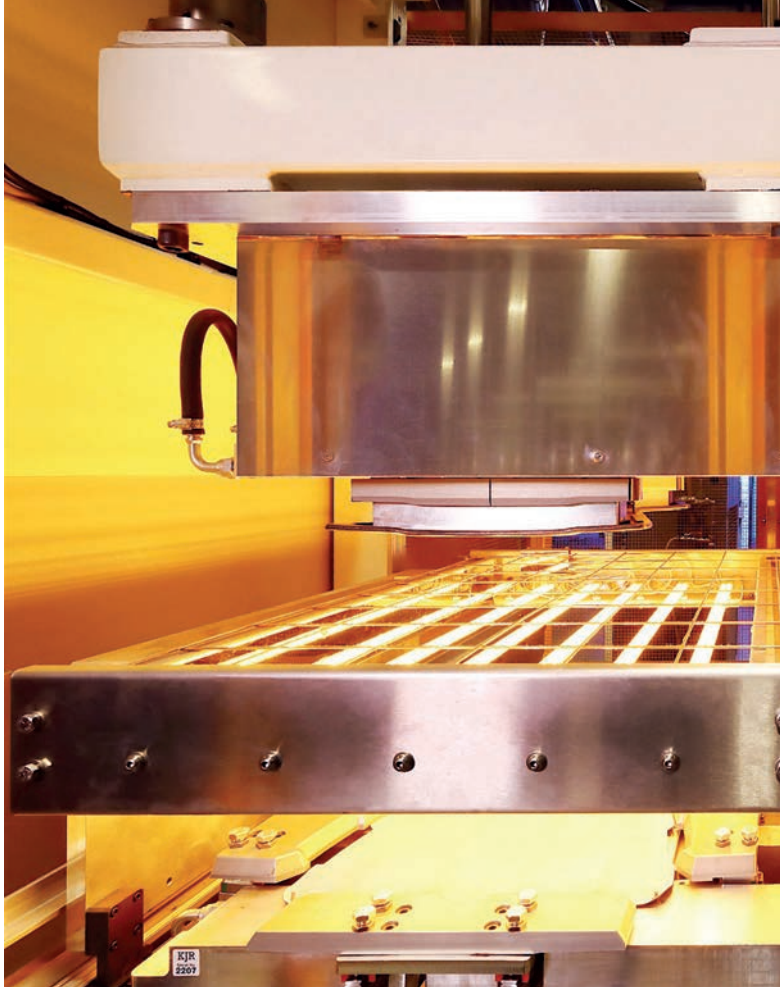
INTELLIGENT INFRARED SYSTEMS SAVE ENERGY



Plastics can be formed, joined or deburred by the application of heat. This proves most successful when the heat is effective only where it is required. This is good for the environment and saves energy. A few examples shown here demonstrate successful conversions from conventional systems to infrared technology.

Dr. Marie-Luise Bopp, *Senior Marketing Manager, Excelitas*

KJ Ryan, a company in the UK, specialises in automotive interior trim for both the bespoke market and Tier 1 automotive customers. Its capabilities range from individual components to complete car interiors. To produce cladding for a seat backrest, KJ Ryan called on the proven expertise of P&D Engineering, a company with many years' experiences, working with many companies in the automotive supply chain, who designed and built a special purpose wrapping press.

In the production of the seat backrests, both the customised, cover material, which is coated with an adhesive, and the substrate are loaded into the press. A heater assembly is then shuttled into the machine and heats both the components and the adhesive coating is activated. The heating module is then withdrawn, and the backrest is pressed onto the cover material, which has been made pliable by the heat. The cover material is then laminated onto the backrest and the finished product is then removed from the press.

