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Use of WEICON “Sealant & Adhesive Remover” in the Conservation Process of “Lindley’s Plans”

Abstract

“Lindley’s Plans” is a section of 64 map sheets on paper, textile and cardboard from the cartographic collection “Measurement Department of Management of Savage and Water Supply System Creation”. It was made by a surveyors’ team working for Warsaw Water Supply System Creation under the supervision of Wiliam Heerlein Lindley, engineer, between 1883 and 1915. The collection of maps belongs to the Archives of the Capital City of Warsaw. The history of “Lindley’s Plans” is complicated and bound to the turbulent past of Poland. The maps are a work of art, which has unique historical and artistic value. Because of that, they are thought to be equal to the greatest pieces of cartographic and geodetic work worldwide. This high position is owed to the accuracy of cartographical precision combined with fabulous artistic form.

The condition of the whole collection was disastrous. Together with natural aging processes, we noticed the influence of water and mechanical damage as well as previous improper repairs. On many map sheets we observed numerous brown stains of foxing character. The greatest damage was, however, from orange and brown paint stains of a physical and chemical nature. On 14 of the maps the stains covered almost the whole surface of the drawing. On another 6 maps the number of stains was considered to be average, as they covered only some parts of the drawing. On other maps sheets there were only slight stains of paint. They were visible in the form of tiny pulverized stains, equally dispersed over the whole surface. The origins of such stains may only be supposed. We are sure that sometime before 1937 the back of the maps was treated with orange and brown paint and covered with varnish. Their storage in a pile resulted in the sheets sticking to one another.

During a test of map usage, non-controlled separation of the sheets stuck together resulted in destruction of paint, varnish and the drawing

paper surface. There was a large amount of paint and some varnish left on the front of the maps, sometimes with a layer of paper. The result was enormous mechanical damage to the surface, which disturbed or blocked the possibility of visually perceiving the drawing.

A fundamental assumption of conservation was to make essential, but still minimal intervention to the original objects and to elaborate condition and storage instructions. The most important assumption was care of cartographic value of the maps.

The most difficult conservation task was to remove the orange and brown paint stains. To do that, the "Sealant & Adhesive Remover" agent manufactured by WEICON was used. Before use, proper examinations were carried out.

First, a team of chemists and conservators made an attempt to establish the composition of the agent by using GC-MS. Then aging tests were carried out on contemporary models: handmade paper and Whatman Nr. 1 chromatography paper. Test samples were prepared by applying 3 % Klucel G in ethyl alcohol (96 %) and the WEICON "Sealant & Adhesive Remover" agent.

Aging was done in a climate chamber (for 24 days in stable conditions: temperature of 80 °C, relative air humidity 65 %) and a Suntest CPS+ appliance (for 7 and 14 days). Suntest CPS+ exposure was done in a "sun behind the glass" system with light intensity of 500 W/m² (for light of wave-length $\lambda < 800$ nm) and maximum exposure of 50 kJ/cm².

To mark the aging process, the following measurements were estimated: pH values were marked using Mettler-Toledo pH-meter according to PN-84/P-50109 standard from "cold water solution", resistance to abrasion according to PN-EN 20187:2000 standard and optical values: Brightness (R457) and Yellowness Index according to ISO 11798 and PN-ISO 11475 standards.

From positive research results, it was decided to use the WEICON "Sealant & Adhesive Remover" agent in the conservation process.