



Developing a Methodology for the Utilization of Thread Wastes for Carpet Manufacturing

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Abstract

The growth of the world population has significantly increased in the past few decades as a result of industrialization, urbanization, some socio-economic factors, etc. Therefore, the consumption of resources has tremendously being increased while the waste of those resources becoming a huge environmental issue. The apparel industry is one of the main industries which consumes many natural and synthetic resources causing the generation of non-degradable or light-degradable wastes. The intended research focused on the development of an optimized methodology for the utilization of thread wastes to manufacture carpet product. Different ratios of urea-formaldehyde, water, and thread wastes have been taken to make the initial pulp of manufacturing the carpet product. The considered compositions of the ratios of urea-formaldehyde, water, and thread wastes of 1:1:1.25, 1:1:0.83, 1:1:0.62, and 1:1:0.5 were used respectively for manufacturing the carpet with 12 replications from each composition. The carpets were manufactured following compression molding technology. The product was tested under four different tests which are abrasion tests (196mm³) in 1:1:0.5 replication. The water absorption is 21.79% in 1:1:0.5 replication. The ultraviolet resistance test shows no color change in all replications and the thermal conductivity test is 0.43 W/mK in 1:1:0.5 replication. The carpet manufactured from the composition, which is urea-formaldehyde, water, and thread wastes in the ratios of 1:1:0.5 respectively showed the best performance of each test result and concluded to be used for the manufacturing of carpet.

Keywords: *Thread Waste, Urea-Formaldehyde, Manufacturing, Carpet Product*

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