



Thermo Sensor GmbH

A modern and future-oriented company in the field of temperature measurement technology

For more than 20 years, our name has stood for high-quality products for all areas of temperature, measurement and control technology. At our location in Werne (NRW), Germany we develop and produce thermocouples and resistance thermometers in standard, special and explosion-proof designs as well as accessories such as connectors, cables and wires or turned parts, which are used on all continents.

Our wide product portfolio, extensive raw parts warehouse and our efficient organizational structure have a great influence on our flexibility: short delivery times and demand-oriented, customized production are not contradictory for us. A delivery within 5 days is not a rarity for us - it is standard!

Since 1996 Thermo Sensor has been continuously certified according to the respective valid quality management standard; currently according to ISO 9001:2015.

We put particular importance to the accuracy of our products. All probes are tested with the latest methods and equipment before they leave our company. This is guaranteed not only by the quality of our materials, but also by the results of the calibration tests carried out by our trained specialists in our DAkkS-accredited calibration laboratory.

State-of-the-art manufacturing processes, combined with the specialist knowledge of our staff, are the basis for a product quality that meets the highest demands.

Information about our thermocouples for the glass industry can be found on the back side of this flyer. If you have any further questions, please do not hesitate to contact us!

No matter how complex your measuring task seems - make your problem our challenge!

Thermocouples for glass industry

In the production of glass, a constant temperature is of utmost importance. Even slight fluctuations during melting can have a significant effect on the quality of the end product.

For this reason, thermocouples with precious metal thermocouples, such as platinum-tipped probes, are mainly used for temperature measurements in glass melts. Platinum-coated or ceramic protection tubes are also frequently used.

By using platinum for this extremely sensitive temperature measurement, the advantages of precious metals are exploited. Under these conditions, for example, platinum elements have a significantly longer life span than "normal" Type K elements. The higher the rhodium content in the platinum, the longer the life span.

Another advantage of using platinum protection tubes is their temperature resistance. Depending on the design and the type of glass in the melt, these can be used at temperatures up to 1,650 °C.



Of course, we can also offer and manufacture various designs of these special thermocouples (e.g. with different protective sleeves or as angled designs), always exactly adapted to your project requirements and specifications.



The sensor makes the difference!






Thermocouples for glass industry



TEMPERATURE MEASURING TECHNOLOGY

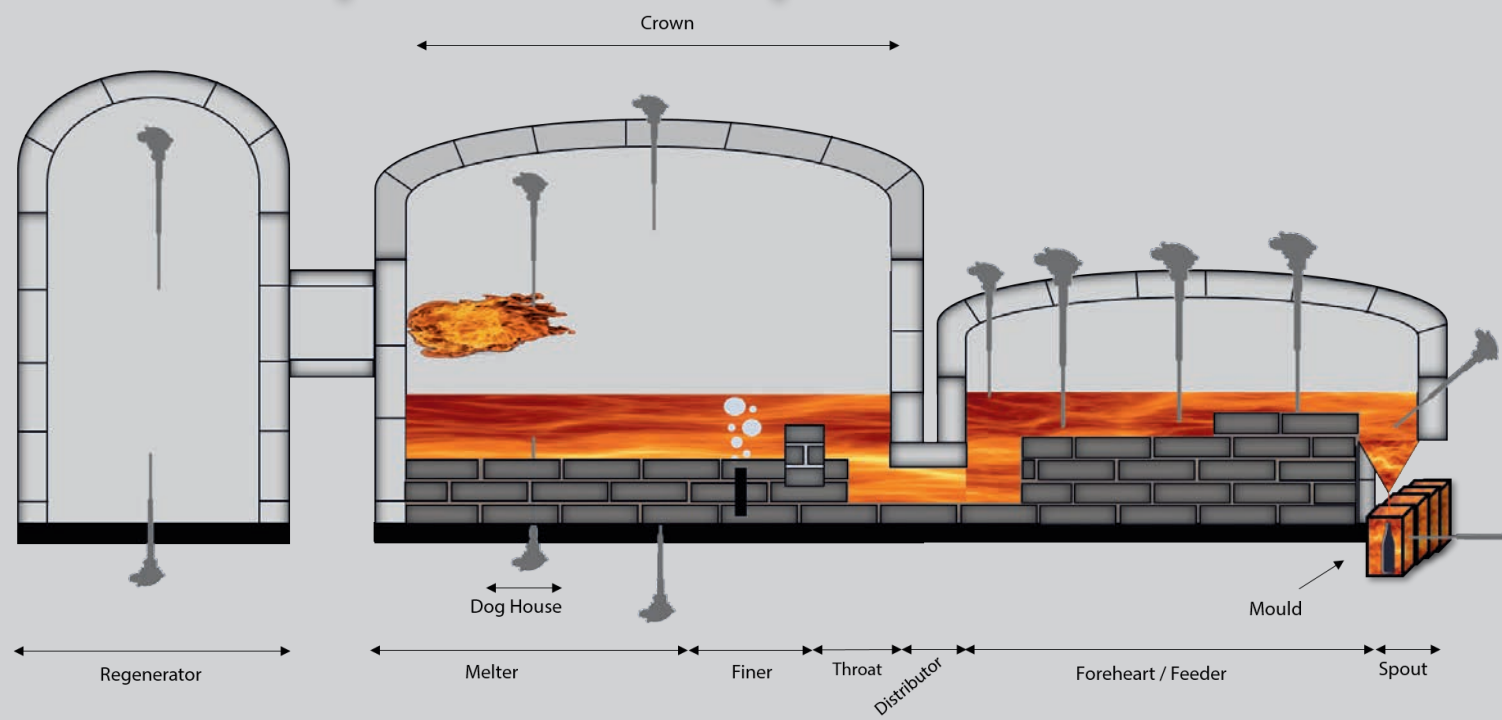
measuring controlling calibration recording testing

