

ABSTRACT

SLM MATERIALS DEVELOPMENT

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The purpose of this project was to create a procedure to efficiently determine a “recipe” of parameter values that create a desired set of mechanical properties. Research was conducted into the laser powder bed fusion process with focus on underdeveloped materials. A design of experiment was used with a set of density correlated parameters to establish a method of producing nearly dense parts. Our methods include SLM printing, metrology, and statistical analysis. An experimental procedure for materials development was designed, but unable to be validated during the scope of this project, due to unforeseen safety issues (exposure to Chromium 6, a toxic substance). Next steps include validation of this procedure using various metal powders in a SLM 125 HL.