

Effect of Fire Retardant Painting Product on Smoke Optical Density of Burning Natural Wood Samples

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Abstract : Natural wood is used in many applications in Jordan such as furniture, partitions constructions, and cupboards. Experimental work for smoke produced by the combustion of certain wood samples was studied. Smoke generated from burning of natural wood, is considered as a major cause of death in furniture fires. The critical parameter for life safety in fires is the available time for escape, so the visual obscuration due to smoke release during fire is taken into consideration. The effect of smoke, produced by burning of wood, depends on the amount of smoke released in case of fire. The amount of smoke production, apparently, affects the time available for the occupants to escape. To achieve the protection of life of building occupants during fire growth, fire retardant painting products are tested. The tested samples of natural wood include Beech, Ash, Beech Pine, and white Beech Pine. A smoke density chamber manufactured by fire testing technology has been used to perform measurement of smoke properties. The procedure of test was carried out according to the ISO-5659. A nonflammable vertical radiant heat flux of 25 kW/m^2 is exposed to the wood samples in a horizontal orientation. The main objective of the current study is to carry out the experimental tests for samples of natural woods to evaluate the capability to escape in case of fire and the fire safety requirements. Specific optical density, transmittance, thermal conductivity, and mass loss are main measured parameters. Also, comparisons between samples with paint and with no paint are carried out between the selected samples of woods.

Keywords : extinction coefficient, optical density, transmittance, visibility

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