



Press Release

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NC State's FREEDM Systems Center and Henkel aim to advance materials development for power electronics

Henkel and North Carolina State University enter research partnership

Düsseldorf, Germany and Raleigh, NC, USA – Henkel and North Carolina State University's (NC State) Future Renewable Electric Energy Delivery and Management (FREEDM) Systems Engineering Research Center today announced a new partnership agreement designed to study the impact of materials technology on power electronics applications. Henkel, well-known for its global presence in the industrial and consumer goods markets, has joined the FREEDM Systems Center as an Associate Member and will also leverage services from NC State's Packaging Research in Electronic Energy Systems (PREES) lab facilities as part of the agreement.

"Henkel and NC State have previously partnered on various projects," says Iqbal Husain, Professor of Electrical Engineering and FREEDM Director, noting that the new association marks a more formal collaboration. "Most recently, Henkel's team provided specialized materials that enabled us to meet aggressive targets in the design of a high-power electric vehicle fast charger. We see many areas such as this where our relationship can bring notable results."

Partnerships between industry and academia are a focus area for NC State University, the results of which have led the University to rank fourth in the United States for industry-sponsored research and second for research commercialization. The school's FREEDM and PREES resources, located on its Raleigh, NC-based Centennial Campus, are national models for public-private collaboration.

As a materials leader in the power and industrial automation sector, Henkel believes relationships with academia have broad benefit, facilitating acceleration of market-ready solutions for some of the industry's most significant challenges. Justin Kolbe, Director of

Market Strategy for Henkel's Power and Industrial Automation business, is looking forward to many development opportunities through the FREEDM association, acknowledging the growth potential for Henkel in the power electronics space and the significance of NC State's proven leadership in the field.

"The demands on power electronics across many applications are immense," explains Kolbe. "The often-contradictory objectives of increased power densities, high reliability, expansive functionality and cost efficiency are driving new approaches to systems design. Our team is excited to work with NC State to evaluate how Henkel's enabling materials in leading-edge power electronics devices can address future industry challenges."

Part of this deeper appreciation for next-generation designs is gained through practical application, which is why the PREES lab is integral to the development work. "PREES is focused on advanced packaging for power electronics," shares Doug Hopkins, Professor of Electrical Engineering and PREES Director. "We look forward to working with Henkel to expand simulation capabilities and use their products in packaging prototypes."

For more information about Henkel materials for power electronics, visit <https://www.henkel-adhesives.com>. Details regarding NC State's FREEDM and PREES resources are available at <https://www.freedm.ncsu.edu/>.

About Henkel

Henkel operates globally with a well-balanced and diversified portfolio. The company holds leading positions with its three business units in both industrial and consumer businesses thanks to strong brands, innovations and technologies. Henkel Adhesive Technologies is the global leader in the adhesives market – across all industry segments worldwide. In its Laundry & Home Care and Beauty Care businesses, Henkel holds leading positions in many markets and categories around the world. Founded in 1876, Henkel looks back on more than 140 years of success. In 2019, Henkel reported sales of more than 20 billion euros and adjusted operating profit of more than 3.2 billion euros. Henkel employs more than 52,000 people globally – a passionate and highly diverse team, united by a strong company culture, a common purpose to create sustainable value, and shared values. As a recognized leader in sustainability, Henkel holds top positions in many international indices and rankings. Henkel's preferred shares are listed in the German stock index DAX. For more information, please visit www.henkel.com.

About FREEDM

The FREEDM (Future Renewable Electric Energy Delivery and Management) Systems Center is a National Science Foundation Engineering Research Center founded to address the grand challenge of integrating more renewable energy resources on the distribution grid. Since 2008, FREEDM researchers have authored hundreds of technical publications and patented dozens of innovations. Their 200+ PhD graduates now work in academia, government research labs, and industries around the world. The FREEDM Industry Consortium includes electric utilities, power electronic manufacturers, electric vehicle developers, and other organizations which support their core research areas of Wide Band Gap semiconductors, Electric Transportation, Power Systems, and Renewable Energy.

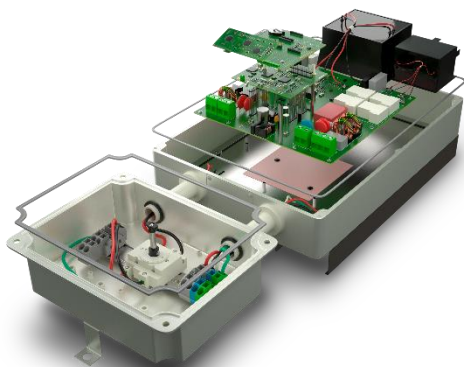
Photo material is available at www.henkel.com/press

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