

CFRTP LARGE-FORMAT TRUCK BED

SINGLE-PIECE CONTINUOUS FIBER-REINFORCED THERMOPLASTIC COMPOSITE

Traditional steel truck beds are heavy, corrosion-prone, and require separate aftermarket liners for protection. Re:Build eliminated that trade-off with a single-piece truck bed built from Glass Fiber Polypropylene (GFPP) continuous fiber-reinforced thermoplastic composite (CFRTP). This large-format structural component (62” x 42”) matches the strength of steel while building impact and corrosion resistance directly into the bed, so no separate liner is needed. It is one of the industry’s first large-format CFRTP components in a major structural application for a production vehicle.

CAPABILITIES DEMONSTRATED

- Large-format structural composite design
- Custom CFRTP process development
- Automated tape laying
- Low-temperature hot forming
- High-volume economics: 2-min TAKT
- Molded-in finish, no secondary operations
- Part consolidation and process elimination
- Domestic composite supply chain

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THE PROJECT

This innovation is in active commercialization for an electric truck, targeting 2027 model-year production, with custom high-volume production equipment developed alongside the product itself.

The project also established a short, U.S.-based composite materials supply chain in partnership with Avient Corporation, which supplies the engineered GFPP material system. This domestic strategy reduces logistical complexity and transportation costs while increasing manufacturing resilience.

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THE PRODUCT

Material: GFPP composite consisting of 63% glass fiber and 37% polypropylene resin. This formulation was chosen to solve several performance requirements at once. The continuous glass fiber reinforcement delivers steel-equivalent structural strength at roughly half the weight, while the polypropylene matrix provides inherent resistance to impacts, scratches, chemicals, and hail.

How It's Made: The part is produced through a fully custom CFRTP process. Automated tape laying places and orients the fiber precisely to maintain structural properties, followed by a low-temperature hot forming step analogous to automotive hot metal stamping but optimized for thermoplastics. The final surface finish comes directly out of the mold, eliminating secondary finishing operations. The process runs across two custom-built manufacturing cells at a 2-minute TAKT time, making CFRTP viable at high volumes.

Performance & Results:

- 50% weight reduction vs. steel construction
- Structural integrity matching steel with superior damage resistance
- Impact and chemical resistance with no additional protective coatings
- No rust or corrosion over the vehicle lifecycle, protecting resale value
- Eliminates the separate metal bed fabrication, corrosion treatment, painting, and liner installation
- Removes paint-booth VOC emissions from the manufacturing process
- Weight savings improve vehicle efficiency over its operational life

BY THE NUMBERS

WEIGHT REDUCTION VS. STEEL	50%
TAKT TIME PER PART	2 MINUTES
COMPONENT SIZE	62" X 42"
COMPOSITION	63% GLASS FIBER / 37% POLYPROPYLENE
PRODUCTION LAUNCH	2027 MODEL YEAR

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