Effect of heat input variation on microstructure and mechanical behavior of SMAW welded super duplex joints

M.F. Benlamnouar, R. Badji, M. Hadji, A. Boutaghane, M. Temmar

Abstract : In the present study, the effect of heat input variation on microstructure and mechanical behavior of SAF 2507 super duplex stainless steel welded using 308L filler metal is investigated. A duplex austenitic-ferritic microstructure is observed in the weld metal whereas some ferrite grain growth is recorded in the heat affected zone (HAZ). Increasing heat input from 1.19 to 2.42 KJ/mm causes a decrease in ferrite amount in the WM and a slight grain growth in the HAZ. A change in the ferrite grain morphology from acicular to circular is also observed in the WM. A better combination of the mechanical properties and microstructual features is obtained for a heat input of 2.42 KJ/mm.

Keywords : super duplex stainless steel, heat input, SMAW, alloying elements