**OPTIMIZATION OF LASER CUTTING PARAMETERS OF COMPOSITE MATERIALS MODIFIED WITH BORON NITRIDE**

**Hüseyin Gökçe[[1]](#footnote-1)\***

**Engineering Faculty, Mechanical Engineering, Çankırı Karatekin University, Çankırı, Türkiye**

**0000-0002-2113-1611**

**Sakine Kıratlı**

**Engineering Faculty, Mechanical Engineering, Çankırı Karatekin University, Çankırı, Türkiye**

**0000-0001-6292-5605**

**Mehmet Güneş**

**Vocational School, Materials and Material Processing Technologies, Çankırı Karatekin University, Çankırı, Türkiye**

**0000-0002-1222-7590**

**Mohamed Babiker Ibrahem ABDALLA**

**Engineering Faculty, Mechanical Engineering, Çankırı Karatekin University, Çankırı, Türkiye**

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| **ABSTRACT** In this study, a total of five different continuous fiber-reinforced composite materials, one control and four with boron nitride modified at different weight ratios, were cut using the laser cutting method, and the changes in dimensions after cutting were observed. Laser cutting parameters (control factors) were determined as cutting speed, laser power, and laser focusing distance. 10, 14, 18 mm/s, 50%, 60%, 70%, and 5, 6, 7 mm were used for cutting speed, laser power, and focal length, respectively. Experiments were performed using a Taguchi L9 orthogonal array for each material. Using the Taguchi method, control factors were optimized in terms of changes in dimensions (quality characteristics), and their importance levels were determined. Even though the impact rates vary for each material group, cutting speed was found to be the most important control factor. This was followed by laser power and focal length. Optimum results were observed at cutting parameters of 50% power value and 10 mm/s cutting speed. With the help of the experimental results, regression analysis was performed, and mathematical models were developed for measurement changes. Mathematical models have been tested with verification experiments, and it has been seen that the models can be used safely. |

# Keywords: Boron nitride, laser cutting, laminated composite, Taguchi method.

1. \* Corresponding author. *e-mail address: huseyingokce@karatekin.edu.tr* [↑](#footnote-ref-1)