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Thesis Title : Study of Influence of Silicon and Zinc on the Properties of Sterling Silver 925 after Cold Forming

Major Field : Production Engineering

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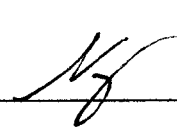
Abstract

The influence of the alloying elements such as Silicon (Si), Zinc (Zn) and Copper (Cu) on the mechanical properties of the Sterling silver 925 for the jewellery products has been studied.

The object of this thesis is to study the influence of Si and Zn on the properties the Sterling silver 925. The experimental part was to add alloying elements of Si between 0.05% and 0.31%, of Zn between 0.75% and 2.1% and of Cu between 3.1% and 5.9% by weight into the Sterling silver 925. Subsequently, they were tested to determine their hardness, tensile strength, elongation and microstructure.

The mechanical property of the cast materials had been characterised and concluded that there were two compositions of particular which were optimum combination of those properties. The first composition (containing Si 0.14%, Zn 1.6%, Cu 4.8% and balance silver) showed the best result of as cast mechanical properties; namely the tensile strength 217 MPa, the elongation 52%, the hardness 74 HV and the wire cold drawing rate 97% without heat treatment. The second composition (containing Si 0.05%, Zn 0.75%, Cu 5.8% and balance silver) gave the most excellent cold draw forming.



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