

Research Article

Wood Lamella Parquet Recovery-Caused by Attack of the Insects

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Abstract

*In the last few decades lamella parquet (which is made of solid wood) has been used for interior house flooring and commercial buildings in Macedonia. The poor structural protection or not placing the parquet very well can create several conditions for developing wood pests that can lead to attacking the floor surface and of course causing problems. The floor surface can be destroyed due to the attacks of insects that can lead to big economic losses. The first part of this paper refers to the floor attacks caused by the insects called *Bostrychus capucinus* L, as well as the damages caused to the buildings. In the second part an overview for recovery is given, as well as methods and techniques that can be used. Also economic parameters that can influence taking actions for recovery are analyzed.*

Keywords: Wood, lamella parquet, insects, recovery

1. Introduction

Parquet flooring is popular in equipping residential, public and work spaces. It is characterized by durability, low maintenance; it satisfies the aesthetic requirements and brings warmth into the space. The floors and the floor coverings have visual dominance into space due to the total area they occupy. For these reasons, the type of flooring has great significance and it does not leave anyone indifferent because its warmth and refines any environment. Parquet strips are the main thing in the interior. Short and narrow wooden elements create the atmosphere of traditional family homes, particularly come to the fore in the premises of a larger area.

Parquet flooring has experienced a peak of popularity in the latter half of the 20th century when it was massively used in equipping newly constructed residential and commercial buildings. Fields that are made of wood, stick to the plastic adhesive foil, which is placed on the floor. This method of installation is very simple, and the proper maintenance can last for several decades, because they are 8 mm thick and can be sanded several times. Lamella parquet is the cheapest solid wood flooring.

There are so many advantages over other parquet materials, primarily because the wood is a raw material and it is a sustainable resource. It needs less energy to produce than any other floor covering and flooring. Wood is a common choice as a flooring material due to

its environmental profile, durability, and restorable ability.

This kind of flooring is well known for its antibacterial properties, because it keeps dust and other allergens, which is very important, considering that many people suffer from various forms of allergies.

Nowadays developing parquet flooring manufacturers use much more durable materials. If you take into consideration that most often traditional flooring thickness is 21 or 22mm, they can be sanded up to ten times, and the most frequent intervals of sanding are recorded every 10 years, you can come to the conclusion that once you set up the flooring it could last for one century.

Technology of production and wood processing is constantly advancing. Introducing innovation in all segments leads to the ongoing development of the parquet. One of the advantages of the parquet is its nobleness and the ability to create a glamorous and comfortable atmosphere. It also enables easy maintenance and care.

During the planning and implementation of wood flooring, the parquet may be exposed to variety of activities. So, due to some technical regulations there are some requirements that need to be satisfied, in a need to ensure their proper functioning.

2. Types and the parquet quality

Nowadays for production of wood flooring, more than 50 kinds of wood are used.

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When choosing a floor besides the color and texture of the wood, the very important thing also is the firmness of the wood. Parquet floors are made from domestic and exotic types of wood. Among the local wood types the most frequent parquet are from oak, ash and batten and sometimes from hornbeam. The final color depends on the type of parquet wood, lacquer and possible desire for toning. There are several types of solid wood flooring:

- Solid parquet,
- Lamella parquet,
- Multilayer parquet,
- Techno parquet,
- Edge parquet,
- Lam parquet,
- Massive planks,
- Massive cubes,
- Finished parquet,
- Bamboo flooring,
- Cork flooring,
- Mosaic, inlays, borders.

All types of flooring listed above, have their advantages and disadvantages. In this paper the topic is the problem of the attack by insects on the mosaic parquet and how you can deal with it. We present the basic elements that are relevant to the topic of work **LAMELLA** Parquet flooring is very specific and is often used in interior furnishing. The slats are 8mm thick. They are horizontally mounted on polyethylene sticky thread and they are joined without glue as mosaic flooring (Picture 1. 1, 2-left). Usually it is set as English embroidery and comes in cubes ready for installation. The Picture 1 provides an overview of the cube mosaic flooring that has an inset of the dark-wood-locust in the middle (A) and LAMELLAR strip of oak (B), heartwood (1) and sapwood (2). The advantages of laminated flooring are low cost and the ability to place it on substrates that are not ideal.



