# Finite element analysis of spot laser of steel welding temperature history

Abstract

Laser welding process reduces the heat input to the work-piece which is the main goal in aerospace and electronics industries. A finite element model for axi-symmetric transient heat conduction has been used to predict temperature distribution through a steel cylinder subjected to CW laser beam of rectangular beam profile. Many numerical improvements had been used to reduce time of calculation and size of the program so as to achieve the task with minimum time required An experimental determined absorptivity has been used to determine heat induced when laser interact with material. The heat affected zone and welding zone have been estimated to determine the effect of welding on material. The ratio of depth to width of the welding zone can be changed by proper selection of beam power to meet the specific production requirement. The temperature history obtained numerically has been compared with experimental data indicating good agreement.