



Wausaukee Composites, Inc.
837 Cedar Street
Wausaukee, WI 54177
(715) 856-6321
www.wauscomp.com

Wausaukee Composites, Inc. – CASE STUDY

Production Trike Body - New Product Introduction (NPI)



Challenge: A Fortune 500 customer wanted to introduce a factory trike as a new open road motorcycle product line, featuring lightweight composite trike body components.

Project Highlights

Design: Wausaukee Composites assigned a dedicated project manager to this NPI project who was responsible to work in concert with the customers design and engineering staff to ensure the trike components that consisted of: Inner Trunk Liner, Outer Body, Trunk Door, Fenders, and Side Covers met the customers form, fit and function requirements. An optimal design for manufacturability goal was established such that aesthetic styling, product configuration, and cosmetic surface requirements were accomplished while still ensuring lowest cost of manufacturing objectives were achieved.

Product Development: In line with our New Product Introduction planning procedure, critical milestones were developed within MS Project and shared with all of the team members utilizing a secure FTP site. Periodic milestone reviews insured that the team, prior to moving forward, approved each critical step. Rigorous test analysis was performed on the composite laminate to ensure long-term durability and also paintability of the molded surface. Production parts were

compared to the original design models using light scan technology to determine any level of surface deviation. The repeatability of secondary bonded assemblies was confirmed using an approved APQP Sampling Plan. Robotic trim capability was documented and submitted to the customer in accordance with the PPAP process.



Prototype Body Assembly

Tooling: Once the initial design was approved, temporary molds were CNC machined from high-density foam tooling materials. Following dimensional validation to design, fiberglass masters were then developed to produce multiple sets of production molds. Using our high-temperature tooling gel-coats, and low shrink tooling resins, the production molds were fabricated by our experienced tooling staff, and reinforced with a welded tubular steel frame. Secondary bonding fixtures were developed from 3-D models using Solidworks® software. These fixtures allow for the accurate placement of mating components and attachment hardware. Vacuum clamping fixtures were developed to restrain the components while being robotically trimmed, to ensure part repeatability.



Glass Reinforcement Placement in Light Resin Transfer Mold (LRTM)

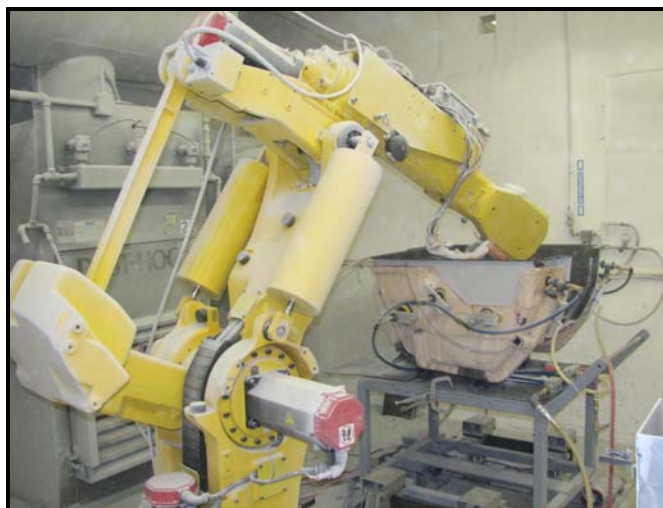
Manufacturing Process: Light Resin Transfer Molding (LRTM) – Following a thorough review of the product technical specifications, field performance requirements, critical-to-quality specifications, and related attributes, we mutually determined with our customer that Light Resin Transfer Molding (LRTM) would be the ideal manufacturing process for the full set of components to be manufactured in this program. Product attributes that led the NPI team to select LRTM as the preferred production process included tight-tolerance dimensional requirements, high glass reinforcement to resin ratio, controlled thickness, finished B-side of the laminate, and controlled product weight, in addition to the reduced-emissions advantages of this closed molded manufacturing process.



Light Resin Transfer Molding (LRTM) Process

Production Environment and Capacity Plan:

Lean manufacturing principles dictated that minimal inventory would be in process at any given time. The work cell layout was developed to allow for linear product flow. Product flow was based on TAKT-time calculations for each of the operations associated with the manufacturing process. Overhead vacuum lines were strategically positioned to allow for optimal mold movement and effective use of floor space. De-molded components moved directly into robotic trim, followed by secondary assembly operations prior to preparation for paint and final packaging. A returnable container solution was developed as an economical and environmentally-friendly alternative to disposable packaging.



Robotic Trim in Vacuum-Assisted Holding Fixture

Results: The trike program was successfully launched meeting the customer’s timeline and budget requirements. Production volumes have exceeded 7,000 units per year.