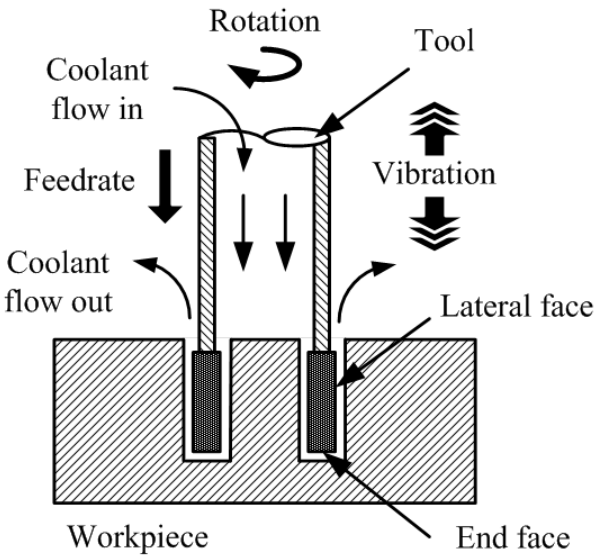


Fig. 1 Illustration of rotary ultrasonic machining (RUM)

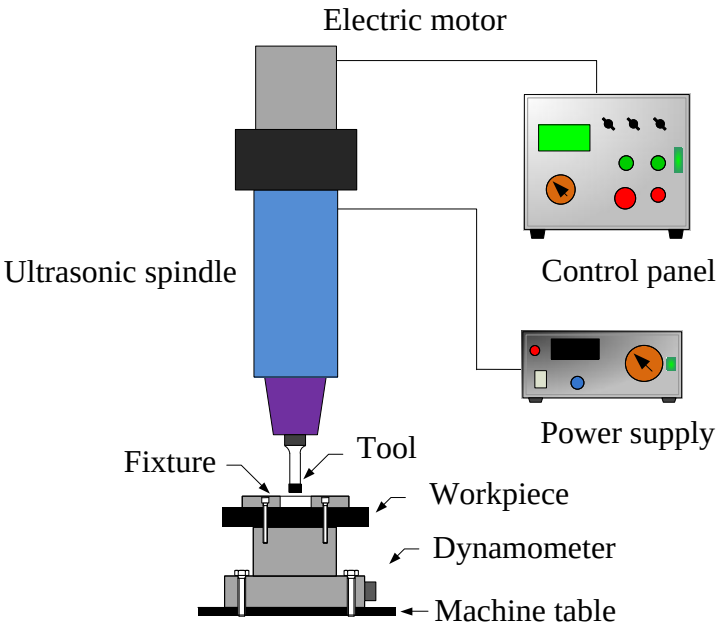


Fig. 2 Illustration of RUM setup

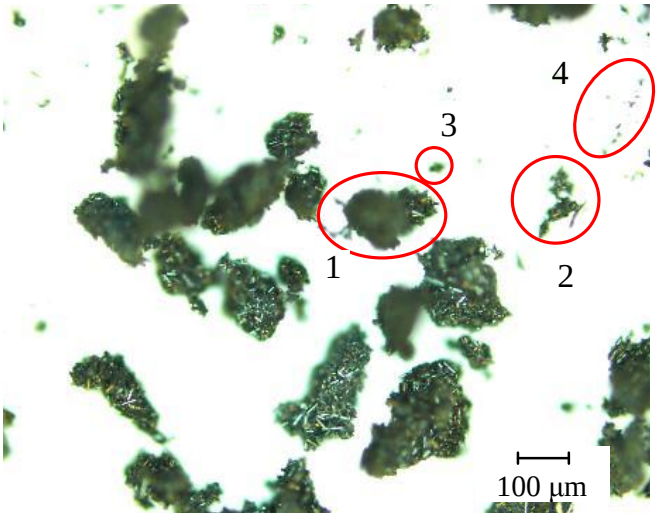


Fig. 3 Typical chips by RUM of carbon fiber-reinforced epoxy

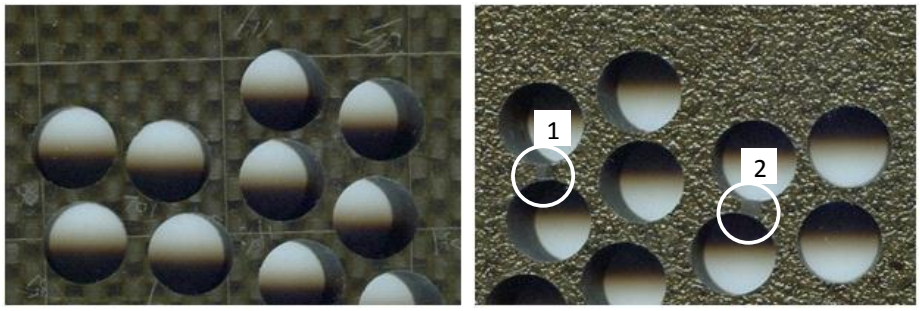


Fig. 4 Observation of the machined holes on the carbon fiber-reinforced epoxy workpiece.

