

The Effect of the Laser Beam on the width of the Cut

Jana Knedlová¹, Milena Kubišová¹, Vladimír Pata¹, Miroslav Marčaník¹, and Barbora Bočáková²

¹*Tomas Bata University in Zlín, Vavrečkova 5669, Zlín, Czechia*

²*Slovak University of Technology in Bratislava, Jána Botu 2781/25, Trnava, Slovakia*

Conventional methods of dividing material due to their limitation to straight cuts have largely been replaced by non-conventional cutting methods, which include laser cutting. Laser cutting of polymer materials has become a priority for the manufacturing industry, mainly due to the constantly growing demand for these materials. The article discusses the effect of the laser beam on the width of the cut using lenses with different focal lengths, under different working conditions, on samples made of PMMA polymer material plates. For the experiment, the samples were produced using an ILS 3NM laser device, a CO₂, with a wavelength of 10.6 μm and with maximum power 100 W, maximum feed speed 1524 mm.s⁻¹. For the selected samples, it was studied how the dimension defined by the machining software differ from the dimension created by the machining.