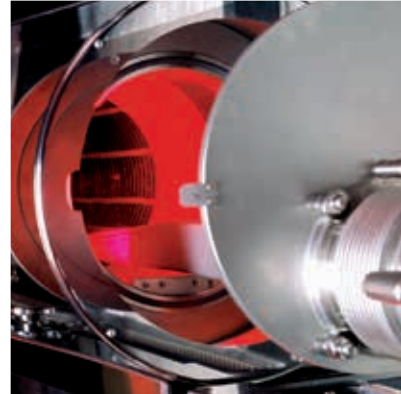
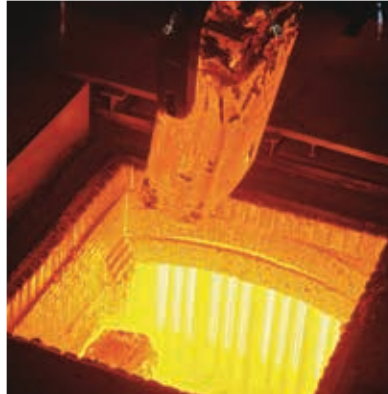
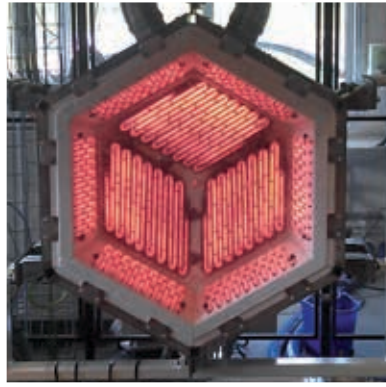
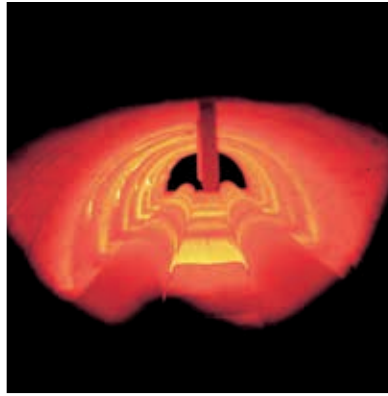


Kanthal® Furnace products and Heating systems



Kanthal® electrical heating systems

Kanthal electrical heating systems deliver significant reductions in energy consumption compared to gas-heated systems. Kanthal electrical heating systems can be used in a broad range of applications, including; ladle driers, preheaters and holders in aluminum and steel processing, cathode and anode assembly pre-heating, calcining, sintering, drying and curing, renewable energy, glass processing and a variety of heat treatment processes that span a wide range of temperatures.

The net efficiency of Kanthal electrical heating systems is typically 70%, compared with only 20% for conventional gas solutions. The design of the system allows the radiation to be more accurately directed towards the target area – a highly efficient heating method.

Using electric heating also eliminates local CO₂ emissions – a step in minimizing the environmental impact. Furthermore, a cleaner, safer and quieter environment is achieved, making it a much healthier place for operators.

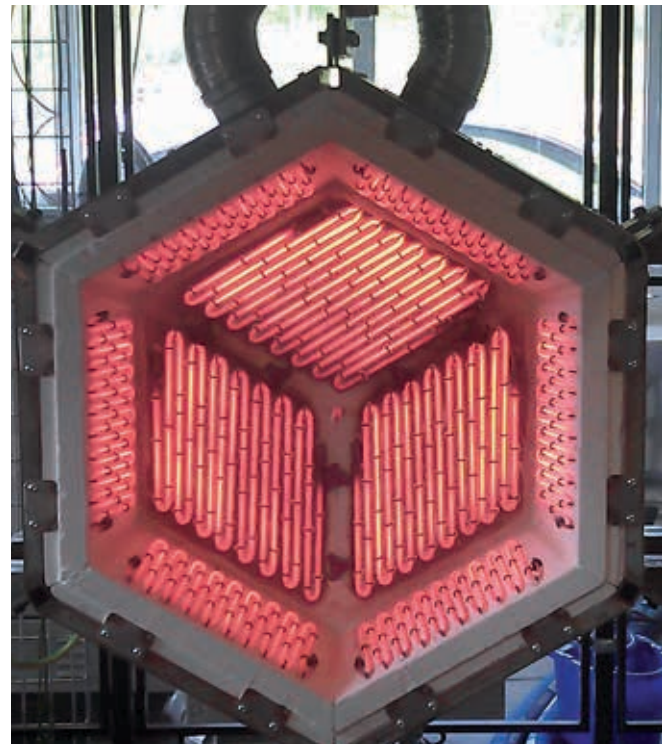
Complete installations and sub assemblies

Kanthal electrical heating systems may comprise the following parts:

