



INNOVATION IN ADDITIVE MANUFACTURING

HUMMINGBIRD 3D SOLUTIONS

Additive manufacturing (AM), commonly referred to as 3D printing, is a staple within the prototyping and modeling worlds. While the prototyping segment remains prominent for AM, short to intermediate run additive manufacturing has become the new trend within the market space. This technology is being used to produce finished parts, manufacture components, and create industrial pieces that are well known for their strength and cost efficiency. While common thermoplastic polymers like ABS (Acrylonitrile butadiene styrene) will remain a staple for 3D printing, the incorporation of carbon fibers, cut glass fibers, and specialty stereolithography resins are allowing innovative firms to thrive. By carefully incorporating these new materials, and in some cases combining them, 3D printing firms, like Hummingbird 3D Solutions, are providing unique solutions for many customers.

Hummingbird 3D Solutions provides businesses with custom high strength, light weight parts without the time and costs associated with molding, casting, forging, or subtractive machining. President, Bryan Isley and his team are utilizing environmentally conscious facilities, state of the art technology, and cutting-edge techniques to yield custom parts for a variety of industries. Isley stated, "With the rapidly progressing materials market and the talent within professional additive manufacturing firms, there has never been a better time for businesses to seek alternative solutions." Isley, who traded a Wall Street career for entrepreneurship, has been adept at spotting emerging trends. Recognizing an emerging materials supplier in the industry, Hummingbird entered into an exclusive distribution agreement with Taulman 3D, who manufactures innovative filaments. Both Hummingbird 3D and Taulman 3D have benefitted from the strong support of Dow Chemical Corporation, which provides raw materials and assists in

formulations for some of these new product offerings. Taulman 3D, along with more established firms such as Markforged, are continually bringing advanced materials to this market sector.

INNOVATIVE MATERIALS

- **Alloy 910** – High-strength, chemical resistant, and FDA approved for direct food and beverage contact. Tensile strength = 56 MPa
- **Alloy 920 GF** – Cut glass filled nylon offering increased strength. Suited for Automotive applications. Heat resistant to 110C. Tensile strength = 91 MPa
- **PPEPS** – Autoclavable with heat/flare resistance and hydrolytic stability. Suited for aerospace, medical, and electrical applications. Tensile strength = 67 MPa
- **Alloy 960 CF** – The strongest of the alloy series due to carbon fiber. Has tensile strength in the same realm as many modern aluminum alloys. Tensile strength = 97 MPa
- **Carbon Fiber** – Has tensile strength in the same realm as many modern steel alloys. Used to replace machined aluminum. Tensile strength = 700 MPa
- **Kevlar®** – Optimal for parts that experience repeated and sudden loading. Tensile strength = 610 MPa
- **Fiberglass** – Provides high strength at an accessible price. Tensile strength = 590 MPa
- **HSHT FG** – Exhibits Aluminum strength and high heat tolerance. Tensile strength = 600 MPa

Hummingbird 3D Solutions recently put these innovative materials into practice when approached about replacing a cast aluminum part by a customer in the Triad Area. The team is currently offering resolution by using Continuous Fiber Fabrication (CFF), which integrates linear stands of carbon fiber throughout layers of a proprietary blend to create a part with an incredible strength-to-weight ratio. This isn't the first collaboration between the two companies. The large manufacturing firm has been operating machines for many months utilizing custom Alloy 910 gears made by Hummingbird.

REASONS TO UTILIZE ADDITIVE MANUFACTURING

Flexibility - AM allows for easy alteration of existing parts, recreating out-of-production parts, and the ability to alter material characteristics and colors.

Reliability - AM is capable of producing accurately designed parts providing great strength while yielding long service life.

Speed - AM decreases lost production time for manufacturers by expediting the availability of repair parts for machinery. AM allows companies to enter local market spaces more quickly on finished goods or marketing pieces.

Cost-Effectiveness - For small to intermediate production runs, AM is far superior in terms of cost to injection molding, casting, forging or subtractive machining. With the advancements in materials, these cost savings can now be achieved by companies that were once reliant solely on metal parts to meet their needs.

For more information on additive manufacturing and how to integrate it into your organization's supply chain, visit Hummingbird 3D Solutions (www.hummingbird3d.com), call 336-792-6637, or email them directly at info@hummingbird3d.com



WE MANUFACTURE HIGH QUALITY INDUSTRIAL PARTS EFFICIENTLY, RESPONSIBLY, AND LOCALLY.



hummingbird3d.com | 336.792.6637 | 256 W Trade St, Burlington, NC