MULTI RESPONSE OPTIMIZATION OF THRUST FORCE, TORQUE AND FLANK WEAR IN DRILLING FOR S50C STEEL USING TAGUCHI-GREY RELATIONAL ANALYSIS (GRA) METHOD

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ABSTRACT

A research was conducted for the optimization of the drilling process of S50C steel, with multiple performance characteristic based on the orthogonal array with Taguchi-grey relational analysis method. The experimental studies were conducted under varying the drilling process variables, i.e., cutting speed (m/min), feed rate (mm/rev) and point angle (°). The optimized multiple performance characteristic were thrust force, torque and flank wear. The quality characteristic of thrust force, feed rate and point angle was smaller-is-better. Since all process variable had three level, the experiment design used L₉ orthogonal array with replication. Experimental results have shown that machining performance in the drilling process can be improved effectively through this method. The drilling process variables which significantly affected thrust force, torque and flank wear are cutting speed, feed rate and point angle.

Keywords: GRA, flank wear, Taguchi, thrust force, torque.
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