C. Born:

Ultraschallschweißen zellulärer metallischer Werkstoffe mit Blechen

Lehrstuhl für Werkstoffkunde, Universität Kaiserslautern, 2004
Werkstoffkundliche Berichte: Bd. 11

ISBN: 3-932066-10-3
ISSN: 1433-2744

Abstract

This work introduces the ultrasonic welding technique for the joining of cellular metallic materials to sheet metals. The systematic investigations show the possibility to produce joints with high strength in very short welding times. During the weldings no significant plastic deformations of the joining partners especially of the foam structure takes place. Thermographical investigations demonstrate that the temperatures in the weld contact area during ultrasonic welding were significantly lower than the melting point of the joining partners. The bond formation occurs in solid state. Microscopic investigations show that during the welding a disruption and dispersion of oxide surface films occurs. As a consequence of the relative movement of the joining partners additionally a mechanical inter-locking of the joining partners takes place. The joining partners are pressed together to atomic distances, the result is metallic bonding. It could be shown that a successful foaming after ultrasonic welding of unfoamed precursor material and sheets is possible. The spectrum of weldable materials is widespread. Furthermore different material and process specific influences an the welding process were investigated systematically. Different applications were presented. The investigations underline that ultrasonic welding is especially suited for the joining of metal-foams to sheet-metals.

„Werkstoffkundliche Berichte“ are available from:

Lehrstuhl für Werkstoffkunde
Technische Universität Kaiserslautern
Gottlieb-Daimler-Straße
67663 Kaiserslautern
Tel.: 0631/205-2413
Fax: 0631/205-2137