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LASER BEAM WELDING OF ADVANCED HIGH STRENGTH STEELS

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ABSTRACT

Advanced High Strength Steels(AHSS) have been extensively used in automobile and construction industry due to their high strength and high ductility. while several techniques exists for joining, of late laser beam welding has been popular in industrial applications in order to minimize the heat affected zone. The present work aims to evaluate the mechanical and microstructural features of laser welded similar welds of TRIP steels and disimilar welds between TRIP and Dual Phase (DP). Similar and dissimilar plates of 90x45x1.2 mm , were welded by using 3 KW power supply laser beam at a rate of 4 mm/min. The welded samples were tested for tensile test as per ASTM E8 (subsized specimen). The samples were also examine for their microstructural features. It is observed that the strength of the welds are nearly 77%. The ductility is approximately 30% in the weld specimen. The fusion zone indicated the martensitic structures in both similar and dissimilar welds between TRIP-TRIP and TRIP-DP steels. In the HAZ and base metal martensite and bainite were observed. The condition leads to strength and correlate in to the microstructural features.

Keywords: Dual phase steels, Laser welding