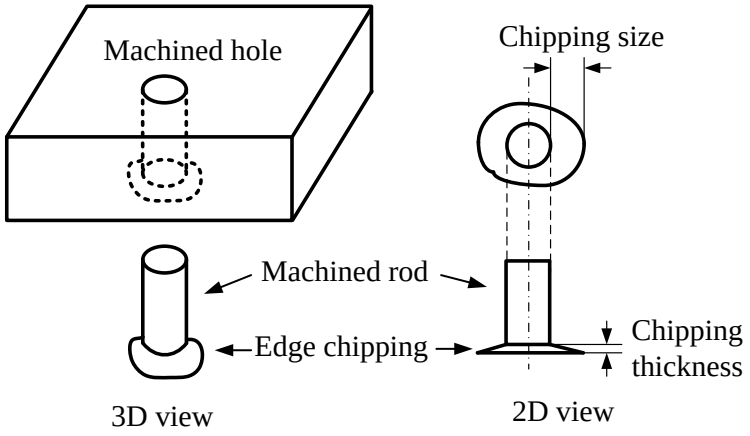


Fig. 5 Illustration of chipping size and chipping thickness in RUM

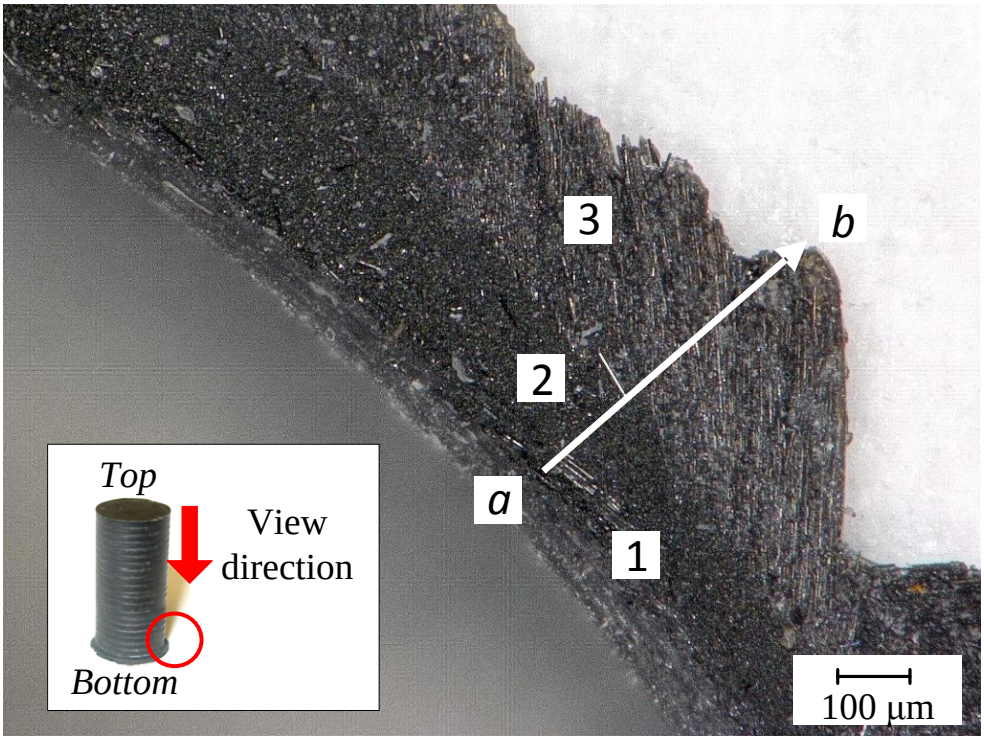


Fig. 6 Observation of machined rod and chipping size

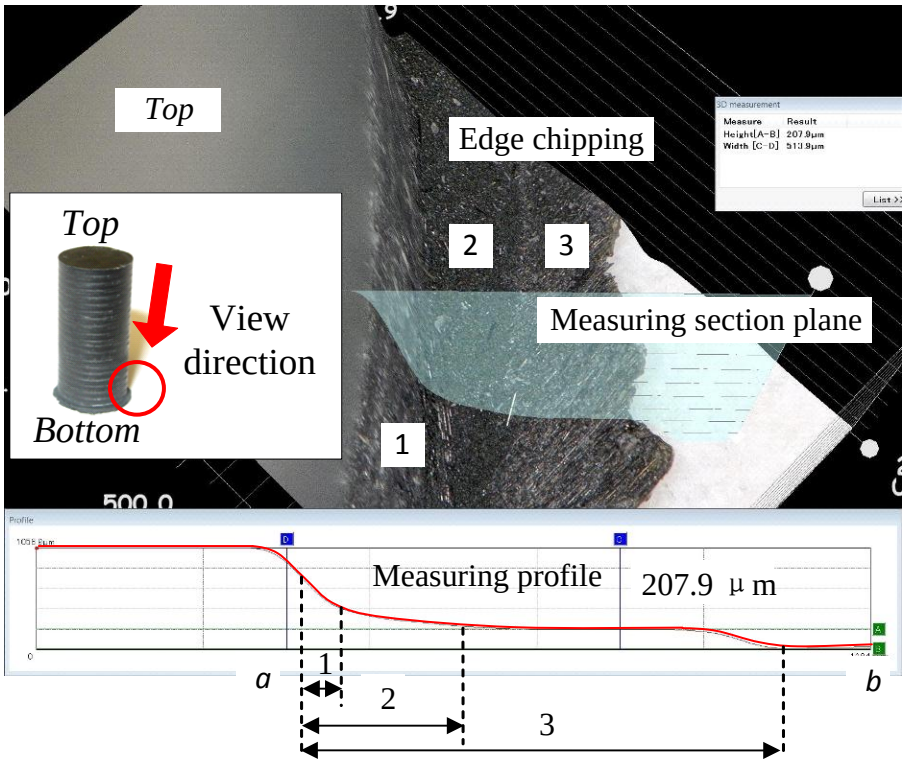


Fig. 7 Observation and measurement of chipping thickness

