

3D PRINTING IN THE CREATION OF STRUCTURES CUBESATS VS. CONVENTIONAL MATERIALS

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ABSTRACT

The creation of the CubeSat marked the beginning of a growing interest in space technology exploration. CubeSat is a standardization aimed at reducing satellite production costs and lead times, enabling access to space for universities or research groups with scientific resources to experiment with new technologies and facilitate aerospace research. Over the years, key aspects such as component miniaturization, propulsion systems, energy efficiency, and communication have been improved. However, challenges persist in space robustness, costs, and operational longevity, making the proper selection of materials essential as they must withstand the extreme conditions of space. 3D printing has gained prominence in the space industry, although its potential in aerospace applications has been explored, its adoption in CubeSats still faces challenges. Through a systematic literature review, the impact of 3D printing on CubeSat structures compared to conventional materials was investigated, analyzing their key properties against space conditions. The results highlighted the flexibility and customization offered by three-dimensional manufacturing, but also underscored the advantages of conventional materials in mechanical strength. Additive manufacturing is transforming the space industry, and the choice between 3D printing and classical materials will depend on the needs of the space mission.

Keywords: CubeSat, Structural Design, 3D Printing.

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