



Badanie tłuszczoodporności papieru banknotowego

Investigation of grease resistance properties of banknote paper

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Problem statement

Opracowano specjalną metodę eksperymentalną do szybkiego określenia właściwości tłuszczoodporności papieru banknotowego. Przy użyciu tej metody określono odporność na tłuszcz różnych rodzajów papieru banknotowego. Wyniki rankingu próbek papieru były całkowicie skorelowane z klasyfikacją próbek, zgodnie z charakterystyką energetyczną papieru.

Słowa kluczowe: *tłuszczoodporność, banknot, papier banknotowy, parametry energetyczne papieru*

A special experimental method for an expeditious definition of the grease resistance properties of the banknote paper was developed. Using this method, the grease resistant properties of the different kinds of the banknote paper were determined. The results of the paper samples ranking were completely correlated with the samples ranking according to the energy characteristics of the paper.

Keywords: *banknote grease resistance, banknote paper, energy parameters of paper*

Biotic and abiotic objects are the sources of the banknote deterioration. People serve as the biotic objects. It should be noted that this source does the biggest impact of the banknote degradation processes. As was mentioned by other papers [4, 5], the fingers touching process is the major determinant of banknote soiling. Fingerprints accumulate over time and form a yellow-brown layer of an old sebum. They consist of a mixture of sweat (99% water, 1% solids) and sebaceous secretion as well as other materials accumulated on the fingers. Therefore, the contamination layer formed on a banknote surface consists mainly of a mixture of the secretion of the human sebaceous glands (fatty acids (antinea, acetic, oleander, valerian, kapron, etc.)) and dry inorganic dirt (soil components, primarily clay) [3]. After a short time (as usual a few days), the volume of the fingerprints on the banknote surface decreases due to evaporation of volatile components, becomes more viscous, and after that becomes almost solid [2]. As a consequence of these processes, the oil-repellent characteristics of banknote paper becomes important factor of the soil-resistant properties of banknotes in circulation.

The grease resistance is an ability of paper to not to pass the grease through. From other perspective it is a paper feature of not being penetrated by oil components and to withstand anti spots characteristics during the contact with different kinds of greases [7]. It is very important to evaluate the barrier properties of banknote paper. However, there is an insufficient discussion of the impact of the grease resistance indicators on the deterioration of banknote papers. Method 3M KIT [9] is widely used for determination of the oil content of packaging materials for products containing vegetables and animal fats. The Kit test is used to quantify or compare the performance of papers and boards, used for food contact and other packaging applications where resistance to grease staining is important [8]. However, this

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