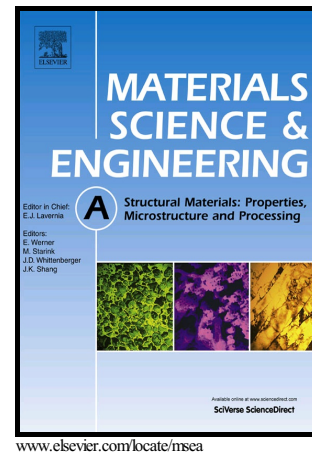


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The tensile behaviors and fracture characteristics of stainless steel clad plates with different interfacial status

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Abstract: The mechanical properties and fracture characteristics of stainless steel clad plates by vacuum hot rolling at different rolling temperature of 1100°C (S1), 1200°C (S2) and 1300°C (S3) are investigated in detail. The carburized layer thickness and grain size is gradually increased with the increasing rolling temperature. The sufficient alloy element diffusion, recovery and recrystallization at the bonding temperature of 1300°C lead to the highest interfacial shear strength and the lowest longitudinal tensile strength among the three clad plates. However, the tensile ductility is increased with the increasing rolling temperature, which is attributed to the increased interfacial bonding strength. The strong interface can effectively delay the formation of interfacial delamination crack and premature localized necking, resulting into a prolong uniform plastic deformation stage with a low stress triaxiality. In addition, there are many intergranular tunnel cracks with the length of 50~150µm presented in the carburized layer due to Cr₂₃C₆ carbides on the grain boundary, which can effectively toughen the

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