

THE EFFECT OF TOPOLOGICAL OPTIMIZATION ON THE STRENGTH PROPERTIES OF PARTS MANUFACTURED BY ADDITIVE MANUFACTURING

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Abstract:

Topological optimization is one of the ways in which it is possible to reduce the amount of material consumed during the production of the considered part. This is especially true in manufacturing through additive manufacturing technologies, where it is easier to achieve various specific shapes that are generated by software for topological optimization. By means of topological optimization, it is possible to achieve significant savings in the production of parts, by saving material but also the time of production of parts. Therefore, it is necessary to focus on this issue and bring new knowledge in this area.

The presented article describes the method of implementing topological optimization with subsequent software evaluation of its strength. Parts optimized in this way are manufactured using additive manufacturing technology according to a pre-prepared experiment plan. The produced parts were subjected to strength testing and subsequently the measured values were compared with the values obtained through the software. The results obtained through experimental activity were also statistically evaluated and the most significant factors affecting the final strength of the investigated part were identified.

Keywords:

additive manufacturing; 3D printing; Strength; FDM; SLS;