



Electrification and Decarbonization

TUTCO Electric Heaters Used in Dehumidification

In environments characterized by elevated humidity levels or industrial processes generating moisture as a by-product, numerous challenges can arise. Addressing the necessity to eliminate and dry out humidity and moisture from various media becomes crucial, and the conventional approach has historically involved utilizing direct-fired natural gas or steam to generate the required heat for dehumidifiers. However, with the global shift away from fossil fuels in various industries, there has been a notable surge in the adoption of electric heaters.

Our electric open-coil heaters are meticulously engineered to cater to the unique specifications of each customer. This customization ensures that our heating solutions not only align seamlessly with the specific requirements of diverse applications but are also optimized for efficient manufacturing processes. By tailoring our heaters to meet individual customer needs, we contribute to streamlined production, ultimately saving valuable time in reaching the market and minimizing costs.



TUTCO Farnam stands at the forefront of this transition, offering a diverse range of both custom and off-the-shelf open-coil heating solutions tailored to meet the demands of various dehumidification and restoration applications. These applications span a wide spectrum, encompassing job-site drying, pharmaceutical manufacturing, plastic processing, material drying, and more.

Whether it's the controlled drying of materials on job sites or the precise temperature regulation needed in pharmaceutical manufacturing, TUTCO Farnam's open-coil heating solutions are designed to excel. Our commitment to innovation, coupled with the environmentally friendly shift towards electric heating, positions us as a reliable partner for industries looking to enhance their dehumidification and restoration processes.

As technology advances and industries evolve, TUTCO Farnam remains dedicated to providing cutting-edge heating solutions that prioritize efficiency, sustainability, and customer satisfaction.

To learn more about energy transition, [click here.](#)

How to Calculate Wattage Requirements Quickly

by Ian Renwick



When you need to determine the wattage required to heat an application, you can delve into some nitty-gritty details when it comes to calculating that number. If you have a good temperature controller, you're safe to overestimate that number and still be okay, resulting in a system that reaches the desired temperature without the need for lengthy calculations.

Presented here are a few quick ways to determine the wattage requirement for different scenarios. You don't have to worry about heat loss via convection and radiation or concern yourself with other aspects of the calculation.

To heat something by a certain amount, you just need to know the type of metal you're heating, its mass, the change in temperature required, and how quickly you want to get it to temperature. Based on the type of material, you'll look up a coefficient for the material being heated that goes into a simple equation, and you're off!

Here's the table of coefficients for some common materials:

Material	Material Coefficient
Stainless Steel	0.050
Incoloy 800	0.050
Inconel 600	0.046
Aluminum	0.100
Brass	0.040
Copper	0.042
Iron	0.052
Titanium	0.053
Tungsten	0.013
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Water	0.420
Oil	0.180

The equation looks like this:

$$\text{Wattage} = \text{Material Coefficient} \times \text{Lbs of Material} \times (\text{Desired Temp} - \text{Starting Temp [in } ^\circ\text{F]}) / \text{Hours to Get to Temperature}$$

The equation above, using the numbers from the table, calculates the wattage requirement for heating the mass to temperature and then adds about 40% on top of that. The additional wattage is enough to account for the heat losses to the environment that would occur. The Material Coefficient number is just a modified Specific Heat of the material to give the wattage calculation that extra boost.

Here are a few examples:

1) Let's say you have a sealing platen weighing 24 lbs that you need to get to 300°F from room temperature (72°F) in 30 minutes. It's made of stainless steel.

The solution to the equation above is: $\text{Wattage} = .05 \times 24 \times (300-72) / 0.5 = 547.2$ watts. Call it 550 or 600 watts to play it really safe. That's how many watts you need (presumably in electric heaters) to heat your platen from room temperature to 300°F in about half an hour. You can drill a few holes parallel to the face of the platen and insert cartridge heaters that will produce 600 watts.

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How to Calculate Wattage Requirements Quickly (continued)

2) You have a large outdoor circular aluminum trough weighing 50 lbs filled with 80 lbs of water that you need to get to 70°F from a cold condition of 40°F, in an hour.

This solution requires using the equation twice; one for the aluminum trough and one for the water. For the trough itself the equation is $0.100 \times 50 \times (70-40) / 1 = 150$ watts. For the water the equation is $0.420 \times 80 \times (70-40) / 1 = 1008$ watts. Add those two together and you get 1158 watts in total. Round that up to 1200 watts and you should be good to go. The heat can be applied either by wrapping the trough with a large band heater or by heating the base with inserted cartridge heaters. Either way, get 1200 watts into the system and you should be able to get it to temperature in about an hour.