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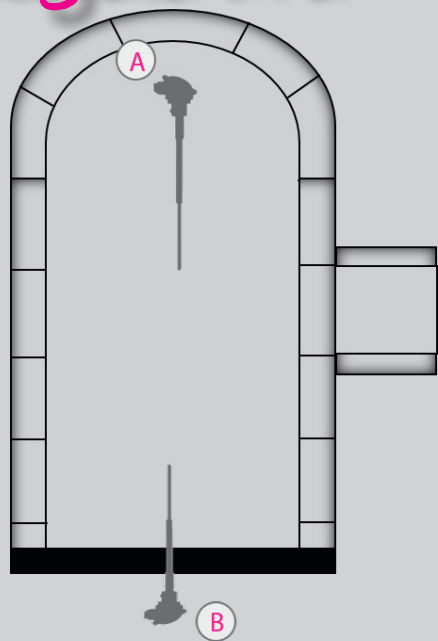
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Thermocouples in an end port fired furnace



Regenerator



A B Regenerator

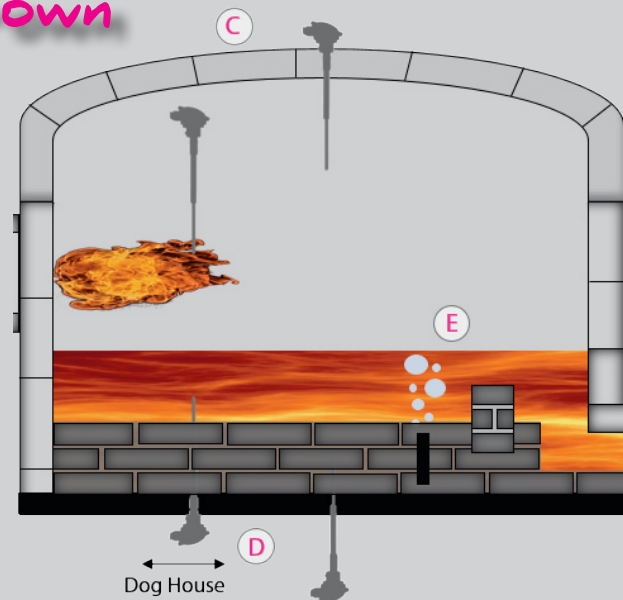
For temperature measurement in the regenerator area, we offer elements for the vault, as well as for the exhaust duct. In order to guarantee an exact measurement in this area, thermocouples made of high-quality ceramics with precious metal thermocouples are used.

In the rear wall of the regenerator or in the exhaust gas branch ducts, lower temperatures usually prevail. Here we recommend thermocouples with heat-resistant metallic protection tubes.

