GÜNTHER

Thermocouples
for the non-ferrous metal industry

Temperature Measurement Technology
Reliable . Precise . Certified

Thermocouples for the non-ferrous metal industry

GÜNTHER as a partner in metal processing

GÜNTHER GmbH Temperaturmesstechnik has been manufacturing thermocouples and resistance thermometers for applications in almost all industrial sectors at five European locations since 1968. The core business is the development and production of small series tailored to the requirements of the customers.
Extensive material stocks, as well as different, independent suppliers for raw materials or components used allow for short production times. This also guarantees that spare parts can be supplied at short notice.
A long-established QM system and our own calibration laboratories ensure the highest quality standards.

The high temperatures, the chemical damage caused by gases and the various alloys used in the melting of non-ferrous metals pose particular challenges for our sensors and the protective fittings we use.
Our experience in this field, which has grown steadily over decades, enables us to manufacture temperature sensors with a particularly long service life.

The right temperature sensor for every application

GÜNTHER has been supplying a regular customer base from the metalworking industry for years. These include renowned manufacturers and processors of non-ferrous metals and their alloys, such as producers of

- Light alloy wheels
- Aluminium components for the automotive, aerospace and aviation industries
- Aluminium components cast using the low-pressure casting process
- Copper parts in copper smelters
- Brass fittings in sanitary fittings manufacturers
- Magnesium components for the automotive industry

Our temperature sensors are also used in the extraction of the actual raw materials, for example through fused-salt electrolysis for aluminium extraction.

Customised sensors and special components

Light metal foundries mainly use type K thermocouples and products of the EKatech series (tubes and components made of silicon nitride). GÜNTHER specialises in products for non-ferrous metal foundries and provides support in the development and supply of new, innovative customised solutions.

Temperature sensors used most often

- Sheathed thermocouples for temperature monitoring and control in melting or holding furnaces and casting machines
- Thermocouples with connection heads for fixed installation in furnaces

Special components

- Ceramic EKatech protection tubes (silicon nitride)
- EKatech stalk tubes for low-pressure casting
- EKatech immersion heater tubes (electrically or gas-heated)

Mineral-insulated thermocouples without protection tubes can be used in almost all branches of industry, including foundries. Thermocouples of this type are used for temperature measurement up to +1200°C.
Sheath thermocouples have numerous advantages:

- The small in size and their high flexibility allows for temperatures to be measured in places that are difficult to access
- Short response times due to a compact design
- The outer sheath protects the thermocouple wires from oxidation, corrosion and chemical contamination
- Sheathed thermocouples are resistant to many types of mechanical stress

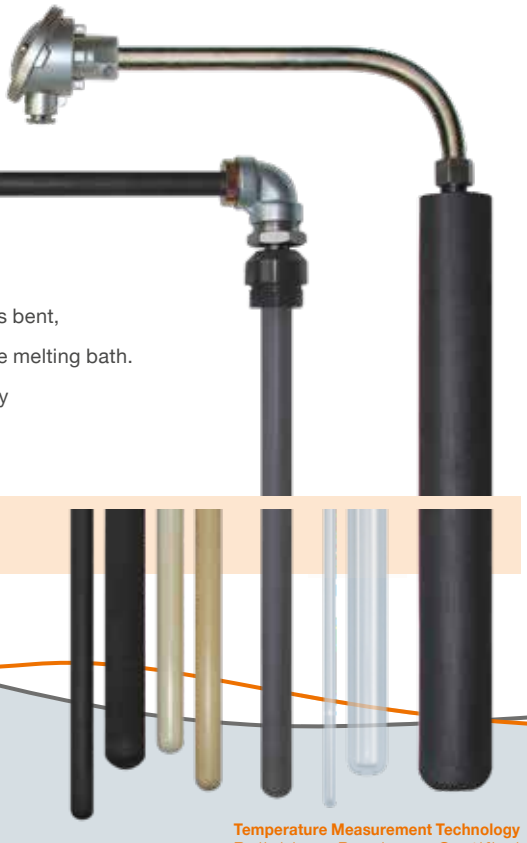
Extensions

In order to withstand the often extremely adverse conditions, we offer resistant thermocouple extensions for all applications. They consist either of particularly heat-resistant, armoured compensating cables or of robust, mineral-insulated sheathed cables. These are freely configurable in length and design, and are usually fitted with strain-relieved, heat-resistant connectors at both ends.

Angle thermocouples

Angle thermocouples (GÜNTHER product groups 30 - 36) with support and immersion tubes bent, welded or screwed from one piece are often used for direct temperature measurement in the melting bath. This design facilitates the installation of the sensors and positions the connection head away from the high temperatures and rising vapours.
The respective immersion tube materials depend on the alloy of the melt.

