

Influence of PWHT on Steel Hardness

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Post weld heat treatment is performed to minimize the amount of residual stress, with result from welding. Post weld heat treatment is also performed to reduce yield strength and hardness values. It will also provide higher fracture toughness and superior impact properties. Changes in these properties are the direct result of microstructural changes that occur during post weld heat treatment.

The poster will show the welding of 8630 Mod low alloy steel, using the Submerged Arc Welding process (SAW). The joint design will be a single V using Sd2.1NiCrMo Modified Oerlikon electrode and UV420TTR Thyssen flux. Controlled minimum preheats and maximum interpass temperature will be indicated.

Post weld heat treatment will be performed at a temperature below the lower transformation temperature of 1333 degrees F (Ac1) to prevent the formation of untempered martensite. The range for post weld heat treatment will be from 1180 degrees F to 1240 degrees F for ½ hour to 24 hours.

There will be photographs of the weld and transverse hardness test of test specimens.

The poster will have graphs illustrating the relationship between post weld heat treatment and hardness of 8630 Mod low alloy steel. The graphs will represent the correlation of post weld heat treatment to hardness of the metal; heat affected zone and weld metal at different times and temperatures.

There will be photographs of microstructures in these test areas.