
Departmental Seminar

Seminar Title : On material removal and tool wear in microwave drilling of borosilicate glass
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Abstract : In the present investigation, microwave energy at 2.45 GHz was used to drill borosilicate glass using different metal-based concentrators (tools) in an environment of a dielectric fluid. Machining performance of different tools was monitored in terms of tool wear rate and amount of material removed; correlations were drawn between the operating parameters, material removal rate, and the tool wear based on the computational as well as experimental results. It was found that the tungsten carbide (WC) concentrator performs better than graphite and stainless-steel concentrators. Further, the effect of wear of the WC concentrator tip on the dimensional accuracy of the holes was studied. An increase in input power showed a positive influence on the material removal rate while enhancing the tendency for thermal cracking. Higher dielectric flow velocity helped in minimizing thermal cracks and removed the bulge around the hole. The wear of the concentrator tip also reduces the material removal rate.