

# Eaton Pioneers Production of Safer, Lighter and Stronger Composite Materials



Engineers at Eaton's Engineering Center in Pune, India, are gaining valuable new insights into the production of improved composite materials through a process known as multi-scale digital modeling. The technology can be applied to a broad scope of aerospace products, including fuel tubes, fuel-pump housings, fuel delivery components, lightning isolators, canisters, and environmental control system ducting.

## **Shaping the Future of Aerospace Manufacturing**

The multi-scale digital modeling process at Eaton applies specifically to short-fiber reinforced

injection-molded composites. Sometimes referred to as the "analysis first" approach, digital modeling, or digital prototyping, has increasingly played a role in product design.

"Eaton has been very proactive in developing innovative materials that will help aircraft manufacturers design safer, lighter and more fuel-efficient aircraft," said Anthony Vaughan, director of engineering for Eaton's Conveyance Systems Division.

"Having a strong global engineering team gives Eaton the capability to conceptualize and design improved technologies that are helping shape

the future of aerospace manufacturing."

Eaton has led efforts to develop many composite products, including fluid-conveying components for fuel, hydraulic, coolant and engine systems. Composite materials help reduce aircraft weight and improve fuel efficiency. In addition, they are easier and more cost-effective to manufacture and assemble.

## **Eaton Technology Takes the International Stage**

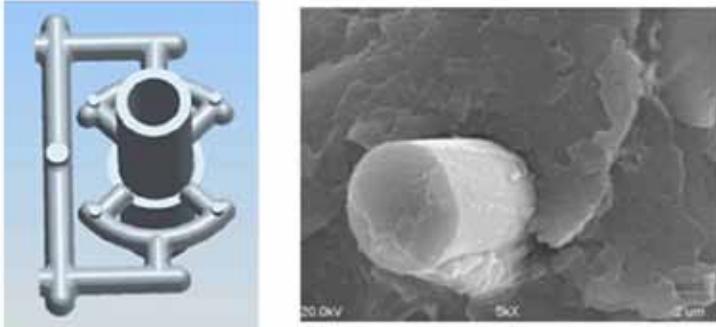
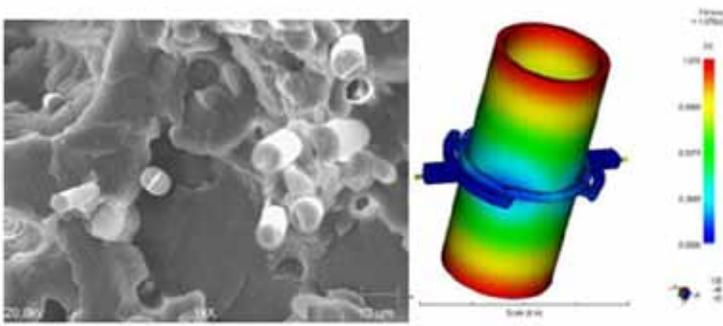
In July 2012, Eaton's expertise in modeling short-fiber reinforced composites took center stage during the International Conference

on Structural Nano Composites, hosted at Cranfield University in the United Kingdom.

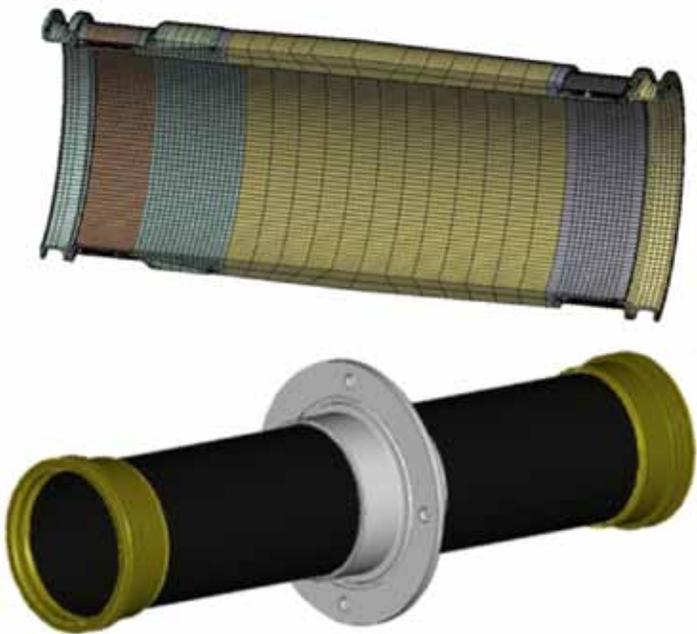
"Eaton's presentation was well received, and we welcomed the opportunity to discuss the technology's potential in multiple industries," said Anil Gupta, head of the Modeling and Simulation Center of Excellence at the Eaton India Engineering Center. "The multi-scale modeling approach can be used to produce stronger, lighter materials for aerospace, as well as improved products for the automotive industry, such as oil pans and valves."



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Structural analysis of the composite components reduces time consuming and expensive physical testing.



Digital prototyping optimizes material configuration and short-fiber orientation of injection-molded composites.