



PhoenixTM
Phoenix Temperature Measurement

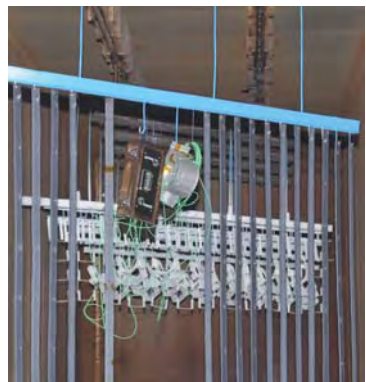
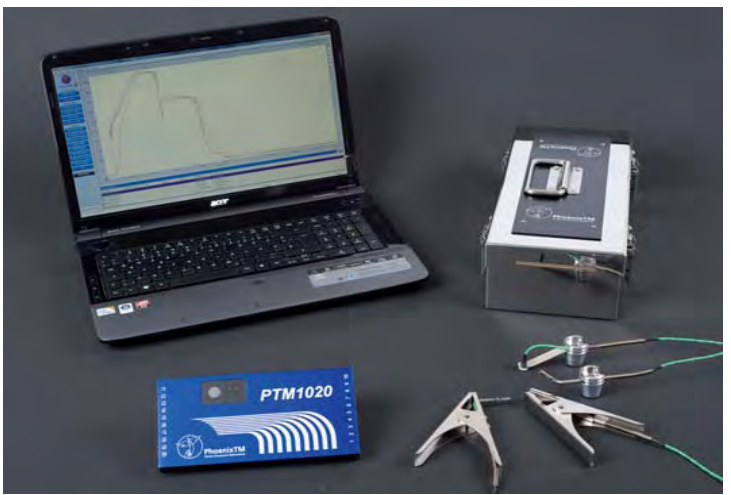
Temperature Profiling Systems



PhoenixTM
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Where experience counts!

The preferred profiling system for all your quality assurance and process optimisation needs!



Thermal Barriers
PhoenixTM develop Thermal Barriers to suit specific applications; for example coating processes require Thermal Barriers to be free of all traces of silicone, whereas in the heat treatment industry, where Thermal Barriers are subject to high rates of heating and cooling, minimizing Thermal Barrier distortion is the main criteria. In other processes such as heat treating aluminium road wheels Thermal Barriers need to withstand full immersion in water from a high temperature. PhoenixTM can also design Thermal Barriers to meet specific process conditions, such as steel reheat processes which require graded insulation layers to withstand the 1300°C temperatures within the furnace. The many years experience of senior PhoenixTM personnel working within these industries is translated into the superior design of their Thermal Barriers for all heat treatment and finishing applications.

TS04 range (-150°C to 300°C)
Specifically designed for the finishing industry, the PhoenixTM TS04 Thermal Barrier range offer ease of handling and high thermal performance in a compact design. They are designed to accept the PhoenixTM 20 channel Data Logger and being built from silicone-free materials they are ideal for use in the automobile industry. PhoenixTM can also design Thermal Barriers longer duration processes or where water spray may be part of the process.

TS05 range (up to 350°C)
Developed for the ceramic industry, the PhoenixTM TS05 series Thermal Barriers travel beneath the kiln car for a sustained period at moderate to high under car temperatures. Built from high grade stainless steel these Thermal Barriers use evaporative water technology to keep the Data Logger cool and protect against mechanical damage and the dusty environment of a ceramic kiln.

TS01 range (0°C to 800°C)
Developed for processes up to 800°C the PhoenixTM TS01 Thermal Barrier range is perfect for applications in the aluminium, glass and steel industries. Microporous insulation and a 'latent heat accumulator' or heat sink provide protection against the temperatures inside of the furnace. Made from high grade stainless steel, with an easy to replace thermocouple wear strip, the TS01 Thermal Barrier range is robust and durable.

TS02 range (0°C to 950°C)
Processes such as carburizing at temperatures up to 950°C, demand a Thermal Barrier which can withstand severe changes in temperature, pressure, and aggressive atmospheres. Strengthened and reinforced at critical points to minimize distortion, PhoenixTM TS02 Thermal Barriers are designed to offer full protection to the Data Logger in demanding conditions.

TS06 range (0°C to 1100°C)
Built for solution treatment and age hardening where high temperature and water quench are part of the process, the PhoenixTM TS06 Thermal Barrier range is designed to offer protection to the Data Logger from these conditions. These Thermal Barriers use the principle of evaporating water to keep the Data Logger cool in the furnace, and can re-fill in the quench to allow it to undergo a further heating period as is normal in aluminium or stainless steel solution treatment.

TS07 range (up to 1300°C)
In processes such as steel slab and billet reheat where temperatures are extreme and process times long; the PhoenixTM TS07 Thermal Barrier is the obvious choice. Manufactured from the highest specification materials and using graded insulation layers and evaporative water technology, these Thermal Barriers are built to withstand repeated use in these harsh environments.

