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Cold sprayed W/Ni/Fe alloy coating: microstructure and mechanical properties

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Abstract: W/Ni/Fe alloy coating with different tungsten (W) content were prepared on CuCrZr substrate by cold spray (CS) process. The coating's surface and cross-section morphologies were investigated by scanning electron microscope. Results demonstrated that the CS W alloy coating was compact, voidless, crackless and free from impurities. The cohesive strength of CS W/Ni/Fe alloy coating were higher than 30MPa. The coating's maximum Vickers hardness was measured to be 528 HV. The minimum porosity of deposit was measured to be 0.1%. Its maximum thickness can reach up to 1.9 mm when graded method was applied. The thermal shock cycles of graded coating can reach up to 330 and 46 at 500°C and 800 °C respectively.

Key words: W/Ni/Fe coating, cold spray, copper alloy, porosity and microhardness, thermal shock.

1. Introduction

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