

Activated TIG (A-TIG) Welding Technology for Stainless Steels

The Tungsten Inert Gas Welding (TIG) process is used in fabrication to achieve full penetration welds in pipes and shell components used in nuclear reactors made of austenitic stainless Steels and duplex stainless steels. The process is also suitable for use in power generation, oil and gas and other industries for single pass welds and the root passes of multiple-pass welds in sheet, plate, pipe, and tubes. Advantages of using the TIG process include high quality welds, precise control of welding parameters and heat input and low equipment costs. The productivity of TIG is limited for some applications because of low deposition rates, shallow penetration limited to 3 mm or variable penetration caused by small variations of trace elements such as sulphur in the base material. IGCAR has developed Activated TIG welding fluxes to overcome the above limitations and also reduce the fabrication cost. These fluxes increase weld penetration by as much as 12 mm in single pass welding and mitigate variable weld penetration in low sulphur containing steels.

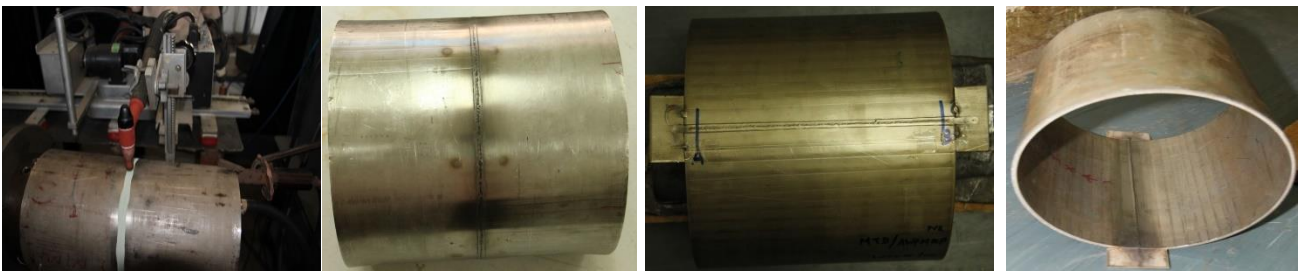
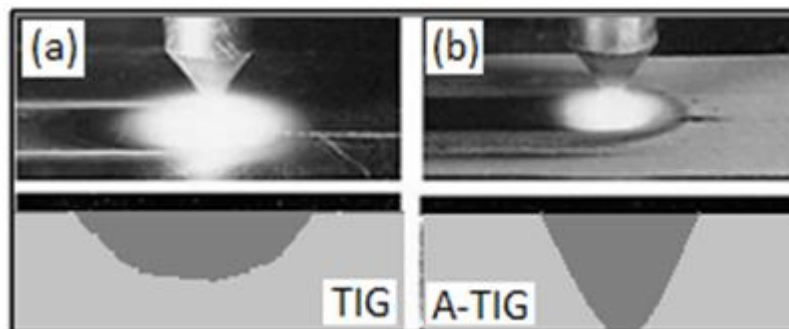


Figure A-TIG Welding of 304 L stainless steel pipe

Major Advantages

The activating fluxes enhance depth of penetration by more than 300 percent during autogenous welding. A-TIG welding reduces heat input, mitigates heat to heat variation on depth of penetration, and minimises distortion. The mechanical properties are improved and A-TIG welded joints exhibit better corrosion resistance.

- Reduced number of passes for large thickness welding
- Reduced consumption of filler wire
- Reduced joint preparation requirements
- Enhanced productivity
- Homogenous microstructure and improvement in mechanical properties
- Significant reduction in cost of fabrication



(a) TIG Welding

(b) A-TIG Welding