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Tattoo Wall®: study of the stability of an innovative decorative technique through hyperspectral imaging and possible application in the mural painting's restoration

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ABSTRACT

The main purpose of this contribution is to report some first preliminary analyses of a new and never investigated decorative technique named Tattoo Wall®, especially the possible changes due to ageing artificially induced by extreme humidity conditions in view of a possible application in crypts, churches or outside wall paintings. This innovative decorating technique involves transferring digital images on wall surfaces through a transfer paper with solvent-based ink and fixative. For the experimental tests, we chose to work on a color scale as wide as possible, to test each single color, and on different materials. The printed colors were applied on hydraulic mortar, containing marble powder combined with Ledan C30, particularly suitable for restoration in environments with high relative humidity (RH%). Moisture ageing was obtained by placing the sample in a box with RH% fixed to 92% thanks to the presence of salts (sodium sulphate deca-hydrated) for compressively two years (96 weeks). Reflectance spectrophotometry for color measurements and hyperspectral imaging (HSI) were used to assess the effect of high relative humidity exposure. The experimental data were statistically treated in order to evaluate their significance. Testing enabled us to verify the stability and durability of Tattoo Wall® under high relative humidity, with little chromatic alterations. Testing could and should be conducted also on different surfaces and materials (paintings on canvas and wood, oil on wall, etc.) to make it as complete as possible and guarantee the use of Tattoo Wall® in most cases of pictorial reintegration, reducing the risk of human error.

Keywords: Tattoo Wall®, digital fresco, painting reintegration, reflectance spectroscopy, Hyperspectral Imaging

1. INTRODUCTION

This paper presents the results obtained during an experimental study on the Tattoo Wall®: an innovative decorating technique that involves transferring digital images on wall surfaces through a transfer paper with solvent-based ink and fixative (see details at: <https://www.tattoowall.com/en/home>). Tattoo Wall® is a technique allowing for transferring directly an image on a surface resulting in a final effect very similar to fresco painting. For this reason it is called “digital fresco”. Tattoo Wall® has been rarely used in restoration applications and in the few cases generally as support for replacing fragmentary wall paintings [1]. Two recent applications of Tattoo Wall® in the restoration field concern the wall paintings of the Ovetari Chapel in the Eremitani church in Padova and those of the apse of St. Peter Basilica in Tuscania (a town in Central Italy in the district of Viterbo). The Eremitani chapel was destroyed by the bombings of the Second World War and the church of St. Peter in Tuscania by the earthquake that interested the area in February 1971 [1, pp. 42-76]. In both cases the photographic documentations made before the wall paintings destruction allowed for printing the artworks in 1: 1 format and replace the fragments of recovered wall paintings directly on the prints [2-3].

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