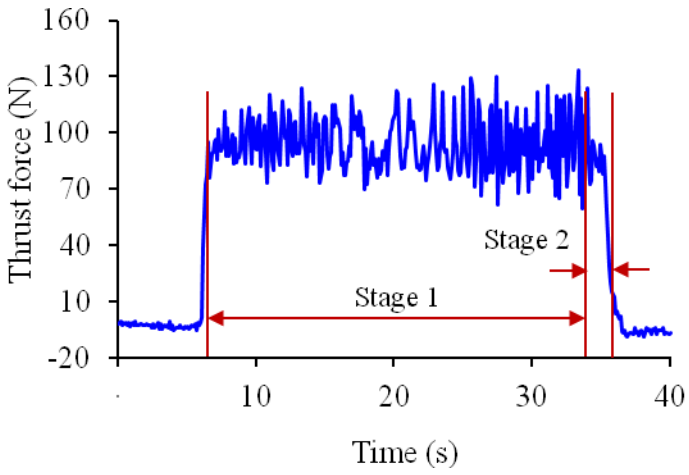


Fig. 8 Typical force curve in RUM of carbon fiber-reinforced epoxy

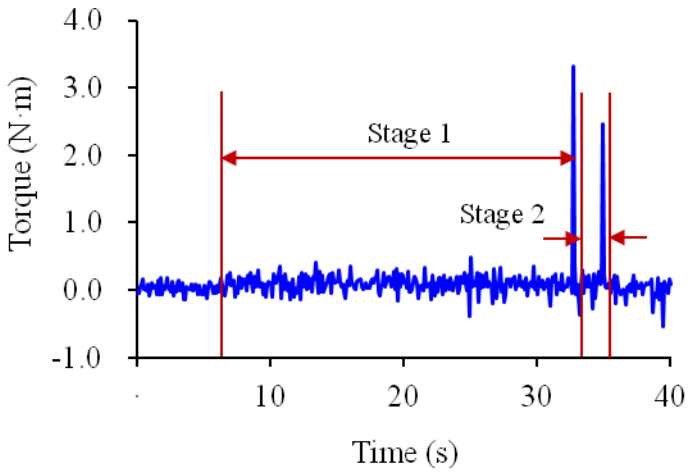


Fig. 9 Typical torque curve in RUM of carbon fiber-reinforced epoxy

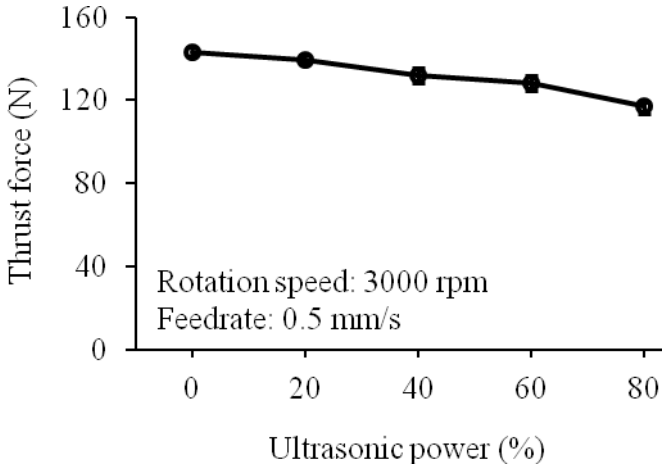


Fig. 10 Effects of ultrasonic power on thrust force

