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M1Po3B-05: Exploring Cryogenic Properties of 3-D Printed Materials using FDM and SLA Techniques

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In recent years, 3-D printing has gained widespread popularity as a cost-effective method for rapid prototyping across various fields. The emergence of new materials has broadened the potential applications of 3-D printing, such as opto-mechanical supports in cryogenic environments. However, many of these materials lack defined thermal and mechanical properties under cryogenic conditions. This paper addresses this gap by determining the thermal conductivity and stress of various 3-D printed materials fabricated using both Fused Deposition Modeling (FDM) and Stereolithography (SLA) techniques under cryogenic environments. The materials selected for this study exhibit a total mass loss (TML) lower than 1%, a critical criterion for cryogenic applications. Through analysis and experimentation, this study aims to provide valuable insights into the performance and suitability of select 3-D printed materials for cryogenic applications.

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