عنوان مقاله:

Calculation of energy lost by radiation and convection during laser welding of TA۶V titanium alloy

محل انتشار:

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خلاصه مقاله:

AbstractLaser welding is being used more frequently in industrial processes because of its advantages; therefore, energy loss in welding is an important issue during planning and operation. We calculated the energy losses expected during the laser welding of TA۶V titanium alloy. We used the heat equation to describe the energy distribution of solid and liquid TA۶V. The solid-to-liquid phase change was taken into account by comparing the accumulated energies and enthalpy of fusion. A numerical model was used to calculate the energy lost by convection and radiation. Finite difference calculations were performed using a FORTRAN-based computer program to solve the heat equation. The numerical results suggested that the appropriate laser welding velocity and power were in good agreement with the experimental data published elsewhere in the literature. The results showed the importance of the influence of the energy lost by radiation and convection in the welding area on welding energies and temperatures.

کلمات کلیدی:

Laser welding, Heat equation, Enthalpy of fusion, Convection, Thermal radiation, Titanium alloy

لینک ثابت مقاله در پایگاه سیویلیکا: