

ANCHORING-BASED CONTROL OF DISSIMILAR MATERIAL INTERFACE FOR MULTI-MATERIAL LASER DIRECT ENERGY DEPOSITION

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Key Words: Laser direct energy deposition; Multi-material additive manufacturing; Interfaces.

Multi-material additive manufacturing can be used to fabricate components with multiple materials possessing new functionalities that cannot be realized by a single material. Laser direct energy deposition (L-DED) is a well-known metal additive manufacturing technology which are relevant to multi-material fabrication. However, for many combinations of dissimilar metallic materials, brittle intermetallic phases are easily formed at interfaces that often result in delamination cracking and make the materials difficult to be joined. In this study, a L-DED processing method is developed to achieve multi-material components with a strong interface bonding, based on anchor-like structures produced during the L-DED. Multi-material L-DED of Fe-Al dissimilar materials – a well-known combination of materials that are difficult to join – is demonstrated.

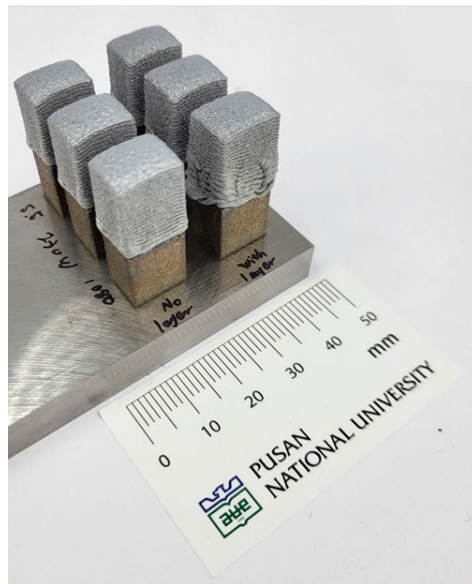


Figure 1 – Fe-Al multi-material samples produced by L-DED.