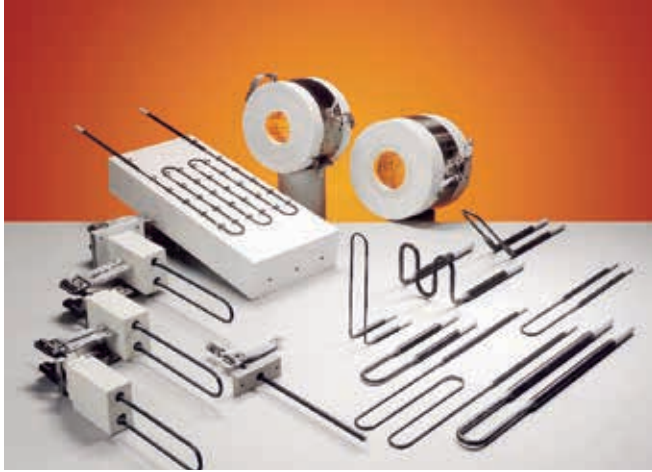
- Heating elements
- Thermal insulation
- Casing and framework
- Hydraulic, pneumatic, or mechanical lifting
- Conveyor system
- Control and regulation equipment
- Industry standard communications for PLC and integrated process control systems.
- Installation
- Commissioning
- After market support and service
- Preventative maintenance
- Optional choice including smart surveillance monitoring of condition, function, energy usage, and predictive failure

Kanthal electrical heating systems delivers robust and repeatable reliability from one expert source.

From application assessment, through design, manufacture, delivery, installation, commissioning, and after-market support, we are there at your side in order to ensure optimized trouble free operation, with minimal downtime.



Kanthal® Super heating elements and Superthal heating modules



High power and long life, non-aging electric MoSi₂ heating elements. Manufactured as ready-made elements in seven material grades. Kanthal Super 1700, 1800, 1900, ER, RA, HT and NC, straight or bent in a broad range of standard and customized dimensions. Standard element dimensions: 3/6 mm, 4/9 mm, 6/12 mm, 9/18 mm, 12/24 mm.

Element temperature up to 1850°C (3360°F)

Also available as Superthal heating modules combining Kanthal Super elements and ceramic fiber in the form of half cylinders, cylinders, panels, disks, high power reflector modules, or completely tailor made. For use up to 1725°C (3140°F) element temperature.

Kanthal® Global® SiC heating elements



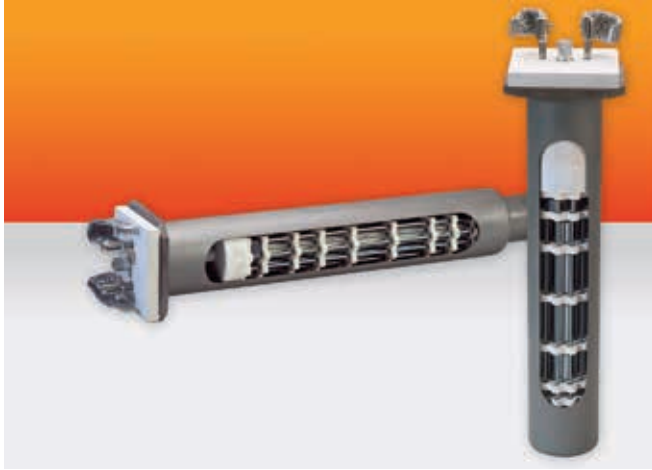
Extremely versatile heating elements manufactured in straight, spiraled, single or multi-shank designs for a broad range of applications including heat treatment, melting, and sintering.

Element temperature up to 1650°C (3000°F)

- Size range from 10 mm up to 75 mm Ø (0.375 – 2.95 in.)
- High power concentration
- Can be installed in any orientation
- Simple installation – No support necessary inside the furnace
- LL, SD, SDA, AS, ASA, SG, SR, B, Type U, W and multi-shank.



Tubothal® heating element inside radiant tube



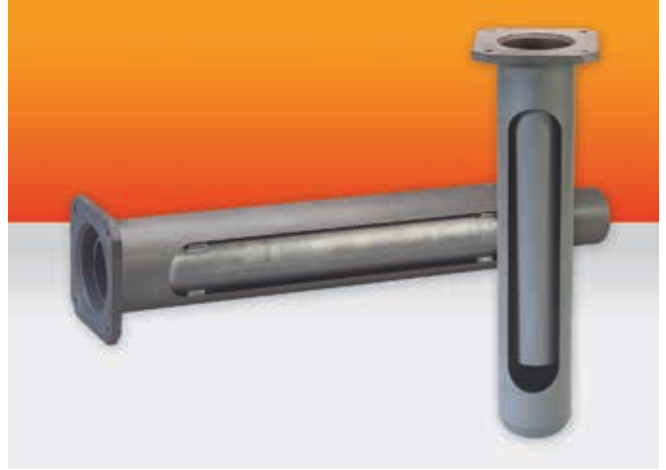
Tubothal radiant tube heating elements inside Kanthal APM/APMT or Sandvik FeNiCr radiant tubes. Our most powerful long life metallic element system for use inside all types of radiant tubes, ideally APM or APMT.



