

**Vor-x<sup>®</sup> graphene: A multi-functional material with real-world product adoption**  
**Christy Martin**

Vorbeck Materials Corp, 8306 Patuxent Range Rd, Suite 103, Jessup, Maryland, USA  
[christy.martin@vorbeck.com](mailto:christy.martin@vorbeck.com)

**Abstract**

Vorbeck Materials Corp. is a technology company established in 2006 to manufacture and develop applications using Vor-x<sup>®</sup>, Vorbeck's patented graphene material initially developed at Princeton University. Vorbeck launched the world's first commercial graphene product in 2009 with the introduction of Vor-ink<sup>™</sup>, a graphene-based conductive ink. Vor-ink<sup>™</sup> formulations harness the exceptional conductivity of graphene into ultra-flexible and robust inks and coatings for the printed electronics market. Designed for operation on standard graphic printing presses without the need for specialized equipment, Vor-ink<sup>™</sup> has successfully run on commercial presses at speeds up to 150 m/min. Vor-ink<sup>™</sup> is currently being used in a range of consumer applications from printed circuits to sensors and goods using Vor-ink<sup>™</sup> circuits are on the shelves in major retailers today.

In conjunction with the Pacific Northwest National Labs (PNNL) and Princeton University, Vorbeck has also developed Vor-charge<sup>™</sup>, a fully formulated anode composite next-generation battery electrode material, which entered beta testing with commercial partners in 2010. The team is also developing next generation lithium batteries, including lithium-sulfur and lithium-air systems and is working to rapidly bring this new technology to market. Vorbeck is working to integrate the new batteries into hybrid medium duty vehicles and is collaborating with companies to incorporate the new technology in toys, tools, and commercial vehicles.

We will discuss the latest technical advancements in our Vor-ink<sup>™</sup> materials and their role in enabling (through improved performance, reduced cost, and simplified processing) item-level applications to high-volume consumer goods and in wearable electronics applications. Updates on energy storage products and composite materials will also be discussed.