TUTCO HEATING SOLUTIONS GROUP

TUTCONNECT
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TUTCO FARNAM | TUTCO SUREHEAT | TUTCO CONDUCTIVE


# Electrification and Decarbonization

## Electricity delivers value for pizza ovens.

Traditionally, pizza ovens relied on natural gas for intense heat. However, the volatility of gas supply and environmental concerns have led businesses to seek alternative solutions. TUTCO Farnam has met this challenge by leveraging its electric heating expertise for the food service industry. When a food service client sought an electric heating solution for their pizza ovens, TUTCO Farnam assessed their requirements and developed viable options. They introduced open-coil heaters, delivering rapid bursts of high-temperature air, and the innovative Flow Torch™ heaters, designed for optimal pizza oven performance.

One advantage of TUTCO Farnam's electric heating solutions is the superior control they offer. Unlike gas-fired ovens, their electric heaters provide precise and programmable heat, ensuring consistent quality and enhancing operational efficiency. These features reduce errors and improve overall productivity in food service establishments. Additionally, TUTCO Farnam's electric heating solutions provide safety benefits. By eliminating open flames and combustible gases, the risk of accidents and fires is significantly reduced, creating a secure working environment for employees and customers.

TUTCO Farnam's commitment to innovation and customer satisfaction is demonstrated through its comprehensive electric heating solutions for pizza ovens. By transitioning to electric alternatives, businesses can overcome gas disruptions, address health concerns, and embrace sustainable practices.

As the food service industry evolves, TUTCO Farnam empowers businesses to adapt and thrive. Their range of electric heating solutions, including open-coil heaters and Flow Torch™ heaters, revolutionizes pizza oven operation. With precise control, programmability, and enhanced safety features, TUTCO Farnam enables food service establishments to deliver exceptional pizzas while benefiting from electric heating technology.

***To learn more about energy transition, click here.***

# Thermal Expansion, Friend or Foe? by Ian Renwick


Thermal Expansion is the propensity of solid matter to increase its volume when heated. This change in volume occurs in all directions of an object in length, width, and height. The amount of change is proportional to the change in temperature, the initial dimensions of the object and by material itself. Thermal expansion can work with you or against you, depending on the how objects are arranged.

First, here are a few interesting examples of thermal expansion.
The truss of the Eiffel Tower is made of iron and stands 1063 ft tall. The temperature in Paris varies through the year from about 30 to 80°F or a 50°F temperature swing. On hot days, the tower is 6" taller than on cold days.

Railroad tracks are made of hot rolled medium carbon steel. Depending on their location in the world, track might see a large temperature swing over a year, possibly as much as 80°F. Between those temperatures a mile of track varies in length by as much as 30" or almost 2 1/2 feet between winter and summer. That expansion and contraction must be account for in track layout to avoid warping and bucking of the tracks which can lead to train derailment.

Let's get into it:
The amount of growth or an object is calculated by only having to know 3 things and multiplying them together. They are the starting dimension from where you want to measure your expansion (or contraction), the change in temperature (in °F in our examples), and the coefficient of thermal expansion (CTE) for the material (in imperial units). You can find CTEs online with a simple search, but here are a few common ones.

| Material | CTE |
|---|---|
| Iron | 5.8 - 6.5 µin/in·°F |
| Plain Steel | 6.0 - 6.9 µin/in·°F |
| Stainless Steel | 8.0 - 9.6 µin/in·°F |
| Incoloy 800 | 8.0 µin/in·°F |
| Brass | 10.0 - 10.6 µin/in·°F |
| Aluminum | 11.7 - 13.3 µin/in·°F |
| Pyrex Glass | 2.2 µin/in·°F |
| Polyethylene | 60 - 110 µin/in·°F (milk jug material) |

The prefix µ is the Greek letter mu, meaning micro or millionth. Glass and polyethylene are included in the list to show how varied different thermal expansion rates can be.

Here's how to perform some calculations.
Imagine you have a cylindrical cartridge heater measuring 24" long, and you want to know how much it will elongate if it goes from 72°F to 1000°F. The cartridge heater sheath is made of Incoloy 800. The CTE of Incoloy 800 is 8.0 µin/in·°F. That elongation factor is read as 8 millionths of an inch per inch in length per degree Fahrenheit. Knowing those three values and multiplying them together gives you: 24in x (1000°F-72°F) x 8.0 µin/in·°F.

