

# Kanthal® electrical heating solutions for rodding shops



**KANTHAL**

## Clean up your shop

*Replacing gas burners with electrical heaters in your rodding shop can save you significant costs and generate substantial environmental and safety benefits. You not only achieve lower energy consumption, you also gain a much cleaner, safer and quieter environment, making it a more secure place for your operators.*

Equally important, you reduce your greenhouse gas emissions to near zero – another step in your securing your reputation as an environmentally responsible corporate citizen.

### **Paint it green**

Although the rodding shop is only one of many steps in a primary aluminum processing plant, it is a critical one. With electrical heating from Sandvik, you have much more efficient pre-heating, re-heating and drying solutions for your anode blocks, stubs and ladles.

So why not turn your rodding shop into a green one? Following are some of the advantages of electric heating over gas in more detail.

### **High efficiency heating in the rodding shop**

Kanthal® electrical heating solutions provide significant improvements over gas burners at critical stages in the rodding shop, in each process step, with the exception of

the anode stub drying station. Kanthal heating solution includes a heating element located in a reflector arrangement that allows the radiation to be more accurately directed towards the target area.

### **Your one-stop shopping partner**

Working closely with our customers, we provide complete, one-stop shopping solutions, from system design to delivery and installation supervision. Our installation services include all mounting hardware and fixtures needed for a complete installation and after-sales support for the lifetime of your product.



To get in contact with your local representative, visit [www.kanthal.com](http://www.kanthal.com) or show this QR-code to your smartphone.





## SOME KEY ADVANTAGES OVER GAS BURNERS

### Energy efficiency

Open gas heaters are much less accurate than electricity. Energy efficiency is only 20% with gas, compared to 70% with electricity, which allows radiation to be accurately transferred to the target area within a specific amount of time.

### CO<sub>2</sub> emissions reduction

Less energy consumed results in less CO<sub>2</sub> emissions – a vital step in transforming your operations into a greener process.

### Workers' health

Gas, compared to electrical heating, generates a lot of noise and fumes and potentially unhealthy work environment.

### Safety

Greater accuracy ensures the object is exposed to radiation in a consistent way, ensuring the object is quickly and thoroughly heated, avoiding the risk of leaving behind residual moisture – a potentially explosive situation.

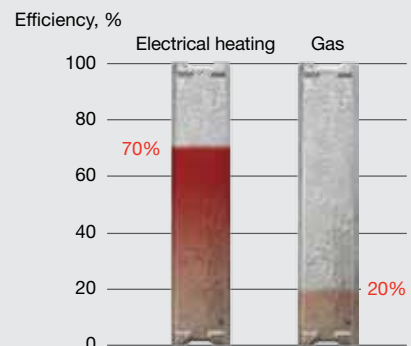
### Reliable performance

Unlike gas burners, electrical heating solutions offer a very even and controlled heating distribution that is consistent from batch to batch, ensuring reliably predictable results.

### Low maintenance

A burners require frequent adjustments and maintenance. Electric heaters are significantly more robust.

## Electrical heating compared to gas



# Anode stub drying station

Anode stubs must be heated up to at least 100°C (180°F) to remove any traces of water or vapor – a potentially dangerous issue that also deteriorates the quality of the welded joint.

## Improved safety

Kanthal® high-density power radiating system ensures that any object prior to contact with liquid iron is brought up to 100°C (180°F), eliminating any risk of explosion.

## Higher quality of welded joint

A perfectly dry stub contributes to a homogeneous welded joint free of porosity, ensuring minimized voltage drop over the thimble.

## 3–4 times more efficient

Open burners with atmospheric air mixture consume approximately three to four times more gross energy compared to electricity.



# Anode pre-heating station

Prior to pouring molten iron into the anode slot, it is critical that the temperature in the slot is raised to about 100°C (180°F) as quickly (in less than 1 minute) and evenly as possible, improving the conditions for welding the stubs to the anode and securing the safety of the operation. The more even and thorough drying achieved by our electrical heating system contributes to minimizing the voltage drop over the thimble.

## Improved safety

Due to the porous nature of the material, anodes tend to accumulate some humidity during storing, which can result in an explosion, at worst, or a connection failure upon becoming energized. Kanthal highly focused reflector-based electric heating solution ensures more thorough drying.

## Accurate heat transfer

Kanthal reflector technology is uniquely designed to provide focused radiation in to the stub holes only, and not on the anode block itself. That means that significant energy savings can be achieved. Electric heat transfer rate is 70% compared to only 20% for gas.



# Ladle drying, ladle pre-heating and ladle holding station

With optimized curing during the dry out/baking process Kanthal solution ensure that the refractory lining lifetime is significantly extended. To both extend the life of a ladle and reduce the risk of thermal shock, ladles must be pre-heated to 1200°C (2190°F) before being filled with molten cast iron.

Kanthal solutions are more energy efficient, and provide dual functionality for both pre-heating and holding of liquid metal (valuable for when the anode rod mating operation is delayed for any reason).

## Multi functionality efficiency

Replacing open-flame burner with more uniform Kanthal heating solutions, provides much greater efficiency and operating flexibility for ladle drying, pre-heating and holding.

