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Bringing on the Heat



The OEMs who manufacture these ovens and heaters use infrared heating elements, which are more energy efficient, cheaper to operate,

provide controllable heat, and are significantly more environmentally friendly.

Infrared heating elements are available in standard, off-the-shelf designs such as flat panel models, but there is a host of custom infrared elements that have been developed by OEM suppliers to meet the unique requirements of specific applications.

Whether custom or off-the-shelf, properly sized, infrared heating elements can have dramatic, positive effects on the performance and even cost of the heating apparatus as well as its application. So, it benefits the OEM to collaborate with its supplier before settling on element design parameters and specifications.

Standard or custom?

Oven/heater applications can vary widely among market segments, even within the same industry. For example, within the printing industry, different heaters or elements are used by screen printing, paper, and 3D printing industries.

"There may be some standard specifications within the OEM models available for some specific applications, but in many cases the OEMs don't have the in-house technical resources to determine exactly whether an off-the-shelf element is suitable or if a custom design is

required," says Jesse Stricker, founder of INTEK Corporation (Union, MO). "Or they may not have the experience to consider all of the intricacies of heat transfer, reflection and controls."

INTEK is a manufacturer of heaters and elements for industrial ovens and dryers used in continuous process heating for production automation and material handling in a wide range of industries.

Stricker, who has been involved with the industrial heating field for over 40 years, says that in many cases it is quite practical to tailor infrared heating elements to provide the exacting performance necessary for the heater/oven to provide optimum productivity and minimum downtime in a given application. "To say the least, the specifications should be confirmed with the heating element supplier", he adds.

Determining specifications

Whether standard or custom element design is anticipated, certain design criteria should be established with the element supplier at the outset.

"OEM designers sometimes use different terminology, so the first question we usually ask is 'Do you need a filament, element or heater,'" says INTEK's Stricker.

Basically, a filament is the bare heating wire (usually nichrome) that

generally requires some sort of additional construction to provide a finished, usable element. An element generally consists of a filament wire encapsulated in a ceramic body or suspended by ceramic bushings and includes terminal wires necessary for connecting to supply power. Heaters generally consist of a heating element and insulation contained in a sheet metal housing suitable for installation using brackets or structural framework of some design.

Next, what is the desired size of the element which is determined by the actual heating surface needed for your application? What are the dimensions of the heater frame? Where will this be mounted or installed (allow necessary clearance for good fit)?

What are the electrical specifications: watts, volts, amps, ohms? Does it require single-phase or 3-phase operation?

The next thing to be considered is how the filament, element or heater is connected to supply power and what the location is of each element lead wire, as well as the method of attachment or termination required.

"The element supplier should be able to resolve all of these (above) requirements," says Stricker.

Confirming specifications

Whatever the element design specifications, they should be discussed

and confirmed with the supplier whenever possible.

"I believe it is important that a supplier is willing and able to provide support from design to completion, that you get a personal response, and get to talk with someone who has experience with the application in question," says Stricker. "I feel that the most effective way to provide support is through face-to-face meetings with the OEM's design group. That may be a little bit more time consuming, and may involve flying or driving some distance, but we feel it is important. Of course, in some instances Skype might be as effective as meeting the people in person."

Stricker says INTEK also provides its OEM customers with an approval drawing for each new element design.

"The digital drawing illustrates our design discussions and how we understand the requirements of the application," he explains. "It is an important tool that helps us obtain customer approval before going into production."

Meaningful value-added

Value-added services can in some cases be vital to the success of a customer/supplier relationship. For example, they can include extra services or assurances that supplies will be available when required.

"Expect thoroughness from your supplier and good response time," Stricker advises. When his company completes a design they offer to stock the element so customers won't have delivery problems. This service is performed in several different stages: raw materials, work in progress, and finished goods are all kept on hand. This type of service enables OEM customers to meet their delivery requirements just in time when they are in short supply.

Stricker adds that it is important to OEMs that suppliers maintain strict confidentiality regarding product designs, applications and financial arrangements.

"These days virtually all products and processes have some proprietary aspects", he says. "That is why we share design concepts - not proprietary information. This is an important distinction that allows us to help our OEM customers achieve their goals in a unique manner, and yet protect their product and process information at the same time."

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