عنوان مقاله:

Investigation of the Microscopic Aspect of the Stress Distribution in the Accumulative Roll Bonding Process Using the Slab Method

محل انتشار:

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خلاصه مقاله:

The accumulative roll bonding (ARB) as a severe plastic deformation (SPD) procedure aimed at enhancing the mechanical properties of metals and alloys. In the present study, a new slab method is proposed for estimating the forming stress field for cold extrusion of metals cross the alumina interlayer powder particles by accumulative roll bonding process. Plastic deformation behavior of the metal at the interfaces of the strips was investigated. Distinctive particles arrangements are used for different zones in the extrusion channel in the present models and the forming stress during the extrusion process affected. The corresponding results have also been determined analytically and by using the finite element software, ABAQUS. It was found that the theoretical prediction of the forming stress of the extruded metal cross the interlayer particles is in good compliance with the numerical measurement. Moreover, the interfaces of laminates have been studied to investigate the behavior of particles by scanning electron microscopy (SEM).

کلمات کلیدی:

Slab Method, Roll bonding, Interlayer Particles, Aluminum