



T **TOOLING**
TECHNOLOGY
A TOOLING TECH GROUP COMPANY

CASE STUDY

TRIENDA: SHIPPING BATTERIES SAFELY

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Customer: TriEnda is a global manufacturer of thermoformed packaging, automotive and material handling solutions in Portage, Wisconsin. Together with sister company Penda and their parent, Kruger Family Industries (KFI), the group employs more than 800 associates in four locations across North America and enjoys a nearly five-decades-long reputation as a leader in the thermoforming industry.

- **Challenge:** A major North American automotive supplier asked TriEnda to manufacture a reusable shipping container for the battery packs used to power battery electric vehicles (BEVs), one that would meet demanding UN criteria for shipment of dangerous goods. Constructed of ABS (Acrylonitrile Butadiene Styrene) and steel substructure for strength, the container must support robotic loading and unloading of the 37 compartmentalized trays within, each carrying 16 relatively soft, liquid-filled battery cells for a total of 592 per container.
- **Solution:** The customer originally conceived that the battery trays be injection-molded. However, with a height tolerance of ± 0.013 " per tray and the fact that only a few injection mold machines in the entire country had sufficient tonnage for that size workpiece, TriEnda soon realized the battery trays would be extremely difficult to manufacture as specified. Instead, it was decided to use the thermoforming process, even though ABS plastic is much more difficult to thermoform than the HDPE used elsewhere in the container. Undeterred, TriEnda personnel built a prototype mold, tested the process, and after customer approval, turned to longtime supplier Tooling Tech Group (TTG) of Ft. Loramie, Ohio for the production tools.

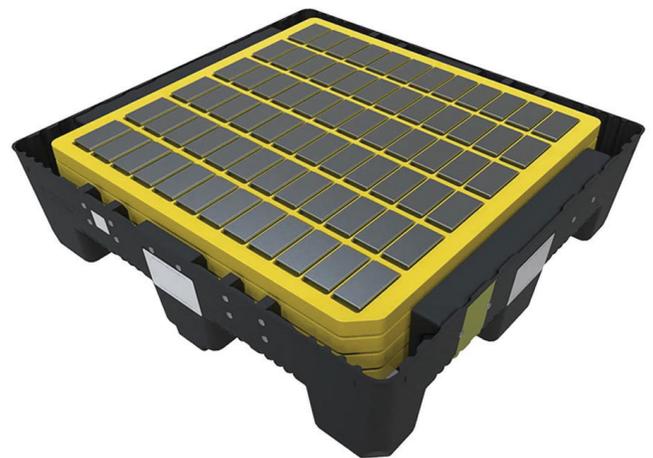


- **Description:** TTG has worked with TriEnda and Penda for more than four decades, almost since the company’s founding. The Ohio facility specializes in thermoform tooling and has a long track record with KFI, due in part to an in-house foundry that it uses to create aluminum tools from—in this case—a customer-supplied pattern. After delivery and testing of the production tooling, TriEnda soon discovered a serious problem: the battery packs supplied by the OEM did not meet the original design specifications. This meant the tooling had to be reworked. TTG proved well-equipped to handle this request and turned the revised tools around within a few weeks, meeting the demanding delivery dates required in the automotive industry.



Enclosed Pack

- **Results:** Many thousands of successful battery containers and tens of thousands of trays later, TriEnda management looks back at their accomplishments with pride. “It was probably the most challenging project we’ve ever worked on,” says a company spokesperson. “Between our ability to get ABS to thermoform within the very tight tolerance callouts, Tooling Tech’s quick response and excellent flexibility in the face of changing requirements, and other obstacles like the straight stack configuration we developed to safely and securely carry the pack’s heavy load—it was a big ask for everyone involved and quite an accomplishment overall. I’m very proud to have been part of it.”



Open Pack

COMPANY OVERVIEW

Tooling Technology, originally founded in 1982, specializes in providing thermoform tooling as well as rotational and blow molds for producing plastic components and structures. Equipped with its own aluminum foundry, Tooling Technology handles all phases of the tool build in-house, from design and pattern to fabrication and finishing. Additionally, the company is home to the Segen Quick System for simplifying industrial setups, changeovers, workholding, clamping, fixturing and alignment. In 2018, the company became one of the Tooling Tech Group of companies.

Tooling Tech Group builds custom automated systems for assembly, joining and inspection as well as tooling for a variety of applications including thermoform molding, high compression composite molding, blow molding, rotational molding, die casting, and stamping. Industries served include automotive, appliance, lawn and garden, agricultural, aerospace, marine, and off-road vehicle industries, among others. Through organic growth and acquisitions, the company has become the largest tooling provider in the United States with 650+ employees, 13 modern facilities and over 1 million square feet of manufacturing space across four states.

The depth and breadth of our capabilities is achieved through the combined experience of our company units, with each of these companies being in business for 30+ years, providing both extensive industry experience and financial stability that you can rely upon. Our unique differentiator is the ability to provide all tooling services from design to engineering to simulation to machining to fabrication to try-out all within one company. This single source ability can help to streamline your business operations and simplify your life. We take full responsibility for quality, delivery, and cost management of each project starting at concept through “on time, every time” delivery.



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