



# eMobility Manufacturing: Solving the Industry's Biggest Challenges

How Precision Converting  
is driving EV innovations



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Production of electric vehicles (EVs) is expected to increase dramatically over the next several years to meet the rising demand fueled by changing consumer preferences, government mandates and tax incentives.

In 2021, EV sales in the U.S. [more than doubled](#) compared to the previous year, and the global EV market is [projected to grow](#) from around \$287 billion in 2021 to roughly \$1.3 trillion by 2028. That means there is significant growth opportunity for OEMs, suppliers and other automotive manufacturers.

To capture market share, manufacturers need to develop superior products that outperform the competition while providing a positive user experience. This is no easy feat given the complexity of eMobility applications.

At [Precision Converting](#), we've helped numerous manufacturers develop eMobility solutions for a wide range of EV applications. From thermal management to bonding solutions to reducing noise and vibrations for individual parts, we've helped design, manufacture and deliver effective, durable solutions that enhance EV products. This whitepaper explores some of the most pressing challenges faced by EV manufacturers and how Precision Converting is uniquely positioned to deliver innovative solutions that exceed expectations.

## Challenge #1 Thermal Management

Thermal management is one of the biggest challenges facing automotive suppliers, OEMs and others working on electric vehicle projects. EV battery assemblies generate a significant amount of heat when in use, as do all variations of EV charging stations. Engineers need reliable ways to transfer heat and cool systems while preventing and managing thermal runaway to protect end users.

Precision Converting has extensive experience developing custom thermal management solutions that allow EVs to perform at optimal levels. In one recent project, a battery manufacturer needed a better way to cool the battery cells to prevent a thermal event (i.e. when one of the battery cells fails and starts to propagate a failure within the rest of the battery assembly). We reviewed their design and application requirements and ultimately supplied a silicone foam as a sealing and insulating layer between the battery modules. Silicone foam is highly flame resistant so it isolates fire in the case of a thermal event so it can't penetrate the next module.

There are other flame blocking materials like inorganic papers that are thinner but equally proficient at blocking high temperatures from moving throughout the battery. Ceramic paper, for example, is a mineral-based product made into a sheet that can be applied on the inside of battery modules and outer enclosures to prevent fire from penetrating the aluminum skin of battery assemblies. At Precision Converting, we've worked with a wide range of thermal interface materials and have the converting capabilities to develop custom solutions that protect both products and users through effective thermal management.

## Challenge #2 EMI Shielding

Every electronic device produces some level of electromagnetic waves (EMW). These man-made emissions, along with natural sources of EMW, can create electromagnetic interference (EMI) that is potentially harmful to electrical systems. This is why it's so important for engineers to ensure all sensitive components are protected from EMI using proper materials alongside optimized shielding and grounding techniques.

We routinely talk with OEMs and automotive suppliers who specifically need dielectric insulation materials to protect the EV battery itself from harmful EMI. We often propose using a conductive film to wrap battery cells and block stray radiation coming from electronic devices. Our comprehensive approach to EMI shielding ensures no potential vulnerabilities are overlooked, giving automotive manufacturers confidence that sensitive components will be adequately protected to achieve optimal performance.

## Challenge #3 Bonding

To build a finished electric vehicle, hundreds, if not thousands of individual parts must come together and be securely fastened to last through years of everyday use. In many EVs, bonding of larger structural components like the chassis, housing for battery assemblies or exterior side panels are joined together using metal fasteners, liquid adhesives or welding solutions.

Bonding applications using flexible materials like pressure sensitive adhesive (PSA) tapes typically involve things like badges, side moldings and components that are assembled inside of the vehicle. In these instances, die cut adhesive tape is often used to adhere parts to various substrates. The adhesive material used is extremely important because of the specific requirements associated with plastic to glass bonding or adhering parts to automotive paint.

Precision Converting can not only guide selection of adhesive materials, but we can also provide the precise converting processes to achieve tight tolerances, even for materials that are fragile or difficult to tool. Our large inventory of high-quality



materials and proven history in developing off-the-shelf and custom adhesive solutions allows us to meet application-specific needs with fast turnaround times.

