

## ANALYSIS OF THE DISTRIBUTION OF AXIAL FORCE VALUES IN DRILLING, DEPENDING ON MACHINING PARAMETERS

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### ABSTRACT

*Drilling is one of the most widely used material machining processes, with applications in various industries such as machinery manufacturing, automotive, and aerospace. One of the factors that influence the quality and efficiency of the machining process is maintaining a constant cutting force.*

*Maintaining the cutting force at a constant level during drilling is essential for ensuring dimensional precision, surface quality, tool durability, operational efficiency, and safety. Implementing advanced technologies such as automated control systems and force monitoring can significantly contribute to process optimization and risk reduction. This ensures high-quality production with reduced costs and increased productivity.*

*In this study, the axial force distribution during the drilling of an aluminum alloy, 2024 T351, was determined, with measurements conducted for three combinations of machining parameters. A total of 27 holes were machined using drill bits with diameters of 6, 8, and 10 mm, cutting speeds of 50, 60, and 70 m/min, and feed rates of 0.1, 0.25, and 0.4 mm/rev.*

*The axial force measurement was performed using a Kistler dynamometer available in the Manufacturing Engineering Department of the Faculty of Engineering at the “Dunărea de Jos” University of Galați.*

**KEYWORDS:** cutting force, drilling, statistical control.