

Studies upon properties of lacquer coatings from oil – wax products formed on steamed locust wood (*Robinia Pseudoacacia* L.). Part III. Chemoresistance

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Abstract: *Studies upon properties of lacquer coatings from oil – wax products formed on steamed locust wood (*Robinia Pseudoacacia* L.). Part III. Chemoresistance.* The aim of the work undertaken on an experimental basis was to study the properties of coatings based on oil-wax products formed on the surfaces of native (unmodified) and thermally modified locust wood in steamed. The scope of studies into account the determination of resistance the finishings for selected cold liquids action used in the household. The study was performed according to the procedure described in PN-EN 12720 standard. Based on the results carried out experiments it was stated among others that resistance of surface finishings on selected cold liquids action was influenced by both of the kind of substrates, and applied oil-wax products. Higher resistance to cold liquid action had finishings formed on steamed wood.

Keywords: locust wood, oil-wax product, finishing, chemoresistance, cold liquid action

INTRODUCTION

In previous articles upon investigations of the properties of finishings on the basis oil-wax products, formed on the surfaces of thermally modified locust wood in steamed version, presented results of aesthetic-decorative features (Piernik, Proszyk and Nowaczyk-Organista-in press) and thermal resistance (Piernik and Proszyk 2011). In the next part of the continuing this problem concerning with chemical resistance of finishings Resistance finished surface to cold liquids action is determined in the procedure so called chemical test. Substances used for investigations in most cases used in everyday household. Depending on the utility properties of the surfaces is selected suitable liquids among others, such as organic solvents, juices, liquors, acids, bleaches and paste (Paprzycki and Serafinowska 1992, Nowaczyk and Krzoska-Adamczak 1999, Krzoska-Adamczak 2001, Boliński 2002, Mateńko-Nożewnik and Proszyk 2004, Proszyk, Mateńsko-Nożewnik and Kolasiński 2004, Proszyk et al. 2007). Some liquids everyday interaction adversely on finished surfaces. The aim of this study was to determine the chemical resistance of finishings on selected cold liquids and the course of durability in the thermal aging conditions.

EXPERIMENTAL

Selection and characteristics of experimental materials and coatings on basis oil-wax products, which are marked as OSMO, BECKERS and ALTAXIN, presented in the article Piernik, Proszyk and Nowaczyk-Organista (in press). Resistance of surface finishings of the cold liquid action was determined according to the procedure described in PN-EN 12720 standard. Selected agents in form: acetone (pure), black shoe polish (Carrefour Comp.), coffee (soluble Jackobs), red wine (Cavignon) and Sidolux-domestic cleaning-preservative agent were applied on surfaces finishing at various time (appropriate: 10 s; 1-2-10 min and 1-6-16-24 h). Liquids were applied with the use of blotting paper (mass weight 450 g/m² and diameter 25 mm). Pieces of blotting paper were dipped for 30 s in particular liquids and then were put on tested surfaces and covered with vessel for weighing tightened with paraffin. After specified time both utensils and pieces of blotting paper were removed and then samples were conditioned for 24 h. Then the place of the test was cleaned with a cloths soaked with a cleaning agent and distilled water. An evaluation of surface changes, visually was made, using descriptive numerical grade scale with the use of a 5 degree results scale (5- no visible changes of surface, 1- structure changes).

Investigations were done after 3, 6 and 9 cycles of thermal aging in the version of changes temperatures acc. to PN-88/F-06100/07 standard (method A).

RESULTS

Example results from the resistance of coatings to the cold liquids appropriate acetone, coffee, red wine, shoe polish and Sidolux agent, affecting at respectively 1 and 24 h, and their course as a function of changes temperatures cycles are given in Tables 1 and 2.