That takes care of heating solids and liquids with an easy estimation that will get you working well enough. When heating air, a couple of other equations are used, depending on whether the air is compressed or not. That's a story for another Ask Ian. If you have a complex application that needs more attention to determine the wattage requirements, please contact TUTCO and we'll be glad to help.

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Feature Application

Welding of Non-Woven Material



In the realm of non-fabric and industrial welding applications, precision is paramount, and TUTCO SureHeat process air heaters emerge as indispensable players. These heaters are instrumental in facilitating the welding process with a keen focus on heat, speed, and pressure, offering a critical role in achieving seamless welds across a diverse spectrum of materials. This includes Vinyl (PVC) Laminated Fabrics, Polyurethane, Digital Textiles, and more.

The methodology employed for the seamless welding of thermo-plastic industrial fabrics is straightforward yet sophisticated. TUTCO SureHeat process air heaters efficiently compress and channel air across electrical heat elements, maintaining meticulous control over temperatures ranging from 700°F to 1,350°F. This precise orchestration ensures the fusion of fabric pieces with utmost accuracy, resulting in solid bonds that guarantee the final product's resilience against breaks and leaks.

The application scope of fabric welding extends far beyond a singular industry. TUTCO SureHeat's process air heaters cater to various sectors, including the manufacturing of tensile structures, pool liners, high-speed rolling doors, oil booms, billboards, and more. The versatility of these heaters positions them as key players in diverse industrial settings where high-temperature, controllable heat is paramount.

TUTCO SureHeat boasts a comprehensive lineup of process air heaters, featuring models such as the Jet, Max, and Max HT. Tailored specifically for industrial OEM equipment, these heaters are designed to meet the unique demands of hot air welding applications.



They provide the necessary high temperature and controllable heat required to ensure precise and efficient fabric welding processes.

In essence, TUTCO SureHeat process air heaters stand at the forefront of non-fabric and industrial welding applications, offering a reliable and versatile solution for achieving seamless welds across an array of materials in diverse industrial settings.

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Automotive Application Cleans Up with TUTCO



A customer in the automotive industry sought a heating solution for their machined components manufacturing process, which involved immersing parts in four distinct tanks containing varied solutions: an etching acid solution, a neutralizing base, a chemical wash, and a mild detergent rinse. The challenge lay in finding a heater that could safely and effectively operate in all four vats with their respective solutions.

In response to the customer's specific requirements, TUTCO engineered a highly customized tubular element assembly capable

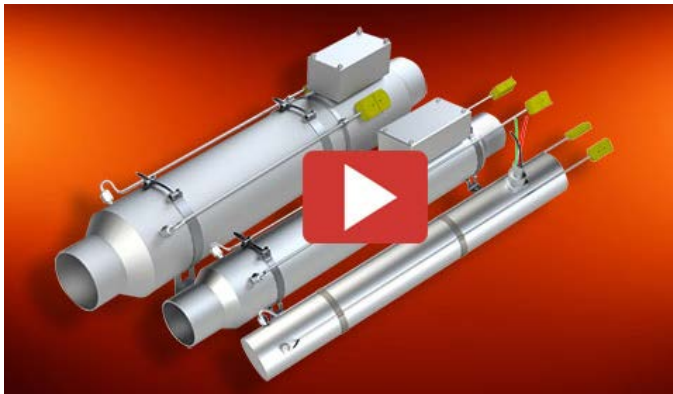
of withstanding exposure to the diverse chemical solutions present in the manufacturing process. The design of this tubular element assembly was meticulously crafted to be exceptionally robust, ensuring resilience against chemicals, high moisture levels, and the rigorous treatment inherent in a high-paced manufacturing environment. This durability not only guaranteed the longevity of the heater but also minimized downtime, contributing to enhanced efficiency in the manufacturing process.

Through a series of iterative upgrades and improvements, the performance and lifespan of the heater were continually optimized, providing the customer with a heating solution that was both reliable and efficient. The custom tubular element assembly emerged as a crucial component in the customer's production process, addressing the specific challenges posed by the diverse chemical solutions involved and contributing to the overall success of their manufacturing operations.

[MORE THINKING OUTSIDE THE BOX](#)

Feature Video

TUTCO Farnam's Heat Torch™ Heaters



TUTCO Farnam Heat Torch™ inline air heaters are ideal for rapidly heating compressed air or any non-combustible gas. The industrial strength open coil heating elements provide efficient heat transfer through direct contact with high-pressure airflows with rapid heater response time. Heat Torch heaters deliver precise output temperature control when these paired with off the shelf sensors and controllers. Robust design, high-quality materials, and workmanship provide long life and performance margin. Available in multiple sizes, including some that have the option of ceramic or mica cores, the Heat Torch can be ordered with pressure testing as an add on service.

[WATCH THE VIDEO](#)



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