

This article was downloaded by: [TÜBİTAK EKUAL]

On: 3 September 2010

Access details: Access Details: [subscription number 772815469]

Publisher Taylor & Francis

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



The Journal of Adhesion

Publication details, including instructions for authors and subscription information:

<http://www.informaworld.com/smpp/title~content=t713453635>

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

Deniz Aydemir^a; Gokhan Gunduz^a; Saadettin Murat Onat^a

^a Faculty of Forestry, Department of Forest Industrial Engineering, Bartin University, Bartin, Turkey

Online publication date: 02 September 2010

To cite this Article Aydemir, Deniz , Gunduz, Gokhan and Onat, Saadettin Murat(2010) 'The Impacts of Heat Treatment on Lap Joint Shear Strength of Black Pine Wood', The Journal of Adhesion, 86: 9, 904 – 912

To link to this Article: DOI: 10.1080/00218464.2010.506157

URL: <http://dx.doi.org/10.1080/00218464.2010.506157>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.informaworld.com/terms-and-conditions-of-access.pdf>

This article may be used for research, teaching and private study purposes. Any substantial or systematic reproduction, re-distribution, re-selling, loan or sub-licensing, systematic supply or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

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

Deniz Aydemir, Gokhan Gunduz, and
Saadettin Murat Onat

Faculty of Forestry, Department of Forest Industrial Engineering,
Bartın University, Bartın, Turkey

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].

Received 10 July 2009; in final form 11 May 2010.

Address correspondence to Deniz Aydemir, Faculty of Forestry, Department of Forest Industrial Engineering, Bartın University, Bartın 74100, Turkey. E-mail: denizoren32@yahoo.co.uk