



For immediate release

FAILURE ANALYSIS OF POLYMERS IN AUTOMOTIVE COMPONENTS

[Midland, MI] -- A Michigan analytical lab is providing automotive component manufacturers with an effective resource for quickly identifying and correcting defects in plastic and composite parts, helping to minimize downtime and reduce the number of rejects, in-service failures and recalls. With the steadily increasing use of polymeric materials to replace metals for the weight savings and cost advantages -- often in critical applications -- the ability to quickly and reliably investigate modes of failure also contributes to improved product safety and reduced potential for liability.

“When plastics were only used for interior components and trim pieces, there were fewer physical demands placed on the parts and less of a need for failure analysis,” commented Research Specialist Kevin Battjes. “Today’s cars are a different story -- performance-related components such as fan blades, cooling and fuel systems, fluid reservoirs, electrical and mechanical systems, bushings and other performance-related parts are now commonly made of

polymeric materials. In addition, high visibility and high value trim pieces that impact fit and finish are of greater importance than ever before. As a result, ensuring their durability has become a critical issue, and failure analysis is a crucial part of that quality assurance process.”

Even the most stable manufacturing process occasionally experiences product defects, and part failure has always been expensive, whether it’s measured in lost production time, wasted material or reduced customer satisfaction. The sheer number and diversity of the applications for plastics and composites has made analysis more complex than ever before, often requiring specialized experience and analytical capabilities.

“There are many variables that can affect the production and/or performance of a molded part,” Battjes continued. “At some time, most molders have had to deal with the sudden appearance of a visual or mechanical flaw, even in the apparent absence of any change in formulation or processing conditions. Identifying the cause of the failure and initiating its prompt correction are essential to maintain profitability, avoid liability and protect the reputations of the molder and OEM.”

Impact Analytical employs a wide range of powerful tools to analyze defects in fabricated parts, including optical and electron microscopy imaging, coupled with elemental analysis. “When molded plastic parts experience defects, patterns appear in the fracture or wear surface that give clues to the mechanism and often the ultimate cause of the failure,” Battjes elaborated. “Imaging the failure surface and analyzing the elemental composition can be used to help detect foreign

particles, non-homogeneous mixing, cold welds during molding, cyclic loading, poor adhesion to reinforcing fibers and void formation,” he said.

For more than 25 years Impact Analytical has provided extensive problem-solving capabilities, detailed analysis, and method development to customers in manufacturing and academia. The company’s experienced technical personnel also help customers implement quality control programs, certify suppliers, and characterize unknown materials. With considerable resources in polymeric science, Impact Analytical maintains resident expertise in material formulation, process engineering, packaging and physical properties testing.

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