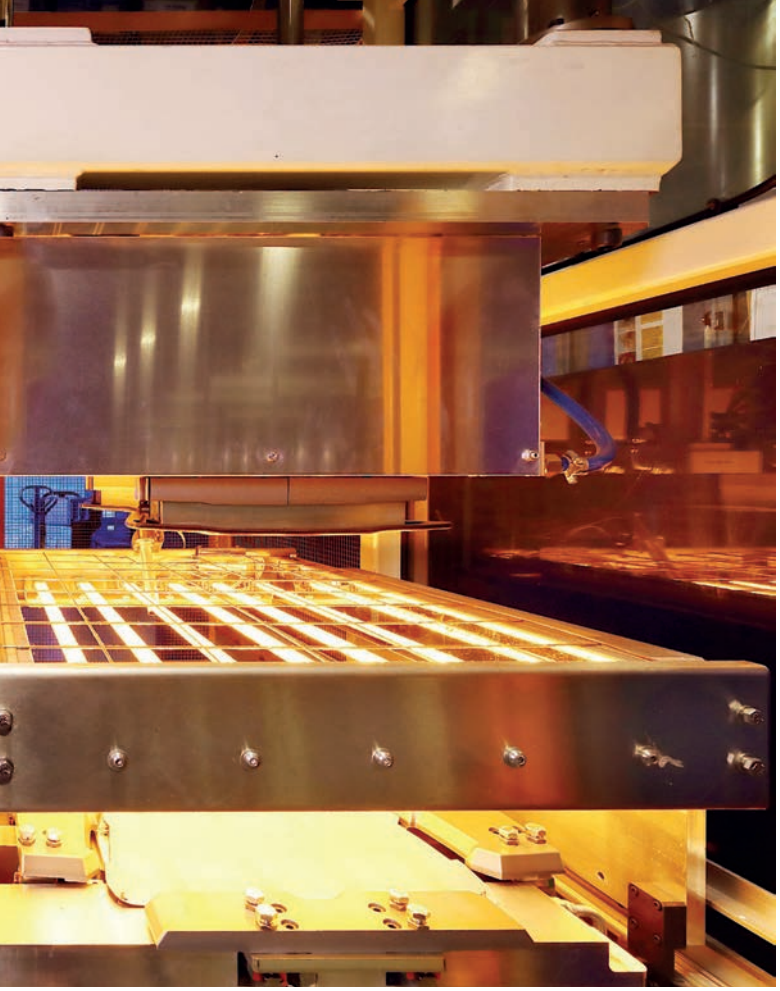
In previous machines, the heater assembly used ceramic heaters. However, these were energy intensive and needed to be replaced at regular intervals. Consequently, for this new press, P&D Engineering replaced the ceramic heaters with twelve fast response medium wave infrared emitters from Excelitas. These have reduced energy consumption by 73% and their fast response allows quicker ramp-up times, which has meant that cycle times for the operation are now much faster. In addition, overall costs have also been reduced, as the new infrared system has a much longer working life, which also means less maintenance.

"We are very pleased with the performance of the new presses," comments James Billingham, Project Engineer at KJ Ryan, "In fact, we have now asked P&D to provide two more presses equipped with the infrared heating system."

Shortwave infrared emitters for small spaces in industrial processes are easily aligned with the edges of three-dimensional products – transferring relatively large amounts of energy quickly to narrow surfaces

DE-BURRING WITH INFRARED EMITTERS

The cycle time for de-burring plastic interior car parts is around 40 seconds, including parts-handling. This is made more difficult when varnished cladding components, decorative panels or glove compartments for left- and right-hand drive vehicles need to be finished in the same machinery. The company Hahn of Sontra tried various methods to remove these burrs: mechanical, by grinding off or milling and thermal, using a hot air oven or a Bunsen burner. All of these methods were carried out manually and the end results could be very different in quality, depending on the skill of the operative. Consequently, Hahn worked with Excelitas to create an infrared system, using small, short-wave Noblelight emitters. These work very well on the edges of three-dimensional products; they are very controllable and transfer a



lot of energy in a short time to limited surfaces. The de-burring of products is now automated and takes place within 5 seconds. To demonstrate this was the best decision, Hahn calculated the total energy demand per de-burring cycle, first with a hot air oven and then with infrared emitters. This showed that hot air demanded 42.5 Wh per cycle, compared with 8.7 Wh for infrared emitters.

Hahn have analysed the complete process intensively and Rainer Stueck, their managing director, is totally convinced of the energy efficiency and says, "Following on from our calculations, we have established that the infrared system has paid for itself within six months."

TARGETED HEAT SUPPLY FOR INCREASED THROUGHPUT

The dashboard of a car is made from plastic. This is produced in a mould with heat and then covered with a sound-proofing coating. By using Carbon infrared emitters, Faurecia in the UK has achieved significant savings in energy and time. Previously, the heating had been carried out by foil strip emitters and steam, and this was proving too slow to meet up-graded production speeds, so that the heating stage increasingly limited the total production process. By installing Carbon infrared emitters, heating could be significantly improved. Carbon infrared emitters transfer large amounts of energy very quickly, so much so, that Faurecia could dispense with the steam, which had previously been used for pre-heating. The PE-EVA (polyethylene ethylene vinyl acetate) components are now heated directly in the mould, so that heat-up rates have been improved by 16%. Cycle times have been reduced by 20 seconds and there are energy savings of 9kW/hour, because of the elimination of the pre-heating.

Images: *Excelitas*

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PUT AN END TO ENERGY WASTE WITH TECHNICAL LIGHT

Since the energy crisis, questions are increasingly being asked about the conversion from gas-fired ovens to infrared systems for industrial heating processes. Excelitas focuses on the extremely efficient transfer of energy by technical light, by UV- or infrared radiation. These act directly in the material to be heated and do not need a heat-transfer medium. Unfortunately, in today's busy commercial life, many companies do not have the time and the capacity to think about new technologies. It is often easier to continue with what is tried and tested. However, experience shows that an intelligently planned conversion can bring benefits in the long term. For example, optimally matched infrared emitters help to apply the heat in a targeted manner and not waste it to the surrounding environment. Modern infrared systems can be switched on and off in a matter of seconds and so can provide significant energy-efficiency, as there is no pre-heating or heating while on stand-by. Excelitas is in active communication with an energy consultant, who has conducted several cases for us. A conversion from a gas-driven system to an infrared system, operating with green energy, can bring quite enormous savings in CO2 emissions. This saves carbon tax and is eligible for funding. Consequently, infrared- and UV-systems contribute to sustainability in industrial manufacturing.

ROLAND ECKL,
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