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This study presents a graphical concept to address the dimensional and geometric viability of 3D printers with test targets, named as GETTs that are complementary to those currently available. This study has validated that dimensional failures can be observed and estimated visually with systematic target designs. The GETTs examples from three suites of test targets (line, angular and circular) presented in this study have demonstrated the feasibility in detecting geometric and dimensional errors. With further validation with high addressability machines and more machine-specific target designs, GETTs have the potential as a simplified print quality inspection tool, a working standard, a target for in-line system control, and for studying the system or subsystem responses to process parameters.

The aims of this research are to develop geometric element test targets, measurement methodologies and to assess system responses of additive manufacturing (AM) processes. By exploiting and measuring systematic limitations, the project seeks to determine transfer functions between digital representations and printed parts as well as to explore opportunities for use of the GETTs in in-line assessments and process controls.

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