Tube temperatures up to 1250°C (2280°F)

- Size range from 68 mm dia to 170 mm dia (2.68 – 6.7 in.)
- Radiant tube systems from 83 mm dia to 198 mm dia (3.26 – 7.8 in.)
- Maintenance free operation
- Can be produced >6 m long (>20 ft)

Kanthal APM™, Kanthal APMT™ or Sandvik 353MA and Sandvik 253MA tubes



Long life, robust, high performance extruded tubes for a wide range of furnace applications, including radiant protection tubes for electrically heated and gas fired systems.

Tube temperatures up to 1250°C (2280°F)

- Std. size range from 26.7 mm dia to 260 mm dia (1.05–10.24 in.)
- Long tube life
- Maintenance free operation
- Carburization and sulfidation free APM/APMT tubes
- Nitriding systems using 353MA tubes
- Muffle tubes for strand annealing furnaces
- Thermocouple protection tubes
- Inner and outer tubes for SER gas burners
- Retorts
- Available as straight, U- and W-shaped tubes



Metallic heating elements – Wire, Strip, Rod, Tube



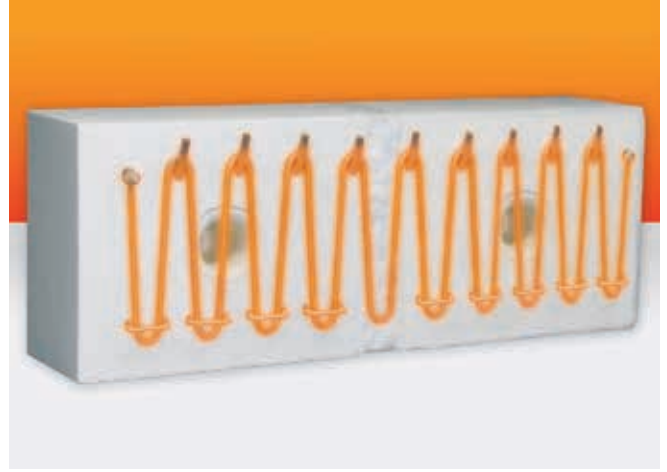
Ready-made metallic heating elements made from wire or strip in Kanthal iron-chromium-aluminium alloys or Nikrothal nickel-chromium alloys.

Element temperatures up to 1425°C (2600°F)

Metallic heating elements can be manufactured to any specifications and with short delivery times. Examples of element types are:

- Coiled wire elements
(i.e. spiral elements and edge-wounded elements)
- ROB – Meander elements
- Sinuated (corrugated) strip elements
- Cartridge elements (i.e. bundle rod elements and cage elements)
- Tubothal heating elements

Fibrothal™ heating and insulating modules and systems



Prefabricated heating modules with metallic heating elements and vacuum-formed ceramic fiber insulation. High performance low thermal mass package.

Element temperatures up to 1350°C (2460°F)

- Fast and easy to install and replace
- Increased insulation
- High power concentration
- Virtually any shape and size
- Ideal for huge furnaces
- Low weight construction
- Low energy storage
- Muffles, cylinders, half cylinders, part cylinders, panels, custom shapes

Diffusion cassettes

Fibrothal diffusion cassettes is a 'plug and heat' solution for the production of high-quality crystalline silicon wafers for solar cells and semiconductors.

Element temperatures up to 1350°C (2460°F)

The diffusion cassettes are of low mass design type with vertical or horizontal elements.

Customized heaters for specific applications can be delivered on request.



Air heating cassettes



With Kanthal air heating cassettes it is possible to heat air or gases up to 800°C (1470°F) and maintain a uniform temperature throughout the oven, furnace or process equipment. The air heating cassettes can be produced to fit most existing or new furnace designs. Installation is very simple in most cases.

- Compact design
- Easy to install
- High power output
- Long service life
- Light weight
- Customized design

Moduthal™ heating modules



Prefabricated heating modules with metallic heating elements and non-electrically conductive, dense ceramic insulation.

Element temperatures up to 1350°C (2460°F)

The construction method of Moduthal heating modules ensures accurate positioning of the coils and eliminates the distortion or other problems connected to conventional open coil elements in grooves or on tubes.

