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激光与光电子技术应用

高强镀锌钢激光填粉焊接工艺试验研究

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摘要: 为了研究高强镀锌钢激光填粉焊接工艺, 采用正交实验法优化了激光功率、焊接速度、离焦量等焊接工艺参量。结果表明, 激光填粉焊接速率过低时, 焊缝易于产生熔质堆积和焊接孔洞; 增大离焦量可实现粉末的有效利用; 装配间隙为0.25mm(母材厚度的31%)时, 高强镀锌钢激光填粉焊接的最佳工艺参量为激光功率1500W, 焊接速率30mm/s, 离焦量12mm, 此时, 焊缝表面成形良好, 其拉伸试验断裂产生在母材。

关键词: 激光技术 工艺优化 正交实验 添加粉末

Process study on laser welding of high strength galvanized steel with powder filling

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Abstract: In order to optimize the process parameters in laser welding of high-strength galvanized steel with powder filling, orthogonal experimental tests were used to analyze such process parameters as laser power, welding speed and the defocusing distance. The test results show that the accumulation of the molten mass and the welding holes might occur at low welding speed; the defocusing distance should be increased to achieve the effective addition of the powder. The optimization

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process parameters for laser welding of high-strength galvanized steel with powder filling were 1500W laser power, 30mm/s welding speed and 12mm defocusing distance. Under these welding conditions, good weld performance was obtained and the base material was broken in tensile fracture tests.

Keywords: laser technique process optimization orthogonal experiment powder filling

收稿日期 2013-04-01 修回日期 2013-04-19 网络版发布日期 2013-12-02

DOI: 10.7510/jgjs.issn.1001-3806.2014.01.001

基金项目:

国家自然科学基金资助项目(51175162); 湖南省自然科学基金重点资助项目(12JJ2032)

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