



**SIMULATION OF LASER AND HYBRID LASER WELDING USING
SYSWELD**

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ABSTRACT

A 3D finite element analysis has been developed and conducted using finite element code SYSWELD to simulate the laser welding process of concealed T-joint welding and hybrid laser welding process of one-sided T-joint. Material used in the research is mild steel plates (S355). The simulation was done to determine the optimum welding parameter and later to predict the distortion of T-joint plates using laser welding process. In order to determine the optimum welding parameter, various case studies were conducted by varying the laser power and welding speed as independent input variables while weld profile (bead width and depth of penetration) are dependent variables. SYSWELD, through heat source modeling, was capable to generate the weld profile of laser welding numerically which then was used to determine the optimum process parameter of laser welding. Transient simulation was performed for three case studies on various clamping conditions to predict the distortion by using the optimized parameter of laser welding. Selected simulation result was verified by comparing the welding profile from the simulation with the weld profile from analytical method of previous studies and found out to be in satisfactory agreement.

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