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包覆不锈钢粉末激光烧结深度的影响因素

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摘 要：制备一种用于激光烧结成形的包覆不锈钢粉末。应用数值模拟预测结合实际测量方法，研究激光功率、激光束扫描速度、预热温度及铺粉密度等参数对激光烧结深度的影响。结果表明，随着预热温度、铺粉密度与激光功率增加，烧结深度增加；随着扫描速度增加，烧结深度降低。但当扫描速度不超过2 mm/s 时，烧结深度随扫描速度的增加反而增大。提出一种利用数值模拟预测结果进行激光烧结工艺参数选择的方法。

关键字： 包覆1Cr18Ni9Ti粉末；选择性激光烧结；烧结深度；数值模拟

Effects of laser processing parameters on sintering depth of polymer-coated stainless steel powder

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Abstract:A type of polymer-coated stainless steel powder used in selective laser sintering technology was prepared. The effects of laser power, scanning velocity, preheating temperature and powder spreading density on sintering depth were studied, by the using of numerical simulation and practical measurement method. The results show that the sintering depth increases with the enhancement of preheating temperature, powder spreading density and laser power. The sintering depth decreases with the increase of scanning velocity. When the scanning velocity is less than 2mm/s, the sintering depth increases with the decrease of scanning velocity. How to select laser-sintering parameters of polymer-coated stainless steel powder was discussed based on the numerical simulation results.

Key words: polymer-coated 1Cr18Ni9Ti powder; selective laser sintering; sintering depth; numerical simulation

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