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Mechanical properties of gas metal arc welding (GMAW) welded ductile cast iron with microalloyed steel

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One of the best metal joining methods using gas metal arc welding (GMAW) is already used in the agricultural machinery industry to assemble any body parts of dissimilar ductile cast iron with microalloyed steel. Capacity of some loading i.e., bearing of the machinery components depends on mechanical properties on the quality of weldments. In this research for GMAW, with the use of a microalloyed steel filler, of a new microalloyed sheet steel and a ductile cast iron cylindrical bar steel is investigated. Examined quality butt weld beads as microstructure and mechanical properties were taken by applying different mean ferrite grain size according to Hall-Petch relationship. As well as phase volumetric fraction, mechanical properties changes and ferrite grain coarsening as in the heat affected zone (HAZ) at the welding steels joints were also determined. Considering the experimental results, maximum errors of 4.4% and 2.1% were found in the evaluation of mean ferrite grain size and yield stress, respectively.

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