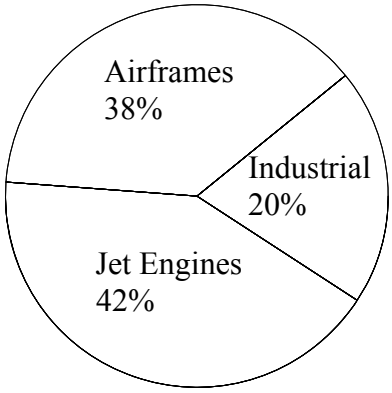
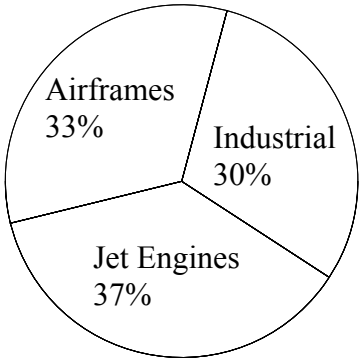


(a) USA



(b) Europe

Fig. 1. Proportion of titanium consumed in 1990 (after [1]).

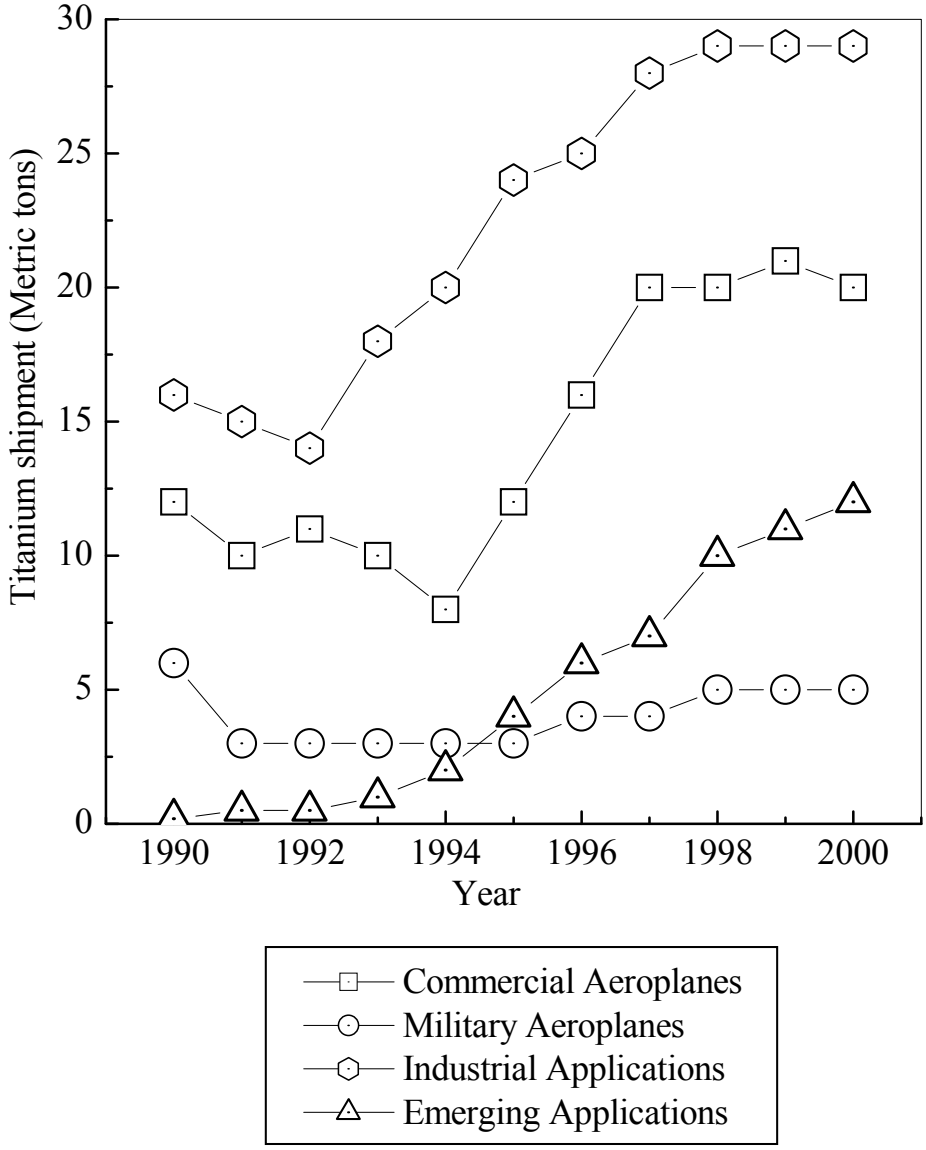


Fig. 2. Titanium mill product shipments in the USA (after [1]).

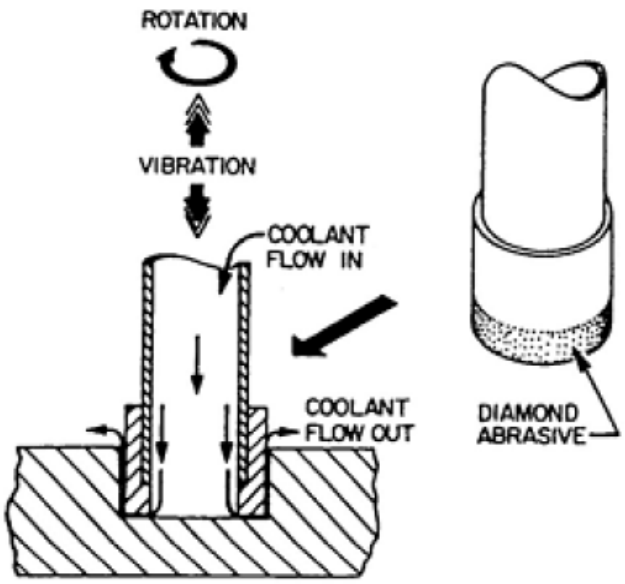


Fig. 3. Illustration of rotary ultrasonic machining.

