

## Infrared Heat Improves Seating & Trim Appearance



A tier-one supplier of seating and interior components to the automotive industry contacted us for a solution to a manufacturing problem. They chose Fostoria because of our past experience with Ford and

GM...they knew we could do the job. Their seat covers and trim pieces showed excessive wrinkles and puckers, affecting the appearance and quality of the product. Seat materials varied from cloth (fabric), multiple grades of vinyl, a combination of both, or all leather.

They had previously used steam on cloth applications, but unwanted moisture remained when the seats were bagged for shipment to the assembly plant. Steam is not very effective on vinyl and can not be used on leather. The solution was dry, electric infrared heat.

Dry heat could be applied in two ways, hot air or electric infrared. Hot air was ruled out because it lacked the efficiency and control needed to process many varied parts. Electric infrared was chosen because of its "instant-on" capability and the ability to focus heat for precise time periods on exact seat locations.

We therefore designed a contoured, multiple control zone, electric infrared oven. The design used both vertical and horizontal burning tungsten quartz lamps (short wavelength, T-3 lamps) with alternating angular beam reflectors. The flexibility of an infrared system allowed our engineers to design multiplecontrol zones and contour the oven to the profile of the seats - maintaining consistent temperatures.

Heat zones are controlled by manually adjustable SCR power controllers that vary the intensity of the short wavelength infrared emitters from 0 to 100%. The drying temperatures required on the trim, as well as the time cycle (residence time in oven) varies according to the seat design and trim material. Temperatures range from 180° to 250°F and time cycles from 45 to 90 seconds.

Vertical lamps are used in angular beam reflectors to direct heat to the leading and trailing ends of the seats as they move through the oven. The instant responding T-3 lamps are automatically deenergized if the conveyor is stopped, preventing overheat damage to the seats. Radiometers can also be used to monitor the temperatures of seats

exiting the oven, and will indicate an over or under temperature problem.

## **Nap Relief and Reviving Fabric Memory**

Electric infrared technology was also used to solve problems with a new fabricating process being implemented on high-end, fancier seat models. This process used a steam heated press (contoured to the shape of the seat) to bond the trim material directly to the shape of the foam. But, this caused the nap of the fabric to be crushed or flattened. Our engineers first used infrared heat to remove the remaining moisture from the seat, and secondly, included counter weighted brushes to finesse the fabric back to its original state. We specified standard T-3 infrared lamps and reflectors to focus heat only where needed, in precisely controlled zones to vary oven temperatures for different seats. Cycle times were about 60 seconds but varied with the moisture level in the seat. Care was taken so the heat level in the oven would not reactivate the bonding material used to attach the trim to the foam.

These Fostoria ovens are now successfully used in many locations throughout the United States, North America and Europe.