TUTCONNECT

INSIDE THIS ISSUE

The Importance of Thermocouples and Flow Switches

When it comes to heater performance and safety, two unsung heroes play a critical role—thermocouples and flow switches. These essential components work together to ensure precise temperature control and prevent potentially costly or dangerous failures. Understanding the function of thermocouples and flow switches is key to maintaining efficiency and safety when using process heat as part of your application. Thermocouples are vital for monitoring and controlling temperature in heating systems. TUTCO Farnam equips its process heaters—including the Heat Torch™, Cool Touch™, Flow Torch™, and Pressure Torch™ with type “K” thermocouples as standard. However, depending on your needs, type “J” or RTD thermocouples are also available on specific models.

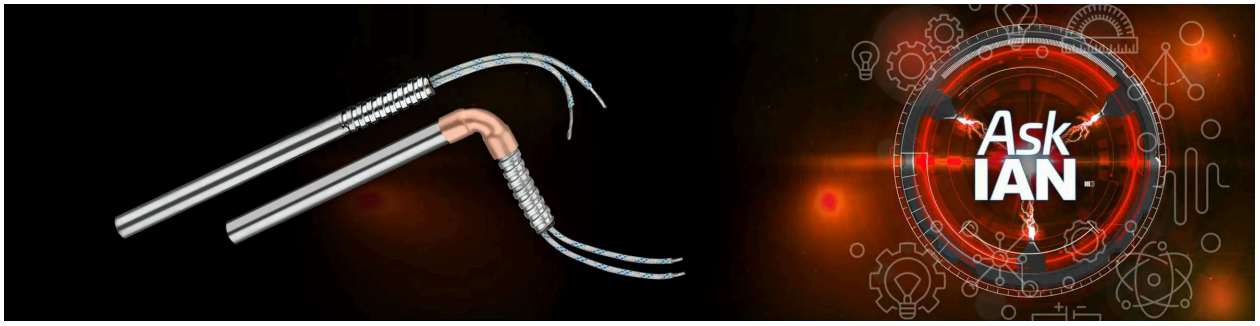
Without thermocouples, a heater temperature would be regulated solely by airflow, which can lead to dangerously high temperatures beyond the heater’s capabilities. To prevent this, thermocouples ensure accurate temperature measurement and control, keeping the heater within safe operating limits.

TUTCO Farnam’s heaters are designed with two thermocouples positioned at the exhaust. One measures process temperature, while the other serves as a high-limit safeguard to prevent overheating. The placement of these sensors at the same depth is crucial—any variation can result in inaccurate readings and impact system performance. If replacement is needed, it’s essential to install the new thermocouples at the same depth for consistent readings. For users who require temperature monitoring downstream, additional calibration and testing may be necessary on your part.

While thermocouples protect against overheating, flow and pressure switches serve as another safeguard for heaters. TUTCO Farnam recommends using flow switches over pressure switches because airflow—not just pressure—is the primary concern when it comes to heater safety. Even if there is pressure in the system, it does not necessarily mean there is sufficient airflow to dissipate heat effectively. Flow switches are designed to detect low or no-flow conditions, automatically cutting power to the heater to prevent overheating and potential failure. This small yet crucial component is a cost-effective solution that can save businesses from expensive repairs or replacements.

Thermocouples and flow switches are more than just add-ons; they are critical to the safe and efficient operation of any heating system. By ensuring precise temperature control and adequate airflow, these components help extend the life of heaters and prevent costly downtime. Whether you're installing a new system or upgrading an existing one, investing in high-quality thermocouples and flow switches is a small price to pay to protect your system.

Configure Your Heater



Heater Life in Two Extremes

by Ian Renwick

At TUTCO, we manufacture a large variety of electric heaters for a wide range of applications. These heaters get treated very gently in some applications or utterly abused in others. Following are the extremes of what our heaters have been through, and how we've been able to keep customers happy with what we've provided.

Several years ago, I recall receiving a single failed cartridge heater from a customer that used it in a wax stamping machine. We didn't learn much more about the application than that. Upon examining the heater we knew the operating temperature must have been pretty low because there wasn't too much discoloration on the sheath. Upon checking the date code marked on the heater and the build history for the part number, we were able to determine that the heater was 30 years old. Yes, we had built the heater once, 30 years ago. After some further inquiries we discovered that the heater hadn't been installed recently, but had been in use the entire time. People that worked at the business for over 25 years had never seen the heater being replaced. Well, it finally failed, and the customer returned it wanting a full 8D analysis of the failure and a corrective action to prevent future occurrences. When we told them the heater was 30 years old they apologized, retracted their request and ordered another one.

At the other end of application extremes was a band heater customer that used our heaters at the end of an extrusion machine in a filthy environment, and at a temperature higher than we recommended. Failed heaters were initially returned to us and they were caked with burned plastic and black oily soot. The customer knew their application was bad. It was so bad they got an average of about 3 weeks of life out of our heaters. They couldn't be happier because several competitor's heaters had only lasted a few hours or a day at the most. It got to a point that we told the customer to just dispose of the failed heaters on-site as there wasn't anything we could do to improve things if their application and operating temperature weren't going to change. They ordered the heater from us on a regular basis for about three years. They went through many heaters. I'm still amazed by that. Three weeks of life, and they were happy.