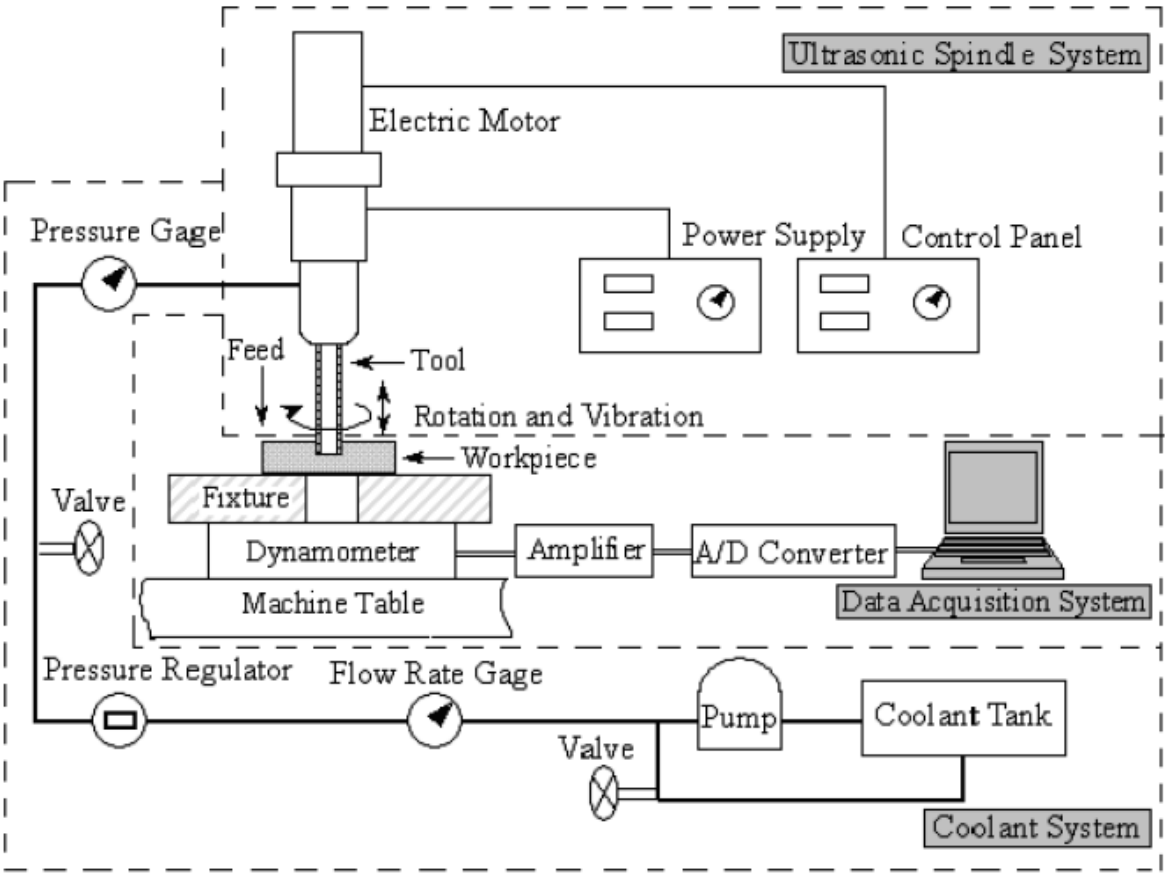


Fig. 4. Experimental set-up.

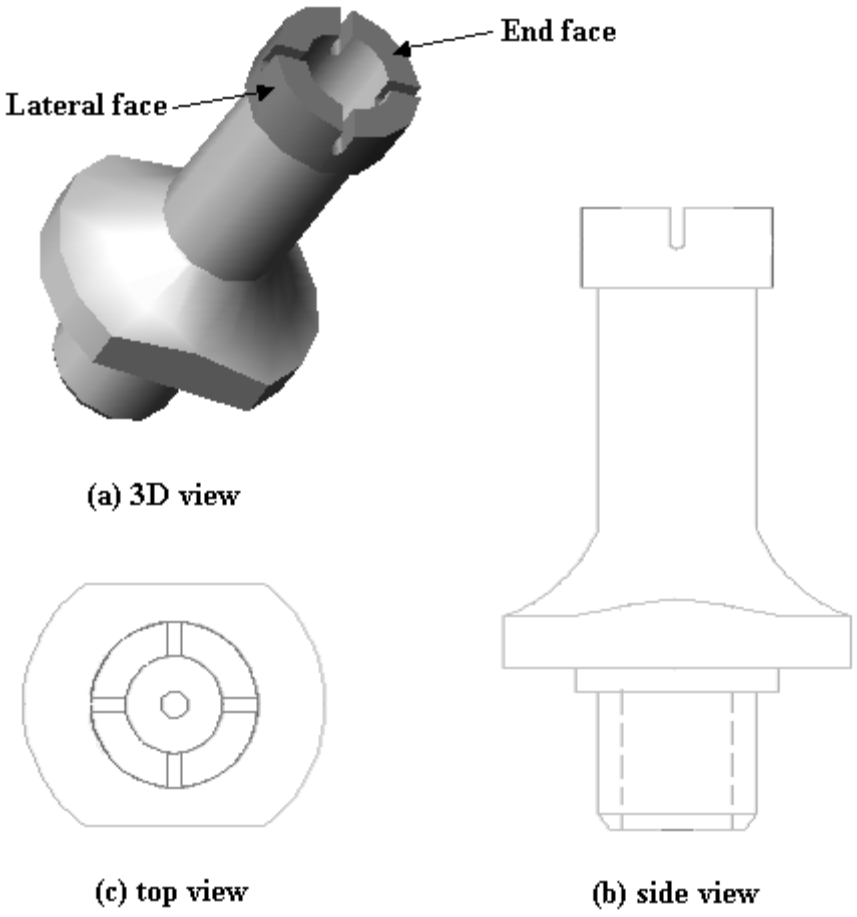


Fig. 5. Illustration of the cutting tool for rotary ultrasonic machining.