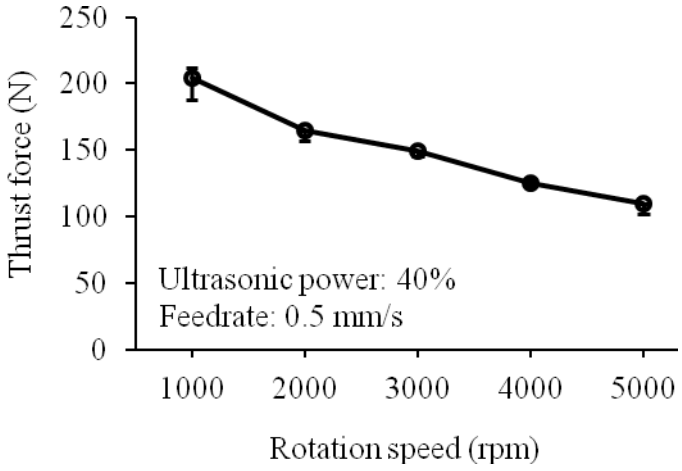


Fig. 11 Effects of rotation speed on thrust force

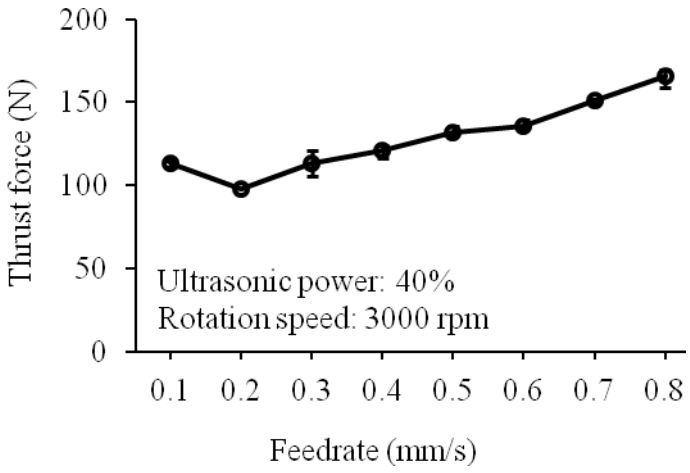


Fig. 12 Effect of feedrate on thrust force

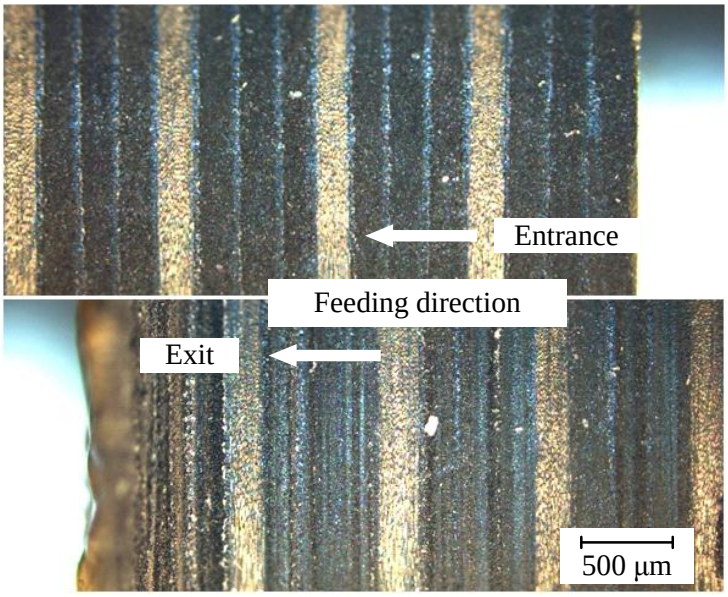


Fig. 13 Observation of the machined surface in the hole.

