

Chapter 2

Advancement in Ultrasonic Machining for 3D Profile Cutting



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Abstract Hard and fragile materials for example ceramics, glass and quartz crystals are getting extra consideration in modern years owing to their higher characteristics for example high strength, high hardness, chemical durability and low density. Ultrasonic machining is an abrasive based advanced machining with non-chemical, non-electrical and non-thermal process that is particularly suitable for those brittle and hard materials. The USM process principle, mechanism of material removal, varieties of USM set up, tool development of USM process, improvement and production of 3d profile by USM process and various research issues are studied and summarized in this chapter. It also highlights the effects of different parameters of USM process on performance and development of USM process.

Keywords Ultrasonic machining · Profile accuracy · Ceramics · Surface roughness · Material removal rate

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