TUTCONNECT

TUTCO FARNAM | TUTCO SUREHEAT | TUTCO CONDUCTIVE

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TUTCO SureHeat Joins Forces with RIFT to Advance Iron Fuel Technology™

As global industries seek carbon-neutral energy alternatives, hydrogen has emerged as a promising clean energy carrier. But despite its potential, large-scale hydrogen transport remains costly and technically complex due to the gas's low energy density and volatility. Current methods—such as liquefying hydrogen or converting it to ammonia—are both expensive and energy-intensive.

One promising solution lies in using hydrogen to reduce iron oxide (rust) into elemental iron. This iron can be stored and transported as a solid fuel, then combusted to produce high-temperature heat. The combustion byproduct—iron oxide—can be collected and reused, forming a clean, circular fuel cycle with water as the only emission during reduction.

Dutch company RIFT (Renewable Iron Fuel Technology) is pioneering this approach with their Iron Fuel Technology™, aiming to slash 1 gigaton of CO_2 emissions per year by 2050. Their process offers an innovative, zero-carbon method to store and move renewable energy from locations like offshore wind farms or desert solar installations to energy-hungry regions.

Iron Fuel Technology™ acts much like a rechargeable thermal battery. Iron powder is combusted in specialized boilers to produce high-grade heat without direct CO_2 emissions. After use, the spent iron (rust) is regenerated back into usable iron powder using hydrogen—creating a fully sustainable energy loop.

To enable this process, RIFT has teamed up with TUTCO SureHeat, who will supply a critical component for the Direct Reduction of Iron (DRI) system: a high-efficiency heater capable of bringing hydrogen to the required high

temperatures under moderate pressure.

TUTCO SureHeat's Specialty Flanged Inline (SFI) Heaters are tailor-made for this demanding application. Key features include:

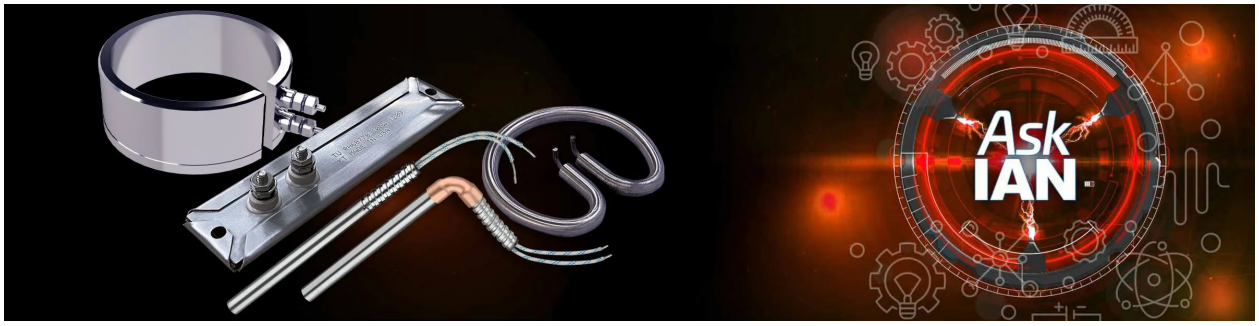
- **Reliable high-temperature operation** for hydrogen processing
- **Compact design** to suit space-limited systems
- **Quick ramp-up** for faster cycles and lower energy use
- **Scalable architecture** to support varied production demands

Iron Fuel Technology™ has applications across multiple sectors, including:

- **Industrial manufacturing** – Emissions-free thermal energy for chemical and metal processes
- **Food and beverage** – A greener option for steam and heat-driven operations
- **District heating** – Sustainable heat for homes and commercial buildings
- **Grid balancing** – Stored renewable energy to stabilize supply and demand

TUTCO SureHeat and RIFT are proving that clean energy solutions can be powerful and practical. As RIFT prepares to launch its first commercial installations—initially targeting the food & beverage, specialty chemicals, and pulp & paper industries—this partnership marks a major step toward scalable, zero-carbon heat.

Read the Full Story



The Sheath Material Used In Our Heaters

What are the outsides of our conductive heaters made from, and why?

by Ian Renwick

We are asked many times what our heater sheaths are made of. Here's a breakdown, and why the materials are used.

Standard Cartridge Heaters have sheaths made of 304 stainless steel. This is a good stainless steel for high temperature applications that can withstand the heat of what's being generated inside the heater. The presence of nickel and chromium help with that. It's the most common variety of stainless steel in the world, which helps with costs.

316 stainless steel adds a little molybdenum to the alloy mix, giving it better corrosion resistance especially in marine applications, but it's a lot more expensive. 304 stainless steel is more than sufficient for the vast majority of applications. There are few very special applications where we'll build heaters made from 316 stainless steel, but they are quite expensive due to the sheath alloy required. Both alloys are good up to 1000°F. The sheaths of Ceramic Strip Heater, Ultima Strip Heaters, Flatbar Tubular Heaters and some Tubular Heater are made from the 304 stainless steel for the same reasons.

