

## Determining Fire Resistance of Wooden Construction Elements through Experimental Studies and Artificial Neural Network

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**Abstract :** Artificial intelligence applications are commonly used in industry in many fields in parallel with the developments in the computer technology. In this study, a fire room was prepared for the resistance of wooden construction elements and with the mechanism here, the experiments of polished materials were carried out. By utilizing from the experimental data, an artificial neural network (ANN) was modeled in order to evaluate the final cross sections of the wooden samples remaining from the fire. In modelling, experimental data obtained from the fire room were used. In the system developed, the first weight of samples (ws-gr), preliminary cross-section (pcs-mm<sup>2</sup>), fire time (ft-minute), fire temperature (t-oC) as input parameters and final cross-section (fcs-mm<sup>2</sup>) as output parameter were taken. When the results obtained from ANN and experimental data are compared after making statistical analyses, the data of two groups are determined to be coherent and seen to have no meaning difference between them. As a result, it is seen that ANN can be safely used in determining cross sections of wooden materials after fire and it prevents many disadvantages.

**Keywords :** artificial neural network, final cross-section, fire retardant polishes, fire safety, wood resistance.

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