C Crown

Temperatures of up to 1,800 °C are reached in the trough vault of the glass melting furnace. Crown or vaulted thermocouples are used here, which are fully operational even under these extreme conditions. In order to anticipate a poisoning of the elements, we only use ceramics and materials of the highest quality during production and attach particular importance to processing. As standard, we manufacture the thermocouples with a double protection tube made of C799. Crown and vaulted thermocouples can be used for both direct and indirect temperature measurement in the vault.

Crown



D Bottom / Sidewall

Similar to the temperature measurement in the tub vault, the temperature in the tub bottom and the side wall is also of great importance in the glass melting process. The temperature is measured both directly in the liquid glass and in the wall of the melting tank. For this temperature measurement, we recommend thermocouples with precious metal protective sleeves made of platinum or with high-quality ceramic protective tubes.

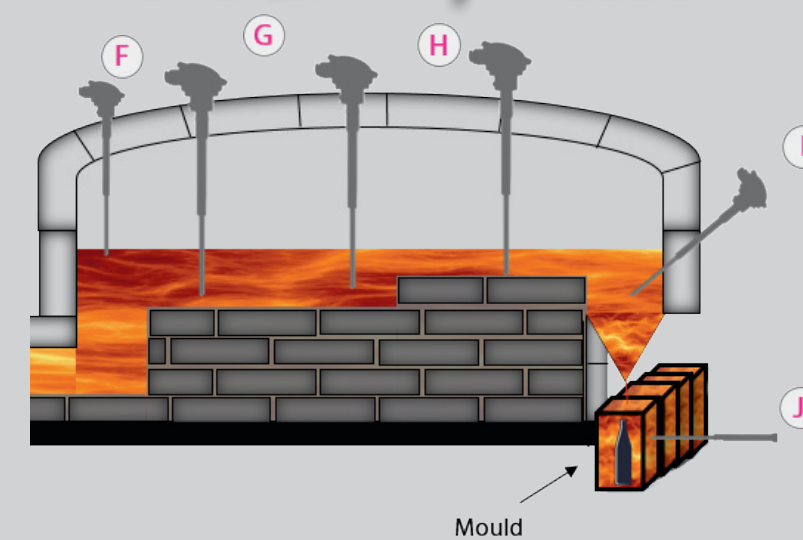
E Bubbler tubes

Bubbler systems are used to support the refining and homogenization process (prevention of bubble formation in the glass) within the melt. They increase the convection current in the melting system and act as a physical barrier to prevent hard, unmelted glass from flowing into the refining area.

Spout



Foreheart / Feeder



F Glass level probes

Glass level probes are not used for temperature measurement in the classical sense, but monitor and control the filling level of the glass melt. The design of the probe consists of an aluminium oxide protective tube, which is characterised by its excellent electrical insulation and high mechanical strength. The filling level is checked by a precious metal pin or sheet with a seat at the lower end of the protective tube.

I Spout Thermocouples

Spout thermocouples monitor the temperature of the liquid glass at the last position and provide information on its viscosity. We can adapt the design of the sensors specifically to the technical specifications of your U-flame furnace. Thermocouples with precious metals are used, both in standard and special designs, for example with exchangeable protective sleeves or as angle elements.

G H Distributor, Foreheart & Feeder

In this section of the glass melt, the thermocouples continuously control and regulate the temperature of the liquid glass. Since the measuring tip is in constant contact with the hot glass during monitoring, we only use thermocouples with precious metal protective sleeves. We can offer these in various variants - e.g. with different platinum alloys and coatings or as dispersion-hardened sleeves. Depending on the application, single or double thermocouples are used for the distributor and forehearth thermocouples. The glass temperature can be optimally regulated by means of their output signals. For the "sieve or matrix measurement" 3 triple thermocouples are often used, whose 9 measuring points are arranged as a matrix in the glass stream.

J Mould-Thermocouples

For the final section of the glass melt, thermocouples of type K, type J or type N are used as sheath thermocouples in various designs and diameters. They are used for continuous temperature measurement directly in or in the periphery of the glass moulds. We can offer you thermocouples from a diameter of 0.25 mm, depending on the diameter applicable in temperatures up to 1,100 °C.