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Effect of H13 coating thickness on the mechanical and thermal properties of copper alloy substrates deposited via laser cladding

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Copper alloy components, such as molds and tooling, allow efficient thermal dissipation but are prone to surface damage due to their relatively low strength. Applying hard coatings such as tool steels deposited by laser cladding, can significantly enhance surface strength, thereby extending the lifespan of these components.
In this study, H13 coatings with varying thicknesses were deposited onto copper-beryllium alloy substrates using laser cladding, with an intermediate stainless steel layer applied to suppress cracking. The morphology, microstructure, and elemental distribution of the H13 coatings were characterized. Additionally, the effect of coating thickness on the heat-affected zone depth, microhardness, load-bearing capacity, and thermal conductivity of the copper-beryllium substrates was carefully examined.

Speaker Country

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