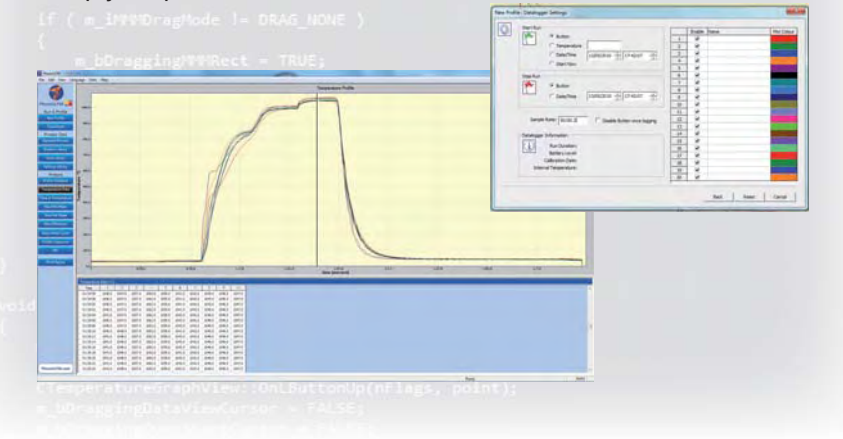


PhoenixTM Data Loggers
At PhoenixTM we believe that data loggers for thermal profiling must be built to operate in the harshest environments while maintaining accuracy throughout their operating temperature range. All PhoenixTM Data Loggers include these important features:

- PhoenixTM Data Loggers are easy to use and require no complex keypad programming sequences.
- Accurate, logged data is stored securely in non-volatile memory.
- Electronic components are housed in a water resistant, tough machined aluminium case which is designed to minimize damage in the event of a catastrophic failure in a water quench process.
- PhoenixTM Data Loggers are designed to be maintained at local service centers, and use standard batteries.
- PhoenixTM Data Loggers can operate in both low vacuum and high pressure environments.

Thermal View Plus Software

PhoenixTM has developed a powerful software package to quickly and easily analyze data from your process. Screen layout is clear and using the enhanced control bar makes this a very easy, but powerful package to operate. All results are saved in a database for easy access which can be organized in a logical manner using the multi column sorting facility. The analysis functions allow you to examine and assess all your critical process parameters in a fast uncomplicated way. Process templates can be constructed so data can be overlaid against a backdrop which represents all physical points within your oven / furnace. PhoenixTM software has all the essential functions you require to keep your process under control.

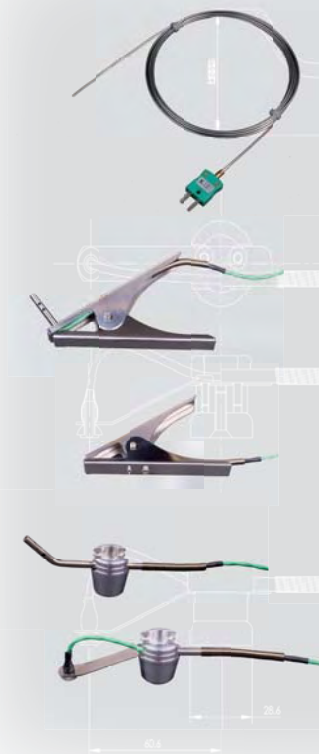


PhoenixTM Thermocouples

PhoenixTM offers thermocouples in many different designs, according to your product and process:

Temperatures up to 250°C: Triple wrapped PTFE/stainless steel braid/PTFE insulated type K thermocouples are normally specified. PhoenixTM thermocouples have a unique design of removable sensor (magnetic or clamp) so that when the insulated cable wears, it can be replaced without the need to buy a complete assembly. This results in high potential savings.

Temperatures above 250°C: mineral insulated (MI) type K thermocouples are specified. In this type of probe the thermocouple wires are insulated by compacted magnesium oxide and covered by a flexible Microbel sheath which offers protection against high temperatures (up to 1150°C), aggressive furnace atmospheres (e.g. carburizing), and electrical interference. Thermocouples are available in different lengths and diameters, although 1.6mm diameter is normally specified.



What is temperature profiling?

All industrial ovens or furnaces use thermocouples to control the zone temperatures. However these thermocouples measure only atmosphere temperature in their respective zones and do not indicate the true temperature of the product, which is vital to ensure the heat treatment specification is adhered to.

In many continuous furnaces it is difficult to measure the actual product temperature because this requires long thermocouples to be connected to the product and fed through the whole length of the furnace, which is both expensive and unsafe. 'Trailing' thermocouples are also less accurate as the test can only be carried out in a partially loaded furnace (due to the thermocouples trailing through), which may affect the measured temperature profile.

Infra red cameras can provide product temperatures, but they cannot provide an accurate profile through the furnace, or determine the temperature at the centre of the load as they measure only surface temperature.

PhoenixTM can provide a solution:

Our monitoring system travels through the furnace with the product, logging temperatures from up to 20 thermocouples connected to the product or distributed in the load to get an accurate thermal 'balance'. The system is easily placed on the line with the product causing less disruption and gives a more accurate picture of true product or load temperature. At the end of the profile run a powerful software package analyses the logged data to determine whether the specification has been met.

The profiling trials can be quickly carried out allowing you to resolve any furnace problems quickly, and to provide your customers with an assurance of a consistent process control.

PhoenixTM has evolved to bring innovation, quality and simplicity to the process of temperature profiling.

Temperature profiling products through a heat treatment, finishing, or firing process is achieved by attaching thermocouples to the critical points of the product, connecting these probes to a Data Logger, and by protecting the Data Logger with a Thermal Barrier, the whole system can travel through the heat treatment process together with the product. In this way the true product temperature is monitored and stored for later analysis.

Design of the monitoring system from the thermocouples, through to the Thermal Barrier is critical as this electronic measuring device is required to monitor product temperatures with a high degree of accuracy while resisting extremes of temperature, atmospheres, and pressure.

With over 60 years of combined temperature profiling experience, the senior PhoenixTM personnel have a deep understanding of all aspects of the design of products for these industries, and most importantly, have good knowledge of the processes in which they will be used.

Customers can be assured that temperature monitoring systems supplied by PhoenixTM will have true experience designed into them, will be built to the highest quality standards, but will also be easy for operators to use.



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