## Challenge #4 Noise, Vibration, Harshness (NVH) Management

Electric vehicles are inherently quieter than those with internal combustion engines (ICE), which makes any noise more noticeable. This is why many OEMs and automotive suppliers come to Precision Converting looking for noise, vibration and harshness (NVH) solutions. They need to ensure that internal mechanical and structural components don't create unwanted sound while also protecting critical parts like the battery from excessive impact.





Precision Converting has extensive experience developing custom NVH solutions that meet the unique needs of our customers. For example, one EV manufacturer came to us with a straightforward problem borne out of a confusing mystery. Drivers of this particular EV were noticing a strange noise that seemed to be coming from near the battery. After investigating the phenomenon, engineers discovered that as the vehicle was driven and the battery temperature increased, the sheet metal deflected creating a low frequency noise. Through consultation with our engineers and materials experts, the team decided to use polyethylene foam to fill the gap so the sheet metal would no longer move and create the unwelcomed noise.

In other applications, our team has used felt as an interface material between structural parts to prevent them from vibrating and making noise. We have also applied UHMW (ultra-high molecular weight) tape—a material specifically designed for squeak prevention—between two pieces of sheet metal to prevent unwanted noise.

The key in developing NVH solutions is to find materials and engineering solutions that achieve target performance requirements and create a better user experience without dramatically altering component design or adding significant weight or cost to the vehicle. Our team has the engineering and materials expertise to identify, isolate and resolve NVH issues using custom solutions that improve the user experience.

## Challenge #5 Sealing and Gasketing

There are many parts of an EV that require sealing or gasketing solutions to achieve adequate ingress protection. Various elastomers (i.e. silicones, EPDM, CR, NBR) are used for gaskets to create reliable seals around windows and doors, prevent contamination of critical electrical components or as insulators for thermal or EMI protection. But these kinds of requirements are not unique to electric vehicles as many of the same components are found in ICE vehicles.

One area of the eMobility market that does require new innovation is outdoor electric charging stations. These stations are essentially outdoor electrical boxes that need to be able to withstand a wide range of environmental conditions and last for years. Creating such durable solutions requires careful design considerations, thoughtful materials selection and precision in the converting and manufacturing process.

Precision Converting has helped automotive manufacturers achieve NEMA 4x-rated enclosures with sealing and gasketing solutions that meet the most stringent project and budget requirements.

Our custom enclosure gaskets, shims and seals are available in a variety of different elastomers and custom formulations. Each material offers proven advantages and our engineering experts can assist manufacturers in selecting the best option for the given project requirements. Our expertise is backed by ISO 9001:2015 and AS9100 certifications to ensure quality solutions that allow charging stations to operate properly for years in even the most challenging environments.

## Challenge #6 Materials Sourcing

One of the biggest challenges automotive manufacturers have faced over the last several years is sourcing necessary materials in a timely manner. The supply chain issues exacerbated by the start of the COVID-19 pandemic continue to cause problems for manufacturers across the world. Without the ability to source quality materials, OEMs and automotive suppliers can find themselves stuck, unable to innovate or deliver on contracts.

This is where manufacturing leaders turn to Precision Converting. Because we are a preferred 3M converter, we have unique access to high-quality, industry-leading materials. We can often source materials other converters can't because of our strong relationships with 3M and other major materials suppliers. We also have a complete team of materials science experts on staff who can help manufacturers find alternative materials when a particular product is unavailable. We work to understand your application requirements and then suggest other engineered materials that present the same characteristics to achieve target performance. In other words, when manufacturers have an issue sourcing or choosing materials, they come to us to provide the expertise and connections they need to keep projects moving forward.

## The Bottom Line

Developing successful eMobility solutions is anything but simple. However, with the right partner, OEMs and automotive suppliers can overcome design and production hurdles to achieve their strategic business goals. By working with a converter like Precision Converting that has extensive experience in the

eMobility space, manufacturers can streamline product development and manufacturing processes to increase operational efficiency and create innovative products that truly move the needle in the growing EV market.

## The Precision Converting Difference

Precision Converting helps solve complex manufacturing challenges with custom-converted precision parts using the industry's most advanced flexible materials. A division of Hisco, our experienced application engineers and manufacturing specialists can customize, convert and fabricate high-quality components based on your requirements to help you bring your products to market faster. We have developed custom solutions for organizations across industries and are ready to help you enhance product quality and performance while increasing manufacturing efficiency.

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