

# Thermoplastic Composites

ADDED LAYERS OF STRENGTH AND FLEXIBILITY  
FOR DESIGN, PROTOTYPING AND MANUFACTURING



# Empowering the world to conceptualize, manufacture and implement advanced composite solutions.

For more than 30 years, Automated Dynamics has been a global leader in automated composite production. We specialize in the manufacturing of high-performance composite structures, development of advanced automation equipment and solution-based engineering services. Through the use of a true out-of-autoclave (OoA) process, we bring additive manufacturing to

continuous-fiber thermoplastic composite parts, saving weight and improving reliability in today's most demanding engineering environments. We offer patented Automated Fiber Placement (AFP) technologies. As recognized innovators, we have produced hundreds of thousands of composite parts for over 500 clients in 17 countries.



## What are Thermoplastics?

Thermoplastic polymers are melt-processable plastics. Addition-type thermoplastics are capable of yielding long molecular chains with very high molecular weights.

## What does this mean?

When a thermoplastic polymer is heated above its melt point, the plastic softens enough to be processed. When the heat source is removed and the temperature drops below the plastic's melt point, it freezes, or solidifies. This process can be repeated, allowing parts to be created one layer at a time. Complex geometries can be formed with thermoplastics, without the need for secondary processing, such as curing in an autoclave.

## Why Use Thermoplastic Composites?

Compared with traditional metal materials, neat (unreinforced) plastics and even thermoset composites, fiber-reinforced thermoplastic composites:

- **Have dramatically superior strength-to-weight capabilities**
- **Offer lighter, less brittle, tougher parts**
- **Possess greater fatigue properties**
- **Provide greater resistance to corrosive chemicals, water absorption and heat**
- **Utilize Out-of-Autoclave (OoA) processing that drastically reduces cycle times and energy consumption**

As an additive layering process, the use of thermoplastic composites can trim significant time and expense during design, prototyping and manufacturing. Thermoplastics are recyclable and repairable, which cuts down on waste, and their ability to bond to differing materials enables the creation of hybrid structures.

Call us for immediate assistance -OR- visit our website for more details and technical information!

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