

Abstract

This study investigates the properties of medium density fiberboard made from branches of forest trees that conducted in two steps. In the first step the effect of press temperature, mat humidity and MF to UF ratio on physical and mechanical properties of the prepared boards was studied. MF to UF ratios at 5 levels(23:77, 18.75:81.25, 12.5:87.5, 62.5:93.75, 2:98), press temperature at 5 levels(176.8, 170, 160, 150, 143.2) and mat humidity at 5 levels(16.36, 15, 13, 11, 9.64) were used as first stage variables. Also press (6 min) was considered as a constant factor for all treatments was envisaged. Physical strengths Thickness Swelling(TS) and Water Absorbance(WA) after 2 and 24 hours soaking in the water and mechanical strength Initial Bond(IB), Modulus of Rupture(MOR) and Modulus of Elasticity(MOE) of boards were analyzed according to EN622-5 standard and statistical analysis was done with SPSS 20 soft ware. Results show that the maximum ratios of Melamine to Urea resins have a significant effect on flexure strength and modulus of elasticity such that maximum rupture strength and modulus of elasticity was related to manufactured boards with maximum percentages of Melamine resin. Internal bond of the boards was significantly improved with increasing of the temperature, humidity and ratios of Melamine to Urea resins. Although water absorbance resistance of the boards was significantly affected by Melamine resin content as Minimum water absorbance resistance is for boards with maximum ratios of Melamine to Urea resins. Minimum Thickness Swelling was also belonged to the boards which contains maximum amount of Melamine resin contents. In the second step the effect of press closing speed in 3 levels (1, 3 and 5 seconds for each millimeter) and although boards thicknesses in 3 levels (10, 16 and 25 millimeter) was studied. Press time, resin content, manufacturing and testing board's stages was done same as first step. The results show that the maximum of flexural strength and Modulus of elasticity was related to the boards which were manufactured with maximum duration of closure span press and minimum thickness.

Key words: Medium density fiber board, Melamine formaldehyde resin, Press temperature, Mat humidity, Modulus of Rapture.



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**The Thesis Submitted for the Degree of Master of Science
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Title:

**Effect of press temperature, mat moisture and
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made from branches fibers of forest trees**

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