

STUDIES ON Ti-6Al-4V TO Ti-6Al-4V AND STAINLESS STEEL BRAZED JOINTS USING LOW TEMPERATURE FILLER METAL

Titanium joining methods follows welding, diffusion bonding, and brazing have been developed. Brazing is a method of permanently joining process which is suitable for similar and dissimilar metal joining applications. Brazing is potential for joining dissimilar metals, because it involves the melting of the filler material only which eliminates the problems that occur when dissimilar metals are fused. The benefits of titanium brazing in comparison with other joining methods are: reduction of energy and heat input, reduction of residual stress, and a lighter weight structure with the absence of a heat affected zone.

Titanium brazing filler metals can be characterized as either high temperature or low temperature filler metals. High temperature filler metals are based on titanium based alloy systems or palladium based alloy systems. Low temperature filler metal can be classified into three groups such as silver based system, aluminum based system, and zirconium based systems, with brazing temperature below 800°C, thus avoiding thermal treatment above the α - β transformation. Brazing of titanium with steel can be carried out by using a vacuum furnace which offers distinctive benefits in excess to other brazing methods, including low residual stresses in the brazed joint. The silver based filler metals act as a buffer for stresses. Moreover, low pressure is required within the bonding zone during the joining process.