Most often, immersion tubes made of EKatech, UCAR, graphite, SiC, but also boron nitride, alutite or quartz glass are used.



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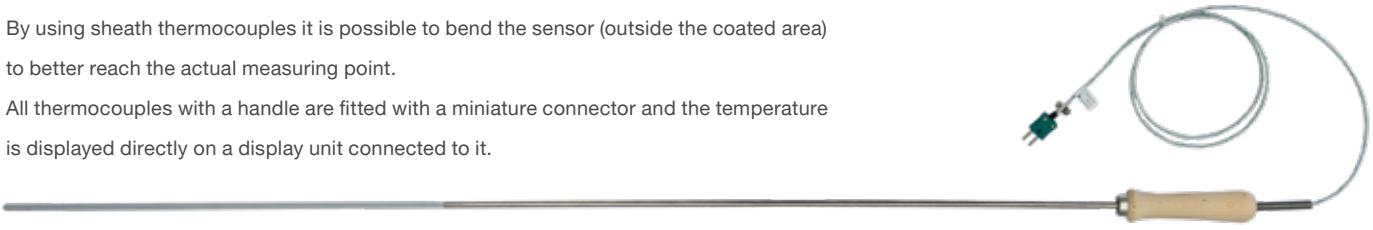
Thermoelements with permanently connected ceramic protection tubes

In addition to the possibility of attaching EKatech protective tubes to the holding tube by means of a screw connection, the connection between the neck tube and the protective tube is often permanently cemented.
Depending on the application, this design is a low-cost alternative to adapter connections.
This design is used for both straight and angled elements.

Type K thermocouples with handle (in-situ measurement)

These mobile sensors are mainly used to measure the temperature of non-ferrous metals in casting vessels.
Due to the design, very short response times may be achieved with this type of sensor.
GÜNTHER also manufactures – in addition to the standard sensors of this series – particularly durable elements with an additional, special ALOXMA coating.
By using sheath thermocouples it is possible to bend the sensor (outside the coated area) to better reach the actual measuring point.
All thermocouples with a handle are fitted with a miniature connector and the temperature is displayed directly on a display unit connected to it.



Protective coatings for ceramics and metals

EKamold Cast-C and EKamold Cast-M

The protective coatings EKamold Cast-C and EKamold Cast-M are intended for surfaces that come into direct contact with molten metal.
Ekamold Cast-C is used for ceramic surfaces based on boron nitride, protects the surface from wear, reduces friction and protects the melt from contamination.
EKamold Cast-M protects metal surfaces on the basis of titanium(II) oxide. The coating extends the service life of the materials and protects the melt from contamination.
The protective coatings offered by our company do not contain solvents and are water-soluble. Due to their nature as suspensions, they are easy to process and apply without any problems.

Products made from technical ceramics

EKatech: one material - many advantages

Essential features of components made of EKatech

- High abrasion resistance, thus no contamination of the melt/alloy
- Gas tightness
- Corrosion resistance
- Very good thermal conductivity
- High electrical insulation
- High thermal shock resistance
- High operating temperature up to +1300°C (in air)
- No preheating necessary during operation at temperatures up to +900°C
- Extensive mounting material available

EKatech protective tubes

Protection tubes made of special ceramics guarantee high mechanical strength, long life and very good thermal conductivity, ensuring accurate and reliable temperature measurement in many demanding applications.

EKatech protection tubes are available as stand-alone fittings or as part of a complete thermocouple.

In the standard version, protection tubes are provided with a groove and are connected to the support tube in front of them by means of a suitable adapter.

Connection adapter for secure fastening

The standard method of connecting EKatech thermowells is by means of adapters specially designed for this purpose, which are available from stock at GÜNTHER.

Adapters for SIN/SSIC protection tubes without groove

Two cutting rings ensure an absolutely tight connection between the protection tube and the holder tube.

Screw adapter

Consists of two half shells which fit exactly into the groove of the protection tube and thus fix it in place.

Ball adapter

The protective tube is fixed in the same way as the screw adapter.

The flexibly mounted screw connection allows the thermocouple to oscillate freely at an angle of 30°.

This absorbs shocks and vibrations as far as possible and increases the service life of the protection tube.

