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Review of surface metrology artifacts for polymer-based additive manufacturing

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Abstract

Test artifacts, resembling real machine parts, allow quantitative evaluation of system performance and insight into individual errors, aiding in improvement and standardization in additive manufacturing. The article provides a comprehensive overview of existing test artifacts, categorized based on geometric features and material used. Various measurement techniques such as stylus profilometry and computed tomography are employed to assess these artifacts. Specific artifact categories include slits, angular or linear features, variable surfaces, and others, each accompanied by examples from research literature, highlighting diverse artifact designs and their intended applications. The paper underscores the importance of user-friendly and unambiguous artifacts for dimensional control, particularly in surface metrology. It anticipates the continued growth of metrological verification in future manufacturing environments, emphasizing the need for precise and reliable measurement results to support decision-making in production conditions.

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