Deployment of the Taguchi technique for surface roughness optimisation

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Abstract: The aim is to investigate the machining parameters that are important to optimise surface roughness (*Ra*) through experimentation for EN45 steel material (AISI 9260). Optimisation of the machining parameters for a cylindrical grinding operation helps to save time, cost, and influence to get better surface characteristics and surface finish. The study deployed the Taguchi technique. The scrutinised factors included the feed rate, work speed and the depth of cut (DOC). Experimental set up involved the L_9 orthogonal array. Minitab® and Microsoft® Excel 2016 generated results after applying the design of experiment. The *Ra* was tested by using a portable surface roughness tester. The silicon carbide wheel and a hydraulic cylindrical grinder machine were used. After analysing the generated results, DOC was found to be statistically significant. The influential parameter of *Ra* was found to be DOC as it contributed to 45.3% and 58.6% before and after heat treatment processes, respectively.

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