

# PATINA AND ITS FORMATION ON A WOODEN CHURCH FLOOR – CASE PETÄJÄVESI OLD CHURCH AND VIKKI CHURCH IN HELSINKI

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**ABSTRACT:** Scratches and other kind of wearing on the floor are caused by everyday actions, such as walking, soiling or for example dropping goods on the floor. During the time they might transform into patina. The aim of this study is to examine wooden patina in selected church floors: an old wooden floor and a modern one. The study also discusses the possibilities of a modern wooden floor to be patinated, when the modern maintaining culture is strong today. The research was done using both literature research and own observations. This study shows that aging and patination of wooden floors, especially new ones, is a wide and sometimes also complex combination of people's opinions, traditions, and maintenance concerns.

**KEYWORDS:** Patina, Wooden floors, Church, Finland

## 1 INTRODUCTION

Patina is an obvious and natural thing when looking the old wooden floors in historic churches. The wooden floors have worn for decades and centuries because of use, and most people think they are beautiful. Scratches and other kind of wearing on the floor are caused by everyday actions, such as walking, soiling or for example dropping goods on the floor. Technical features and choices such as wood species, wood structure and wood surface treatment affect how permanently the traces of use remain on the floor. Heating and air conditioning together with the outdoor conditions, determine the current conditions every time when wearing of the wooden floor happens.

The aim of this study is to examine wooden patina in selected church floors. What is patina, how does it appear in old wooden church floors in Finland, for example in Petäjävesi Old Church. What kind of thoughts are faced concerning the wearing of the modern wooden floor in Viikki Church where the floor is expected to patinate over time. This study also discusses the possibilities of a modern wooden floor to be patinated, when the modern maintaining culture is strong today. The research was done using both literature and own observations.

In previous studies wood and wooden floors have been evaluated from the viewpoint of how wood feels and how it influences people. Rametsteiner [1] has found out that people consider wood as a pleasant material and they feel that the presence of wood make them comfortable. It is

also known that wood has a healthy and calming effect on people [2]. Rice et al. [3] has noticed that people have a natural understanding of that wood creates a healthy environment. Tuuva-Hongisto [4] adds that in people's minds feeling of aesthetic, warmth and authenticity is connected to wood.

In Finland the attitudes towards using wooden floors are contradictory. On the one hand wood as material is considered natural, warm, ecological and in all ways pleasant to use, on the other hand wood is often considered a material with poorer durability than other common floor materials such as laminate and plastic in Finland have [5].

## 2 PATINA

The word patina has multiple origins [1]. It is partly a borrowing from Latin but also partly a borrowing from Italian. The word paten was used already in 17th century to mean the layer coming to the surface of the copper. In Latin, paten means a shallow flat vessel or bowl from which the Italian word patena is inspired. As a descriptive concept, patina means a gloss or sheen; specification that on wooden furniture or surface is produced by age and polishing.

All buildings carry their history on their surfaces and that means that also time is written in every building. Mattinen [7] writes that buildings are not static entities; they are constantly evolving and changing, and their appearance

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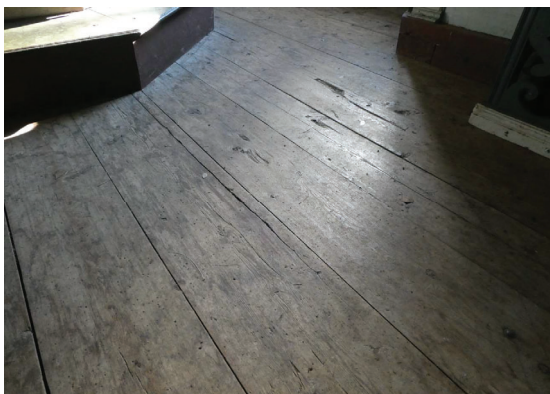
reflects the changes that have taken place over time. The different signs and marks on buildings, whether they are intentional or unintentional, contribute to the overall character and story of the building [7].

An old environment can be comforting and familiar, offering a sense of safety and continuity. This is because the built environment serves as a tangible reminder of the past, offering a message that can be deeply personal and meaningful. In this way, the patina that accumulates on a building's surfaces can serve as a bridge between the past and present, connecting us to the people and ideas that came before us [7].

The concept of patina refers generally to the desirable surface changes that occur over time due to natural weathering, aging, or use. These changes can add character and depth to a building, giving it a sense of history and uniqueness. In contrast, soil and dirt usually refer to unwanted surface contaminants that accumulate on a building due to neglect or lack of maintenance [7].

