosion even in the case of small defects in the coating layer.

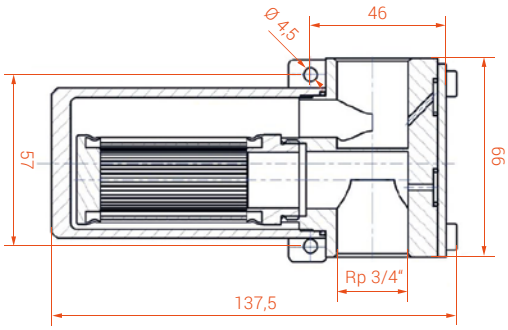
Can also be offered as a service for other products

STAINLESS STEEL IN-LINE FILTER

LF 80-200

Reliable protection of your cooling/heating channels

Dirt particles in coolants often result in clogging the small cooling channels, which render the mould inserts unusable. This maintenance-friendly stainless steel in-line filter LF80-200 offers a cost-effective and excellent protection against foreign particles, in particular for conformal cooling channels of injection moulds. The filter can be flanged to the mould or operated directly with temperature control units.
The high filter performance is based on a star-shaped folded stainless steel sieve that prevents the ingress of all particles > 200 µm into the cooling channel.



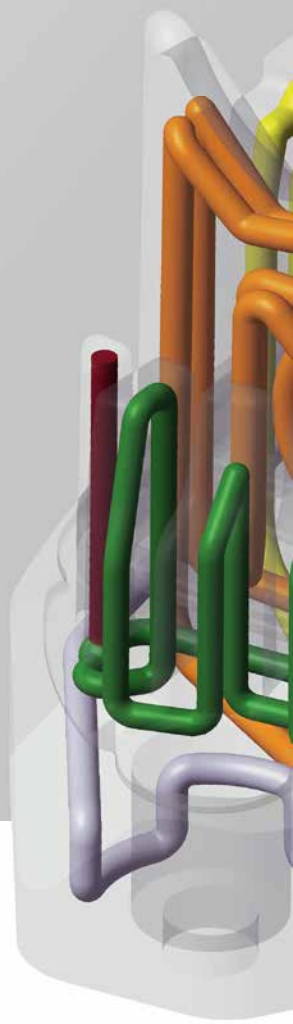
Versatile use
The filter is suitable for water-based or oil-based coolants with a flow rate of up to 80 l/min and offers versatile application possibilities in a temperature range of -10 to +260°C and a pressure of 16 bars.

Simple maintenance
Due to the maintenance-friendly concept, the filter insert can easily be removed and cleaned with compressed air, in an ultrasonic bath or using a high-pressure cleaner. The filter housing remains in the system circuit.

The LF80-200 can be delivered with an optional maintenance indicator.

ALL ADVANTAGES AT A GLANCE:

1. **Cost-effective with high filter performance**
2. **Simple maintenance and cleaning**
3. **Suitable for high flow volumes**
4. **Large temperature range**



Listemann Technology AG has been a recognized specialist for vacuum brazing for more than 20 years.

Renishaw is a pioneer in the field of additive manufacturing (AM) with more than ten years experience of supplying and servicing AM technologies.

LISTEMANN
perfecting materials

RENISHAW
apply innovation™

Listemann Technology AG
Ober Au 38 · Postfach 170 · LI-9487 Bendern
Phone: +423 375 / 9010
Telefax: +423 375 / 9020
E-mail: info@listemann.com
Internet: www.listemann.com

Renishaw GmbH
Gielster Stück 6 · D-58513 Lüdenscheid
Phone: +49 7127 / 981-1616
Telefax: +49 7127 / 88237
E-mail: konstruktion@renishaw.com
Internet: www.renishaw.de

www.iqtemp.com

iQ temp
Intelligence + quality for moulds and dies

A brand of Listemann Technology AG
and Renishaw GmbH