Abstract

This research aimed to compare between two soldering techniques, conventional and laser methods. Metallic pieces were joined in two ways: butt and overlap as known soldering designs.

The test pieces were soldered manually by 100 W electrical tool. Similar numbers of pieces were soldered by Nd:YAG laser with 50 W. The test pieces, for both traditional and laser, were tested for tensile and shear strengths.

The tensile test results showed the laser superiority on the conventional method in loading and ductility. The shear test results showed that laser still super in loading but ductility declined given traditional electric soldering better ductility.

Nd:YAG laser soldering gave fast and clean joints in addition to its ability to solder sensitive and intricate designs. Conventional electric soldering method is more suitable for open, plane joints.

الخلاصة

يهدف هذا البحث الي المقارنة بين طريقتين من طرق اللحام بالتصدير.الطريقة التقليدية وطريقة استخدام الليزر. تم لحام وصلات من الواح معدنية بطريقتيين التقابلية والتراكبية.

عدد من الوصلات الاختبارية لحمت يدويا بكاوية كهربية بقدرة **100**وط ولحم نفس العدد بواسطة ليزر **Nd-YAG**بقدرة **50** واط. هذه الوصلات الملحومة بالطريقتين اخضعت لاختباري الشد والقص.

اظهرت النتائج في اختبار الشد ان العينات الملحومة بالليزر تفوقت على العينات الملحومة بالطريقة التقليدية من ناحية التحميل والمطيلية.

اظهرت نتائج اختبار القص علي الوصلات التراكبية ان عينات الليزر تفوقت على نظيرتها التقليدية من ناحية التحميل .بينما تفوقت العينات التقليدية علي عينات الليزر من ناحية المطيلية.اظهرت التجارب ان لحام الليزر يتم بطريقة اسرع وانظف .كما انه يمكن ان يستخدم للحام الاجزاء الداخلية والحساسة التي يصعب الوصول اليها بالطرق التقليدية.

Dedication

To the sole of my father

To my mother

To my family

To the sole of our colleague Moawia

To my teachers

To all the resistance for liberty and piece

Acknowledgement

I Thank with great appreciation, my supervisors Prof. Dr Nafie A .latif and Prof. Dr. Sabir M.Salih for their valuable guidance and support.

I am really indebted to many people who aided me in the prediction of this research, with particular thanks to the personnel and staff of the institute of laser Sudan University of Science and Technology (SUST). In addition to staff members of the college of engineering who supported me with ideas and references.

My thanks are also extended to the center of the research and industrial consultancy for their help with experimental tests.

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