

ABSTRACT

A method (300) for repairing a steel alloy article is provided. The method includes depositing (302), using a first welding process, a first weld repair layer across a surface of the steel alloy article to be repaired. The first weld repair layer forms a heat-affected zone (HAZ) in the steel alloy article beneath the surface. The method also includes tempering (304) the heat-affected zone by depositing (358), using a second welding process, a second weld repair layer across the first weld repair layer. The first welding technique is different than the second welding process and induces a lower heat input into the steel alloy article than the second welding process, wherein a thickness of the first weld repair layer is thinner than a thickness of the second weld repair layer.

[Figure 3A]