STRENGTH CHARACTERISTICS OF ADHESIVES AND PAINTS FOR WOOD USED IN FURNITURE MANUFACTURING IN KENYA

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ABSTRACT

The wide variety of brands of Polyvinyl acetate adhesives (PVA) and Nitrocellulose clear wood varnishes (paints) available for woodwork in Kenya makes it difficult for users to select appropriate brands due to lack of information on their performance. There is need therefore to document, evaluate and rank the available brands based on performance.

A survey was conducted to establish the available brands and consumer preferences based on perceived performance and price. Strength testing was done to evaluate the strength of adhesive joints and paint bonds based on three adhesive brands, three paint brands and three wood species. Specimens were tested using a Universal Strength Testing Machine. Strength data was analysed by analysis of variance at $p = 0.05$.

Survey results indicate that there are twelve different brands of PVA adhesives and eleven of paints used in the furniture industry. Statistical analysis revealed that large-scale and small-scale sellers had similar opinion on the performance of the adhesives and paints. Furniture manufacturers had similar opinion on the performance of adhesives but differed in opinion regarding the performance of the paints. A list of the ranked products was produced.

Strength results show that lap joints had the highest mean bond strength and differed significantly from dowel and mortise and tenon joints.

There was no significant difference between the strength of dowel and mortise and tenon joints. This was attributed to differences in pressure uniformity and joint surface smoothness among the joint types. Cypress wood produced the strongest bonds for both adhesives and paints, differing significantly from camphor and pine whose bond strength did not differ significantly. This was attributed to difference in wood density and extractives among the species. In the case of adhesive brands, Supa Bond, Ponal Professional and Woodex glue produced bonds of strength in that order and differed significantly from each other. Results of paint brand tests show that Alfa automotive had the highest strength and differed significantly from Apex and Blue Seal. The strength of Apex and Blue Seal did not differ significantly. These observations were attributed to differences in formulation used by different adhesive and paint manufacturers.

It is recommended that all the adhesive and paint brands in the market be subjected to strength testing to enable ranking based on strength. Kenya Bureau of Standards should enforce quality of adhesives and paints through product monitoring in the market.