

激光与光电子技术应用

选择性激光烧结制件冷等静压工艺及模拟

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摘要: 为了提高选择性激光烧结制件的相对密度, 使用冷等静压进行致密化。在Drucker-Prager-cap模型的基础上对选择性激光烧结制件的冷等静压过程进行数值模拟, 并对模拟结果进行了理论分析和实验验证。结果表明, 通过冷等静压工艺可使选择性激光烧结制件的相对密度明显提高, 制件收缩比较均匀, 典型尺寸的实验结果与目标尺寸的误差在0.41mm以内, 模拟结果与实验比较符合。对选择性激光烧结制件进行冷等静压处理, 拓展了粉末激光快速成形技术的应用领域, 为其应用于工程实际奠定了技术和实验基础。

关键词: 材料 相对密度 模拟 选择性激光烧结

Technology and simulation of cold isostatic pressing of selective laser sintered parts

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Abstract: In order to improve the relative density of parts made of selective laser sintering (SLS), cold isostatic pressing (CIP) was carried out for densification. Numerical simulations of CIP SLS parts were made based on Drucker-Prager-cap model. Theoretical analysis and experimental verification were conducted based on simulation results. The results show the relative density of SLS parts was enhanced obviously. The contraction of the parts was uniform. The errors between experimental results and wanted dimensions of main dimensions were within 0.41mm, which indicated the simulation results accorded with the experiment results. The post-process of CIP SLS parts develops the application field of powder laser rapid prototype that lays the technical and experimental foundation for engineering practice.

Keywords: materials relative density simulation selective laser sintering

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