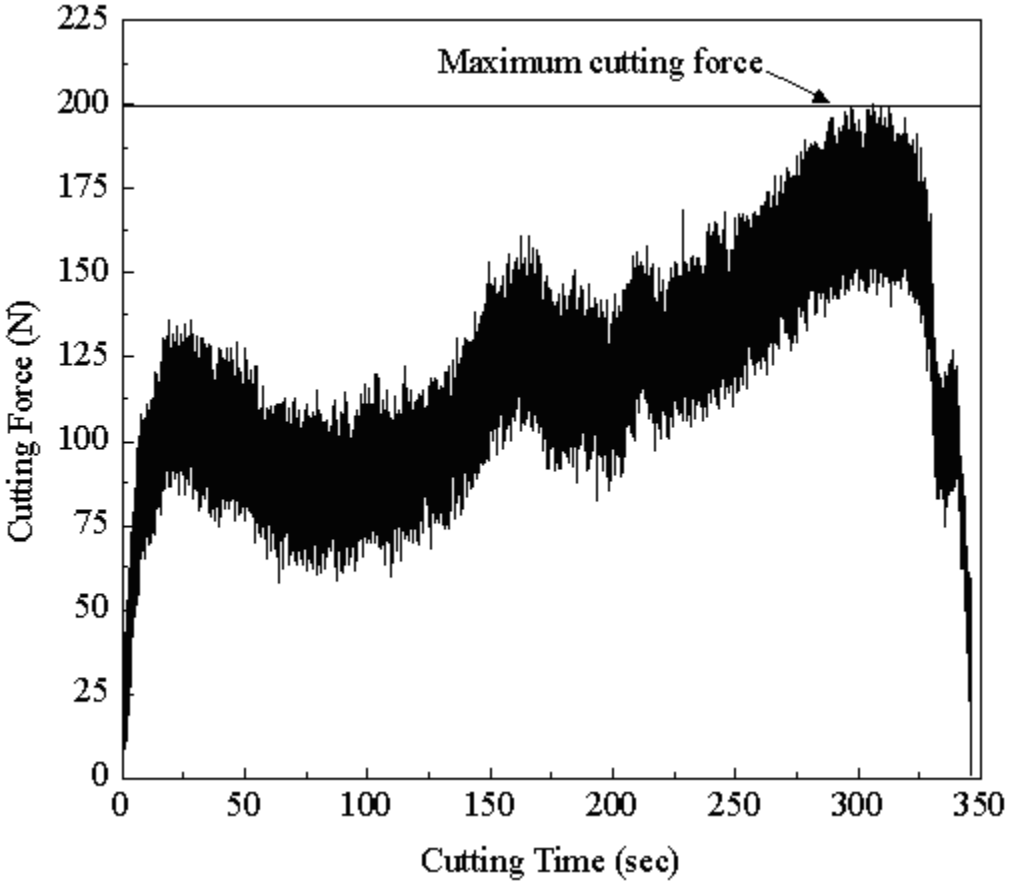


Fig. 6. Measurement of maximum cutting force.

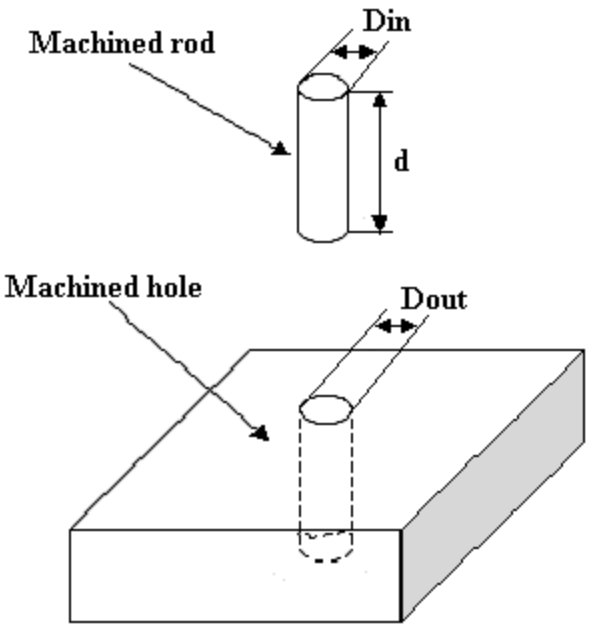


Fig. 7. Illustration of the hole and rod machined by rotary ultrasonic machining.

Fig. 8. Position of tool holding for observation of tool lateral face.

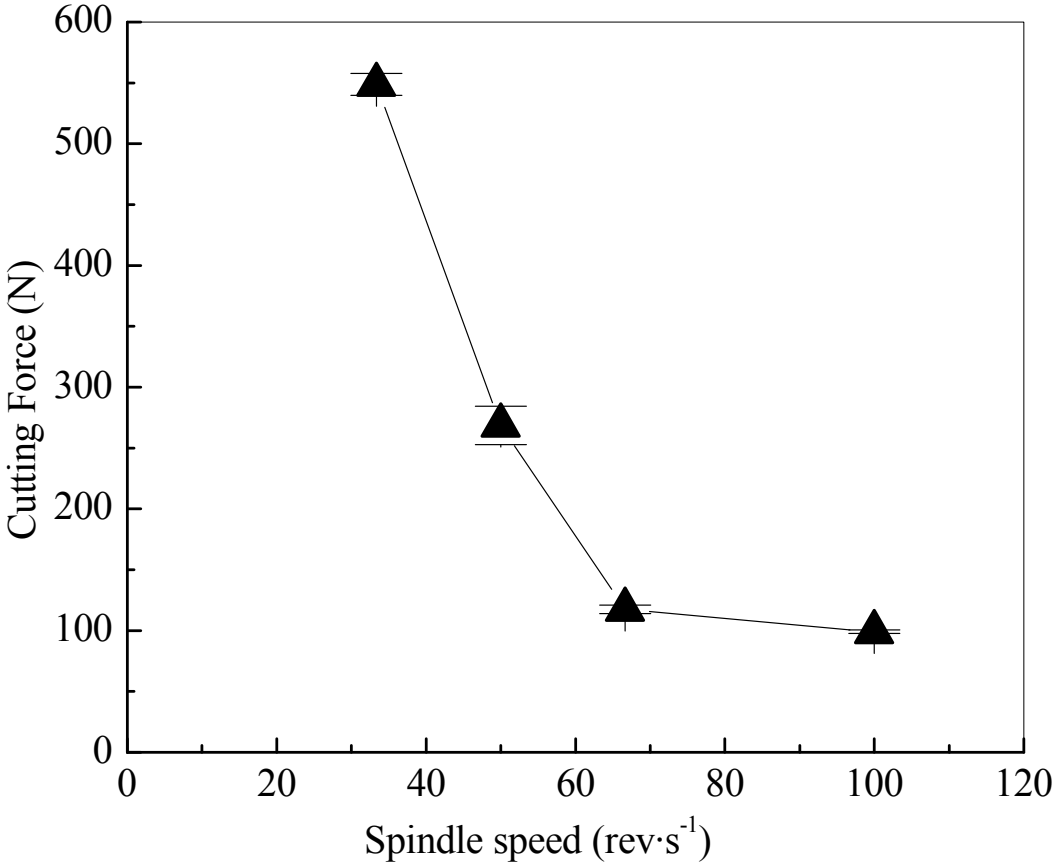


Fig. 9. Effects of spindle speed on cutting force.