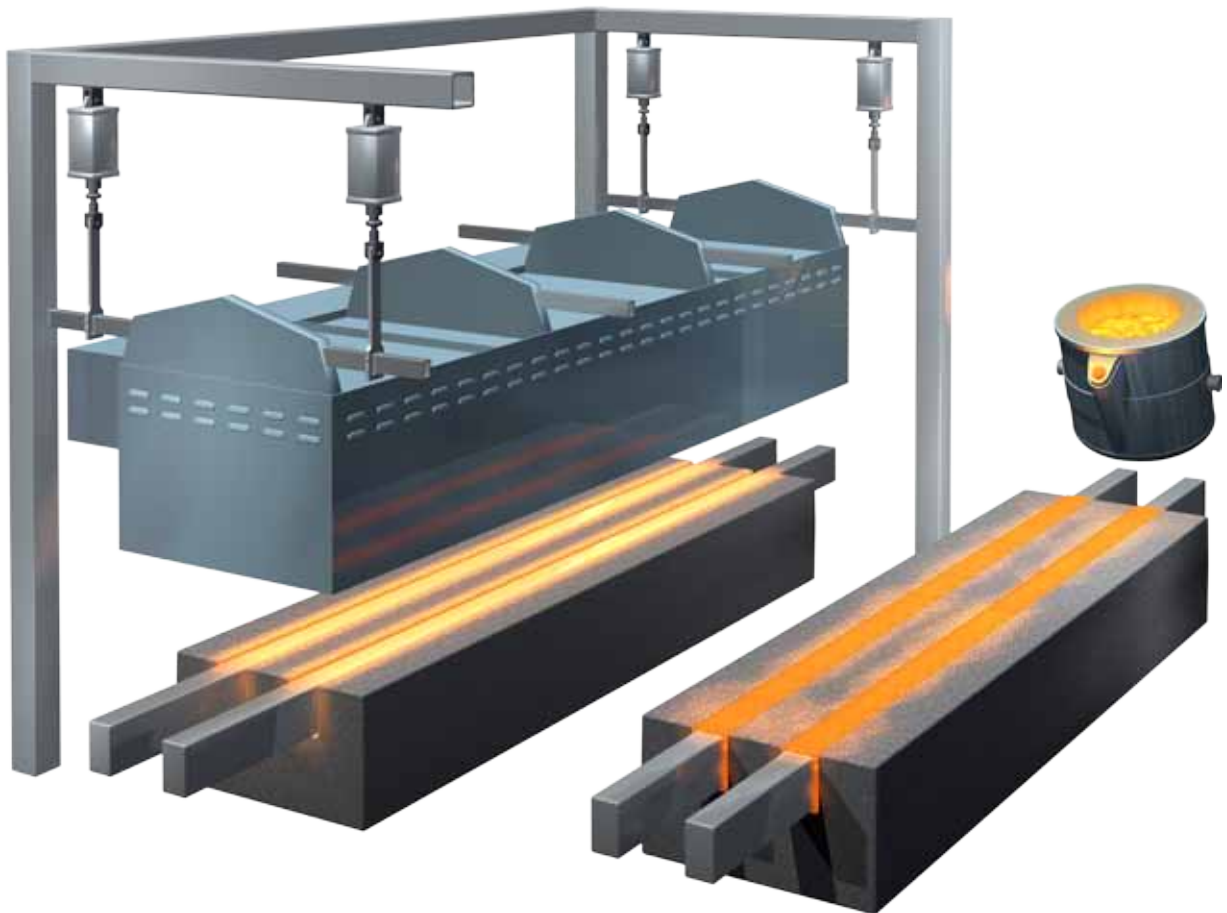


# Cathode pre-heating station

By heating the pre-assembled steel bars and cathode block, Kanthal® solution eliminates the need to move, lift and/or position hot steel bars, a potentially dangerous process. The Kanthal solution also ensures consistent bar positioning and cathode heating.

## **Simplified handling**

Kanthal cathode pre-heating station deliver heat energy directly to the steel bars in the graphite block and provides indirect heating of the graphite slot. Huge energy savings are achieved by eliminating the need for heating up the entire mass of the graphite block. Lifting and moving of hot and heavy bars by cranes and lifting devices is eliminated, greatly reducing the risk of accidents. This enables more efficient cathode handling and greater precision in positioning of the bars.



# Alcan Iceland Ltd. cuts costs by USD 100 000 annually

Since 2004, Alcan Iceland Ltd. has decreased the propane consumption overall by 39% by switching to electrical heating.

In the rodding room Sandvik replaced three open flame burners for anode pre-heating with three high power density heaters and thus achieving highly focused heat and high efficiency. Similarly, the ladle heater was replaced with electrical heaters utilizing the dual functionality of both pre-heating an empty ladle and holding of molten metal.

The Kanthal efficient design of the electrical stub heater ensures efficient heat transfer reaching the minimum surface temperatures on the stubs within the specified time frame.

In the rodding room the estimated savings are USD 100 000 annually.



**Sandvik Group**

The Sandvik Group is a global high technology enterprise with 47,000 employees in 130 countries. Sandvik's operations are concentrated on three core businesses: Sandvik Tooling, Sandvik Mining and Construction and Sandvik Materials Technology – areas in which the group holds leading global positions in selected niches.

**Sandvik Materials Technology**

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

Kanthal is a Sandvik owned brand, under which world class heating 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 Systems Certificate as a materials organization, approval to ISO 9001, ISO/TS 16949, ISO 17025, and PED 97/23/EC, as well as product approvals from TÜV, JIS 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.

Recommendations are for guidance only, and the suitability of a material for a specific application can be confirmed only when we know the actual service conditions. Continuous development may necessitate changes in technical data without notice.

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