

Table 1

Workpiece material properties

Property	Unit	Value
Young's modulus	MPa	190
Poisson ratio		0.25
Density	$\text{g}\cdot\text{cm}^{-3}$	3.50
Tensile strength	MPa	130
Compressive strength	MPa	1750
Vicker's hardness	$\text{kg}\cdot\text{mm}^{-2}$	1190

Table 2

Experimental conditions

Machining variable	Unit	Value
Spindle speed	rev·s ⁻¹	50
Feedrate	mm·s ⁻¹	0.09
Ultrasonic vibration power supply*		35%
Ultrasonic vibration frequency	kHz	20
Coolant pressure	MPa	0.21

* Power supply percentage controls the amplitude of ultrasonic vibration.

Table 3

Experimental results

Support length (mm)	Chipping thickness (mm)		
	Run 1	Run 2	Run 3
4.5	1.01	0.99	0.96
8	0.89	0.83	0.81
10.5	0.76	0.72	0.80