

中國機械工程學會第二十四屆全國學術研討會, 中原大學, 2007 年 11 月 23-24 日:
2298-2303

應用田口法於 H 型異形材輥軋成形最佳參數選擇

陳狄成; 陳正富

摘要

本文使用三維有限元素模擬軟體 DEFORM 3D 分析輥軋加工時多孔性 H 型異形材於輥隙內之變形過程, 分析方法採用剛塑性模式, 並假設輥軋時輥輪為剛體, 且不考慮輥軋過程的溫度變化。本研究進行一系列的模擬分析, 其模擬輥軋條件包含輥輪外型 H_w/H_g 比、上下輥輪半徑、摩擦因子和多孔性板材壓下率等, 預測輥軋過程中異形材的填充率、有效應力及多孔性密度變化等, 並應用田口方法設計 H 型異形材於輥軋過程中填充率之最佳參數。

關鍵字: 田口方法; 有限元素; H 型異形材輥軋

Optimum Parameter Selection in H-Profiled Beam Rolling by Using Taguchi Method

陳狄成; 陳正富

Abstract

A three dimensional finite element code DEFORMTM 3D has been proposed in the work to examine the plastic deformation behavior at the roll gap during shape rolling of porous H-profiled beam. The rigid-plastic model was used in the finite element code. The rolls are assumed to be rigid body and the change of temperate during rolling is ignored. The analytical model is also employed to systematically examine the filling ratio at the roll gap, mean stress and various density of the beam at exit of the rolled product, which are both affected by various rolling conditions such as the H_w/H_g ratio of the roll profile, rolling radius, friction factor, the porous thickness reduction, etc. This study applies the Taguchi method to design the rolling parameters to optimize the filling ratio at the roll gap.

Key words: Taguchi method;Finite element;H-profiled beam rolling