A Project Report On

"EXPERIMENTAL INVESTIGATION OF DRILL GEOMETRY FOR BURR MINIMIZATION IN DRILLING"

(Approved by KSCST)

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ABSTRACT

Burr formation in drilling is one of the serious problems in precision engineering and mass production. The exit burr degrades the precision of products and causes additional cost of deburring. Since deburring processes are not yet well automated, the productivity of advanced manufacturing systems is often reduced.

However, these processes are labour intensive and add to the total cost of components. Exit burrs are dangerous during machining and cause groove wear, hence strongly affect the productivity and assembly process.

Therefore, understanding the drilling burr formation and its dominant parameters is essential for controlling the burr size. It is necessary to reduce the burrs on components at the production stage in order to save cost and time of deburring. This necessitates the optimization of drilling process to determine the optimal process parameters.

In this project work drilling tests were carried out using drills with various drill shapes for burr minimization. Final objective of this study is to develop compatible drill shape for minimization of burr formation.

For experiments, general carbide drills, corner drills, chamfered drills and step drills are chosen. Burrs are formed by various cutting conditions and in two different work materials.

Tool cutter and grinding machine is used to change the drill geometry and Digital Vernier Caliper is used to measure burr geometry. Also Radial drilling machine is used to perform drilling operations on the work-pieces at different feed rates and cutting speeds.

As a result of the experiments, step drills with specific step angle and step size are suggested for burr minimization.