INNOVATIVE APPROACH FORASSESSING THE FLEXIBILITY OF ADDITIVELY FABRICATED LATTICE STRUCTURE CERAMICCOMPOSITE PARTS

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Advanced Manufacturing Transformations in Crafting Ceramic Composite Structures with Unparalleled Properties are being explored. Applications ranging from aerospace to biomedical engineering benefit from these advancements. Ensuring optimal structural integrity and performance entails precise assessment of the flexibility of these composites, including Youngś modulus and damping ratio. This paper introduces an innovative approach that employs modal and harmonic analysis for accurately evaluating these mechanical characteristics.

A composite material consisting of 35 percent photoresin and porcelain powder has been selected for SLA additive manufacturing 3D printing. Samples have been produced to ascertain natural frequencies and mode shapes. To enhance the strength-to-mass ratio, a lattice structure has been chosen and optimized. Following sample production and final curing, natural frequency and harmonic analysis have been conducted to extract Youngś modulus and Poissonś ratio. These results enable the design and production of ceramic-resin composites tailored to specific applications.