

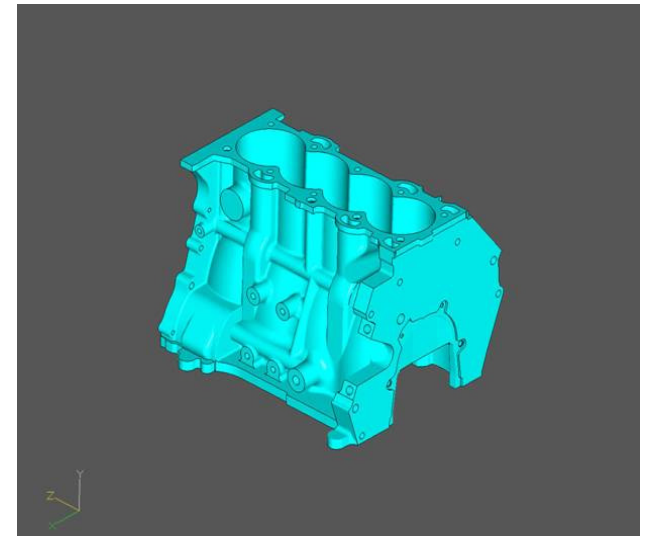


**Advancement in
Molding and Forming
Carbon Fiber Components**



Prototype Cast Manufacturing

- Known as an industry innovator, since 2006 we have produced prototypes and mid-range production runs of ferrous & non-ferrous components into the automotive, military, aviation and industrial markets.
- Our in-house product design, engineering R&D and project management service fully complement our parts processing and machine facility.
- After 20+ years of pioneering the material/process, Matti Holtzberg and PCMI are now partnered in the development of a leading-edge, patented molding/forming process for the production of **FRP-Carbon Fiber Composite** products utilizing **chopped carbon fiber** technology.





PCMI and Carbon Fiber

- Carbon fiber has remarkable properties such as tensile strength, stiffness, low density, conductivity and chemical inertness, making it ideal for a wide range of applications.
- Using conventional molding techniques, our patented molding process, which uses chopped carbon fiber enables parts traditionally made from ferrous or non-ferrous metals to be made from **FRP-Carbon Fiber Composite** and retain all the carbon fiber properties
- This innovative new material/process offers tremendous advantages over conventional cast and fabricated metals and alloys:

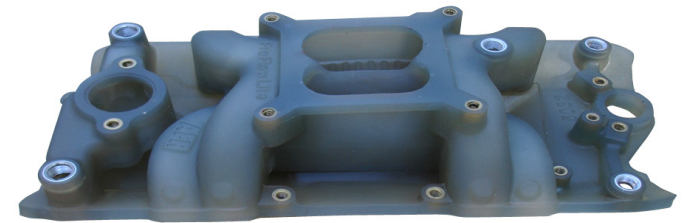


FRP-Carbon Fiber Composite Advantages

- Energy savings – No melting of material
- Time/Cost Savings – Net parts, minimum to no secondary machining required.
- Over molding of sub components (threaded inserts, bearings etc.) eliminating time consuming and costly ancillary operations.
- CF molding provides a unique solution to product weight reduction up to 50% over metals, while retaining performance.
- CF molded parts provide excellent energy absorption characteristics.
- CF molded parts offer high performance, high specific modulus and high strength.

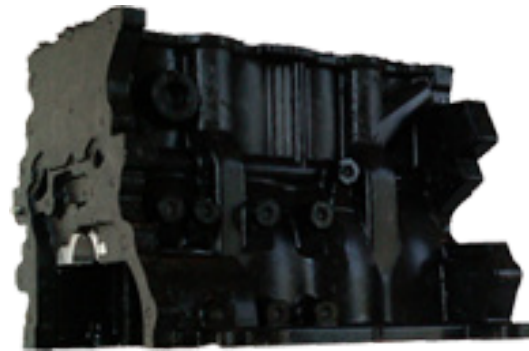
FRP-Carbon Fiber Composite Advantages

- Tooling Costs much less than comparable cast metal molds.
- Tooling Life typically 3–4 times and up to 5 times as long.
- CF Molding allows small or large components to be molded.
- Very complex, intricate parts can be molded or formed!



FRP-CF Composite – Additional Benefits

- Reduced NVH compared to metal parts.
- Smaller carbon footprint – no melting metal.
- Minimum heat signature compared to metal parts.
- Recyclable process.
- Suitable replacement for aluminum, magnesium and some iron parts.





FRP-CF Composite vs. Laid-up Carbon Fiber

- FRP-CF Composite can produce very intricate, complex parts to be molded or formed. L-CF cannot.
- FRP-CF Composite molding can be fully automated. L-CF requires intensive and costly manual labor.
- FRP-CF Composite does not require heat curing. L-CF requires curing in an autoclave or oven.
- Recyclable process.
- FRP-CF Composite parts can be made more efficiently and less expensively than parts being produced by the L-CF process without sacrificing performance and can therefore open-up whole new markets.

