

# Using Impedance Sensing to Improve SMC-IMC Molding

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## **Abstract**

Impedance sensing technology provides a proven method for thermoset molders to monitor and control the cure process. Similar to dielectric cure monitoring, impedance technology uses the changing electrical properties of the thermoset as it cures to determine the appropriate time to end the cure. The technology uses low-voltage sensors mounted in the mold and computer software to analyze the resulting signal. The technology has been implemented in production SMC, BMC and phenolic applications.

Recently the technology was implemented on an SMC freight truck body panel with a conductive in-mold coating (IMC). The body panel was in production at a major supplier of automotive and trucking body panels. This was the first application in which the technology monitored the IMC portion of the cure as well as the SMC portion of the cure.

This presentation reviews the first implementation of impedance sensing technology in an IMC application. Results discussed in this article will show that impedance sensing technology:

- Reduced the overall cure time from 150 seconds to 118 seconds, representing a cure timesavings of 21.3%.
- Automatically detected the optimum time to inject IMC, ensuring the SMC was adequately cured before starting IMC injection.
- Automatically detected the optimum time to end the IMC cure, ensuring the IMC was properly cured while simultaneously reducing the IMC cure time from 45 to 33 second.