World Academy of Science, Engineering and Technology
International Journal of Mechanical and Materials Engineering
Vol:17, No:07, 2023

Advanced Approach to Analysis the Thin Strip Profile in Cold Rolling of Pair Roll Crossing and Shifting Mill Using an Arbitrary Lagrangian-Eulerian Technique

Authors : Abdulrahman Aljabri, Essam R. I. Mahmoud, Hamad Almohamedi, Zhengyi Jiang

Abstract : Cold rolled thin strip has received intensive attention through technological and theoretical progress in the rolling process, as well as researchers have focused on its control during rolling as an essential parameter for producing thinner strip with good shape and profile. An advanced approach has been proposed to analysis the thin strip profile in cold rolling of pair roll crossing and shifting mill using Finite Element Analysis (FEA) with an ALE technique. The ALE (Arbitrary Lagrangian-Eulerian) techniques to enable more flexibility of the ALE technique in the adjustment of the finite element mesh, which provides a significant tool for simulating the thin strip under realistic rolling process constraint and provide accurate model results. The FEA can provide theoretical basis for the 3D model of controlling the strip shape and profile in thin strip rolling, and deliver an optimal rolling process parameter, and suggest corrective changes during cold rolling of thin strip.

Keywords : pair roll crossing, work roll shifting, strip shape and profile, finite element modeling
Conference Title : ICMFMC 2023 : International Conference on Metal Forming and Material Considerations
Conference Location : Zurich, Switzerland
Conference Dates : July 24-25, 2023