

Brazing technology of bimetallic (Ti64 & SS321) glandless valves

1. Description of technology

The technology involve development of sound joint between Ti64 and SS321 components combining thread joint configuration which provides strength and metallic sealing by vacuum brazing using suitable braze alloy. Initially identified few probable silver base brazing alloys and carried out number of vacuum brazing cycles to optimize brazing alloy, quantity (volume) of brazing alloy, brazing temperature and time with respect to the microstructure and bond strength of the joint. Another key parameter is the filling of the area between the threads over a length of 200 cm. After successful trials the brazing procedure was optimized with Ag-28wt% Cu brazing alloy

Initially two dummy components were taken and brazed with the optimized parameters. The brazed components were successfully pressure tested at L&T Audco. Subsequently the components were also subjected to shock test and found to meet the design requirements. Using optimized brazing cycle, DMRL has successfully brazed eight glandless valve components and supplied to L&T Audco, Chennai.

2. Application areas

This technology has been developed and demonstrated its use for valves used in critical application which requires zero leak tightness. It can be used in submarine and ship applications. This technology with various dissimilar metal combinations can also be used for application in missile components as fuel tank related joints.

3. Joint test results

Brazed assembly successfully withstood the hydraulic testing pressure of 250 kgf/cm². Another critical requirement of shock testing followed by hydraulic testing to meet the design specifications has also attained.



Brazed components