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## Selective Laser Melting of Fiber-Reinforced Glass Composites

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### Abstract

A selective laser melting (SLM) process is developed for manufacturing of a novel glass fiber-reinforced glass (GRFG) composite material. Experiments using a continuous wave fiber laser are conducted for demonstrating this SLM process using borosilicate S-glass fibers and fine soda lime glass powders, which have distinct glass transition temperatures. During laser scanning, fine glass powders turn into viscous flow. The molten glass flows through and encapsulates the relatively solid fibers, which are not fused due to their relatively higher glass transition temperature. Upon cooling, a compacted GRFG composite forms with a high volume ratio of intact and well-encapsulated glass fibers.

### Keywords

Fiber-reinforced glass composite; selective laser melting; fibers; glass powder; microstructure.

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