



Joining magnesium alloys using friction stir welding and laser welding

By Lorelei Commin

LAP Lambert Acad. Publ. Sep 2009, 2009. Taschenbuch. Book Condition: Neu. 219x153x15 mm. Neuware - The challenges of weight reduction in aerospace industry have drawn considerable interest in magnesium alloys technologies. Assessing the efficiency of new joining techniques, such as Laser Beam Welding and Friction Stir Welding is then required. The aim of this study is to investigate the relationship between welding parameters and the resulting microstructure and mechanical properties. Friction Stir Welds and Laser Beam Welds were processed using 2mm thick hot rolled plates of AZ31, AZ61 and WE43 Magnesium alloys. A relationship between welding parameters, the temperatures undergone and the weld microstructure was established for each process. FSW induced microstructural changes and complex residual stress distribution, which have a primary influence in FSW mechanical properties. The influence of texture evolution and precipitation evolution on LBW mechanical properties was also determined. Localisation features similar to shear bands were observed in both LBW and FSW. A comparison was made with precipitation hardened alloys (AZ61 and WE43) mechanical properties. Finally, the potentiality of replacing aluminium alloys with these magnesium alloys was studied. 160 pp. English.



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