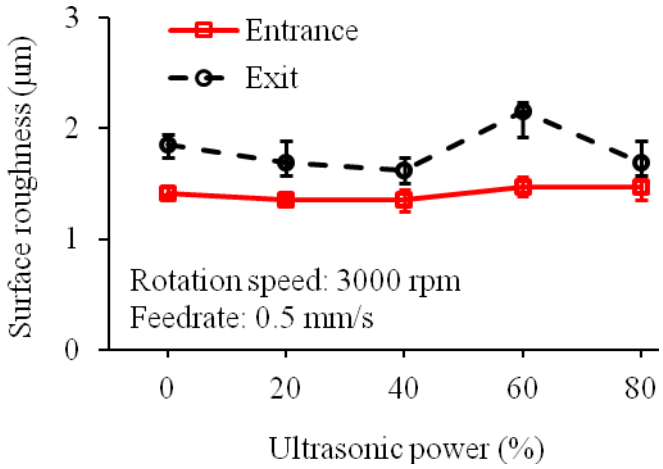


Fig. 14 Effects of ultrasonic power on surface roughness

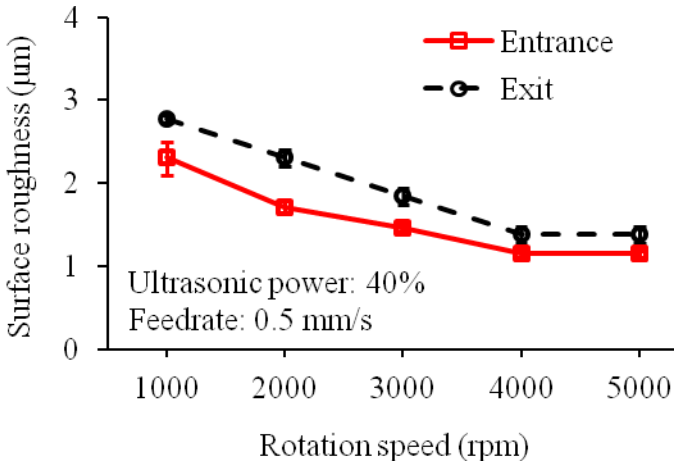


Fig. 15 Effects of rotation speed on surface roughness

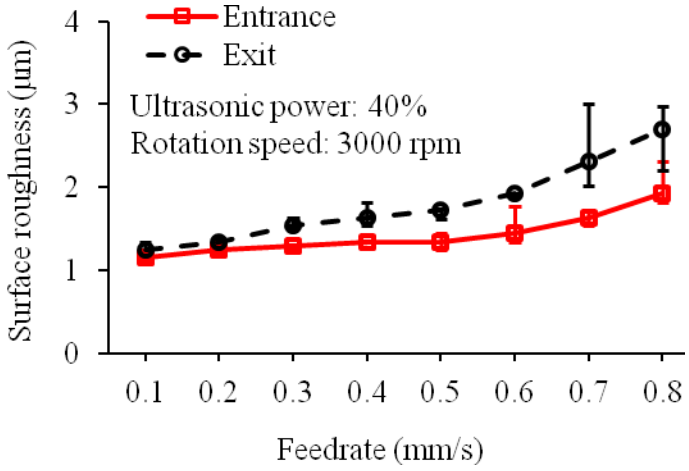
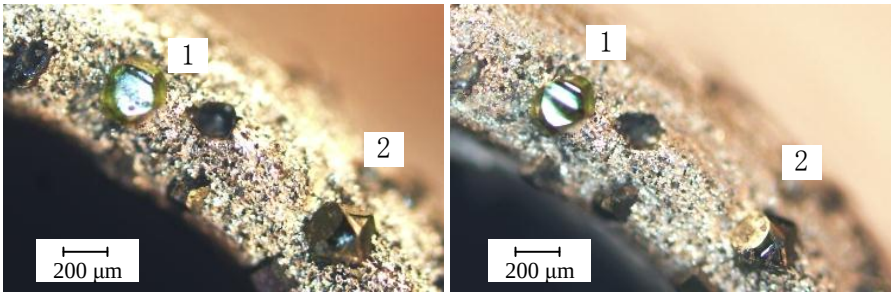


Fig. 16 Effects of feedrate on surface roughness



