

Laser Welding in Inner Diameter (ID) of tubes having a diameter less than 145mm port

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The welding was required to be done on the Inner Diameter (ID) as there were 300 tubes on the sheet of diameter 9m each with Outer Diameter (OD) of 220mm and ID of 200mm with weld thickness 10mm. The access on the OD was not possible since the gap between tubes was 50mm.

The present technique of Tungsten Inert Gas (TIG) welding is a time-consuming process. The defect-free welded samples highly depended on skills of manpower and up to 6 trials of TIG welding had to be done to qualify the standards. Hence the production time to weld 300 tubes was about 6 months.

A High-Power Adjustable Ring Mode (ARM) laser with an output power of 8kW was used for the welding process. We have welded at a speed of 70 sec per tube. To ensure the quality of the ARM laser welding, the samples were subjected to Non-destructive tests and destructive tests and have been accepted as per ASTM standards.