READ THE WHOLE STORY

TUTCO Conductive

# Trucking application shifts to TUTCO custom solution

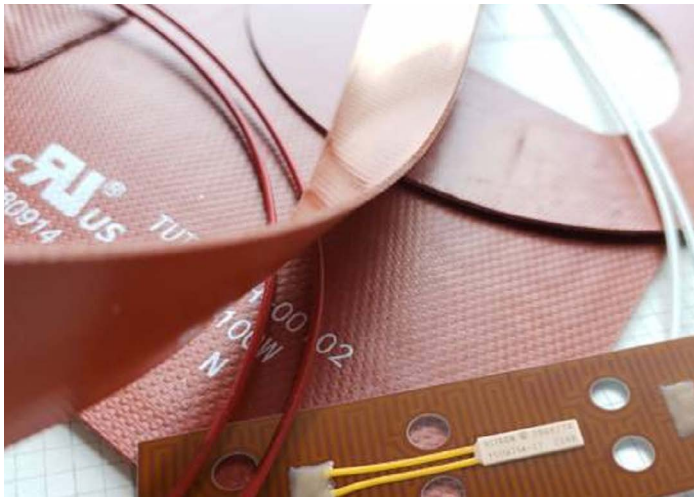

An existing customer needed a new solution for heat in a custom HVAC system used in an agriculture transport trailer that required the temperature to be controlled in a certain range. The heaters would operate in a custom under floor custom air duct and would need to able to withstand an FDA approved wash down in between loads. Traditional HVAC style heaters had been used in the past, but they had to be isolated from the area that needed the heat due to the washdowns which were causing some issues. The heaters also needed to be robust in order to withstand the vibration of the trailer as it traveled down the road.

TUTCO built a custom-designed Finned Ultima Strip Heater for this application with special terminations and mounting features. Our Ultima Strip Band heater is one of the most rugged products on the market. Its tubular heating element provide uniform heat at medium to high temperatures while resisting contamination, corrosion and vibration. It added heat where it needed to be, was able to work in the wash down environment, and was robust enough to withstand the vibration created by the trailer traveling down the road. The customer is now working on retrofit kits for existing trailers and offering it as an option on all new trailers.

MORE THINKING OUTSIDE THE BOX

TUTCO Farnam

# Silicone Rubber Heaters



TUTCO-Farnam offers highly customizable industrial silicone rubber heaters, which possess exceptional durability and excellent heat transfer properties. These heaters utilize etched foil heating elements designed to ensure uniform temperatures across their surface. Silicone rubber heaters are not only highly flexible but also resistant to a wide range of chemicals. They are commonly employed for various applications such as Process Heat, Condensation Control, Freeze Protection, and Composite Bonding/Curing. Due to their flexibility, silicone heaters are particularly suitable for heating irregular shapes and curved surfaces.

In many industrial settings, mechanical vibrations are a common occurrence. However, flexible heaters like silicone rubber heaters remain unaffected by indexing vibrations, mechanical shock, or repeated movement. Silicone material is highly durable and can be flexed repeatedly without stretching or tearing easily.

Etch-foiled silicone rubber heaters can be manufactured in a wide range of custom shapes and sizes. They can be as small as a 1" square or as large as 18"x24". For even larger applications, wire-bound construction allows the production of larger elements. When weight, durability, precise heat, and thermal control are crucial factors, silicone heaters stand out as a superior choice.

## Features

| | |
|---|---|
| Typical sizes: | < 1/2" sq. to 18" x 24" (457x 610mm) |
| Temperature range: | Up to 428°F (Up to 220°C) |

## FlexSpecs Online Configuration Tool

You can build a custom flexible heater with our Flex-Specs tool, view common silicone heater configurations, or call (828-684-3766) to talk about in-stock options.

**STEP 1: Heater Material -** Choose from Silicone, Polymide, or Mica

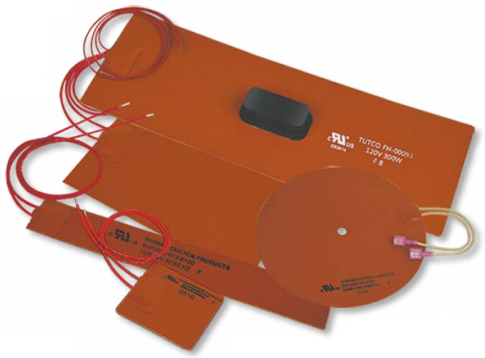
**STEP 2: Power -** Enter desired Voltage and Watts

**STEP 3: Shape and Size -** Any geometric or custom shape

**STEP 4: Sensors and Controls -** Thermostats and temperature sensors

**STEP: 5 Leads and Connectors -** Lead type, length and connectors

LEARN MORE



Feature Video

# TUTCO SureHeat's Hot Air Tools

TUTCO SureHeat's Hot Air Tools are precision electric air heaters that feature an integrated thermocouple for accurate control. These heaters deliver high temperatures up to 1400°F ( 760°C ), with a minimum airflow of 60 SCFH. The compact size makes this product perfect for single-phase OEM applications requiring accurate high temperatures. Its 304 stainless steel body construction is slotted for flared accessories and is available with a closed-Loop SCR power controller and digital temperature controller.

WATCH THE VIDEO

TUTCO HEATING SOLUTIONS GROUP

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