

# High-throughput Process Mapping for Additively Manufactured 316L Stainless Steel and FeCoNiCrMn High Entropy Alloys

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**Abstract:** A high-throughput (HT) method to determine processing maps for 316L stainless steel and FeCoNiCrMn High Entropy Alloy (HEA) has been developed. HT density and hardness measurements of hex-nut shaped samples at varying laser power and scanning speeds allowed for rapid identification of processing window in a Select Laser Melting (SLM) additive manufacturing system. Our experiments with 316L stainless steel and the HEA demonstrate the potential of this approach to quickly identify correlations between processing parameters and physical properties. This method also provides a roadmap for identifying ideal SLM processing windows for novel materials, expanding the pool of materials available for SLM additive manufacturing.