Macromolecular Symposia

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CONFERENCE The 9th Polcom conference 'Progress on Design Techniques and Manufacturing Technologies for Advanced Products and Processes in the Modern Era' (Polcom 2025)

RESEARCH ARTICLE OPEN ACCESS

The Influence of Infill on the Tensile Strength of some Mini-Test Specimens Manufactured by 3D Printing From PLA

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Received: 4 November 2025 | **Revised:** 17 November 2025 | **Accepted:** 24 April 2026

Guest Editors: Giuseppe Lamanna and Constantin Opran

Keywords: 3D printing | empirical mathematical model | polylactic acid | tensile strength | testing mini equipment

ABSTRACT

In industrial practice, situations may be encountered where small parts manufactured by 3D printing from polymeric materials are subjected to tensile stresses. Since standard tensile testing machines are not recommended for performing tests for values less than 10% of the machine's maximum nominal force, it is necessary to design and build a mini-equipment (or mini-testing rig) intended to allow the tensile testing of mini-test specimens. Using this mini-equipment, tensile tests are performed on polylactic acid (PLA) mini-specimens manufactured by 3D printing. The specimens are printed with different infill values, aiming to highlight the influence this factor exerts on the magnitude of the tensile strength. Empirical mathematical models are determined to highlight the influence of the infill magnitude on the ultimate tensile strength (UTS) in the case of polylactic acid mini-specimens.

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