

PROPERTIES OF THE INK-COATINGS WITH ADDED SiO₂ NANOPARTICLES PRINTED ON ALUMINIUM SUBSTRATES

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Abstract

Aluminum is a material used in various printing applications due to its extremely favorable properties. It is a sustainable material with a number of advantages due to its decorative role, surface stability, chemical resistance, light fastness and others. In order to print an ink-coating on the aluminum surface, it is usually specially treated to ensure the stability of the applied coating. Furthermore, the inks used in the printing process should have adjusted properties depending on the application and decorative requirements. In this research, the colorimetric stability of coatings printed on different aluminum substrates was observed. The surfaces of the aluminum samples exhibited different roughness properties, and the inks used in the printing process were modified by the addition of SiO₂ nanoparticles. The aim of this research was to investigate the possible improvement of the stability of the ink-coatings obtained by modified printing inks in screen printing. Printed samples were aged in a test chamber in order to define the influence of the addition of nanoparticles on the colorimetric and gloss properties of the coatings. Additionally, the influence of differently structured surfaces of aluminium on colorimetric properties of printed ink-coatings was observed. The results of the research will provide an insight on the potent use of SiO₂ nanoparticles in inks printed on aluminium surfaces and the influence of surface structure of aluminium on colorimetric properties and lightfastness of printed coatings.

KEYWORDS

aluminium, surface morphology, inks and coatings, nanoparticles, screen printing.