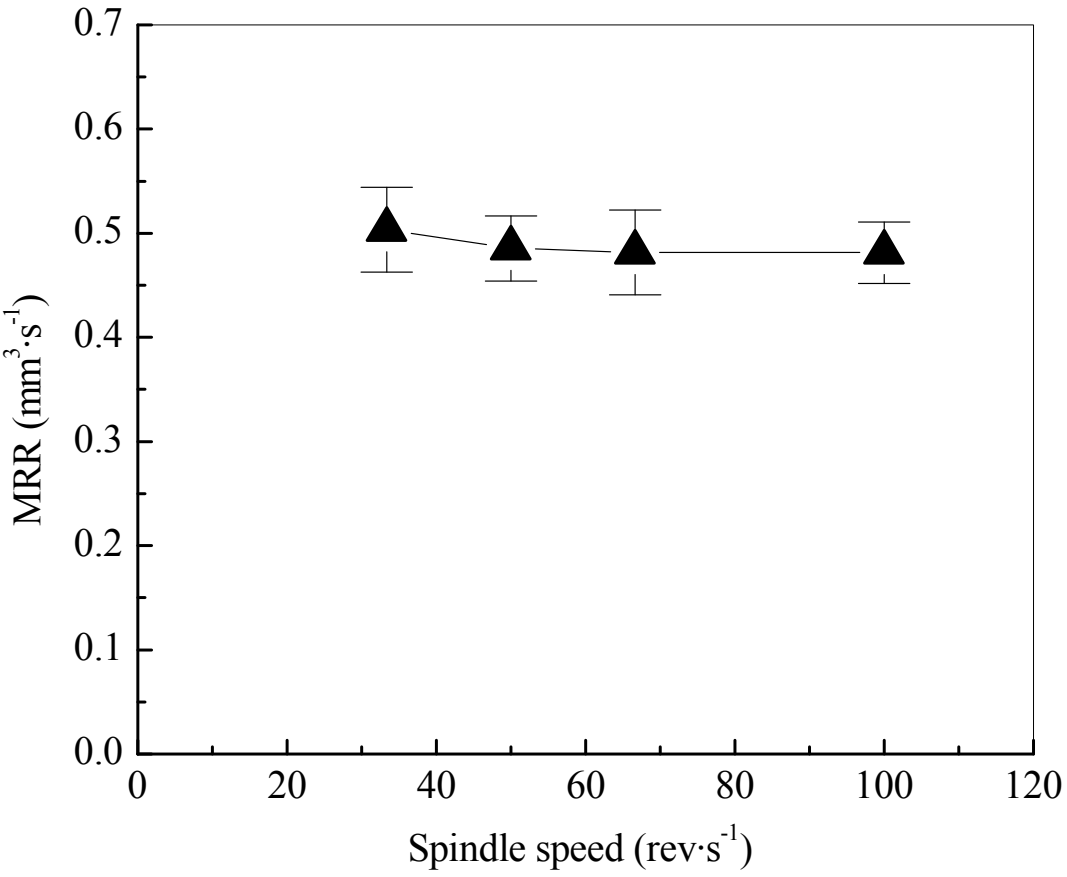


Fig. 10. Effects of spindle speed on MRR.

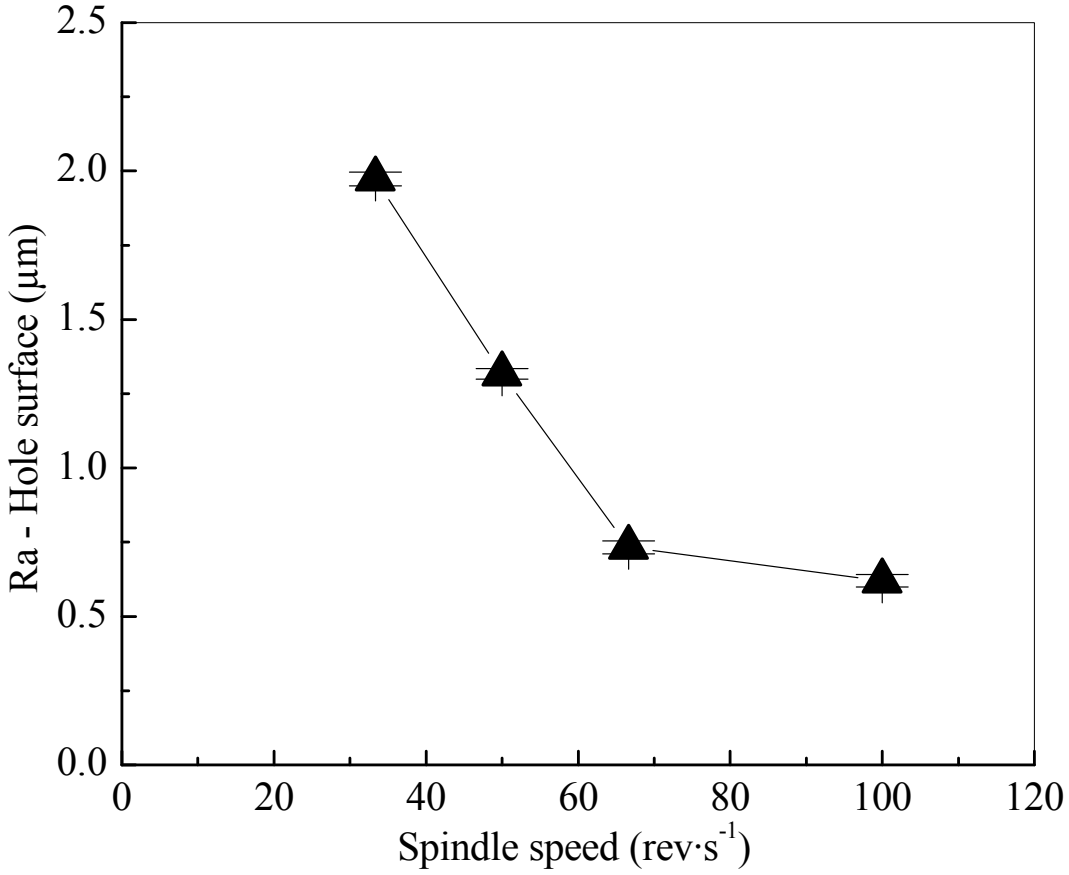


Fig. 11. Effects of spindle speed on surface roughness measured on machined hole.