These contrasting extremes illustrate the remarkable durability and adaptability of our heaters. Whether lasting for decades or performing under harsh conditions, our heaters consistently met the needs of our varied customers. This range of experiences underscores our commitment to quality and customer satisfaction in every application.

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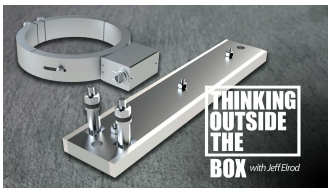
Permanent Heat!



The Permaheat Series of band and strip heaters that are produced by TUTCO Conductive in Cookeville, TN, USA, offer a great, robust option for long-lasting, low-temperature conductive heating needs (up to 600°F). These heaters have tubular heating elements formed and pressed into a machined aluminum extrusion, which allows for excellent heat transfer without the worry of most contaminants damaging the heater. They are available up to a watt density of 40 Watts/In² of heating surface. These heaters can also be built by replacing the tubular heating elements with tubing to be used in hot oil heating and chiller cooling applications. These are widely used in blown film applications along with other plastic injection molding and process applications but can be adapted to many other process applications.

These heaters will have a 20 Ga stainless steel cover for the aluminum extrusion, giving the heater a rugged construction. The heaters are available with a variety of termination styles. We can do basic screw stud terminals with or without a stainless-steel terminal box, high-temp leads with lengths to match your system requirements with stainless steel braid, stainless steel armor, and fiberglass sleeving protection available. We can also offer a stainless-steel terminal box with a German plug installed into the terminal box. We can also offer a variety of other plugs; just let us know what plug you require, and we will evaluate and should be able to offer it to you.

The TUTCO Permaheat Band heaters are available from a 5" diameter to a 106" diameter in widths of 1-1/2", 2-1/2", 3" & 4", with the thickness being 1/2". They can be built in 2, 3, or 4 pieces depending on size and the heater design parameters. They can be built in a full band, partial band, or reverse band (heating the outside diameter, not the inside diameter). The clamping hardware is heavy-duty 1/4-20 SHCS w/ clamp bars, with spring bolt and Belleville washer clamping optional.

The TUTCO Permaheat Strip heaters are available 6" to 50" long standard in widths of 1-1/2", 2-1/2", 3" & 4", with a thickness of 1/2". Many different mounting hole configurations are available, but they need to be evaluated at the time of quote/order based on design.

If you need something off-standard in a Permaheat heater, please consult the factory, and we will be happy to evaluate and see if we can offer you something to meet your needs, as we are happy to do custom configurations. Please contact us, and we would love to help you with all your conductive heater needs, whether it be the Permaheat product line or another one of our other conductive products.

More Thinking Outside the Box

FEATURE PRODUCT

SureHeat Series Heaters

For industries requiring precise, high-temperature spot heating solutions, TUTCO SureHeat's Series Heaters deliver unmatched performance. Whether you need targeted heating for manufacturing, processing, or other specialized uses, the Series lineup is engineered to accommodate different heating requirements:

- **Series I** – A powerful yet compact heating solution, ideal for low-to-moderate temperature applications.
- **Series II** – Offers enhanced performance with improved heating capabilities for a broader range of industrial uses.
- **Series III** – Capable of reaching maximum temperatures of 1600ºF, making it perfect for high-intensity applications.

Series Heaters feature Serpentine™ heating elements housed in a clear quartz tube, available in either an open-end (Style A) or nozzle design (Style B). This design ensures rapid heat transfer and adaptability for different heating scenarios. Each heater comes with a durable, high-temperature silicone rubber adapter, along with male spade power connectors and a grounding bracket for secure installation.

Series Heaters are typically powered by open-loop (manual) controllers, offering a straightforward yet effective way to regulate temperature. By manually adjusting the voltage, operators can control the temperature with ease. Maintaining steady airflow is crucial to preventing element failure.

More on Series Heaters

FEATURE VIDEO

Farnam'sFlow Torch™ Family of Heaters

TUTCO Farnam's Flow Torch heaters are designed for high-efficiency heating of large airflows, making them ideal for a wide range of industrial applications. These heaters, which can be customized with numerous options to meet specific performance requirements can reach temperatures up to 900°F. In this month's feature video, we take a look at the evolution of the Flow Torch family, including the Flow Torch 200 and Flow Torch 400. The Flow Torch 200 efficiently handles airflows up to 115 SCFM at a maximum operating pressure of 120 PSIG, making it a powerful solution for high-pressure applications. Meanwhile, the Flow Torch 400 is designed to maximize flow rates with minimal pressure drop, ensuring optimal efficiency in systems where maintaining airflow is critical. These heaters are widely used in applications such as hot air curtains, air drying, baking, chemical processing, dehumidification, laminating, plastic processing, exhaust gas heating, hopper drying, and sterilization. With their high performance and adaptability, TUTCO Farnam's Flow Torch heaters continue to be the ideal choice for industries requiring precise, high-temperature air heating solutions.

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