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Laser Assisted Manufacturing: A Comparison of Mechanical Properties between LAM and Conventional Techniques

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ABSTRACT

Laser assisted manufacturing methods, such as direct metal deposition (DMD) and laser beam welding (LBW), are promising methods because of their higher precision and greater productivity when compared to traditional manufacturing methods. Because these methods are relatively new, the mechanical properties of samples produced by laser assisted manufacturing are not well understood. In this study the mechanical properties of samples produced by laser assisted manufacturing methods are analyzed and compared with data obtained from traditional manufacturing methods. The DMD process used Fe-TiC and Ti-TiC metal matrix composites, while LBW used AISI 304 stainless steel. The results vary widely with the materials and processes used. Although their use is highly dependent upon the individual applications and their needs, laser assisted manufacturing methods present an alternative to conventional techniques. This study can serve as a guide to comparing the results of various manufacturing methods and choosing the appropriate technique for the desired results.

Keywords: Laser Manufacturing, Laser welding, Laser deposition, Titanium Carbide, 304SS