

عنوان مقاله:

Mechanical Properties and Microstructural Evolution of AA5083/Al₂O₃ Composites Fabricated by Warm Accumulative Roll Bonding

محل انتشار:

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خلاصه مقاله:

In this study, warm accumulative roll bonding (Warm- ARB) process has been used to produce Metal Matrix Composite (MMC: AA5083/-5% Al₂O₃). Starting materials were roll bonded as alternate layers up to 5 rolling cycles with 300°C preheating for five minutes before each cycle. The microstructure and mechanical properties of composites have been studied after different Warm- ARB cycles by tensile test, Vickers micro hardness test and scanning electron microscopy (SEM). The results revealed that during higher Warm- ARB cycles, breaking the layers of alumina particles led to the generation of elongated dense clusters with smaller sizes. This microstructural evolution led to improvement in the hardness, strength and elongation during the Warm- ARB process. The results demonstrated that the dispersed alumina clusters improved both the strength and tensile toughness of the composites. Finally, Warm- ARB process allowed producing metal particle reinforced with high uniformity, good mechanical properties and high bonding strength.

کلمات کلیدی:

Fractography, Mechanical Properties, Metal-Matrix composites (MMCs), Particle-Reinforced composites, Warm accumulative roll bonding

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