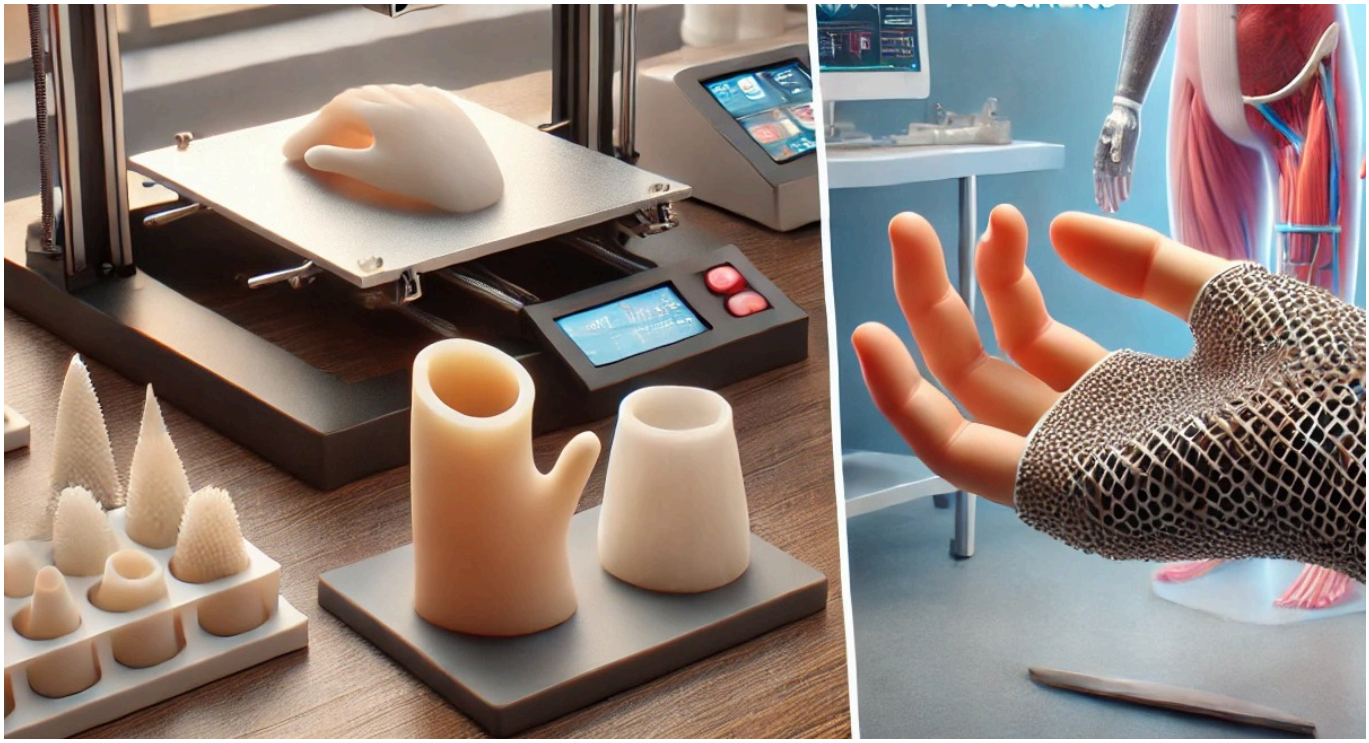
Innovation Partner for Impact

TECH OFFER

Advanced Multi-Material Silicone 3D Printer



KEY INFORMATION

TECHNOLOGY CATEGORY:
Manufacturing - Additive Manufacturing
Manufacturing - Assembly, Automation & Robotics
Materials - Plastics & Elastomers

TECHNOLOGY READINESS LEVEL (TRL): TRL4
COUNTRY: SINGAPORE
ID NUMBER: TO175240

OVERVIEW

Current additive manufacturing technologies face limitations in material diversity, lengthy post-processing times and difficulties in integrating complex structures or fibers into printed components. As a result, traditional 3D printers and processes struggle to meet the growing demand for more versatile applications.

The Advanced Multi-Material Silicone 3D Printer addresses these challenges by enabling 3D printing with a wide range of materials, from soft elastomers to hard epoxies. This technology produces high-resolution geometries with customizable mechanical properties. It enables the fabrication of hollow structures and advanced textures without the need for molds or multi-step processes. It resolves a significant pain point in the production of intricate, flexible components by reducing production time and expanding the range of printable materials. By bridging a critical gap in the market, this technology and its IP offers a flexible, multi-material 3D printing solution that delivers both performance and efficiency.

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The technology owner is looking for potential partnership through R&D collaboration, IP licensing and test-bedding. Ideal collaboration partners across the value chain include companies in automation, robotics, manufacturing, medical devices, and wearable technology.

TECHNOLOGY FEATURES & SPECIFICATIONS

Key Features:

- **Multi-material 3D printing:** 3D print with a wide range of materials, from soft elastomers to hard epoxies, offering greater versatility in applications
- **Direct ink writing (DIW):** printing with support gels enables the fabrication of intricate, high-resolution geometries, including hollow structures and flexible components
- **Automated fiber embedding (AFE):** enhanced mechanical properties of printed objects through seamlessly embedding fibers during the printing process

Specifications of 3D Printer:

- Build volume: 350 x 350 x 400 mm
- Printing accuracy: +/- 0.1mm
- Control pressure: 1-100 psi
- 3 Cameras (Front camera, bottom camera and top stereo vision camera)
- Auto bed levelling
- Multi-material printing
- Integrated pressure control

POTENTIAL APPLICATIONS

- **Healthcare:** ideal for medical devices requiring elastomer components with complex structures, such as custom prosthetics, orthotics, and implants
- **Automation, Robotics, and Manufacturing:** enables the creation of inflatable structures, actuators, and grippers with complex geometries and integrated functionality
- **Wearables:** facilitates the production of smart textiles by printing directly onto fabrics, supporting the development of smart clothing with integrated sensors, communication systems, and responsive elements, as well as fashion enhancements
- **Prototyping:** offers a rapid turnaround for customized components compared to traditional multi-step elastomer molding methods
- **Other Applications:** consumer goods industries that require the fabrication of intricate and flexible components

UNIQUE VALUE PROPOSITION

- **Multi-material product:** 3D printed part with varying elasticity and hardness
- **Seamless integration:** enables high-resolution geometries with hollow structures and advanced textures
- **Design flexibility:** overcomes traditional molding constraints, allowing for greater creative freedom
- **Time and cost efficient:** reduces production and post-processing times compared to traditional multi-step molding techniques

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