TECH OFFER

Continuous Fiber Composite 3D Printing

KEY INFORMATION

TECHNOLOGY CATEGORY:
Materials - Composites

TECHNOLOGY READINESS LEVEL (TRL): TRL5
COUNTRY: SINGAPORE
ID NUMBER: TO175308

OVERVIEW

This system introduces a high-performance composite industrial 3D printer with a modular print system, enabling users to seamlessly switch between different composite print engines. It uses a unique combination of Fused Filament Fabrication (FFF) and Continuous Fiber Reinforcement (CFR) technology to create high-strength parts with exceptional dimensional accuracy. Designed for industrial-scale production, its expansive print volume accommodates the creation of large, complex parts with ease. This is particularly beneficial for industries like aerospace and automotive, where intricate designs are often required. Additionally, the 3D printing approach significantly reduces production time compared to traditional manufacturing methods, allowing for faster turnaround and increased efficiency.

The technology owner is seeking for industry use cases for co-development.

TECHNOLOGY FEATURES & SPECIFICATIONS

This technology utilizes Fused Filament Fabrication (FFF) and Continuous Fiber Reinforcement (CFR) technologies to produce high-strength parts with excellent dimensional accuracy.

- **Large-scale prints:** 375mm x 300mm x 300mm, suitable for large-scale prints in industrial applications.
- **Fine resolution:** Z layer resolution ranges from 125µm to 250µm for composite prints.
- **Wide range of compatible materials:**
    - Composite base material - Micro carbon fiber filled nylon with flexural strength of 71 Mpa. Comes with options containing flame retardant properties or static-dissipative properties. It is high strength, toughness, and chemical resistance when printed alone.
    - Composite material - Ultra-high-strength continuous fiber of flexural strength 540 Mpa. When laid into a composite base material, it can yield parts as strong as 6061-T6 Aluminum.

POTENTIAL APPLICATIONS

- **Automotive industry:** Produce custom parts and components for vehicles, enabling faster development cycles and reducing the need for expensive tooling.
- **Aerospace:** Create lightweight, high-strength parts makes it suitable for aerospace applications, where weight reduction and structural integrity are critical.
- **Medical devices:** Produce custom medical devices and implants, tailored to the specific needs of patients.
- **Consumer goods and other applications:** Create durable and high-quality consumer products, from household items to sports equipment.

UNIQUE VALUE PROPOSITION

- **Hight strength-to-weight ratio:** Yield parts as strong as aluminium material.
- **Shorter lead time:** Produce customized composite parts on demand, which increases time to market, reduce fabrication and inventory costs compared to traditional composite manufacturing methods.