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Long Fiber Reinforced Thermoplastics (LFTs) are Transforming Drones and its Manufacturing

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Exploded view of Drone - showcasing possibilities of Long Fiber Reinforced Thermoplastics use in various parts.



Performance starts with Better Materials

The global drone industry is evolving at an unprecedented pace. From commercial delivery drones and agricultural UAVs to defense surveillance systems and industrial inspection platforms, manufacturers are under constant pressure to build drones that fly longer, carry heavier payloads, and operate reliably in demanding environments.

This is where **Long Fiber Thermoplastics (LFTs)** are emerging as a next-generation material solution.

By combining long reinforcing fibers with high-performance thermoplastic matrices, LFTs provide an exceptional balance of lightweight construction, mechanical strength, impact resistance, and manufacturing efficiency, making them increasingly attractive for advanced drone applications. SKYi's Long Fiber Thermoplastics are engineered to deliver superior strength-to-weight ratios, excellent durability, and processing advantages across demanding structural applications.

Why Drone Material Selection Matters

Every gram of weight added to a drone affects:

- Flight duration
- Payload capacity
- Energy consumption
- Motor efficiency
- Battery size
- Flight stability

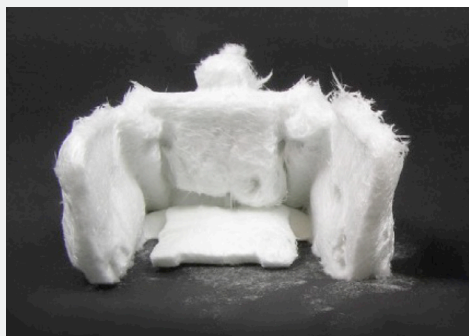
The ideal drone material must therefore combine:

- High stiffness
- Low weight
- Excellent fatigue resistance
- Dimensional stability
- Weather resistance
- Efficient manufacturing

Meeting all these requirements simultaneously is challenging using conventional materials.



Before incineration



After incineration continuous 3D skeleton of fibers

What Makes Long Fiber Thermoplastics Different?

Long Fiber Thermoplastics consist of reinforcing fibers - typically glass or carbon fibers approximately 10–12 mm long - embedded within an engineered thermoplastic matrix such as polypropylene (PP), polyamide (PA), polyesters PET, or PBT, high performance polymers such as PAEK, PEKK etc.

Unlike short fiber composites, the longer fibers create a continuous load-bearing network that significantly improves:

- Stiffness
- Impact resistance
- Fatigue life
- Energy absorption
- Structural rigidity
- Creep resistance

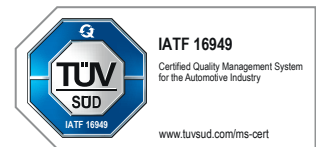
During injection molding, these longer fibers form an internal reinforcement structure that distributes stresses more effectively than conventional short-fiber materials.



R&D Capabilities

- 3 production lines giving combined capacity of 7500MT/annum spread over 65000 square feet
- Flexible pilot-scale long fiber reinforced plastic manufacturing line
- Research partnership with various institutes
- Conditioning chamber, extensometer, injection molding set-up, mold flow and other data generation
- Modified injection molding machine for LFT to produce prototype parts

Certifications



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