

## Standard Temperature Control Quick Connect Couplings: Temperature specification and occupational safety with high temperature applications are critically questioned



Standard Temperature Control Coupling at high temperature applications - a too high risk?

The requirements for temperature control quick connect couplings are very high. The reason: the products are being applied in moulding units and injection moulding applications during the cooling and heating process. There, they are used to connect or disconnect the heating and cooling channels of an injection moulding tool with the temperature control unit. Therefore, the couplings are being served as an interface to heat up the tool through the heating medium to the required temperature (subject to the plastic being used), before the production starts. During the production cycle, the temperature stays constant through this connection.

Thus, the companies are dependent on extremely robust and reliable couplings which have to withstand extreme temperatures..

### Advertising with 250°C Couplings

Currently in the market, standard temperature control quick connect couplings with operating temperatures up to 250°C are being promoted. Such a promise creates impression and suggests an efficient High Temperature Coupling.

A critical review on this declaration leads to some questions:

What are the promised temperature specifications based on?

When are such high moulding temperatures even required, and is the strictly required occupational safety still available?

### Coupling systems with operating temperatures up to 250°C – valid for which medium?

In most cases, the temperature specifications beyond 200°C are relating to air as the medium. But the specific heat capacity (a medium's ability to store heat), of air is significantly lower than for water or oil. The higher the heat capacity of a heating medium is, the quicker targeted and effectiveness of the heating of the tool results, as well as the removal of excess heat. The exact regulation of the tool temperature has a decisive influence to the quality of the manufactured parts.

Due to its low heat capacity, air is usually inappropriate to be used as heating medium. But it's often listed as an "Eye Catcher" on the technical datasheet. The maximum temperature of liquid media (which are also used in practice) lies in the range of 160°C for water and 200°C for oil.

### For which plastics is a tool temperature of 250°C necessary?

Usually, the tool temperature will be held as low as possible, because it results in a major impact on the cooling period and therefore, the cycle period.

Longer cooling periods result in needless, longer cycle periods and thereby, higher production costs. If the cooling period is too short, the component can disperse, deform or a higher post-shrinkage can be implicated.

There are few plastics, which need an operating tool temperature in the range of 250°C, to reach the best possible compromise between the quality and the costs of the component. Temperatures a little over 200° C are only necessary in special cases for high-quality plastics.

### Standard Temperature Control Quick Connect Couplings – Are safe work conditions at high temperature applications possible?

High temperature applications could entail major risks. Especially, leakages of the heating medium often lead to dangerous and serious injuries as well as production downtime.

This can be caused by a leaking coupling. To prevent leakages in the coupling, it's often not just enough to replace the o-ring through a high-temperature resistance sealing ring. Often the weak points are the adhesive bonds of the couplings single components, which fail at 200°C or more and lead to leakages.

A much higher hazard potential occurs when the quick-fit connection is accidentally disconnected. If this happens under pressure, the effluent flow rate is many times greater and the consequences are fatal. This risk is always present when using standard temperature control quick connect couplings, because they do not have a safety locking mechanism. Therefore, we advise the usage of **LUDECKE** TempSecure® temperature control quick connect couplings. It features an automatic safety locking mechanism and indicates through a colour coding if the coupling is safely connected. The uncoupling process requires a manually intentional unlocking movement. An accidental or unwanted decoupling is practically impossible.



### **LUDECKE** recommends for high temperature applications:

- Specialist consulting when selecting an appropriate coupling (incl. sealing material) subject to the heating medium (water, oil, etc.) and operating temperature  
→ General statements can quickly lead to leakages and therefore injuries and production downtime.
- Usage of the **LUDECKE** TempSecure® temperature control quick connect couplings  
→ Patented automatic safety locking mechanism, forced guidance handling with optical colour coding on the locking sleeve (signals a correct and safe coupling, prevents an accidental decoupling)
- For applications which demand a tool temperature over 200°C, fixed screwed fittings should be used.

Since more than 80 years, Lüdecke is the leading partner for developing, engineering and providing coupling systems to connect flexible fluid lines with tools, machines and industrial equipment.

Lüdecke with its headquarters in Amberg, Bavaria manufactures fittings and couplings for a variety of industrial applications for gaseous and liquid medium. The products are offered via our certified technical partners worldwide. Or the products are assembled / integrated by leading machine manufacturers in their own products.

The product portfolio provides a comprehensive range of industrial and customized solutions - Engineered and Made in Germany.

Lüdeckes quality management is accredited with ISO 9001-2008 since 1994, which also means that we permanently improve and revise the process of our company. Our quality standards exceed consequently the worldwide given requirements. From July 2015 on is also certified according to the environmental management (ISO 14001-2004) and energy management (ISO 50001-2011).

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