



# German EV Industry

## and How It Relates to the Fastener Industry

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### The EV Industry in Germany

EV Production in Germany shows what an EV revolution looks like. Electric cars now account for more than 20% of auto production in Germany. German automakers produced 53,221 units of EVs in July, 2021. That works out to 21.7% of the total number of cars produced in Germany in that month. In March of 2020, just 6.8% of new cars produced were EVs, and in January of 2019, only 3.2% of new cars were EVs, according to Energy Monitor. Overall, German car production was down 26% in August.

In 2021, compared to the same month a year ago, yet EV production was up 9%, according to the data supplied by German Association of the Automotive Industry (VDA). Globally, total car sales shrank by 14% in 2020 compared to the previous year, but EV sales increased from about two million units to more than three million units, according to the International Energy Agency. Volkswagen, Mercedes Benz, and BMW are the Big Three of the German auto industry and all three have set goals for their electric car initiatives. Volkswagen expects 50% of its sales in 2030 will be EVs which will rise to 100% by 2040. Mercedes Benz is planning to go all electric by 2030 “where conditions allow,” which is a rather vague commitment. BMW says it expects fully electric vehicles to account for at least 50% of global deliveries by 2030 and has announced that its MINI subsidiary will sell only electric cars from that year.<sup>1</sup>

### New Challenges for EV Fasteners and German Solutions

What fasteners are required in the future? Since cars were first invented, there have always been milestones of innovation. The next one, the e-mobility, is just around the corner. However, new propulsion technology, new materials and new energy sources also result in new challenges in the fastening and assembly technology.<sup>2</sup>

**Storage Devices (Battery):** In this regard, the battery tray is important in an EV. It houses the heart and the central part of an electric car, the storage device (battery). Therefore, it is responsible for the most expensive module, and must be supported by reliable and intelligent connection technology.

One of the heaviest components in an EV is the battery, which runs the risk of negating the idea of carbon emission reductions if the vehicle’s weight dramatically increases energy consumption. Automakers face several challenges with current multi-piece steel and aluminium EV battery enclosures, including the overall weight of case (typically more than 1,000 pounds), and the need for multiple welds, fasteners and bolts which can ultimately result in leaks. Germany is achieving fastener weight reduction whilst maintaining with keeping high torque demand requirement in automotive applications. Industrial drive systems such as Mortorq screws require up to 25% less material in the head yet still provide super high strength internal drive. An example of an innovative system providing the lowest head possible without compromising on fastener assembly performance<sup>3</sup>. On the other hand, they have developed testing techniques for the leak-proofness of fasteners, rivets, and rivet nuts. Anything that has to do with leak-proofness, they manufacture.

**E-machine:** Higher performance and smaller size. These are the attributes demanded for modern e-machines. Germans are involved. For example, the stator to be attached to the case or the inserts for thread reinforcement and customised development parts made of elastomers to cope with this challenge.

**Front and Rear End:** Cars appeal to us through emotions and aesthetics. Particularly the front and rear end shape the modern design of an e-vehicle. They are also affected by increasing technical requirements. Those particularly relate to comfort, safety, reliability and driving performance. In E-vehicles, however, there is much more insulation between components and the chassis than in the past, and bodies are made of a combination of conductive, poorly conductive, and non-conductive materials. In addition, consumers want more and more accessories that require electric power. These changes make grounding both more challenging and, in many cases, far more important.

<sup>1</sup> <https://cleantechnica.com/2021/09/21/ev-production-in-germany-shows-what-an-ev-revolution-looks-like/>

<sup>2</sup> <file:///C:/Users/Sharareh/Downloads/fastening-technology-for-e-mobility-en-8026.pdf>

<sup>3</sup> <https://www.engineerlive.com/content/joined-thinking-electric-vehicle-construction>



The use of modern material and composite designs bears great potential for German innovative fastening technologies.

**Future of EVs in Germany and the Fastener Industry:**

Bloomberg has reported that Germany expects to have 14 million units of electric and plug-in hybrid vehicles on its roads by 2030 as Europe's biggest economy attempts to comply with increasingly stringent emission rules. The forecast is at least 40% higher than a previous estimate thanks to a recent surge in EV sales, Economy Minister Peter Altmaier said. Germany expects to have about 1 million such cars on its roads each month<sup>4</sup>.

**The Most Developed Fasteners That are Used in an EV are<sup>5</sup>:**

**Weld Nuts & Studs**

Through welding, metal fasteners such as weld studs, weld pins, and threaded studs and weld nuts are joined to other metal objects through an arc at the speed of lightning. The process can be highly automated and depends on the type of welding it can only requires access to one side of the material.

**Large Diameter Clinching**

Hardened clinch fasteners increase thread strength and produce clean assemblies. The fasteners can either be installed In-DIE during the forming process or offline using a C-Frame. There are no thermal stresses even with the high resistance to push and torque outs. The resulting clean work environment reduces any concerns about the environment.

**Self-Piercing Technology, Flow Drill Screws**

These fasteners combine drilling and thread forming to increase the speed of one-sided assembly, which drops to less than one minute. Because the rivets are self-piercing, the material experiences no heat zones during installation. The flow drill screws are highly resistant to vibration and loosening torque.

**Structural Blind Rivets**

Because they stand out as a strong solution for structural assembly, these fasteners are excellent for high-tensile applications. Only one side is needed for access and one fastener can accommodate up to four rivets with large diameters. The result is an attachment that is both durable and reliable.

And the main subjects for improvement that Germans are working on are:

Lightweighting fastener technology

Fastening and their coatings within the EV sector

<sup>4</sup> <https://www.bloomberg.com/news/articles/2021-07-13/germany-sees-14-million-electric-vehicles-on-its-roads-by-2030>

<sup>5</sup> <https://provenproductivity.com/fasteners-for-electric-vehicle-body-in-white-design/>

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