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Numerical Analysis of the Influence of Modifications Of The Billet on the Composite Extrusion Process*

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Abstract

A particular challenge for the aerospace industry is to produce elements that are lightweight and at the same time strong. Hence, this article presents research on the extrusion of composite materials with a parallel layer structure to obtain magnesium alloy profiles with an anti-corrosion aluminum coating. The research was carried out using the finite element method, which enabled the analysis of extrusion under various process conditions. In the case of a parallel layer system, for which tests were carried out for two values of the extrusion ratio and two input thicknesses, it was observed that when the materials are extruded with an extrusion ratio of λ=12 and an initial layer thickness of 10 mm, the process ends with reaching a critical value of the layer thickness passing into the sleeve and the material breaking.

Keywords: numerical analysis, extrusion, composite

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