

Heat Treatment Process Parameter optimization for HSS Drill

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Abstract: *Drilling is a cutting process that uses a drill bit to make or widen a hole of circular cross section in solid material. The Bit is pressed against the work piece and rotates at high speed, Due to the increasing competitiveness in the market; the performance of drill bit must be increased. There are various methods to improve the performance of Tool Steel like Surface coating, cryogenic treatment, and optimization of heat treatment process parameter to obtain best possible metallurgical properties. By comparing with other competitor it is revealed that there is gap in performance of Taper Shank Drill. This project based on Optimization of Heat Treatment Process Parameter to improve performance with reduction in cost per component. High Speed Steel M2 material is used as drill material for experimentation. There are four parameter in heat treatment process i.e. soaking temperature, soaking time, tempering temperature and tempering time. Different experiments are performed, for that Taguchi orthogonal array (L9) is used with three levels of heat treatment process parameter. From the response of design of experiments the desired heat treatment cycle is selected. The performance of Taper shank drills in terms of number of holes drilled between two re-sharpening has to be measured. And it is expected from project that the performance of drill in terms of number of drill to be improved with a best possible temp-time relation*

Keywords: HSS M2, drill bit, Taguchi Orthogonal Array, Hardness, Heat treatment, hardness.

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