Picture 1: cube | lamellar parquet – mosaic parquet

Special category of LAMELLAR parquet flooring is the edge parquet, which ensures durability and provides an interesting aesthetic solution. It is made of small,

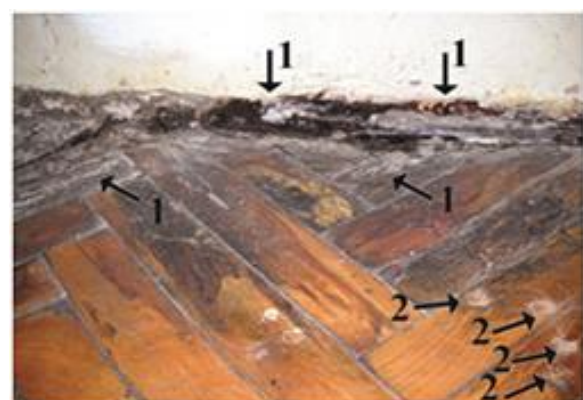
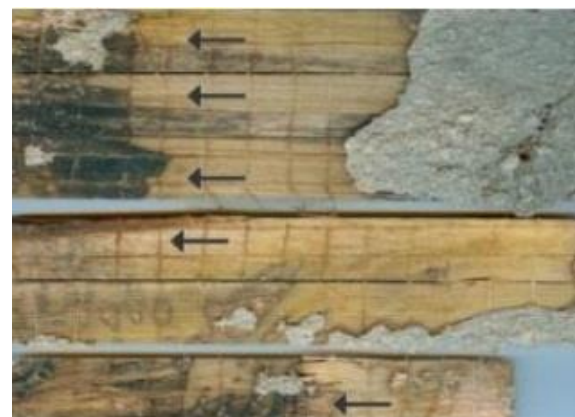
interconnected lattices, in which the contraction and expansion of wood is reduced to minimum. It's easy to use and maintain, and as such it was originally intended for busy spaces. Because of its visual and qualitative value, it has become popular in residential areas. Its dimensions are: thickness from 14 to 22mm, the width of the strip from 10 to 20mm and up to 300mm.

Classification of the parquet does not influence the quality of the flooring, but influences the aesthetic appearance of the top of the parquet plank. The sorting is done according to the natural characteristics of the wood.

Oak and beech parquet flooring is manufactured in the dimensions: length 120 mm, width of 20 to 24 mm and a thickness of 8 mm, the plates 480x480x8 mm plastic mesh and class: "E" - add extra, "S" - standard "R" - rustic and "VS" -non-standard.

3. Attack and wood damaging

Depending on the operating conditions and opportunities, especially when it is not in compliance with the standard requirements, flooring suffers from attacks by fungus, insects and other biotic factors.



Picture 2: Attacked LAMELLAR (up) and solid parquet (down) by fungi and insects

In case of many objects on which laminated flooring was installed, fungus attack happened as a result of permanent or alternate wetting with water. Wetting parquet primarily occurs next to sanitary facilities

(bathrooms, kitchen) and in places where water breaks through the windows and external doors (Pic. 2, 3)



Picture 3: Wetting of the interior spaces through the door (up) and the look of the cement cover under the removed parquet (down)

Wetting the most distant parts primarily leads to wetting the cover of the planks, which first begin to rot and become target of attacks by insects (Pic. 4).



Picture 4: Attacked batten (up) and healthy batten (down)

3.1. Insect attack

In many residential buildings, there was an attack by insects, primarily by **Bostrychus capucinus** L., which caused major damage. During the research, it was not possible to establish the real reasons for the emergence, and spread of the attack. The appearance and intensity of the attacks for the mentioned insect can be seen in Picture 5.



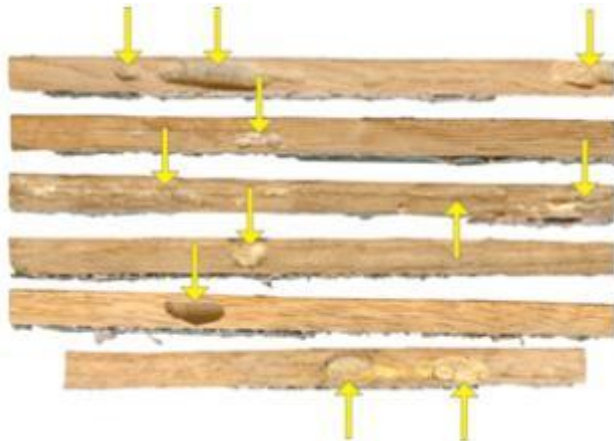
Picture 5: Parquet planks damaged by insects

The insect **Bostrychus capucinus** L., which was the cause of the attack on the lamella parquet flooring made of oak. This insect is 8-14 mm long. His body is black and red cover (Pic.6).



