

## ABSTRACT

A prediction system of tensile properties for heat treated Ti-6Al-4V alloys has been developed. Two different heat treatment processes are conducted to the Ti-6Al-4V alloys, i.e. Solution Treatment with Aging (STA) and annealing process. Different cooling rates have been adjusted to determine the effect on the tensile properties. Ultimate Tensile Strength (UTS), Yield Stress (YS) and Elongation (E) are the kinds of tensile properties which set as the output of prediction system. STA and the annealing process are heat treatment processes which are set as input of the system in combination with annealing temperature and strain rates. In order to develop the prediction system, this study adopts Artificial Neural Network (ANN) which can be used to solve the non-linear correlation problems. Feed Forward Back Propagation (FFBP) as the variety of ANN is adjusted with two types of learning algorithms, that is Gradient Descent with Momentum (GDM) and Lavenberg Marquardt (LM). This study uses Normalized Root Mean Square Error (NRMSE) and Coefficient Correlation (R) to identify the performance of the network.

**Keywords:** Ti-6Al-4V alloys, Tensile Properties, Feed Forward Neural Network