

SUCCESS STORY 84

VULCANIZING AUTOMOTIVE RUBBER DOOR SEALS



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How did a rubber extrusion manufacturer guarantee the physical properties of the product, as it is taken through a vulcanization process?

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Situation and background

Natural rubber has some serious defects; it is weak, easily becomes sticky and is not very elastic. To improve the physical properties (strength and heat resistance) of the material, it is taken through a vulcanization process. The polymeric chains of rubber undergo a cross-linking reaction, initiated by the addition of sulfur to form a stable 3D network. To increase the rate of the chemical reaction, heat is applied. Typically, a target cure schedule for the rubber is 180-200°C (356-392°F) for 2 to 3 minutes. Measurement is very difficult, due to the oven size restrictions.

The winning solution

- A low height, narrow thermal barrier enabled Datapaq® to provide a customized “fit for purpose” solution.
- Using a customized Q18 system, the customer was able to guarantee the quality of the vulcanization process with the desired cure schedule achieved.
- Multiple channels were used to measure oven and product temperature uniformity at different depths in the rubber.

Savings made

- Process verification was achieved without costly downtime.
- Product reject rate was reduced by accurate core temperature measurement.
- Formation of toxic by-products, such as H₂S (g) was prevented by controlling product temperature.

KEY FACTS

Customer's End Product
Automotive rubber extrusion components

Max Temperature Reached
220°C/428°F

Duration of Process
Max 7 minutes

PRODUCT AND BENEFITS



Datapaq Oven Tracker®
DQ1862 datalogger
TB2020 thermal barrier
PA0063/1 thermocouples

- Product temperature uniformity can be measured easily and thus optimized.
- Production throughput can be maximized.