ABSTRACT

A high cost for stainless steel direct application has made the fabricator to innovate to reduce production cost. One of the innovation is cladding. Cladding is covering a base metal with another metal which has better corrosion resistance. With a cheaper base metal price, so the production cost can be reduce. Some experiments are going to do to complete a research about how is the fluence on stainless steel cladding thickness variation at carbon steel in material's mechanical properties technically and economically.

Cladding method which used is overlay cladding where the depositions of clad metals are using SMAW welding. The thickness variations are 12 mm, 11.5 mm, and 11 mm for carbon steel ASTM A36, 2.5 mm, 3 mm, and 3.5 mm for stainless steel E309, and 1.5 mm for stainless steel E316L. E309 used to be an intermediate material to connecting base metal ASTM A36 to E316L, because E316L will not have a good join when directly deposited on carbon steel. To provide a good join between these materials, so some testing procedure in ASME section IX 2013 edition shall be examined, they are face bend test, side bend test, hardness test, and macroetch test.

Examination result on the specimens shows good mechanical properties on this overlay cladding application, it is provide by none of those specimens are rejected by the codes of ASME. On one of the side bend specimen found 1.3 mm discontinuity that still accepted by the code. On face bend specimens there are no discontinuity found. Hardness values on E309 are higher than E316L. And on the macroetch testing, there are no incomplete penetrations or incomplete fusions on the cross section of the materials. Economically, the first and second thickness variations are cheaper than if buy directly from manufacture.

Keywords: Overlay, E309, E316L, mechanical properties, economical