

عنوان مقاله:

The Effect of Power and Maximum Cutting Speed on the Material Removal Rate and Cutting Volume Efficiency in CO2 Laser Cutting of Polycarbonate Sheets

محل انتشار:

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خلاصه مقاله:

In the laser cutting process some well-known parameters, e.g. laser power and cutting speed, play major roles in the performance of the process. Each parameter or a combination of parameters can affect the material removal volume and cutting volume efficiency. The purpose of this research is to study the effect of power and maximum cutting speed on the material removal rate (MRR) and cutting volume efficiency (αVol) in CO2 laser cutting of polycarbonate (PC) sheets. A CO2 laser cutting machine with a maximum power of 130 W was used to cut PC sheets with thicknesses of 2 to 8 mm. The spot size of the focused beam was 0.1 mm on the upper surface of the sheet. The cutting experiments were carried out by varying the laser power from 20 to 100 W and the maximum cutting speed was found for each power. In the range of applied laser parameters for cutting of PC sheets, the results show that the MRR increases with power. The results also indicate that the MRR increases with maximum cutting speed and thickness. The cutting volume efficiency (αVol) increases with power until it reaches the apex of efficiency then, it slightly reduces with increasing power.

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