

MOULD TEMPERATURE REGULATION

Die casting



ADVANTAGES OF TOOL-TEMP TEMPERATURE CONTROL UNITS

Tempering of die casting moulds

In the production of die cast parts, **the control of thermal processes** in the mould is an important factor. Each die casting mould should be heated to the required temperature before starting the casting operation. In general, the service life of the mould increases and the mould is better protected when the **temperature difference between the casting and the mould** is as low as possible. Die casting with a cold or insufficiently preheated form causes in high stresses at the mould surface and also results in loss of quality on the die cast parts.



Precision, increased productivity and constant quality thanks to a mould regulation with Temperature Control Units

Stable heat balance

An optimisation of the mould temperatures in terms of a uniform temperature distribution and a reduction on the peak temperature at the surface can delay early damages of the tool, especially in the form of heat checking cracks and **significantly increase the service life of the mould**. The heat balance of the die cast mould plays a decisive role with regards to the quality of the parts and the cycle times. An **insufficient mould temperature results** in a high reject rate in the die cast. To ensure the quality requirements: surface condition, form filling, to guarantee dimensional and formal precision of the cast parts as well as to keep the cycle times low and service life high, tempering with Temperature Control Units is essential.

Optimal mould tempering

For a perfect mould tempering, Temperature Control Units, heat transfer medium and regulation channels of the mould are important factors in the tool. The heating and cooling channels must be sufficiently large dimensioned for a precise temperature distribution. A large cross-section also keeps pressure losses in the form minimal. The design of the mould channels is a crucial factor when **selecting the proper Temperature Control Unit**. The unit must be able in terms of performance to control the mould temperature. The better the heat transfer characteristics of the heat transfer medium, the faster large amounts of heat can be transferred. In die casting due to the high temperature heat transfer oils are used medium.

The heat transfer TOOL-THERM SH-3 recommended by TOOL-TEMP is a mineral-based and temperature-stable oil for applications up to 360°C.



TOOL-TEMP Temperature Control Units in field-application.

**Pressurised water units up to 160°C
6kW up to 48kW heating capacity**

In a closed system, the boiling point is raised by the static pressure in the circuit to 140°C and to 160°C respectively. TOOL-TEMP pressurised water units are fitted with an **expansion tank**. This makes it possible to work at low pressures and guarantees a stable temperature control. The use of pressurised water units in the magnesium processing is strongly discouraged due to the risk of burns.

TOOL-TEMP pressurised water units are equipped with a **mould drain** for a smooth mould change. On some models mould channels can be flushed dry with compressed air. The **pressure discharge** guarantees a risk-free disconnection of the hydraulic connections while boosting the process water in the cooling water outlet.

**Oil units up to 360°C
8kW up to 48kW heating capacity**

Closed hot oil circuit with **overlying cold oil receiver**. The expansion tank of TOOL-TEMP oil units remains cold in the working process. An evaporation and ebullition from the heat transfer oil in the unit is therefore not possible. The heaters are designed in a way that **oil cracking is impossible**. The **heat exchanger** in the cooling water circuit remains **lime scale free** and guarantees reliability and durability.

TOOL-TEMP oil units are equipped with a **mould drain**. By switching to vacuum operation the heat transfer oil will be extracted into the expansion tank. The expansion tank are correspondingly generously sized to accommodate the **return volume**.

Benefits of TOOL-TEMP Temperature Control Units

TOOL-TEMP Temperature Control Units convince with their **industrial design**. The units stand strong in the particularly rough everyday conditions in die casting.

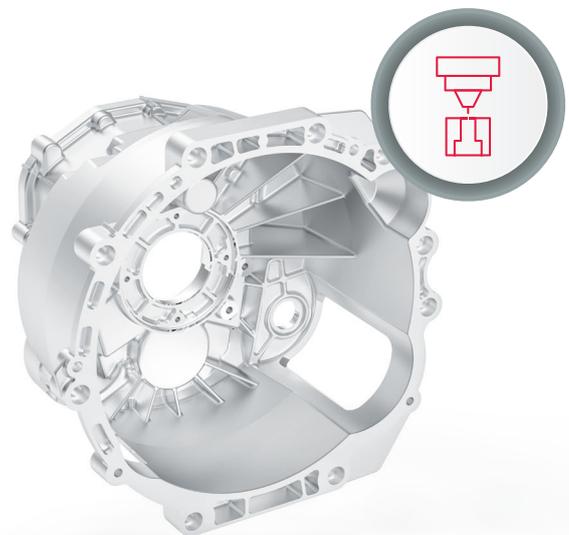
Durable pump with magnetic drive

TOOL-TEMP designed and developed pump with magnetic coupling stands against aggressive corrosive and solids-laden liquids and is a robust and powerful key component in our products. Our pumps are built exclusively in TOOL-TEMP headquarters in Switzerland.

Temperature measurement at the mould

TOOL-TEMP Temperature Control Units offer the possibility to regulate based on the tank temperature or on the temperature at the mould.

The **digital flow** and **pressure indicators** are clearly visible on the unit and serve as essential parameters for consistent production quality.



GLADLY AT YOUR SERVICE



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Produced in Switzerland – worldwide service

- › TOOL-TEMP units are exclusively developed and manufactured in Sulgen, Switzerland. This guarantees a high quality workmanship.
- › Over 40 country agents and 14 TOOL-TEMP subsidiaries ensure a reliable and professional distribution and after-sale service locally.
- › Short reaction times and rapid spare parts supply thanks to large stocks of spares and units.

Safety and reliability

- › Constant quality thanks to the in-house development and manufacturing of core-components like pumps, heat exchangers, electro-technical parts, etc.
- › Only well-selected high-class materials are used in manufacturing process.
- › Clever safety circuits, acoustic and visual alarms to protect your installation.

Cost efficiency and rapidity

- › Our deep level of manufacturing penetration provides a fast time-to-market, also for customised solutions.
- › No costly production off-times and repairs thanks to maintenance friendly units.
- › Good costs / performance ratio guarantees a fast return on investment.

