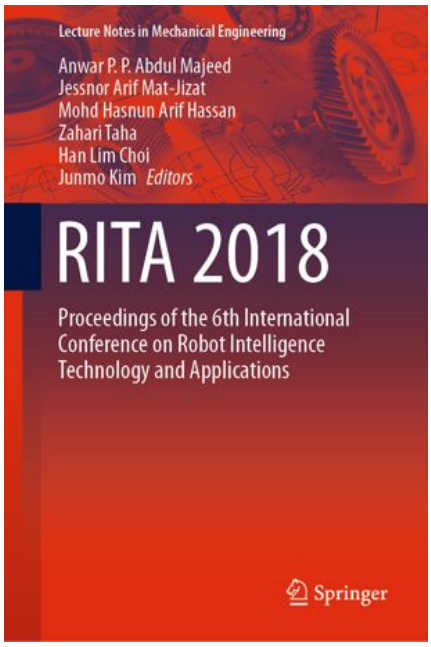

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Contents

The Flexural Strength Prediction of Porous Cu-Sn-Ti Composites via Artificial Neural Networks

Abdelrahman El-Sawy, Anwar P. P. Abdul Majeed, Rabiu Muazu Musa, Mohd Azraai Mohd Razman, Mohd Hasnun Arif Hassan and Abdul Aziz Jaafar

Innovative Manufacturing, Mechatronics and Sports, Faculty of Manufacturing Engineering, Universiti Malaysia Pahang, 26600 Pekan, Malaysia
e-mail: amajeed@ump.edu.my

Abstract:
Porous alloy-composites have demonstrated excellent qualities with regards to grinding superalloys. Flexural strength is an important mechanical property associated with the porosity level aswell as inhomogeneity in porous composites. Owing to the non-linear characteristics of the constituents of the composite material, the prediction of specific mechanical properties bymeans of the conventional regression model is often unsatisfactory. Therefore, the utilisation of artificial intelligence for the prediction of such properties is non-trivial. This study evaluates the efficacy of artificial neural network (ANN) in predicting the flexural strength of porous Cu-Sn-Ti composite with Molybdenum disulfide (MoS2) particles. The input parameters of the ANN model are the average carbamide particles size, the porosity volume as well as the weight fraction of the MoS2 particles. The determination of the number of hidden neurons of the single hidden layer ANN model developed is obtained via an empirical formulation. The ANN model developed is compared to a conventional multiple linear regression (MLR) model. It was demonstrated that the ANN-based model is able to predict well the flexural strength of the porous-composite investigated in comparison to the MLR model.

Keyword: Composite; Flexural strength; Artificial neural network