

Case Study

Case Study: Supporting the Next Generation of EV Engineers

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The Gator Motorsports Formula Society of Automotive Engineers (FSAE) team at the University of Florida has a long-standing tradition of innovation and competitive success. Established in 1991, this student-run organization develops, builds, and races a vehicle each year in Michigan, USA, competing with over 120 teams in a series of events designed to assess the engineering, reliability, and performance of the racecar.

For over three decades, the team raced with an internal combustion engine (ICE) platform, earning a reputation for consistency and excellence. In 2023, recognizing the automotive industry's shift toward electrification, the team made the bold decision to enter the electric vehicle (EV) category for the first time.

"In recent years, we've seen the industry move toward renewable energy sources," said Zachariah Taylor, Battery Pack Engineer for Gator Motorsports. "Learning how to adapt to these changes is an important skill for future engineers, so our team decided it was time to step into the EV space."

The transition proved to be a major engineering challenge. Developing the team's first EV required a complete redesign of the racecar, starting with the battery pack, a central component that introduced new requirements for the chassis and electrical system.

"The car had to be rebuilt from the ground up," explained Bernard Krasuski, F25 Battery Pack Lead Engineer. "We had to design an entirely new battery pack, and for most of us, this was our first time developing a component with that level of electrical complexity."

The team debuted their EV at the 2023 competition, but faced early hurdles, including a small battery fire during water ingress testing. That experience prompted a full redesign of the battery pack in 2024, requiring additional testing and iteration.

By 2025, the team was determined to not only improve their system design but to pass every technical inspection and compete in all of the dynamic events throughout race week. A key part of this effort was refining the battery pack, and the team began exploring performance-enhancing technologies that could elevate their design.

“We knew that plating the high-voltage busbars would improve both the electrical and physical properties of the components,” Taylor said. “After researching plating companies, we quickly reached out to MacDermid Enthone for guidance and support.”

MacDermid Enthone responded swiftly, offering a range of plating options that gave the Gator Motorsports team control over their design and the flexibility to choose the best solution for their application. Alongside the materials, the MacDermid Enthone team clearly explained the benefits of each coating, helping the students make informed decisions to optimize performance.

“When we connected with Zachariah and the team, we sought to provide more than just plating chemistries,” said Ambrose Schaffer, Global Product Line Manager at MacDermid Enthone. “We wanted to educate them on our advanced surface finishing technology and deliver best-in-class solutions to enhance their system design and performance.”

With support from the technical team in New Hudson, MI, MacDermid Enthone supplied Gator Motorsports with busbars plated with their industry-leading [low phosphorus electroless nickel](#) technology. The team quickly installed and tested the new components, which successfully carried the battery pack’s high-voltage current with low contact resistance and no performance issues. On-track testing confirmed these design improvements. The battery delivered consistent power to the vehicle, allowing for longer sessions between charging, which enabled the team to complete over 150 kilometers of testing ahead of the competition.

In June, the team traveled to Michigan for the 2025 Formula SAE Electric competition. Gator Motorsports was one of 88 teams competing, and their performance exceeded all expectations. They passed every technical inspection and finished 25th overall, climbing 10 positions from their 2024 result. The team also made notable gains in individual categories, placing 23rd in cost, 38th in business presentation, 19th in endurance, and an impressive 12th in efficiency. Members of the MacDermid Enthone team were on-site to cheer them on and celebrate their achievements.

“Working with MacDermid Enthone has exceeded our expectations,” said Sean Barney, F25 Team Captain of Gator Motorsports. “They have been incredibly enthusiastic and supportive. It’s companies like MacDermid Enthone that help lay

the groundwork for our team's future in the EV space."

Schaffer echoed the sentiment.

"We're incredibly proud to support the future of automotive engineering through teams like Gator Motorsports," he said. "This talented group of students represents the next generation of innovation and technology, and we're thrilled to play a part in their success. We look forward to cheering them on for many years to come."

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