

## Effect of Welding Heat Input on Intergranular Corrosion of Inconel 625 Overlay Weld Metal

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**Abstract :** This study discusses the effect of welding heat input on intergranular corrosion of the weld metal of Inconel 625 alloy. A specimen of Inconel 625 with a weld metal that controlled welding heat input was manufactured, and aging heat treatment was conducted to investigate sensitization by chromium carbides. The electrochemical SL and DL EPR experiments, together with the chemical ferric sulfate-sulfuric acid and nitric acid tests, were conducted to determine intergranular corrosion susceptibility between the specimens. In the SL and DL EPR experiments, specimens were stabilized in the weld metal, and therefore intergranular corrosion susceptibility could not be determined. However, in the ferric sulfate-sulfuric acid and nitric acid tests, the corrosion speed increased as heat input increased. This was because the amount of diluted Fe increased as the welding heat input increased, leading to microsegregation between the dendrites, which had a negative effect on the corrosion resistance.

**Keywords :** Inconel 625, welding, overlay, heat input, intergranular corrosion

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