Induction heating

Induction heating is widely used in the automotive industry. But as two case studies from EFD Induction show, a little creativity is all it takes to extract even more value from this amazing technology.

The first example involves EFD Induction France. The challenge was to integrate induction drying and curing into the anti-corrosion coating process for brake discs. Complicating matters was the fact that each drying and curing station had to deal with wildly different discs. How could such varying workpieces be individually treated, while only equipping each station with a single induction coil?

EFD Induction worked together with DACRAL, the protection coating specialist, and came up with a solution for drying and curing spray-applied Geomet® 360 brake disc protection. After leaving the machining line, the discs are loaded into the Geomet spray booth. Once sprayed, they are transferred to

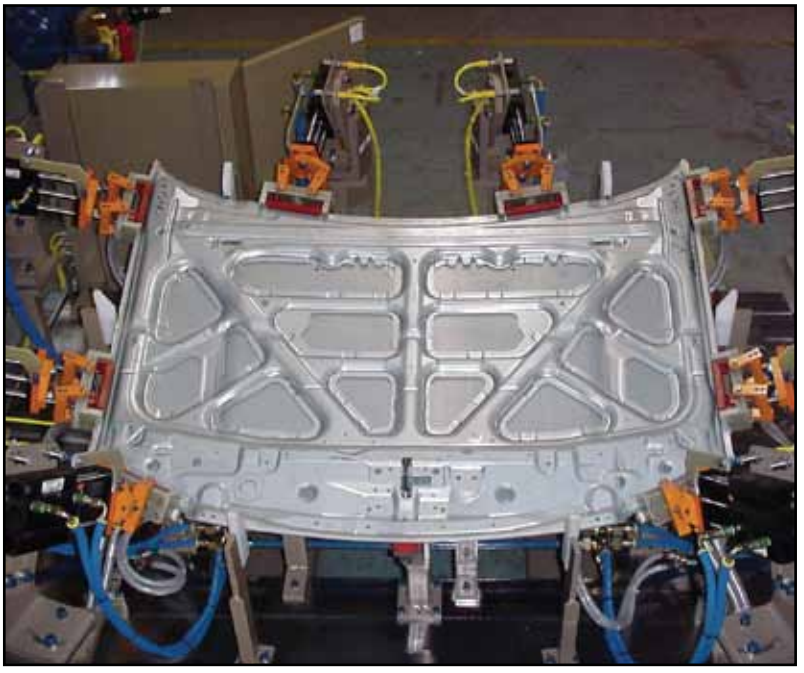
66the induction heating booth for drying and curing. Each drying station features EFD Induction Sinac converters (50kW each). The number of drying stations needed depends on the production rate, the coil's efficiency, and the discs' shape and weight. The actual drying process involves heating each disc to 80-100°C. With induction this takes only seven seconds per heating station for discs up to 7.5kg.

Induction curing is the next step in the process. The curing stations are equipped with EFD Induction Sinac converters (100kW each), and curing temperatures range from 100-340°C, with an allowable deviation of only ±15°C. As each drying and curing station must heat discs of different sizes with a single one-size-fits-all coil, a number of 'free stations' are installed to ensure optimum temperature homogenization for each disc.

The second example involves Jaguar, with which EFD Induction UK has enjoyed a long working relationship. In fact, after providing an award-winning bonding solution for the XJ saloon in the 1990s, EFD Induction's patented L-Coil and U-Coil bonding systems were chosen by Jaguar for several subsequent models.

A key reason for Jaguar choosing U-Coil was the system's elimination of drawbacks associated with spot-bonding. These drawbacks were due to temperature variations caused by panel condition changes and deformation during heating (particularly with aluminum). The launch of the U–Coil in 1999 removed these limitations by ensuring simultaneous heating of inner and outer panels. Also, the self-aligning coil 'head' maintains the coil/panel relationship, even in the event of panel differences or movement while heating. Costs are reduced because there is no longer any need for clamps to maintain panel shape/position. Tooling costs are also lowered. Savings in the form of less downtime and reworking far outweigh the initial capital investment.

The Jaguar X400 (X Type) body shop in Halewood, UK, has U-Coil spot-bonding systems for curing closure panels. The systems have delivered a reliable, high-strength, zero distortion process since commissioning and setup of pre-production panels in 2000. But it was the move of Jaguar's Castle Bromwich facility toward aluminum body and closure construction that really highlighted the benefits of U-Coil. Aluminum hoods and truck lids are now heated on table type tools, and the aluminum doors of the X350 (XJ) are heated while on the cell output conveyors, leading to considerably lower tooling costs and floor space requirements.



Jaguar has bee n using EFD tec hnology for over a dec ade , especi ally for larger item s like alumi num hoods