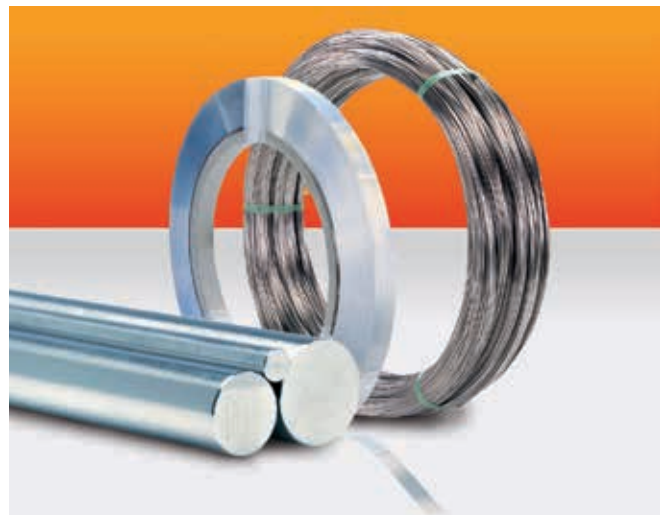
A fiber-free version is available for up to 1250°C (2280°F) element temperature.

High temperature construction materials and components

High-temperature construction materials for the manufacturing of furnace accessories like furnace furniture and furnace rollers. The Kanthal program of high-temperature construction materials includes iron-chromium-aluminium (FeCrAl) alloys for material temperatures up to 1425°C (2597°F) and nickel-chromium (NiCr) alloys – all available in a variety of product forms.

Kanthal high-temperature construction materials are suitable for the manufacturing of construction parts such as:

- Fixtures
- Supports
- Tube hangers
- Fasteners and holders
- Burner nozzles
- Furnace baskets
- Muffles and retorts



Kanthal APMT™ furnace rollers



Furnace rollers made from Kanthal APMT, an iron-chromium-aluminium (FeCrAl) alloy, for heat treatment furnaces with operating temperatures up to 1250°C (2280°F). Kanthal furnace rollers are available in outside diameters from 26 to 260 mm (1 to 10 in.), according to customer design.

- Furnace rollers for continuous furnaces
- Furnace rollers for roller hearth furnaces
- Furnace rollers for walking beam furnaces

Longer service life compared to conventional materials

In extra demanding applications, furnace rollers made from Kanthal APMT may provide considerably longer service life and reduced maintenance compared to furnace rollers made from conventional materials such as nickel-chromium (NiCr) alloys and ceramic materials. This is due to the material's excellent creep rupture strength at high temperatures. Furnace rollers made from Kanthal APMT are also characterized by a very smooth surface which ensures a consistently high-quality finish of the manufactured products. Thanks to Kanthal APMT's superior high temperature performance, the reduced need for cooling may give significant energy savings.

Kanthal® electrical process heaters



In Kanthal electrical process heaters, electrical elements are used for providing heating energy. Elements are installed in a baffle-cage design and tie rods hold the complete assembly together. During the heating process, heated media flows from the inlet nozzle to the heater outlet located at the opposite end of the exchanger.

Kanthal electric process heaters at a glance

- Limited process hookup – simpler installation
- Fast response
- Compact design
- Precise temperature control
- Close to 100% efficiency
- Instant cold start
- Almost 100% turndown capacity (reduced vs. rated capacity)
- Reduced risk of fouling – higher efficiency and less maintenance
- No NO_x emissions (on site)

Whatever your industry we have the right heat for your process

- Oil & Gas
- Petrochemical
- Power generation
- Processing plants
- Chemical
- Marine
- Utilities
- Construction
- General manufacturers
- Primary steel & aluminium plants
- Fertilizers

Process and refinery applications

- Regenerant super heater
- Isomerization heater
- Reduction gas heater
- Fuel gas heater
- Regeneration heater
- TEG / MEG / DEG heater and reboiler
- Steam super heater
- Seal gas heater



Sandvik Group

The Sandvik Group is a global high technology enterprise with 49,000 employees in 130 countries. Sandvik's operations are concentrated on five business areas in which the group holds leading global positions in selected niches: Sandvik Mining, Sandvik Machining Solutions, Sandvik Materials Technology, Sandvik Construction and Sandvik Venture.

Sandvik Materials Technology

Sandvik Materials Technology is a world-leading manufacturer of high value added products in advanced stainless steels, and of medical implants, steel belt based systems and industrial heating solutions.

Kanthal is a Sandvik owned brand, under which world class technology products and solutions are offered. Sandvik and Kanthal are trademarks owned by Sandvik Intellectual Property AB.

Quality management

Sandvik Materials Technology has quality management systems approved by internationally recognized organizations. We hold, for example, the ASME Quality System Certificates as a Material Organization, approvals to ISO 9001, ISO/TS 16949, ISO 17025, and PED 97/23/EC, as well as product approvals from TÜV, JIS, DNV and Lloyd's Register.

Environment, health and safety

Environmental awareness, health and safety are integral parts of our business and are at the forefront of all activities within our operation. We hold ISO 14001 and OHSAS 18001 approvals.

