THE APPLICATION OF ARTIFICIAL NEURAL NETWORKS TO PREDICT THE ARC MORPHOLOGY IN TIG STATIC ARC WELDING WITH DIFFERENCE PARAMETER AND SHIELDING GAS COMPOSITION

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ABSTRACT

There were a lot of research to studies on the effect of parameters and shielding gas composition of the arc is very important, because the arc is an influential component in electric arc welding. The success is largely dependent on the quality on the welding arc and one an indication of the quality of the arc is a morphology of the arc. By studying the influence on the morphology of arc welding parameters expected to control the quality of arc can be done better.

The TIG static arc welding on ASTM A36 steel, carried out by varying the welding current, electrode tip angle, shielding gas debit, arc length, stick out, electrode diameter and shielding gas composition. An arc created to be photographed with digital camera, and then measuring the arc morphology on the photo that has generated.

The result of the research is that there are significant influence of the addition 30% helium element into the shielding gas to the observed response, the increase in arc welding current causes the contact angle decreased, while others will increase the arc morphology. Results of experimental data, used to make prediction methods, namely artificial neural networks (ANN). After several times of training, which can be obtained by artificial neural network used the type traingdx, traingdx algorithm. ANN is simulation with anew input, and performed validation experiment to test the predictive validity. When tested with statistical analysis found that the difference between ANN output with experimental results didn’t differ significantly, so that can be said to successfully to predict the arc morphology of artificial neural networks.

Key words: artificial neural networks, predict, tig, welding parameters, arc morphology.