Table 1. The results of investigations of resistance of finishing from oil-wax products formed on steamed wood to cold liquids action (24 h) and their course vs. function of the number of cycles

Kind of liquids	Kind of substrates	Number of cycles								
		3			6			9		
		Kind of oil-wax products (O - OSMO, B -BECKERS, A – ALTAXIN)								
		O	B	A	O	B	A	O	B	A
Note (scale 5-1 acc. to EN 12720 standard)										
Aceton	Native wood	3	1	4	4	4	3	4	2	5
	Steamed wood	2	3	2	4	2	2	5	3	5
Coffee	Native wood	3	1	1	3	1	2	3	1	2
	Steamed wood	2	3	2	2	3	3	3	3	2
Red wine	Native wood	5	2	5	5	1	2	5	1	4
	Steamed wood	5	3	4	5	4	4	5	2	5
Shoe polish	Native wood	1	1	1	1	1	1	1	1	1
	Steamed wood	1	1	1	1	1	1	1	1	1
Sidolux	Native wood	4	2	3	5	2	1	5	2	5
	Steamed wood	5	1	5	4	2	2	5	1	5

Analysing results carried out of investigations of the resistance of lacquer coatings on the cold liquids action, it was stated, that finishings had various durability. For example all ready after 1 h in the case of acetone and shoe polish, which had shown very low resistance, appropriate, with notes 3-5 and 1 in the accepted scale. Each of the oil-wax products and particular substrate, showed a specific resistance included liquids.

Table 2 The results of investigations of resistance of finishing from oil-wax products formed on steamed wood to cold liquids action (1 h) and their course vs. function of the number of cycles

Kind of liquids	Kind of substrates	Number of cycles								
		3			6			9		
		Kind of oil-wax products (O - OSMO, B -BECKERS, A – ALTAXIN)								
		O	B	A	O	B	A	O	B	A
Note (scale 5-1 acc. to EN 12720 standard)										
Aceton	Native wood	4	4	5	5	5	4	5	5	5
	Steamed wood	3	4	3	4	5	3	5	5	5
Coffee	Native wood	5	2	5	4	2	2	5	2	5
	Steamed wood	4	4	3	5	4	3	4	4	4
Red wine	Native wood	5	4	5	5	3	4	5	4	4
	Steamed wood	5	4	4	5	4	4	5	4	5
Shoe polish	Native wood	1	1	1	1	1	1	1	1	1
	Steamed wood	1	1	1	1	1	1	2	1	1
Sidolux	Native wood	5	3	4	5	3	2	5	3	5
	Steamed wood	5	1	5	5	3	2	5	3	5

CONCLUSIONS

1. It has been shown differently resistance of surface finishings on selected cold liquids action. This resistance was influenced by both of the kind of substrates, and applied oil-wax products. Higher resistance to cold liquid action had finishings formed on steamed wood.
2. In the function of the number of cycles changes temperatures was noted stability tendency of chemoresistance of the finishing surfaces.

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Streszczenie: *Badania właściwości powłok lakierowych z olejo-wosków uformowanych na parzonym drewnie grochodrzewu (Robinia Pseudoacacia L.). Część III. Chemoodporność.* Celem podjętej pracy o charakterze eksperymentalnym było określenie odporności wykończeń na bazie olejo-wosków uformowanych w układzie porównawczym na powierzchni drewna grochodrzewu modyfikowanego termicznie w wersji parzonej oraz niemodyfikowanego. Odporność wykończonych powierzchni na działanie zimnych płynów (aceton cz., czarna pasta do butów, kawa, czerwone wino, środek czyszcząco-pielęgnacyjny) oznaczano wg procedury opisanej w PN-EN 12720, prowadząc obserwacje w różnym czasie (10 s, 1-2-10 min oraz 1-6-16-24 h). Badania prowadzono w funkcji liczby cykli starzeniowych w wersji zmiennych temperatur zgodnie z PN-88/f-06100/07 (metoda A). Na podstawie rezultatów przeprowadzonych badań stwierdzono, że testowane wykończenia wykazywały zróżnicowaną odporność na działanie wybranych zimnych płynów. Odporność ta uwarunkowana była zarówno rodzajem podłoża, jak i zastosowanym olejo-woskiem.

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