

## DEVELOPMENT OF PREDICTION MODELS USING LINEAR ADAPTIVE FILTERS FOR SOME PROPERTIES OF A NEWLY DEVELOPED THERMO-REGULATED BRICK

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### ABSTRACT

The development of prediction models using linear adaptive filters for some properties of a newly developed thermo-regulated brick has been carried out. The research started with the development of the bricks using anthill clay a material known for its thermoregulation property. The bricks were subjected to various tests to ensure that they conform to specifications and standard for thermo-regulated bricks and also to ensure that the thermal conductivity does not differ so much from that of bricks from virgin anthill clay. The tests data upon which the developed prediction models in this work were based were those of water absorption test, compression test and by extension abrasive index. Two models were developed for the prediction of water absorption and abrasive index properties of the developed thermo-regulated bricks. Plots of the predicted values of water absorption and the actual values of water absorption on the same graph showed a tight fitting curve indicating a high degree of accuracy for the prediction model. The plots of the predicted values of abrasive index and the actual values of abrasive index on the same graph showed a tight fit at some points and variations at other points. The performance evaluation of the prediction models showed that the model for the prediction of water absorption had a mean square error of  $8.3521E-4$  and the model for the prediction of abrasive index had a mean square error of 0.0225. The performance evaluation has indicated that the two models have not done badly, though the accuracy of the water absorption model is higher than that of the abrasive index.

**Keywords:** Models; Bricks; Thermoregulation; Prediction; Properties; Linear adaptive filters.