



Instrumentation and Control

[Technology Focus part 2](#)

Turning Up the Heat

In automotive plants, it's sometimes necessary to make spot repairs on parts that are scratched during assembly. Yet curing the repainted parts by putting the whole assembly through a convection oven risks contamination of the finish by dirt as well as degradation of plastic and rubber components.

Brokaw Controls of Dexter, Mich., designs repair ovens and portable heaters for this application. According to the company, infrared heaters that make it possible to repair localized flaws without having to work on the entire assembly.

"You are able to cure paint or adhesives in a small area instead of refinishing the body as a whole," explained Terry Krueger, vice president of engineering.

Infrared energy emitted by the heaters is absorbed differently by various components in the assembly, depending on factors such as the type of materials, color, or thickness. Krueger specified IRt/c.10 non-contact infrared thermocouples, supplied by Exergen Corp. of Watertown, Mass., to control the heaters.

Repair ovens covered with infrared emitters target a particular area of the vehicle.

The sensors make it possible to modulate the temperature of the emitter, depending on the contour of the part, color of the surface, or emissivity of the material, said Krueger.

Krueger said the thermocouple's two-wire design eased installation and maintenance. Brokaw uses as many as 30 sensors per oven.

Previously, the company had used sensors with five, six, or seven wires of 22- to 28-gauge thickness, housed in a cable, and requiring solder connections. Installation was labor-intensive, and troubleshooting and maintenance were difficult to perform, he said.

The two-wire connections of the new sensors are attached with terminal screws, eliminating the solder joints.

Krueger also found that the two-wire sensors give a more stable signal than multiwire sensors, which tend to fluctuate, requiring the values to be averaged out at the end of the signal. Krueger found the shielded two-wire sensor to be stable in a 480-volt environment.

The IRt/c.10 sensors have a built-in air purge, eliminating the need for extra parts or collars, he added.