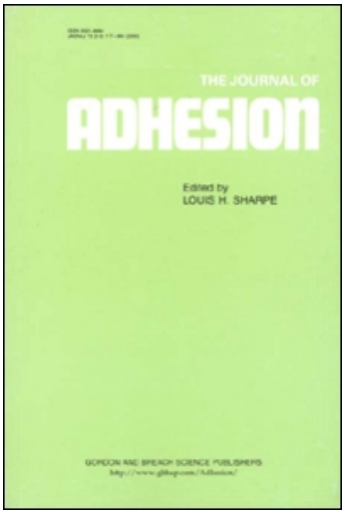

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The Impacts of Heat Treatment on Lap Joint Shear Strength of Black Pine Wood

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The Impacts of Heat Treatment on Lap Joint Shear Strength of Black Pine Wood

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This study was conducted to determine the impacts of heat treatment on lap shear strength, density, and mass loss of black pine wood. In the study, black pine wood boards bonded with polyurethane were subjected to temperatures of 160, 180, and 200°C for durations of 2 and 6 hours. Specimens having two layers were prepared from untreated and treated wood for mechanical testing of bond lines. Data were analyzed using variance analysis and Tukey's test to determine the impacts of changes in density and mass of heat-treated black pine wood on lap shear strength. The results indicated that the lap shear strength of black pine wood decreased as the intensity of heat treatment increased. The results also indicated that the minimum and maximum percentage decreases of lap shear strength were approximately 27% for 160°C and 2 hours and 78% for 200°C and 6 hours.

Keywords: Black pine; Density loss; Heat treatment; Lap shear strength; Mass loss

1. INTRODUCTION

In many European countries, the increased environmental pressures of the last few years have resulted in the important development of thermally modified wood as a non-biological alternative to classical preservation techniques [1]. The heat-treatment process for wood preservation is used as one of the alternatives to the use of chemicals for protecting wood. Heat-treated wood exhibits a lower affinity for water and a strongly modified wettability, which lead to important changes in its behavior with most coating or gluing processes [2,3].

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