



VABILO

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Diffusion Bonding: new methods and latest developments

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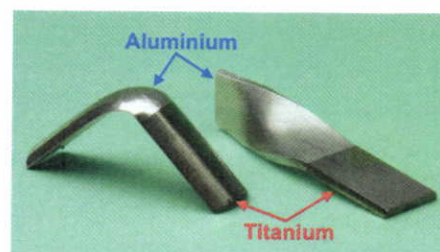
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Abstract:

Welding processes can be classified into: a) Liquid-phase welding, *e.g.* all fusion welding processes such as conventional arc welding, laser welding and electron beam welding; and b) Solid-state welding, *e.g.* forge welding, friction stir welding, explosive welding and solid-state diffusion bonding. In the former case, bonds are established by the formation and solidification of a liquid phase at the interface while, in the latter case, the applied pressure has a key role in bringing together the surfaces to be joined within interatomic distances.

Diffusion bonding, is a joining process wherein the principal mechanism is interdiffusion of atoms across the interface. Diffusion bonding of most metals is conducted in vacuum or in an inert atmosphere (normally dry nitrogen, argon or helium) in order to reduce detrimental oxidation of the faying surfaces. Solid-state diffusion bonding is a process by which two nominally flat interfaces can be joined at an elevated temperature (about 50%-90% of the absolute melting point of the parent material) using an applied pressure for a time ranging from a few minutes to a few hours.



The lecture will present the new methods and latest developments on the field of diffusion bonding.

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