SUCCESS STORY 101

Temperature Monitoring of prototype vehicles in a laboratory test oven to allow efficient OEM process set-up at product launch

Q **How can I guarantee that when a new car is launched to full production, there is minimal process set-up time, costs or risk of delays due to the oven not meeting the specific heating requirements of the car body design and construction?**

A

Situation and background

Durr systems Inc is a global player, providing complete paint cure solutions to the Automotive OEM market. With the drive to reduce body weight and improve fuel economy automotive OEM's are utilizing new materials of construction in modern body designs. These include heat hardened metal, polymer based structural inserts and thermally cured adhesives and sealants. Such materials need to be thermally treated along with the body paint in the conventional OEM paint cure ovens to guarantee product structural integrity and passenger safety. As part of any new car body launch the OEM production Oven needs to be characterized and validated. This process conventionally can take significant time, effort and create costly down time for the line being set-up.

The winning solution

- Durr utilize a full size configurable laboratory test oven to evlaute the neceesary heating requirements of a new car body style or use of new constructuion methods.
- Thermal Testing is performed at the Durr test facility utilizing multiple Oven Tracker XL2 16 Channel systems allowing the test body to be monitored at up to 100 unique measurement locations.
- Thermocouples of different designs can be utilized to meet the specific requirements of the measurement (location and material type). Magnetic Surface probes – Metal, Exposed junction probes – Taped to Plastic inserts or inserted into the structural adhesive core.
- Profile data collected can be analysed directly within the Datapaq Insight software to quantify cure criteria (Ramp Up Rates and Time @ Temperature). Alternatively the data can be exported into Durrs own oven simulation programs to allow prediction of the effect of altering metal thickness and line speeds on thermal profile characteristics..
- Car Prototype sections undergo physical testing to validate thermal profile data post processing.

Benefits

- Oven characterisation and optimisation can be performed on early protypes as part of new body style development project without any need for down time at the OEM plant.
- Durr can colaborate with car deseigners to recommend minor structural changes and avoid need for possible expensive oven redesign and capital investment / retooling at launch.
- Refitting and optimizing the oven as part of the launch can be done with cofindence, efficiency and minimal risk reducing the time required to start the full production schedule.

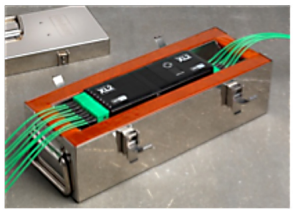
KEY FACTS

Customer's End Product
Car body shell requiring thermal processing of Heat Hardened Metal, Paint, Thermal Adhesives and Structural Polymer Inserts and Seals

Max Temperature Reached
Range 100 to 200 °C / 212 to 400 °F

Duration of Process
Typically 30 to 60 mins

PRODUCT AND BENEFITS



- Datalogger: Multiple 16 Channel XL2 systems located in single test body shell (100 measurement points)
- Exposed junction Type K thermocouple capable of monitoring internal areas of the body shell including areas where adhesives and expanding foams /polymer inserts are incoroprated
- Insight software providing fully certified and traceable validation reports and easy data export to other bespoke simulation programs for further predictive analysis.