



Thermal News *Summer 2012*

closing the loop on thermal solutions

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The Value of Vertical Integration

Successful companies understand their value proposition and diligently focus on technology and business capabilities that make a difference for their customers. Vertical integration of design and manufacturing capabilities are a major reason that many customers select Durex Industries as a critical thermal solution supplier. In the world of thermal solutions, having a supplier with the ability to rapidly design and manufacture high quality custom solutions is critical to their success.

Durex Industries' customer interface starts with a collaborative engineer-to-engineer relationship. Jim Kreisel, Director of Strategic Business Development, stated, *"While some competitors try to buffer engineers from customers, Durex Industries believes the best results occur in an engineer-to-engineer environment. We know that the best designs are achieved when our customers' engineers are working closely with our engineers and understand our capabilities."*

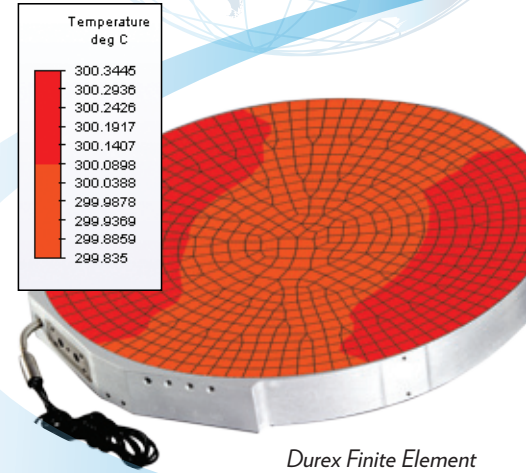
The Durex Industries' precision semiconductor pedestal heater department is an example of how vertical integration is critical for fulfilling our customers' requirements. In our Cary, Illinois facility, Durex Industries designs and fabricates complete pedestal heater solutions. The pedestal heater's heating element and other assembly components are manufactured, formed, cast into aluminum, precision-machined, tested, anodized, cleaned, and packaged in a class 1000 clean room. No other heater supplier has this level of capability within their own domain. As a result, Durex Industries' customers experience faster product design and manufacturing, reduced potential for error, and lower cost. ■

Cast-in Heater Solutions

When is cast-in aluminum or bronze heater the best solution for an application?

There are no clear cut rules for selecting the best heater, but there are critical considerations, including application process temperature, temperature uniformity, and complexity of the heated part. Before looking at the critical decisions, it helps to understand the hierarchy of metal-based industrial heaters.

Electric heaters in their most basic form are simply a length of resistive wire or foil that might be formed into a shape to produce the desired work. With the exception of a few open air heating applications, open coil heating elements are not a practical industrial heating solution, because of inherent robustness (short life), temperature uniformity, and manufacturing challenges.



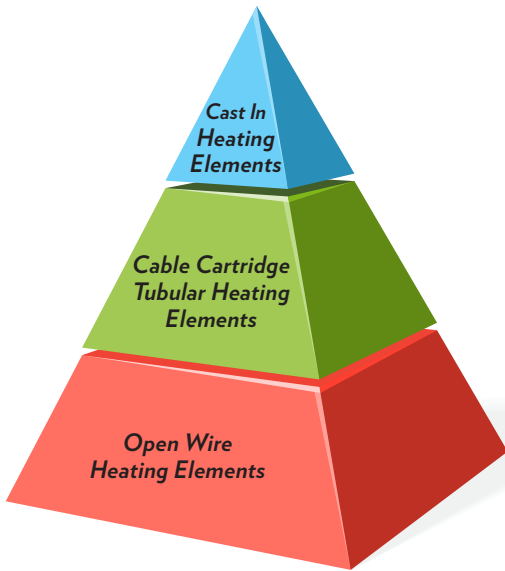
Durex Finite Element Thermal Mapping



CNC Machining at Durex Industries

To improve on performance, the bare heater element can be coiled and inserted into a metal tube with packed insulation, end caps, and various wire configurations. Better known as cable (coil), cartridge, or tubular heaters, these heaters are robust and used in a wide variety of industrial applications. Cartridge heaters are straight lengths, while tubular and cable heaters can be formed into an optimum pattern for an application. The heaters may be inserted into a metal block or used in air or liquid mediums.

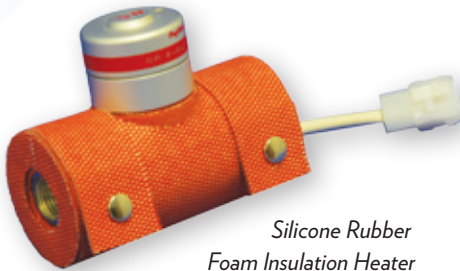
"Durex Industries' goal is to be the BEST overall thermal solution supplier in the industrial thermal industry."



Cast-in aluminum and bronze heaters are at the top of the metal heater hierarchy, because they are truly a heated part rather than a component that is simply inserted or clamped into an assembly. Cast-in heaters are used when an application calls for a robust heated part and excellent temperature uniformity. Intimate thermal contact is achieved, because the heating elements are cast into the metal, creating a homogenous part that has a longer life than assemblies using mechanical fit construction.

For applications requiring cooling, cooling tubes can also be cast into the parts. Superior temperature uniformity is achieved through precise and repeatable heater layout. Post casting operations include precision machining, lapping, and coating of the heated part. Durex Industries delivers a superior cast-in heater solution because most design and manufacturing process steps are under our control. ■

Foam Insulation Flexible Heater Solution



*Silicone Rubber
Foam Insulation Heater*

At SEMICON West, July 10-12, 2012, Durex Industries is introducing their new Foam Insulation Flexible Heater Solution.

This patent pending molded silicone foam insulation system was developed to advance the state-of-art in high

temperature applications. Silicone rubber insulated heaters can be formed to uniformly fit around 3-dimensional parts. The high R-value silicone foam is used to substantially reduce the surface (touch) temperature over extruded silicone rubber insulation materials.

Common applications include heating stainless steel semiconductor gas delivery and vacuum exhaust lines, gas canisters, precursors, valves and other components. ■

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**SEMICON West
2012**

July 10-12, 2012

Booth #1419

**Moscone Center
San Francisco,
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Check out our growing list of standard and custom thermal solutions online at www.durexindustries.com or talk with our Durex Application Engineers at 847-639-5600.

Contact Durex Industries for all your heater, sensor and control requirements.



For more information, visit our website!
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