## 2.1 PATINA AND WOOD

In Finland there are naturally just a bit more than 20 wood species [8]. Most utilized species in Finland are pine (*Pinus sylvestris*), spruce (*Picea abies*) and birch (*Betula pubescens* and *Betula pendula*). Wood patination refers to the natural aging and weathering of wood, which often results in changes in color, texture, and overall appearance (Figure 1.). This process is influenced by several factors, including the wood species, exposure to light and moisture, and the presence of microorganisms.



**Figure 1:** An old patinated wooden floor in Finland. Wearing is characteristic for wooden floors.

Understanding the mechanisms and effects of wood patination is useful for several reasons in modern wood architecture. First, it can provide valuable insights into the durability and long-term performance of wood-based materials in various applications. Second, it can enhance the aesthetic appeal of wood products, particularly in fields such as architecture and interior design.

Sometimes there is only a fine line between what is patina, wearing and what is soiling in people's opinions. When designing modern wide solid wooden floors in public buildings, wearing of the surface must be taken into consideration. Even though wearing is characteristic for wooden floors, people doesn't "know" wood as they did in the past. And that makes it harder for them to accept all the changes on the surface of the wood and changes on the surfaces of wooden floors.

## 3 PETÄJÄVESI OLD CHURCH

The oldest still existing wooden floors in churches in Finland are from the 18th and 19th centuries. Petäjävesi Old Church (Figure 2.) is one of the UNESCO World Heritage Sites located around the world.



**Figure 2:** Petäjävesi Old Church. Photo taken in the beginning of the 21th century.

The architecture of the church has been described as follows [9]:

*Petäjävesi Old Church is representative of the architectural tradition of wooden churches in northern Europe. The Old Church is a unique example of traditional log construction techniques applied by the local peasant population in northern coniferous forest areas. European architectural trends, which have influenced the external form and layout of the church, have been masterfully applied to traditional log construction. The adaption of forms and techniques of varied provenance makes this church a multi-layered landmark and an outstanding example of Nordic church architecture. The church is built entirely of pine wood, worked in a constructive and economical manner.*

*The interior's hand-carved log surfaces with their silky patina and the silvery sheen on the seasoned walls lend the hall its unique atmosphere, which is further enhanced by the slightly irregular placement of the floor beams and pews. The distinctive features of the interior are the elaborately carved pulpit, pews,*

*chandeliers, and galleries with balustrades, which are entirely the work of local craftsmen and artists.*

The interior of the church is presented in Figure 3. and 4.



**Figure 3:** *The dimensions of wooden planks of Petäjävesi Old Church floor are large, which was the standard at that time when the sawing was not industrial as today. The surface of the floor has worn unevenly.*



**Figure 4:** *The patinated interior of Petäjävesi Old Church somehow feels timeless.*

### 3.1 PATINA OF THE FLOOR OF PETÄJÄVESI OLD CHURCH

The wooden floor of Petäjävesi Old Church is a good example of an old patinated wooden plank floor. The patination process of the floor in this church or in others as well has thought not been documented. It is unknown what the Petäjävesi Old Church floor looked like, for instance, 20 or 50 years after its construction.

Today the church floor is beautiful, and the surface of the wooden planks has worn very smooth. The floor is thought uneven. The knots and other harder places have not worn as much as the softer parts of the planks. The surface of the floor is untreated.

### 4 VIIKKI CHURCH IN HELSINKI

Viikki Church (Figure 5.), built in 2005 and designed by JKMM Architects, represents modern Finnish wood architecture [10]. The main parts of the church are wooden. In the church the bundle-like glulam pillars function as load-bearing vertical designs. The frame has been partly braced with reinforced concrete. The spruce panels and boards of the hall walls and all the floors are of radially sawn spruce, which minimizes the movement of the wood indoors. The flooring material is massive spruce boards and the base floor is stone structured. The furniture has been tailor-made to suit the church activities. The interior of the church hall is presented in Figure 6.



**Figure 5:** *Viikki Church in winter 2006. The exterior of Viikki church is clad in cleft aspen shingles and they have turn grey during time as originally planned.*

The large wooden floor of the Viikki Church (Figure 3.) is made of feathered spruce floor boards (30 mm x 120 mm) sawn between the tangential and radial directions. The floor is treated with a mixture of lye and oil.



**Figure 6:** The large wooden floor of Viikki Church is built with the combination of under-floor heating together with a reinforced concrete foundation. When the floor is serviced annually, the chairs are moved out of the way.

