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The welding modes in Laser-arc hybrid lap welding of dissimilar metals

Hongyang Wang, Baoqiang Feng and Liming Liu
Dalian University of Technology, China

The pulse laser-tungsten inert gas hybrid welding method was adopted to realize the welding dissimilar alloys process. The welding modes in the laser-arc hybrid welding lap joint were changed with the varying of laser and arc parameters, which made obviously effects on the dissimilar joints. In Ti and steel dissimilar welding lap joint with Cu interlayer, the welding mode in both of Ti and steel fusion zone were in conductive mode and the thickness of the intermetallic was limited by the accurate control of the welding heat. In Mg and Al alloys dissimilar welding lap joint with Ni interlayer, the welding mode in Mg fusion zone was in keyhole mode and Al fusion zone in conductive mode and the intermetallics was inhibited by the welding mode and interlayer. In Al and steel dissimilar welding lap joint with Cu interlayer, the welding modes in both of Al and steel fusion zone were in keyhole mode, but the thickness of the Al-Fe intermetallic was less than 10 μ m, which was reduced by the hybrid effect of the Cu interlayer and the welding sources. The welding mode should be changed by the character of the dissimilar metals. The formation and distribution of the intermetallic was decided by the welding sources, base metal and the welding process, which made obvious effect on the property of the joint.

Biography

Hongyang Wang received his PhD in Materials Manufacture Major from Dalian University of Technology, China. Now, he is working as an Associate Professor of Dalian University of Technology, a Deputy Director of Key Laboratory of Liaoning Province in China. He is mainly committed to lights welding and dissimilar welding process. His research has brought him more than 20 papers in reputed journals with more than 200 of SCI citation.

wang-hy@dlut.edu.cn

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