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COMPARATIVE ANALYSIS OF ABRASION RESISTANCE OF LAMINATED AND TIMBER FLOORING

In the article the results of abrasion resistance paintwork coatings wooden and laminate floors are presented. Installed the most abrasion-resistant paintwork coatings and the estimation of quality of the laminated floors of various manufacturers was made.

Introduction. A wide range of materials of human and natural origin is used for manufacturing of flooring for dwelling premises and public rooms. Recently cheap floor covering such as linoleum and laminated flooring has been used in residential buildings.

Production of the laminated floors in the Republic of Belarus only is planned to open, therefore all this production is imported. The manufacturing application of high-density fiberboards is driven by economics and reduction in manufacturing time as compared to parquet production. Essential difference will consist in natural beauty, ecological safety, wealth and warmth of natural parquet products and a cold artificial copy of drawing of wood of valuable breeds of the laminated floors.

By consideration of the laminated floors by important consumer criterion the class of its application is very important. The list of the indicators characterizing its class includes the following: durability on blow, resistance to a scratching, resistance to pollution and a burning cigarette, moisture resistance; light resistance. But the most important operational indicator defining durability of floor coverings is resistance to galling. Resistance to galling is an ability of coverings to resist to destruction of blankets as a result of a friction arising at its interaction with other firm bodies or abrasive materials. The surface of a floor covering will be used up and scratched mainly by dirt which sticks to footwear.

For the laminated floors allocate six classes of wear resistance – 21, 22, 23, 31, 32, 33 (easy loading (21) and for public places (33)).

At a choice the consumer of the laminated floor it is necessary to trust on "word" to the seller or information placed on packing of production as check needs the specialized equipment. Especially it becomes actual now as in the market there was cheap production of poor quality.

For ensuring durability of timber floors their protection against influence of external factors is required.

For achievement of these purposes special parquet paint and varnish materials are used. Now in the market of parquet paint and varnish materials there were new compositions, in particular such, as water and dispersive systems. At a choice of this or that material it is important to consumer to know, for as long time safety and appeal of a floor covering will be provided with protective and decorative structure.

The purpose of this work was the assessment of resistance to galling of the laminated floors, and also protective and decorative coverings of timber floors on the basis of the paint and varnish materials applied in living conditions.

Main part. For the research four types of protective and decorative coverings of paint and varnish structures for wood of the Belarusian production were chosen party:

No. 1 (a water and dispersive varnish);

No. 2 (an solvent-borne polyurethane varnish);

No. 3 (an solvent-borne two-component polyurethane varnish);

No. 4 (an solvent-borne two-component varnish of an acid denial), and also water and dispersive parquet varnish of the known German producer;

No. 5 (a varnish without a hardener);

No. 6 (with a hardener). For an assessment of quality of the laminated floors the producers of such look of production most widespread on the market were chosen;

No. 7 (the laminated floor of the 23rd class (Russian Federation);

No. 8 (the laminated floor of the 32nd class (Russian Federation));

No. 9 (the laminated floor of the 33rd class (Germany));

No. 10 (a cork floor).

Average values of operational indicators of paint and varnish coverings

Sample party number	1	2	3	4	5	6	7	8	9	10
Firmness factor	0.033± 0.0045	0.061± 0.0127	0.131± 0.0259	0.148± 0.0446	0.05± 0.0092	0.048± 0.0025				
Number of grinding / quantity of turns	425	260	208	280	263	405	2650	4500	6600	1800
Thickness of a covering	120	185	133	190	100	135				
Shock durability	15	15	10	15	25	30				

As the basis for drawing of paint and varnish materials oak wooden samples were taken by humidity of 8–9% in the size 100×100 of mm and thickness of 18 mm. The covering consisted of three (120±5 g/m^2 1 layer) layers, its thickness was supervised by means of an ultrasonic thickness indicator of "Positector 200". Samples of the laminated floors were cut from the standard laminated boards and had the similar sizes.

The assessment of resistance to galling of materials on which the paint and varnish film was put, was made according to GOST 27820-88 [1], laminates – according to EN 13329 [2].

The method is based on a covering galling by the grinding skin pasted on frictional rollers to a certain condition, and definition of factor of resistance to an galling (on weight loss) or grinding numbers (quantity of turns).

For laminates the quantity of turns of a roller decided on grinding paper before emergence of visible damages – reference points (IP). The reference point is considered reached if the decorative surface is wiped before emergence of a low layer in three sectors. Tests were carried out on the Taber 5135 According to GOST 27736-88 [3] in addition shock durability of coverings of wooden samples was defined.

The results of research are presented in the Table.

Conclusion. At a complex assessment of paint and varnish coverings taking into account their shock durability, it is established that a leading position the import water and dispersive varnish (the 6th party) with a hardener (occupies 405 turns, shock durability of 30 cm) in comparison with a water and dispersive varnish (the 1st party) domestic production (425 turns, shock durability of 15 cm). It means that under operational conditions this covering will better resist a various look to loadings. If to consider an economic component, quality of a parquet varnish of a domestic production approximately twice below import analog and an option of this or that material remains for the consumer.

The most resistant to an galling among the laminated floors there were samples from party 9 (6,600 turns). Slightly less resistant there were samples from party 8 (4,500 turns). Samples from party 7 showed result in 2,650 of turns.

Among the laminated floors samples from party 10 (a cork tree) showed the lowest result. Comparing the received values (quantity of turns) to standard indicators, established that samples from parties No. 7 (the declared class of wear resistance of AC3 [≥2,500 about.]), No. 8 (AC4 [≥4,000 about.]) and No. 9 (AC5 [≥6,500 about.]) satisfy to the declared indicators. At the same time samples from party No. 10 correspond.

At comparison of firmness of the laminated floors and protective and decorative coverings of timber floors the advantageous position is occupied by artificial floor coverings, but thus it is necessary to consider that in tests paint and varnish materials of household application were used. Indicators of resistance to an galling of protective and decorative coverings of industrial coloring in comparison with the laminated floors remain open. But in any case laminated floors are nonrepairable unlike wooden, and also can't transfer fully natural beauty and warmly natural wood.

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