

Optimization of Process Parameters on Ceramic by Abrasive Jet Machining.

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Abstract :- In this present work, fabrication of abrasive jet machining (AJM) setup and parametric study of various process parameters in AJM setup have been carried out. Main important output response is material removal rate (MRR) during the AJM. The main input variables that affect the output responses are nozzle diameter (ND), gas pressure and stand-off distance (SOD). Silicon carbide abrasive with grit size of 100 μm has been chosen to find out the effect of process parameters during making holes on ceramic plate. Experiments have been done by selecting L9 orthogonal array, and results have been optimized with response surface methodology. ANOVA is used to identify the significant process parameters. Statistical results (at a 95% confidence level) show that the percentage contribution of nozzle diameter, stand-off distance and gas pressure on metal removal rate is 42%, 46.9% and 9.7%, respectively. The result shows that the maximum MRR value of 0.018 g/s has been obtained by Taguchi's optimization method. From the results obtained by ANOVA, it has been found out that the stand-off distance is the most significant parameter. Contour plot has been used to determine desirable material removal rate and corresponding operating conditions during abrasive jet machining of ceramic.

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Keywords AJM · Taguchi method · MRR · ANOVA