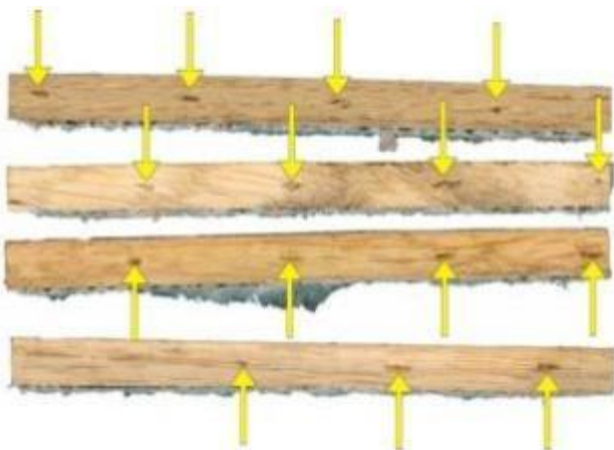
Picture 6: The look of the insect *Bostrychus capucinus* (up) and fungus (down)

Females lay very small eggs usually in cracks of wooden things or at the intersection of the dishes.



Picture 7: Attack on the lamella parquet flooring by insects

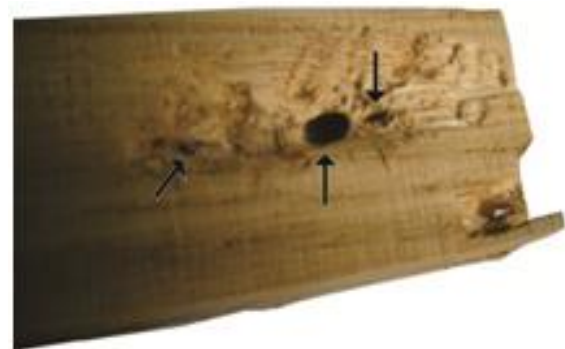
The attacks that occurred on the LAMELLA parquet clearly indicate that the start of the insect development of the eggs began on the parquet plates at the joints. This can be seen in Picture 7. It is indicative that there is a probability that the insect laid eggs in the holes that are created while placing the LAMELLA parquet. Picture 8:



Picture 8: Holes created during the production of the parquet

The central part of the flooring that has been attacked was made of wood with a darker color to get the aesthetic effect of the same wood, so it can be assumed that the attack might come just from these small planks. Despite the fact that the parquet strips were thermally processed, it was not possible to determine whether the material in the central part of the flooring was exposed to heat treatment. In Picture 9 on the left, there is a section marked by arrows corridors with compacted wormhole, and on the right side of the picture, you can see the holes made by the insects.

Bostrychus capucinus swarms in May and June, after 2 to 3 weeks the cocoon are coming out, they can spend several days not eating, and then they crawl into the real wood and corridors to 0.5 cm in diameter (Pic. 5, 7, 9-right).



Picture 9: Central part of the wood, attack of the Insects up, and holes-down

The development could last one year. The dimensions of the hall fit the insect, which can lead to destruction of LAMELLA parquet. The thickness of the parquet flooring while placing is 8 mm, after sanding the same floor gets thinner for about 1 mm, so that the new thickness is about 7 mm, the real insect corridors are about 5 mm in diameter. Since the insect uses LAMELLA parquet flooring for food and accommodation, it does not come to the surface. Also the insect cannot go in the opposite direction because it faces with the adhesive and concrete, so he leaves at about 1 mm, of healthy wood (Official. 10). The attacks on the wood are very difficult to be traced, so it leads to difficulties in determining the steps to recovery because they cannot accurately determine the areas of the room where the parquet has been attacked and replace the flooring.



Picture 10: Thin layer of lacquered parquet flooring, A- inner, B-outer lacquered part

4. Lamella parquet recovery

The recovery of the flooring must be carried out by detailed control that is performed on the entire surface. Reparation is done when there is a large flooring damage due to some external influences. The first approach is eliminating the causes of damage, and then removing the destroyed parquet. When all the damaged flooring is taken out, the process of grinding and coating starts. During the floor recovery anti-insecticide and anti-fungal protection should be applied. Despite the recovery and treatments, it happens that a small number of insects survive the treatment. For these reasons, it is best to remove the entire parquet, burn it and then place new parquet flooring. This approach is justified because of the low price of the LAMELLA flooring, which is several times cheaper than the conventional one. On the right in Picture 10, excavated LAMELLA parquet flooring that was later burned can be seen.



Picture 11: The bottom of the removed part of the parquet (up) and removed lamella parquet attacked by insects (down)

Conclusion

In cases where attack on LAMELLA parquet by insects happened, the first thing should be done is making proper assessment of the actions for recovery. Sometimes in practice the recovery did not give the best results and the attacks by insects appeared later again. Because of the relatively low price, the repressive method of removing the whole LAMELLA parquet and replacing it is the most economical one.

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