HiTemp Cartridge Heaters are made with a sheath of Incoloy 800. Incoloy is a trademark name and is considered a superalloy. Think of it as super stainless steel. It is more resistant to oxidation at high temperatures, which allows us to provide HiTemp Cartridge Heaters at a very high watt density, over twice that of a Standard Cartridge Heater (and other types of elements). If you were to operate two heaters built similarly, expect for the sheath material (Incoloy 800 vs 304 stainless steel), you would see that the heater with the Incoloy sheath would remain slightly shiny while the heater with the 304 stainless steel sheath would darken and show signs of oxidation. That oxidation that occurs on the outside of the heater is also present on the inside of the heater, and if that oxide layer were to get too thick it would interfere with the heater circuit inside. That lower oxidation is what allows HiTemp Cartridge Heaters to operate as hot as they do, with their Incoloy 800 sheaths. Remember, Incoloy 800 is reserved for heaters that need to operate at a high temperature, sometimes as high as 1200°F.

Band heaters, both the HT Mica and Better varieties are built with sheaths of 430 stainless steel. It has a similar temperature rating as 304 stainless steel but is more easily formable. Band heater sheaths are built with a lot of folded sheet metal and the heaters are curved to shape, sometimes quite tightly. 430 stainless steel offers good heat transfer capabilities as well.

Besides being occasionally built from 304 stainless steel, tubular heaters are sometimes built with an Incoloy sheath for those high temperature applications. They are most commonly built from a coated steel tube, which is sometimes called bundy. It consists of a low-carbon steel tube with a thin copper outer layer. It's good for most tubular applications.

Permaheat Band and Strip heaters are built with an aluminum 6063-T4 sheath, or body. A tubular heater sits within grooves of the aluminum body and it conducts heat from the tubular heat to the application. Aluminum 6063-T4 has good formability and machinability characteristics which are important for the production of these products.

As you can see there are several different materials we use for our various heater product lines. They have been carefully thought out, and there's a good reason for all of them.

Read More Ask Ians

Heating Things Up - TUTCO's Total Capabilities!

by Jeff Elrod

In the last few months, we looked at some the history of Tutco from its humble beginnings to its growth into may more markets and technologies and how growth occurred both internal and through acquisitions and partnerships.

For the last three decades, Tutco has changed from a basic appliance and HVAC supplier to being able to offer solutions to virtually all electric heat requirements.

The bread and butter of Tutco are the open coil heaters that are used in appliance and HVAC applications, both residential and commercial. In these markets, we have relationships with the OEM manufactures that have been decades in the making. Tutco is part of their teams, and they turn to Tutco as their heating solutions providers. On the commercial side we offer our own line of innovative duct heaters that have revolutionized this market offering solutions that were first to the market and defining the market, from a UL Listed Outdoor Duct Heater to the “flippable” designs that can be installed in more than one orientation.

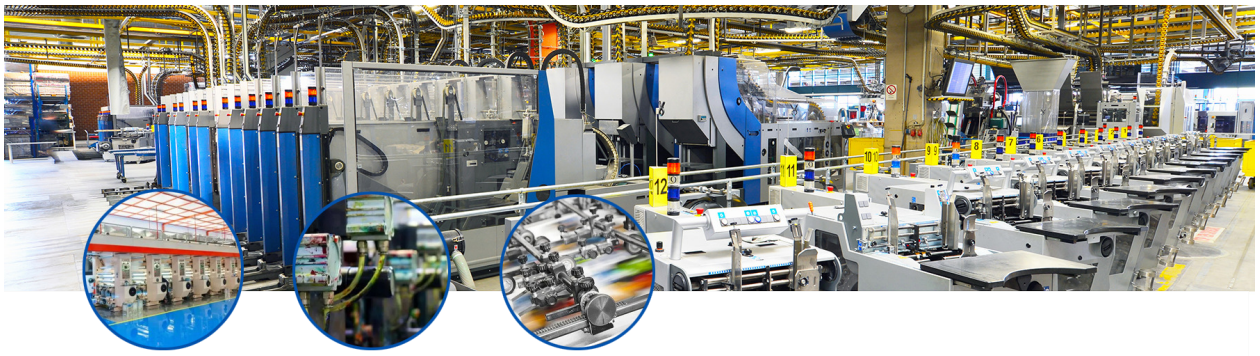
We also offer a line of conductive heaters that include cartridge heaters, and a wide variety of band and strip heaters. These heaters are available in many different configurations with standard options and accessories. The conductive group will also work with you for custom solutions that are outside the normal scope of conductive heaters. Also, the conductive group offers heaters that sometimes use convective heat such as finned strip heaters in the Ceramic and Ultima Strip heater lines. The HT Mica Strip Heaters can be used for applications such as space heating and control panel temperature control.

