

鋁合金自行車座管之斷面改良

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摘要

現今台灣自行車相當普及，各種高價位自行車逐漸變成主流，也代表著自行車得承受更長的路程、更顛簸的路段，使得業界不斷加強各部位零件之強度，但輕量化也是不可忽視的一大重點。基於此種考量，本研究將鋁合金自行車座管作為研究方向，改變座管斷面、擠製速度等變項，並配合田口方法，找出最適合自行車座管擠製之最佳參數組合。首先利用有限元素分析軟體 DEFORMTM 3D，配合直交表進行模擬，分析模擬結果進而計算出 S/N 比，藉以找出適用於自行車座管擠製之參數組合，並根據此參數組合設計擠製模具，來進行擠製實驗，最後比較實驗結果與模擬結果是否一致，以確認有限元素分析軟體應用於自行車座管擠製之適切性。

關鍵字：自行車座管；有限元素分析；田口方法；直交表

Sectional Shape Improvement of Aluminum Alloy Seat Tube of Bicycle

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Abstract

Nowadays, high-price bicycle has been leading the trend of bike industry with the increasing popularity in Taiwan. The development of high-price bicycles has also produced a new generation which mainly aims to both enhance the strength of components and minimize weight design of bikes. In this study, seat posts, extrusion speed and other variables were combined to form a most suitable parameter based on Taguchi method for aluminum alloy seat post of bicycle. By using finite element analysis software, DEFORMTM 3D, along with Orthogonal Arrays for simulation, the analysis of simulation results then calculated the S/N ratio, and after the module received the values, an appropriate parameter for seat post extrusion of bicycle were organized correspondingly. According to the parameter, extrusion experiment was conducted and the results were compared with the simulated ones in order to confirm the applicability of the finite element analysis software used in bicycle for seat post extrusion.

Key words: Seat post of bicycle;Finite element analysis;Taguchi method; Orthogonal Arrays