

Comparison of Tribological and Mechanical Properties of White Metal Produced by Laser Cladding and Conventional Methods

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Abstract : Bearing component has strongly required to decrease vibration and wear to achieve high durability and life time. In the industry field, bearing durability is improved by surface treatment on the bearing surface by centrifugal casting or gravity casting production method. However, this manufacturing method has caused problems such as long processing time, defect rate, and health harmful effect. To solve this problem, there is a laser cladding deposition treatment, which provides fast processing and good adhesion. Therefore, optimum conditions of white metal laser deposition should be studied to minimize bearing contact axis wear using laser cladding techniques. In this study, we deposit a soft white metal layer on SCM440, which is mainly used for shaft and bolt. On laser deposition process, the laser power and powder feed rate and laser head speed factors are controlled to find out the optimal conditions. We also measure hardness using micro Vickers, analyze FE-SEM (Field Emission Scanning Electron Microscope) and EDS (Energy Dispersive Spectroscopy) to study the mechanical properties and surface characteristics with various parameters change. Furthermore, this paper suggests the optimum condition of laser cladding deposition to apply in industrial fields. This work was supported by the Industrial Innovation Project of the Korea Evaluation Institute of Industrial Technology (KEIT) granted financial resource from the Ministry of Trade, Industry & Energy, Republic of Korea (Research no. 10051653).

Keywords : laser deposition, bearing, white metal, mechanical properties

Conference Title : ICMSE 2018 : International Conference on Materials Science and Engineering

Conference Location : Tokyo, Japan

Conference Dates : April 05-06, 2018