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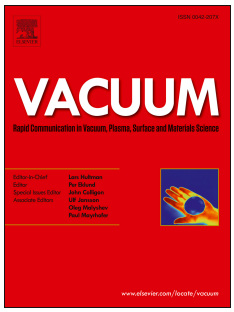

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Effect of heat treatment on the mechanical properties of copper clad steel plates

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Abstract: The mechanical properties anisotropy and heat treatment behavior of copper clad steel plates were investigated in detail. It was shown that the maximum yield strength and ultimate strength of copper clad steel plates are obtained along the tensile angle of 45°, whereas the minimum value of tensile ultimate strength (320.0MPa) can be obtained at the tensile angle of 90°. The fracture region contains fibrous zone in the middle and the edge shear slip. The tensile ultimate strength and fracture elongation are gradually decreased with the increase of annealing temperature, which is attributed to the grain coarsening and interfacial delamination at high temperature. High residual compression stress is relieved at the annealing temperature, leading to low interfacial bonding state. There are no interfacial delamination cracks presented at all the cup drawing testing samples, all the fracture angles of raw clad plate and clad plates with annealing temperatures of 600°C and 700°C are almost 90° due to the mechanical anisotropy. However, due to disappearance of mechanical anisotropy of clad plate with annealing temperature of 800°C, the fracture angle is far away from 90°.

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