

## **Thermal deformation of gas metal arc welding on aluminum alloy t-joints**

### **ABSTRACT**

Thermal deformations can reduce the product quality that causes loss of dimensional control and structural integrity. It may increase the manufacturing cost due to unfitted component. This paper deals with the thermal deformation on AA6061 aluminum alloy T-joint after exposed to heat by gas metal arc welding (GMAW) process. In this study, two main parameters; welding speed and welding voltage were used to evaluate the angular distortion, transverse shrinkage and longitudinal shrinkage occurred in GMAW process. The results show that the angular distortion is larger with lowest welding speed. The transverse shrinkage is reduced gradually with increasing of welding speed and transverse shrinkage also linearly increasing with increasing of welding voltage. The magnitude of longitudinal shrinkage is much smaller than angular distortion and transverse shrinkage. Longitudinal shrinkage is insignificantly affected by changing the welding heat input. These findings are important to identify and minimize the unacceptable welding distortion in product manufacturing.

**Keyword:** Gas metal arc welding; Welding deformation; T-joint; Aluminum alloy