



917/D

## Quality assessment of virgin and recycled papers available in Sri Lanka

G.M. Indunil\* and W.A.R.T.W. Bandara

*Department of Zoology and Environmental Management, University of Kelaniya, Sri Lanka*

The permanence and durability of the recycled papers are important as in virgin papers to decide the ultimate end use. The main objective of this study was to assess the paper quality of recycled paper with aging compared to virgin papers. Three multipurpose virgin papers; 60GSM, 65GSM and 70GSM and three types of recycled papers; Brown Kraft papers, Yellow Kraft papers and White papers were collected. Physical parameters: grammage, thickness, burst strength, tensile strength, water absorptiveness (cobb60); chemical parameters: pH; and optical parameters: opacity, brightness, whiteness of the selected papers were tested in replicate using standard methods. Each test was carried out subjecting sample papers into accelerated aging (ASTM D4714 method) by keeping them in a controlled aging chamber at 50% relative humidity and 90 °C. Samples were tested after aging for 3 days, 7 days, 14 days, 21 days, and 28 days. Opacity has been decreased in virgin papers while increased in recycled papers with the accelerated aging. Other parameters have shown a decreasing trend over time. 70GSM virgin paper type was failed the water absorptiveness test after accelerated aging of 3 days. All the types of recycled papers were failed water absorptiveness test even before aging. pH changes were from alkaline to neutral (pH 9.1 to 7.4) in both virgin and recycled papers over time. Most of the time, overall change of parameters resulted after accelerated aging of 21 days, which is comparable to 7.4 years of natural aging. In conclusion, 70 GSM and all the recycled papers are not suitable for printing and writing but newspaper printing as they failed in Cobb60 test. 60GSM and 65GSM papers can be recommended for printing. Both the virgin and recycled papers can be used as archival or artist's paper for 7.4 years without discoloring or deteriorating. Recycled papers can be recommended for food packaging as they showed the highest permanence in terms of tensile and burst strength. However, as recycled papers failed Cobb60 test it is recommended to pack dry food to avoid moisture.

**Keywords:** Accelerated aging, recycled papers, virgin papers

**E-mail:** mihirigunasekara5@gmail.com