

Application of Hot Pressing to Manufacture Flame-Retardant Panel with Plantation - Japanese Cedar

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(Received: Sep. 12, 2005; Accepted: Sep. 28, 2005)

Abstract

This study used Japanese cedar (*Cryptomeria japonica* D. Don.) as a material, one of the main plantations in Taiwan. The flame-retardant panels were manufactured using the hot pressing method after first having been through the soaking process with a commercial fire retardant chemical (FR). The objective of this research was to increase the value-added dimension of the end product, thereby increasing the utilization of Taiwan's plantations. The results obtained showed that the flammability performance of the panels were increased in accordance with the conditions of the soaking process for 1, 12, and 24 h with 40 kgf/cm² at 120 °C for 30 min of hot pressing, as well as they were able to reach the third grade of CNS 7614. The char for the flame-retardant panels left about 21.34 wt % to 27.77 wt %, at a temperature of 800 °C, in the TGA tests. The results of SEM observation and soft X-ray analysis showed that FR occurred inside the cell cavity or cell lumen of the panels, and resulted in a higher surface density of the panels, reaching up to 0.64 g/cm³. In addition, the physical properties of the panels were improved as well.

Keywords: Japanese cedar, Hot Pressing, Flame-Retardant Panel, Thermogravimetric Analysis (TGA), Soft X-ray Analysis

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