

Synthesis of functionally graded material H13/Cu by LENS technology

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ABSTRACT

Functionally Graded Material (FGM) is classified as advanced material characterized by variation in properties as the dimension varies. The overall properties of FGM are unique and different from any of the individual materials that form it. There is a wide range of applications for FGM. The tool and die industry is interested in depositing a material of high thermal conductivity onto steel in order to improve thermal management and productivity. Most dies in the casting industry for injection moulding are machined from premium grade H13 tool steel. These dies provide excellent performance in terms of mechanical properties and service life, however they are characterised by relatively low thermal conductivity. In this paper, we present an innovative use of the Laser Engineered Net Shaping (LENS) technology. We have explored the possibility of synthesis of FGM using tool steel H13 and copper. Results show successful fabrication of samples with LENS technology and represent a good potential for further development and use.

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