

Evaluating surface quality of heterogeneous surfaces produced by non-conventional machining technologies: methodological advances and challenges

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This paper is focused on the evaluation of heterogeneous surface quality. In the realm of scientific practice, there exists a significant inconsistency in the methodologies employed to investigate heterogeneous surfaces produced by non-conventional machining technologies. Traditional approaches are inadequate for these types of surfaces due to the presumption of surface roughness homogeneity, which does not account for the complexities and variations inherent in heterogeneous surfaces. The utilization of unsuitable assessment methods can significantly hinder the research and development efforts related to these advanced technologies, potentially stalling innovation and the optimization of machining processes. However, through an initial investigation of roughness data obtained from heterogeneous surfaces, discernible patterns have emerged. These patterns suggest a promising opportunity for the development of a coherent and standardized approach to surface quality assessment. Such an approach would enhance the accuracy and reliability of evaluations, thereby supporting the continued advancement and refinement of non-conventional machining technologies. The findings underscore the necessity for a shift towards more sophisticated and tailored assessment methods that can accommodate the unique characteristics of heterogeneous surfaces.

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