Journal of The Faculty Of Agriculture Kyushu University 55(2): 371-377, 2010

Effect of Pre-treatment techniques on Physical, Mechanical and Durability Properties of Oriented Strand Board Made from Sentang Wood (*Melia excelsa* Jack)[1]

Apri Heri Iswanto[2] · Fauzi Febrianto[3] · Imam Wahyudi[3] · Won-Joung Hwang[4]
Seon-Hwa Lee[5] · Jin-Heon Kwon[5] · Sung-Min Kwon[5] · Nam-Hun Kim[5*] · Testuo Kondo[6]

ABSTRACT

Sentang wood (*Melia excelsa* Jack) is one of the promoting fast growing tree species that can be introduced in timber estates and community forest in Indonesia. The objective of this research was to evaluate physical, mechanical and durability of Oriented Strand Board(OSB) made from Sentang wood under various pre-treatment techniques including immersing in hot water, immersing in preservative solution and steamed. Three-layered OSBs were manufactured. The strand composition for face, core, and back was 25%, 50% and 25%, respectively. Methane di-isocyanate (MDI, Type H3M) resin was used as an adhesive in amount of 7%. The amount of paraffin used was 1% based on oven dried strand. The strands were immersed in hot water at 80°C for 2 hours, immersed in 2.5% of CCB preservative solution for 48 hours and steamed at 126°C at 1.4 $kg.cm^{-2}$ pressure for 1 hour prior to be blended with adhesive. The results indicated that OSB manufactured mostly consisted of quarter round and flat strands with high slenderness ratio and high aspect ratio. Pre-treatment of strand by immersing strands in hot water, immersing in preservative solution and steamed resulted in improvement of water absorption of board, some mechanical properties and durability of OSB. Introducing 2.5% CCB preservative on the OSB significantly improved durability of OSB against termite attack but did not influence the strength of OSB. Untreated OSB, OSBs prepared from preserved strands and steamed strands can be used for exterior application, while OSB prepared from hot water immersed strands only can be used for interior application. All OSB parameters manufactured in this experiment were superior when compared with the minimum requirement of CSA 0437.0 standard for Grade O-2 OSB.

Keywords : *OSB, Sentang wood, Hot water immersed, Preservative, Steamed*

1 Received on June 30, 2010
Accepted on July 9, 2010
2 Department of Forestry, Faculty of Agriculture, North Sumatera University, Indonesia
3 Department of Forest Products, Faculty of Forestry, Bogor Agricultural University, Gd. Fahutan Kampus IPB Dramaga, Bogor 16680, Indonesia
4 Division of Wood Processing, Department of Green Resources Utilization, Korea Forest Research Institute, 57 Hoegiro, Dongdaemun-gu, Seoul 130-712, Korea
5 Department of Forest Biomaterials Engineering, College of Forest and Environmental Sciences, National University, 200-701, Chuncheon, Korea
6 Laboratory of biomaterial degien, Division of Sustainable Bioresources Science, Department of Agroenvironmental Sciences, Faculty of Agriculture, Kyushu University Fukuoka 812-8581, Japan
* Corresponding author E-mail : kimnh@kangwon.ac.kr