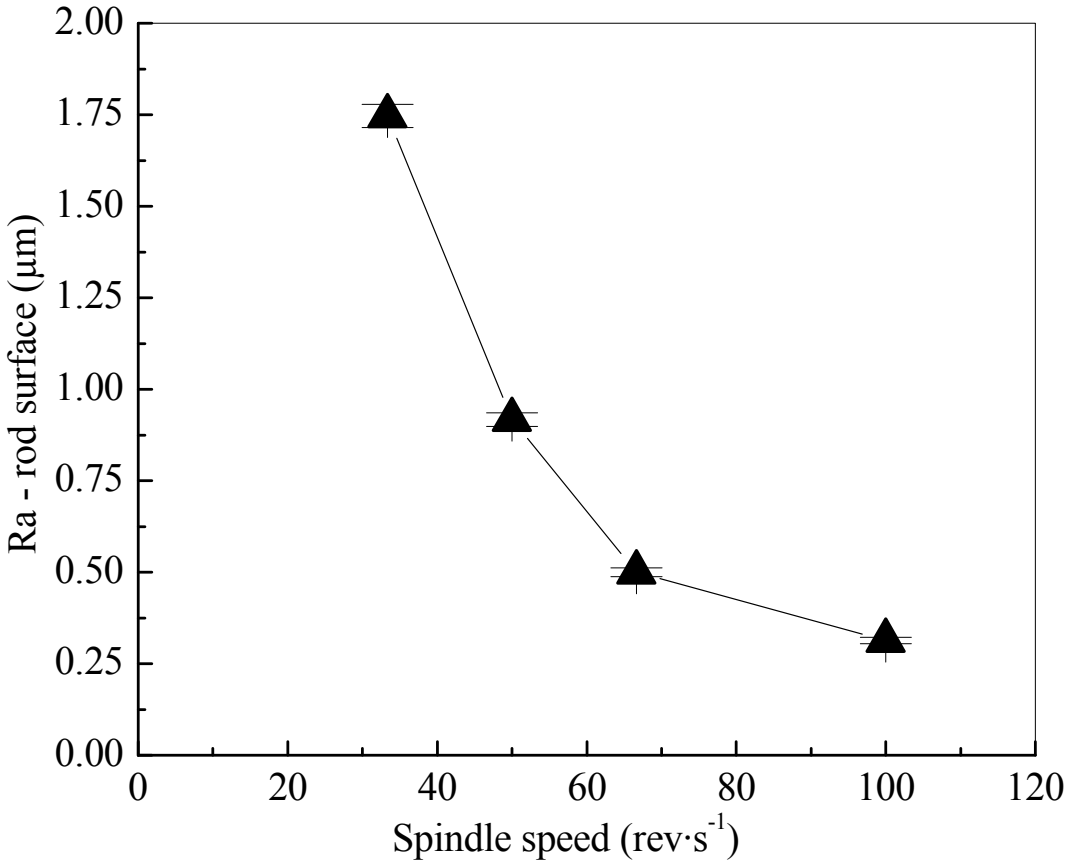


Fig. 12. Effects of spindle speed on surface roughness measured on machined rod.

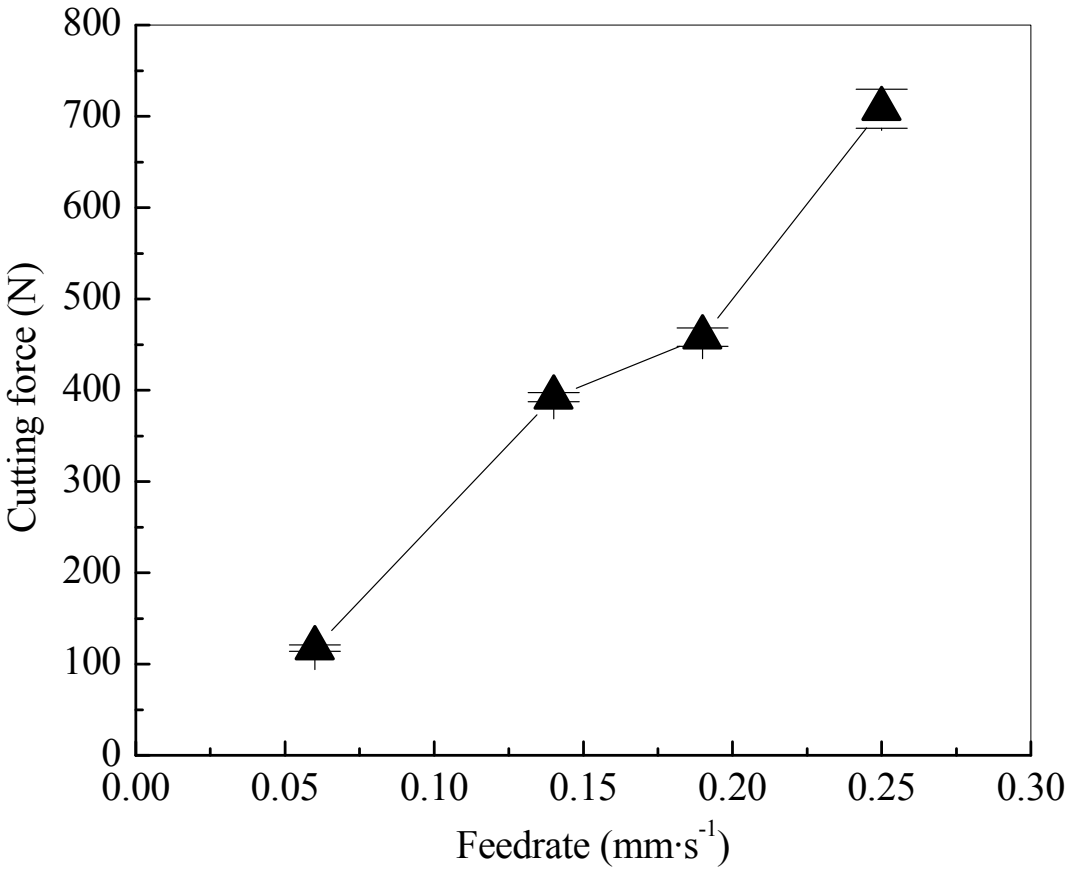


Fig. 13. Effects of feedrate on cutting force.

