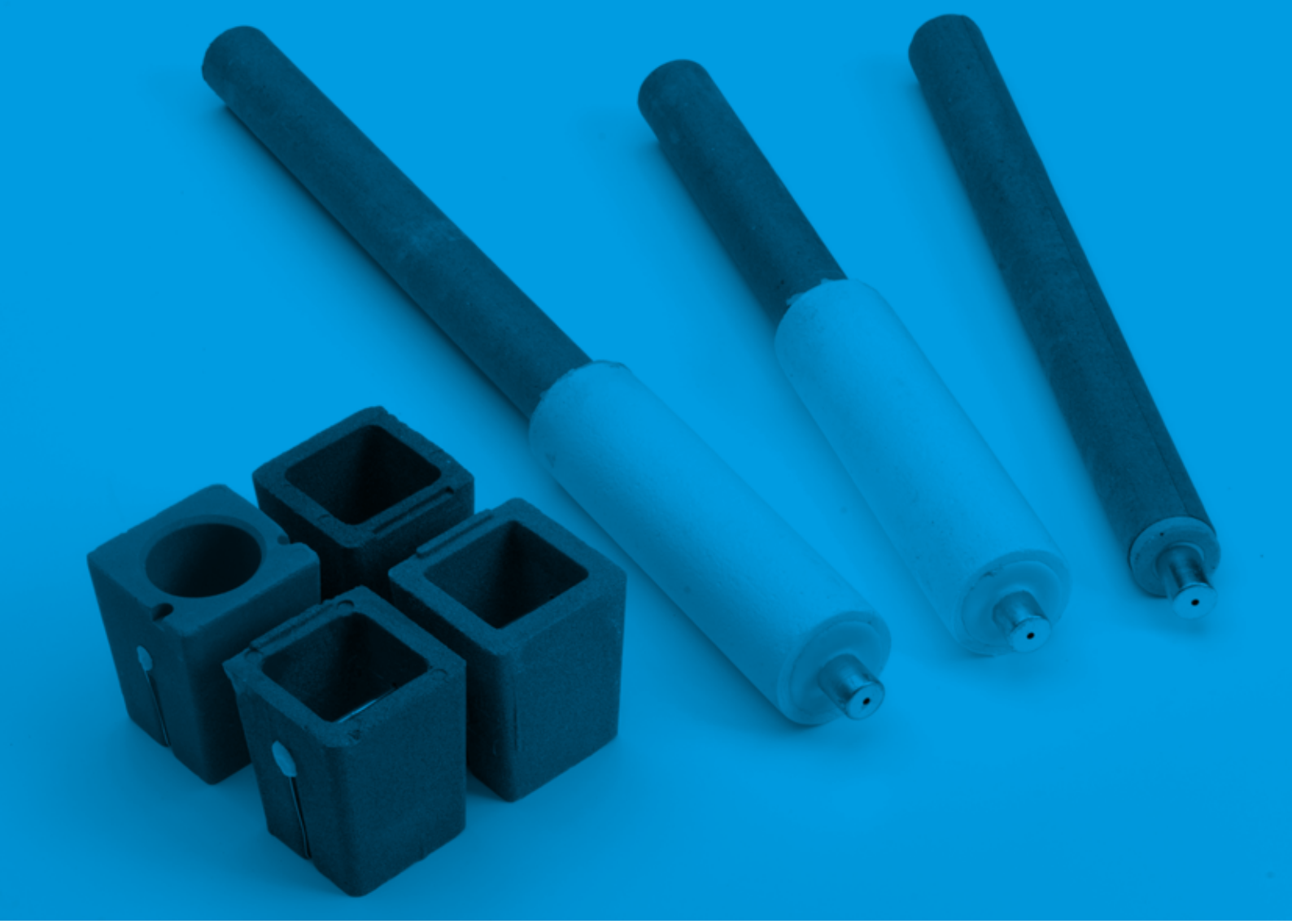
SCHÄFER
THE RISER COMPANY



Temperature Control in Foundries

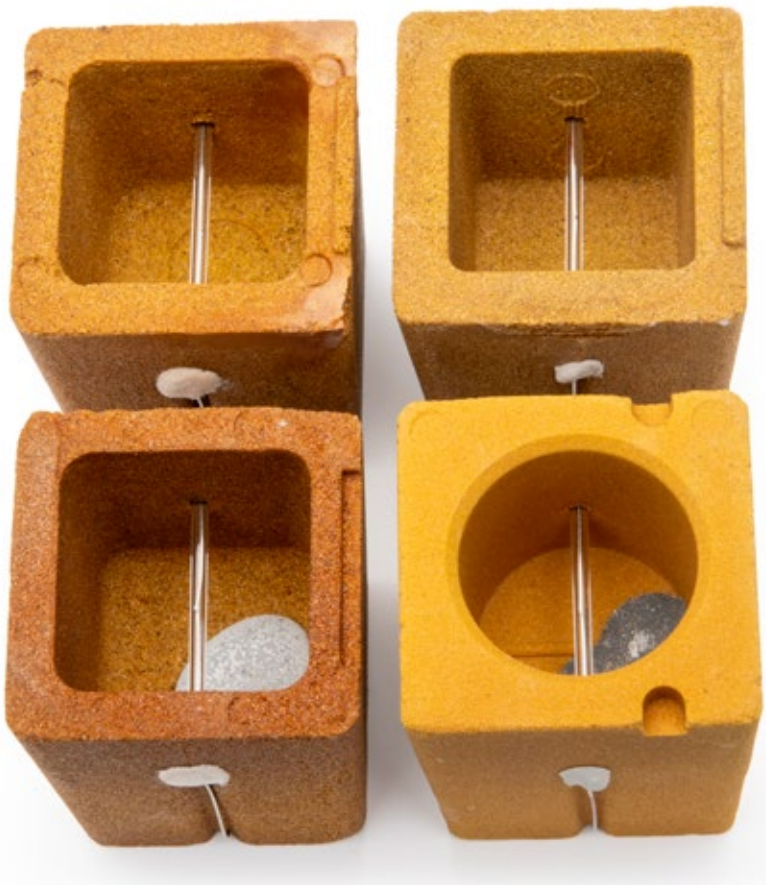
www.gtp-schaefer.com

GTP Fast Cups

The sample crucible for thermal analysis consists of a standardised sand crucible in which a high-precision thermocouple is integrated. This method is often used for on-site testing of the composition of molten iron, as it is quick, simple, reliable and cost-effective.
After filling the sample crucible with the molten metal, the thermal analysis determines the carbon equivalent value (CEL), the carbon content (C), the silicon content (Si) and other components during the solidification process, based on the temperature plateau and the shape of the measured cooling curve.

Working Principle

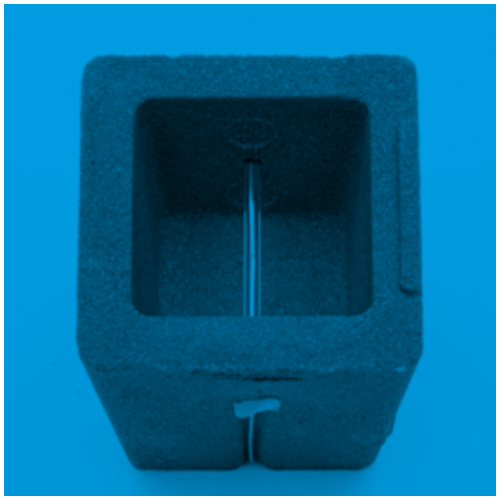
During the cooling and solidification of cast iron, phase changes occur, releasing latent heat of crystallisation. These changes influence the cooling curve. Thermal analysis uses this thermal effect to determine the initial crystallisation temperature and the eutectic temperature points of the cooling curve. Supporting software for thermal analysis helps to determine the carbon equivalent value (CEL), the carbon (C) and silicon (Si) content and to analyse the corresponding properties of cast iron in summary.