Before After

Fig. 17 Attritious wear of the diamond grain on the tool end surface

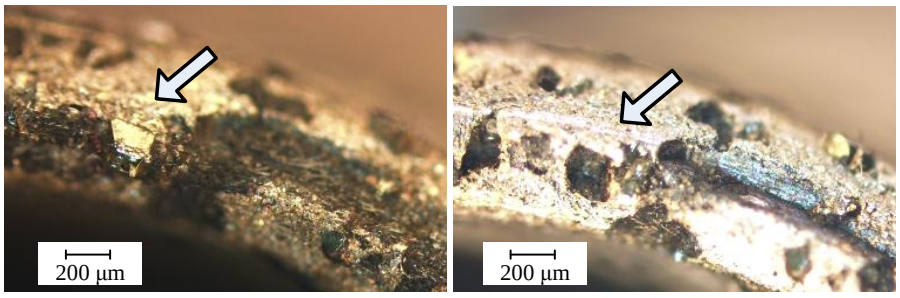


Fig. 18 Grain pulled out on the tool end surface

Fig. 19 Relation between tool weight loss and number of drilled holes

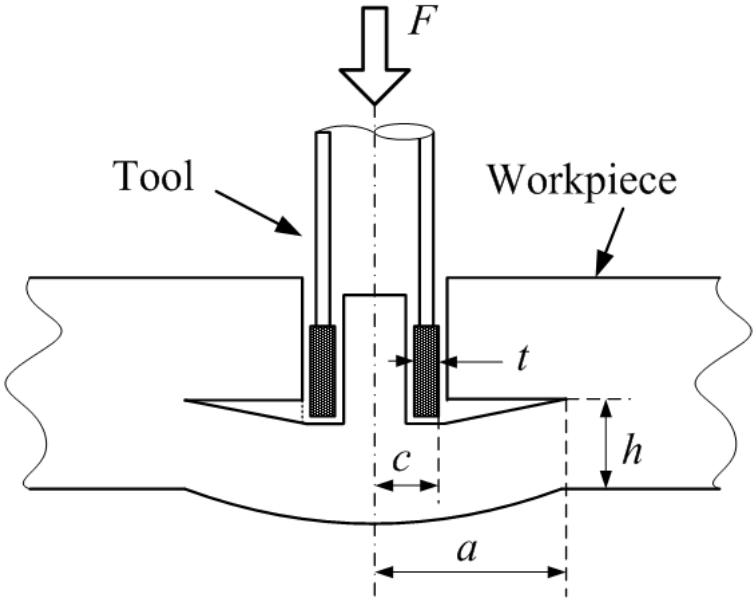


Fig. 20 Illustration of induced deformation in RUM of CFRP