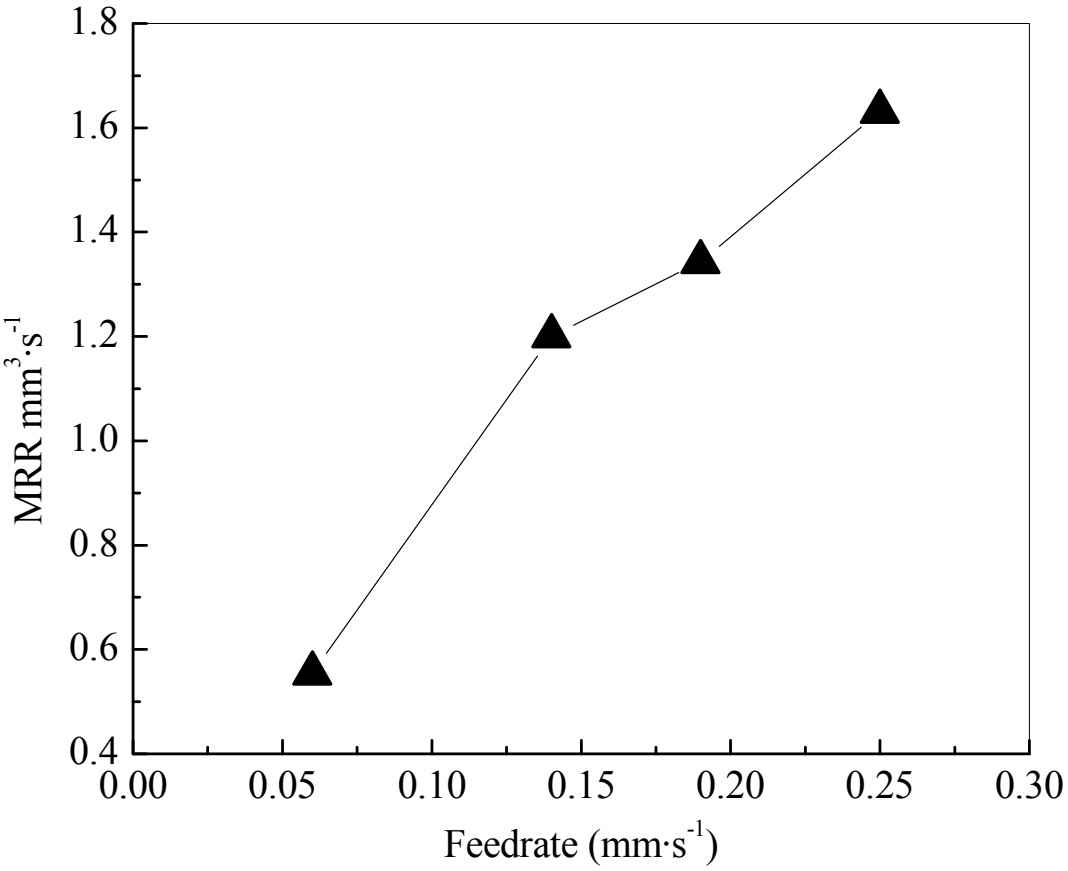


Fig. 14. Effects of feedrate on MRR.

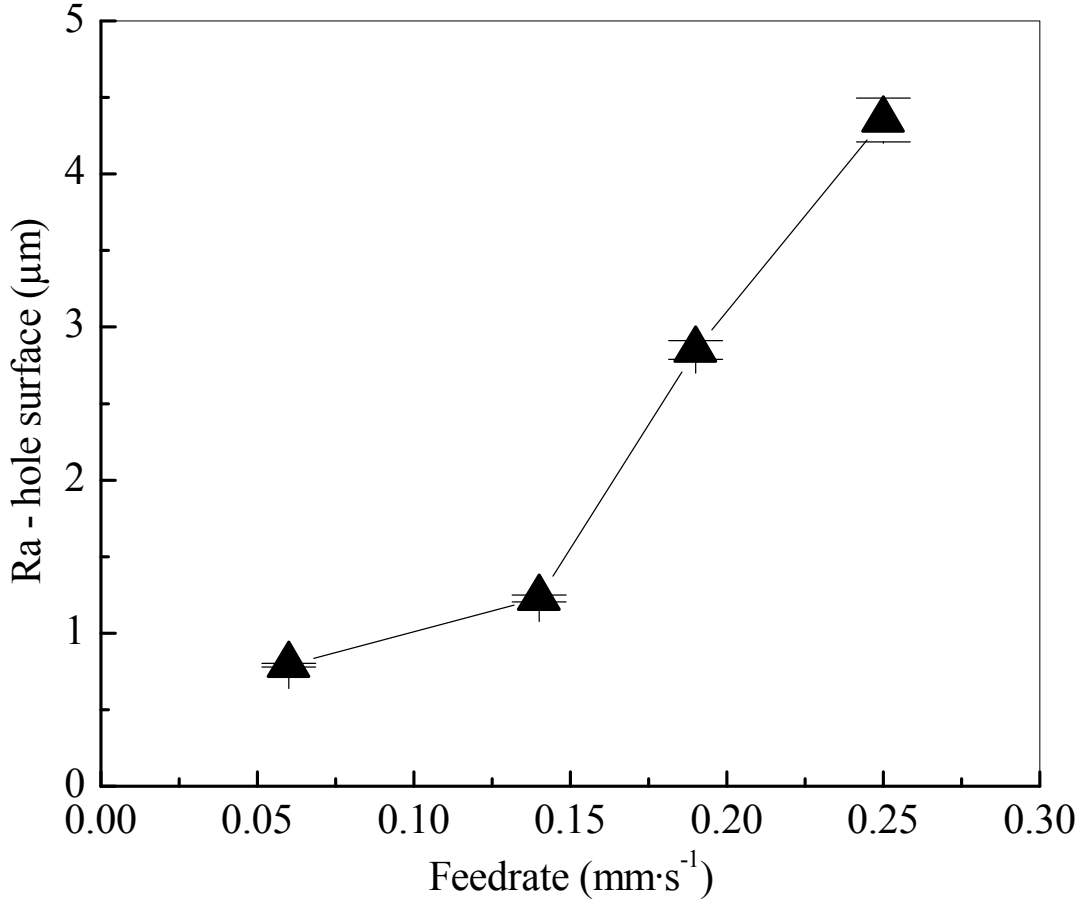


Fig. 15. Effects of feedrate on surface roughness measured on machined hole.

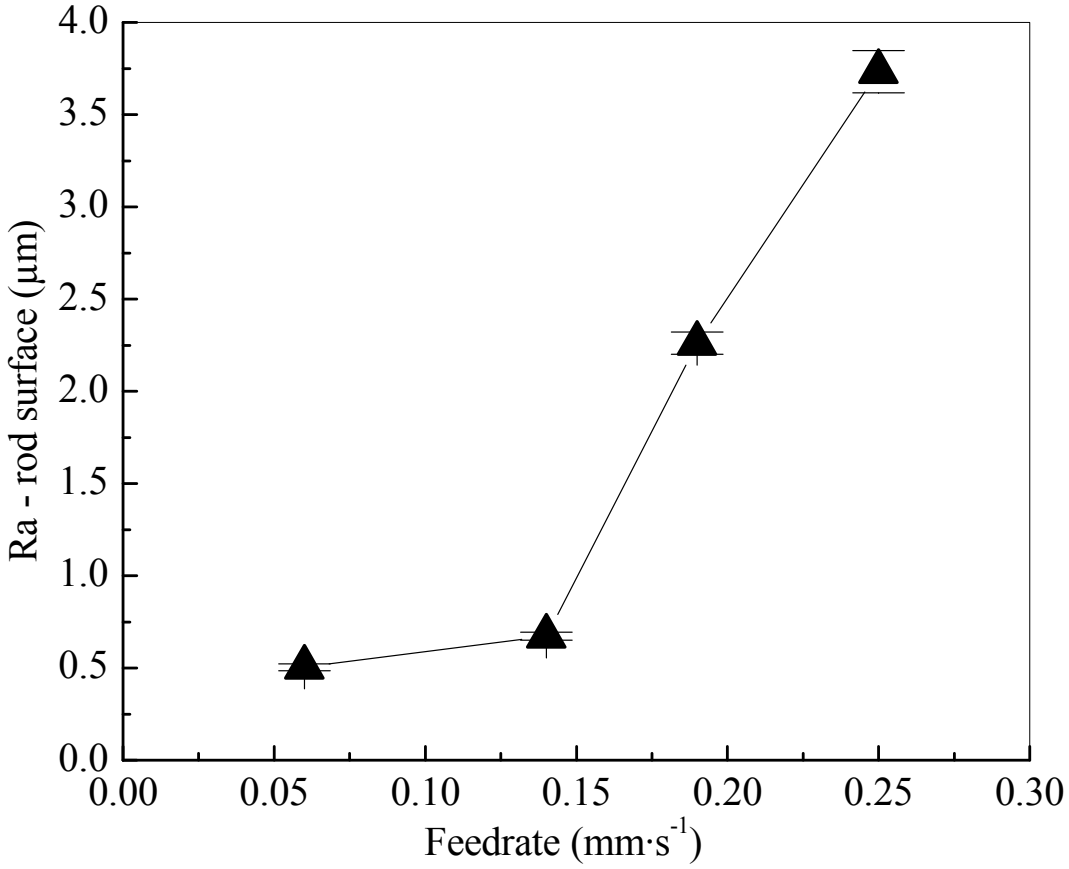


Fig. 16. Effects of feedrate on surface roughness measured on machined rod.

