

EXPERIMENTAL INVESTIGATION ON ULTRASONIC MACHINING OF BULLET RESISTENT GLASS (TYPE B35) USING MIXED ABRASIVE SLURRY

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ABSTRACT

Ultrasonic machining process is a frequently used non conventional machining process for the purpose of machining of brittle and non-conductive materials. It does not cause harm to the work piece surface thermally. Literature review revealed the ultrasonic machining of plain glass with ease, without any deformation and surface damage but very less work has been reported on the machining of bullet proof glass with ultrasonic machining. In present work experiments have been planned to investigate the effect of machining parameters on performance characteristics like tool wear rate, material removal rate, hardness and surface roughness while machining double laminate bullet proof glass (Type B35) for applications in manufacturing industry. Designs of experiments were planned using the Taguchi L18 array and ANNOVA was used to explicit the results. The results shows the maximum material removal rate $34.91 \pm 1.5 \text{ mm}^3/\text{min}$ is observed at 280 grit size, 30% slurry concentration, silicon carbide abrasive and 60% power rate. The Minimum tool wear rate $0.0251 \pm 1.5 \text{ mm}^3/\text{min}$ is observed at 30% slurry concentration, silicon carbide abrasive, power rate 60 and at grit size 280.