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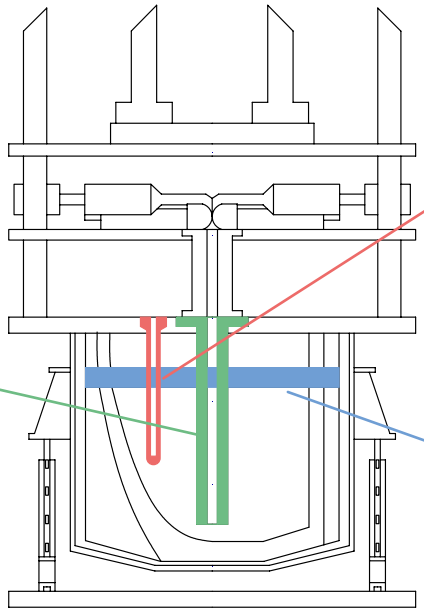
Application of EKatech elements in an aluminium melting furnace

EKatech stalk tube



EKatech protective tube in which
a sheath thermocouple is installed

EKatech heating tube in which
the heating element is installed

EKatech stalk tube with metal flange

Stalk tubes with metal flange are recommended for use in aluminium foundries.
The technically mature and robust design ensures gas tightness, chemical
and mechanical resistance and brings a number of other advantages.
As standard, the tubes that are supplied have the outer diameter of 90 mm.
Tubes with a different diameter can also be supplied upon request.
The tube length and flange size are determined by the respective
individual requirements at the installation site.

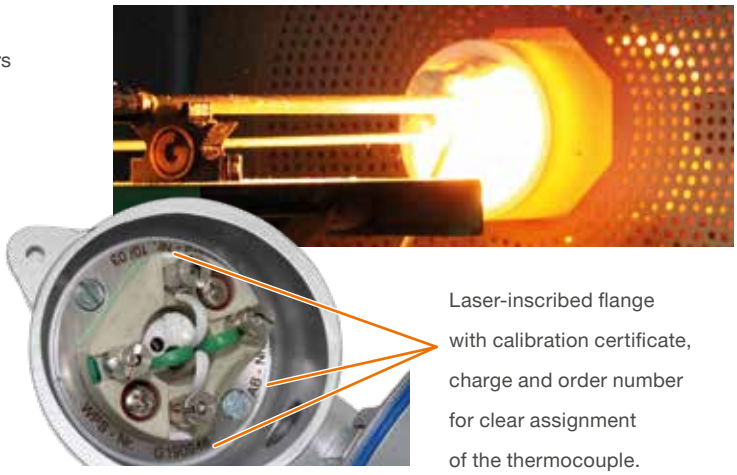
All stalk tubes are supplied with a permanently mounted connecting flange.
These flanges are made of stainless steel as standard
and – depending on the design – have threaded holes
for attaching handles for uncomplicated assembly/disassembly
in the melting furnace.
The permanent, inseparable connection of the flange
to the riser tube ensures a high degree of tightness
and thus protects both the system from damage
and the melt from unwanted contamination.

Service, calibration laboratory and trainings

For a successful heat treatment of components of any kind, an exact temperature or temperature distribution in the furnace is indispensable.
The testing of the temperature sensors used in this process is the task of the **GÜNTHER on-site service.**
Our experienced employees work for you at home and abroad.
The main component of the GÜNTHER service are **SAT measurements (measurement of system accuracy),** and/or **TUS measurements (measurement of temperature uniformity in the furnace)** and the performance of **instrument calibrations.**
If required, we are able to check all international standards and specifications such as AMS 2750 and CQI-9 (automotive and aerospace industry), DIN 17052-1, API 20H, etc.

Calibration of thermocouples in the in-house, accredited calibration laboratory

At its headquarters in Schwaig, GÜNTHER maintains its own **DAkkS-accredited calibration laboratory,** where temperature sensors are calibrated.
The DAkkS accreditation of GÜNTHER GmbH Temperaturmesstechnik is in the temperature range from -100°C to +1500°C. In the temperature range between -100°C and +1550°C a factory test certificate can be issued for calibration.
Through our accreditation for display devices and simulators, we can provide our customers with instruments in our permanent laboratory as well as on location. Furthermore, it is possible to manufacture thermocouples from calibrated charges and to issue a corresponding charge certificate.



Laser-inscribed flange with calibration certificate, charge and order number for clear assignment of the thermocouple.

Training and know-how transfer

To further support our customers, we offer various practical **training courses on the subject of temperature measurement technology.**
The topics range from the basics of temperature measurement technology to more in-depth topics such as the contents of CQI-9 or AMS 2750.
Each participant receives both a comprehensive hand-out with a detailed summary of the training content and a certificate of attendance. All training courses can be held either at the company‘s headquarters in Schwaig or at the customer‘s premises.

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