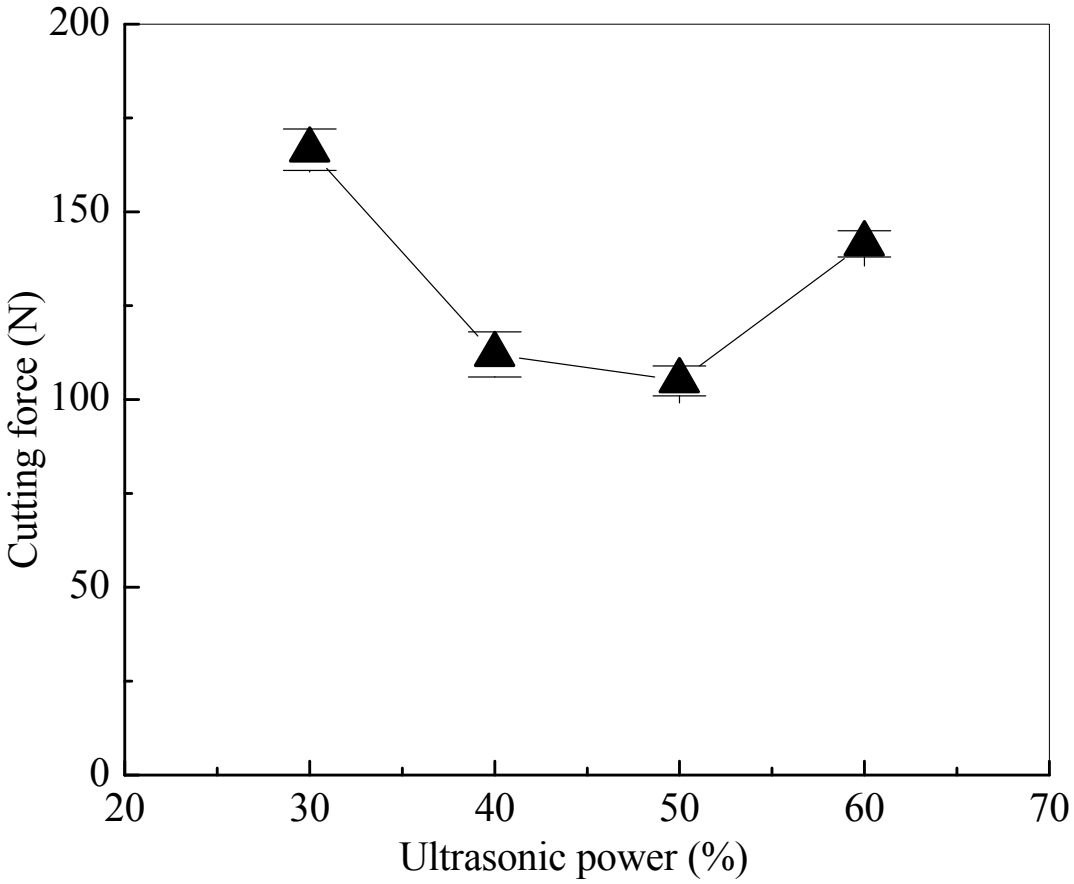


Fig. 17. Effects of ultrasonic power on cutting force.

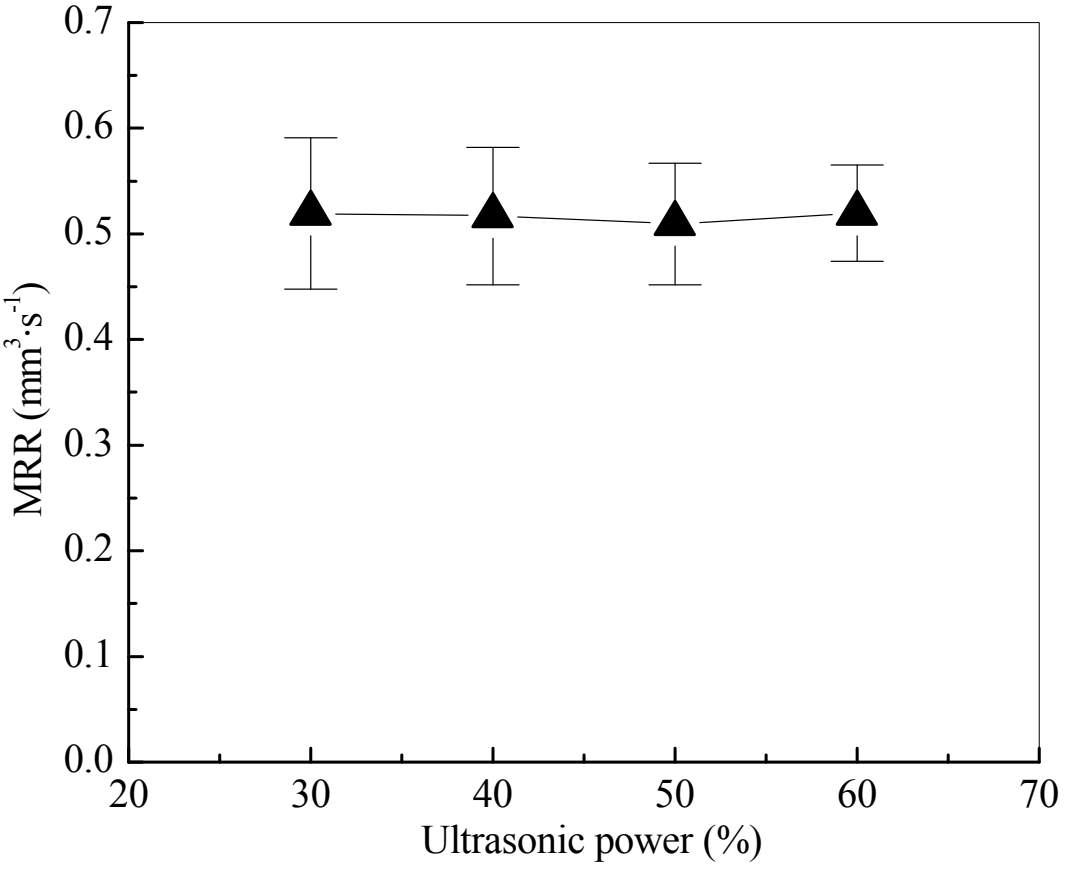


Fig. 18. Effects of ultrasonic power on MRR.