GTP Fast Cups

FC-S (710007)

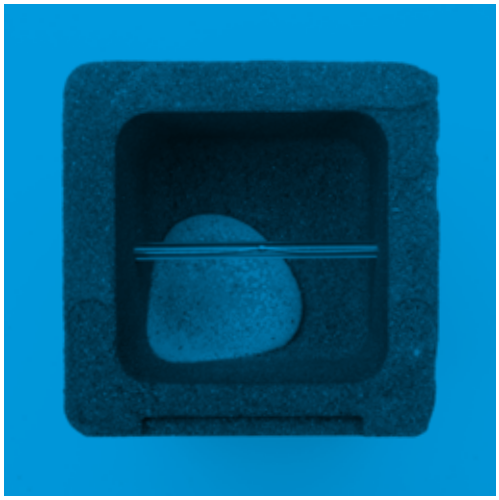
The FC-S (Fast Cup Standard) crucible is used to determine the position of the alloy within the iron-carbon diagram, the nucleation potential and the phase composition of the iron during solidification.



FC-Te/TeS (710008-9)

Designed for the determination of important chemical elements such as carbon equivalent, carbon content and silicon content in grey and nodular cast iron.

The addition of tellurium - sometimes in combination with sulphur - has a decisive effect on the solidification process of the metal. Tellurium promotes white solidification, which means that the iron solidifies in a state that has a more homogeneous and purer structure. This type of solidification is advantageous as it reduces the formation of graphite in grey or nodular cast iron. This sufficient reduction in graphite leads to a more accurate and reproducible analysis of the chemical composition of the melt.



By using FC-TE and -TeS crucibles, more precise data can be obtained, which is not only crucial for the quality control of cast iron products, but also for the development of new alloys and materials.

Article No.	Article Name	Description	Qty/box	L/box [mm]	W/box [mm]	H/box [mm]
71007	FC-S	Fast Cup Standard	100	620	340	180
71008	FC-Te	Fast Cup with tellurium	100	620	340	180
71009	FC-TeS	Fast Cup with tellurium + sulphur	100	620	340	180

Attachments for Thermal Measuring Lances

During the melting process, precise control of temperature changes in the melting furnace, ladle and during iron treatment is essential. The thermal measuring lances (TML) from GTP Schäfer offer an efficient and economical solution for measuring melting temperatures, even under the most demanding conditions. The immersion thermocouples are simply placed on the measuring devices until electrical contact is made with the integrated contact block.

Working Principle

The temperature measurement method is based on the thermoelectric effect of metals. Two different metal wires form a loop that acts as a thermocouple. This has two contact points: The first, which is immersed in the molten metal, is called the 'hot end' or 'hot junction' (measuring junction). The second contact point is connected to the measuring device and is called the 'cold end' (reference junction). If there is a temperature difference between these two ends, a corresponding thermoelectric voltage is generated in the loop, which is used to determine the melting temperature of the iron.

GTP Schäfer offers a comprehensive range of products tailored to the specific requirements of foundries, including measuring devices, immersion heights and spray protection solutions.

Improved Environmental Footprint and Waste Reduction of up to 75%

Conventional thermal measuring lances can be used once in their simplest version and up to twice in higher-quality versions. In contrast, the TML products with splash protection from GTP Schäfer allow process-reliable use of up to four measurements, which enables foundries to reduce waste by up to 75%.

Article No.	Article Name	Description	Qty/box	L/box [mm]	W/box [mm]	H/box [mm]
71003	TML 300-M	Splash protected (300 mm) Multiple use (up to 4 x)	56	370	340	300
71006	TML 400-M	Splash protected (400 mm) Multiple use (up to 4 x)	56	460	350	300
71005	TML 300-S	Single-use application without splash protection (300 mm)	100	360	350	300
71004	TML 400-S	Single-use application without splash protection (400 mm)	100	460	200	260

Other dimensions (600/900/1200 mm) can be supplied on request.

GTP Typ TML 300-S / 400-S / Splash Protected

Technical Features

Type	External Diameter	Internal Diameter	Material
Standard	30 mm	18,4 mm	Paper
Splash protected	30 mm 42 mm	18,4 mm	Silicate fibre S

Reliability	> 98%
Response time	2-5 s
Thermocouple type	S (Pt+Rh Vs Pt)
Accuracy	+/- 1,5°C
Temperature range	205° - 1,710°C
Material	Aluminium

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