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Authors: Ivan Q. Vu, Lindsey B. Bass, Christopher B. Williams, David A. Dillard



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Characterizing the effect of print orientation on interface integrity of multi-material jetting additive manufacturing

Ivan Q. Vu*, Lindsey B. Bass†, Christopher B. Williams†, David A. Dillard*

* Biomedical Engineering and Mechanics Department

† Mechanical Engineering Department

DREAMS Laboratory
Macromolecules Innovation Institute
Virginia Tech, Blacksburg, VA 24061

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Abstract

Relatively few engineering devices and structures are monolithic, as combinations of materials are often needed to meet the necessary functionality, performance, weight, and cost requirements. Progress in additive manufacturing (AM) now allows multiple materials to be produced in a single manufacturing process, opening new opportunities for expeditiously achieving functional and performance targets. Just as interactions at interfaces have long been of interest in the area of adhesive bonding, similar issues need to be addressed for printed composite materials including how print orientation may affect failure. In this study, acrylic photopolymers were printed in a multi-material jetting process to produce fracture specimens consisting of an elastomeric layer sandwiched between two stiffer strips. Findings are offered as contributions to the three process modeling challenge

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