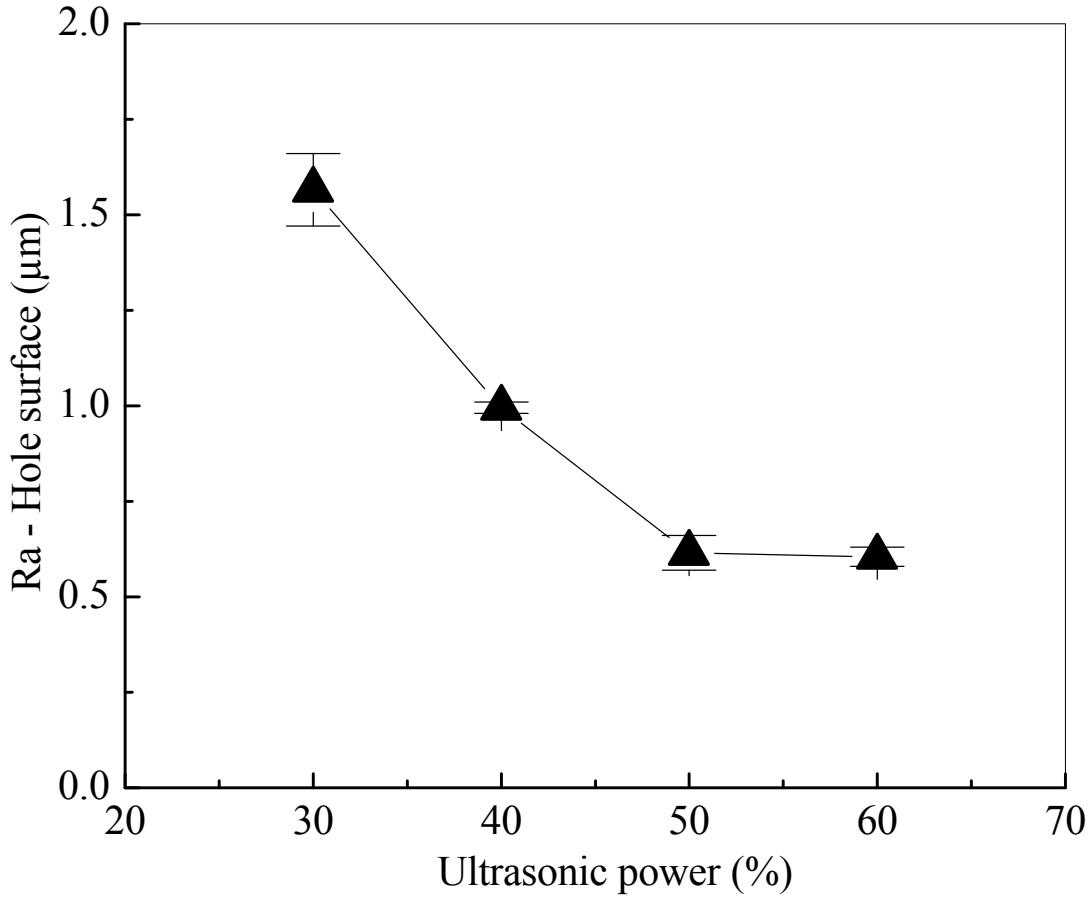


Fig. 19. Effects of ultrasonic power on surface roughness measured on machined hole.

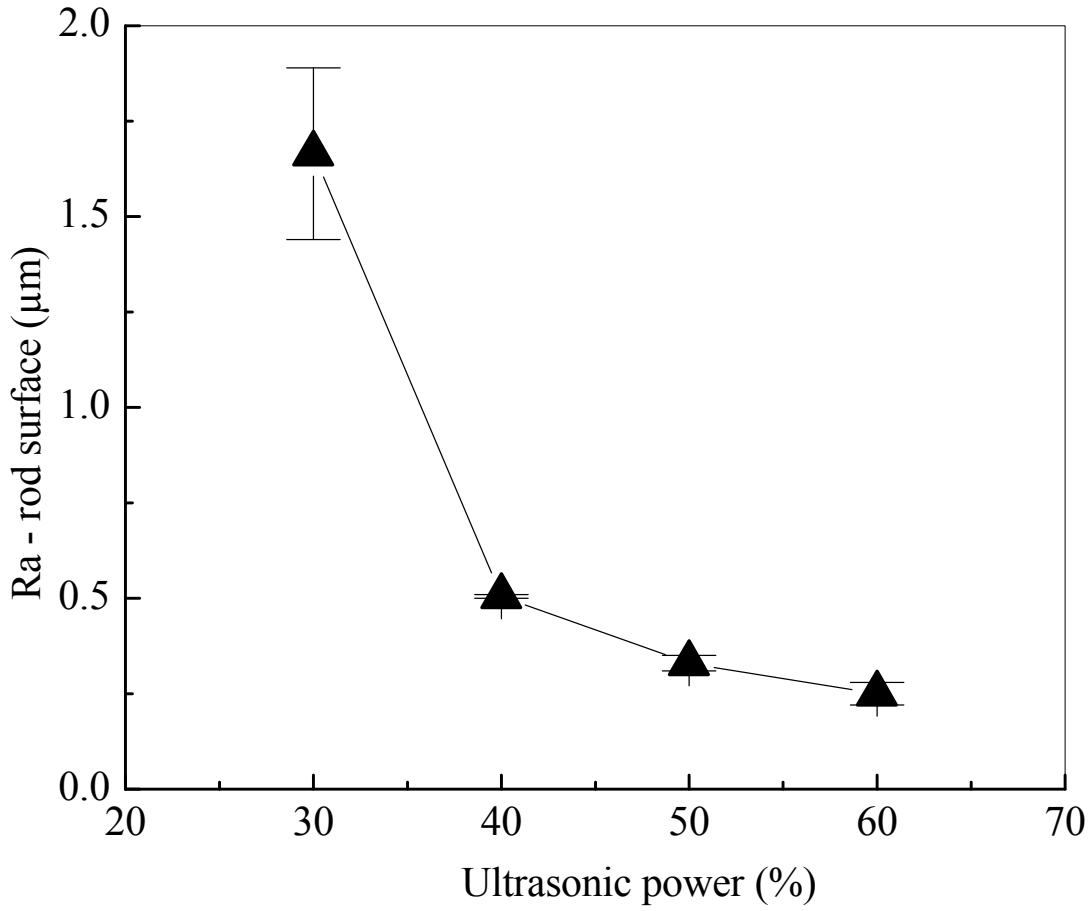


Fig. 20. Effects of ultrasonic power on surface roughness measured on machined rod.

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