Both the Farnam and Sureheat divisions specialize in open coil heating of forced air for many different applications including packaging, food service, drying and now many different green initiatives. Both companies have different strengths so they can generally offer a solution to any open coil forced air solution including many standard products as well as custom solutions for these applications. Many of these products can be used in high pressure situations. We now also supplying flexible heater options and build custom industrial control panels which are not limited to electric heater control, they can be for any industrial application.

Add in the newest addition to the Tutco family, Wattco, and we can offer many different tubular element heater products including immersion, circulation and duct heaters. They offer basic products and controls for this market but also offer explosion proof heaters, heaters for hazardous classification environments and complete heating solutions that are more than just the heaters.

With manufacturing locations in the USA, Canada, Mexico & Asia, we can give solutions to every size from one of our locations. A now retired employee once said we can supply you with a heater smaller than a piece of bread and larger than a bread truck. We can supply you with one special design or mass produce thousands of heaters if need be. We would love to opportunity to be your heating solutions partner.

More Thinking Outside the Box



FEATURE INDUSTRY

Printing Industry Solutions

TUTCO delivers precision and performance across the printing industry

In today's competitive printing landscape, where production speed, print quality, and operational efficiency are critical, TUTCO Farnam and TUTCO SureHeat provide high-performance electric heating solutions for a variety of printing processes. Whether it's Flexographic, Gravure, digital, offset, or specialty printing, TUTCO's air and surface heaters play a key role in drying, curing, thermal air handling and dehumidification applications.

From interstation ink drying to final tunnel dryers, TUTCO heaters are engineered to meet the demands of high-speed presses. Heating solutions like our Flow Torch™, Max, and Jet offer fast heat-up times, stable temperature control, and robust durability—delivering consistent results across a wide range of substrates and ink types.

TUTCO heaters are known for their precision and adaptability. With a range of configuration options, we offer both standard and custom-built solutions designed to integrate seamlessly into new machinery or retrofit into existing setups. Whether the application is drying solvent or water-based inks, curing coatings, or maintaining required temperatures, TUTCO solutions help maintain optimal production conditions.

Our heaters are equipped with advanced features like built-in Type K thermocouples for precise temperature measurement, compatibility with TUTCO SureHeat Control Panels for voltage regulation, and overshoot protection to safeguard materials and equipment. Operating temperatures can be dialed in between 40°C (104°F) and 180°C (356°F), offering flexibility for everything from delicate films to heavy-duty packaging materials.

More Industries and Applications

FEATURE VIDEO

TUTCO's Global Footprint

With six design and manufacturing facilities spread across four countries, TUTCO brings a truly global presence to every project. This international footprint gives us—and our customers—a distinct competitive edge. Depending on a customer's specific requirements, we may design a solution in one location and manufacture it in another, optimizing for speed, cost, and logistics. Our global teams are in constant communication, working collaboratively to ensure seamless integration across time zones and borders. This high level of coordination allows us to accelerate development timelines, maintain consistency, and deliver custom heating solutions that meet exact specifications—anywhere in the world. The ability to manage and execute complex projects across continents allows TUTCO to offer exceptional value and reliability. For OEMs, that means shorter lead times, better scalability, and the confidence of working with a partner that understands the global manufacturing landscape.

Watch More Videos

COMMUNITY

Smiths Day 2025

At TUTCO, Smiths Day is more than just a celebration—it's a meaningful reminder of the values that connect us across all Smiths companies. Held annually, Smiths Day is dedicated to recognizing our incredible employees and their unwavering commitment to the core principles that define Smiths. This year's celebration brought teams together to honor the hard work and dedication that power our success. From community service and fundraising to local volunteering, our employees consistently go above and beyond—not just on Smiths Day, but throughout the entire year. Whether it's supporting food pantries, raising money to support those touched by cancer, or organizing local events, our teams are making a real difference in the communities we serve. Smiths Day is a time to reflect on these efforts and express our gratitude for the people who bring our values to life every day.

Rebuilding Our Community

The team at TUTCO Farnam spent #SmithsDay out in the community helping some of our local residence rebuild and recover from the effects of Hurricane Helene which devastated our area back in September.

Serving Those in Need

Throughout the year, our departments work tirelessly to give back to our communities. The work we did for local food pantries on June 11th will provide meals for 1050 families in need.

TUTCO's Relay for Life

TUTCO's Relay for Life efforts raised $15,000 over the past few months, leading to an event on June 13th. The evening featured games, dinner, bingo, and more—and included a tribute to honor cancer survivors and remember those we've lost.

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