#### 4.1 PATINA OF THE FLOOR OF VIKKI CHURCH

When designing a wide solid wooden floor in a public building, wearing of the surface must be taken into consideration. Wearing is characteristic for wooden floors, still sometimes there is only a fine line between what is wearing and what soiling in people's opinions.

The spruce floor in Viikki Church has worn during the past 15 years after completion of the floor (Figure 7). When designing the church, the original idea was that like in many old churches the floor would patinate beautifully over time. In Viikki Church, however, soon after the building was completed it was noticed that the wearing of the floor was very uneven. Some of the boards were also splitting. In discussions with the persons responsible of the maintenance in Viikki church in Finland it has occurred that these persons fear that the users of the church consider a worn floor as a soiled one and not aesthetically pleasant.

For getting more information the users of the Viikki Church were interviewed around this theme [11]. In the comments from Viikki Church the sticks splitting of the floor came up. Some of the respondents connected the wearing of the floor to the splitting of the boards. If the splitting would not have occurred, the wearing would not have disturbed that much. The splitting of the boards (Figure 8.) were especially irritating parents of children that were visiting the church. Unlike the adults, children did walk with socks on the church floor and got sticks on their feet.

One interviewee commented concerning patina that: "After all, patina is not dirt and sticks, but how is patina then created!?". The changes in the floor led to discussions of what patina is and could the changes of the

surface of the floor even be called patina in such a new modern building.



**Figure 7:** The wearing of the floor in front of a frequently used cabinet, has been intense compared to the surrounded floor.



**Figure 8:** Splitting of the boards in has been a problem in Viikki Church.

## 5 DISCUSSION

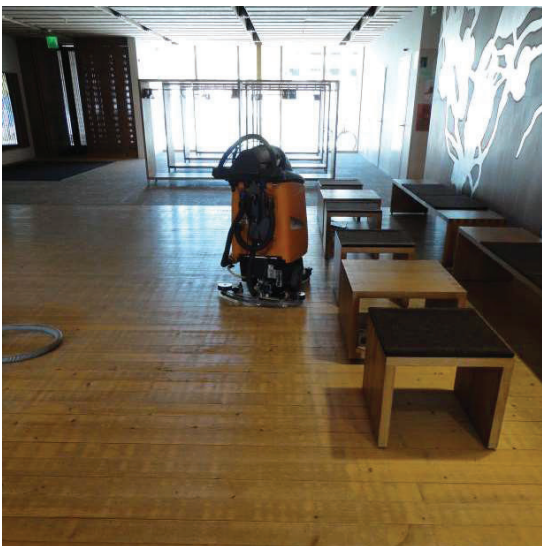
In the Viikki Church the user and visitors have been quite satisfied with the wooden floor in the church hall, but some of the people think that wood as material has not been technically the best choice because of splitting of the boards.

There was a small experiment to change the lye-oil treatment to lacquer in the secondary rooms, but this was

not considered as a successful solution. In addition to that lacquer changes the feeling and atmosphere of the whole floor compared to the natural lye-oil treatment.

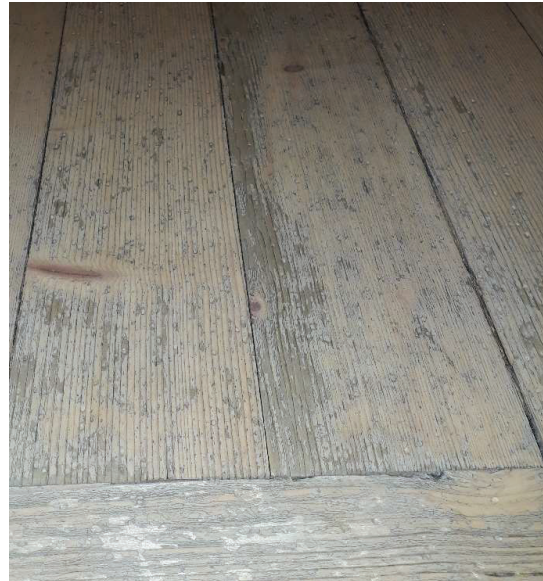
In retrospect can be said that splitting and sticking of the boards could probably have been prevented by being more precise about the quality of the floorboards, so that all the boards would have been exactly radially sawn. Even if the costs in this way would have been higher in the design and building phase, from a wood technical point of view, the better quality floor probably would have paid for itself during the decades if the floor does not have to be maintained as often.

A random visitor in the church does of course not face the same problems with the floors that a permanent visitor, or people working in the churches every day do. It is true that it does not help that a floor looks beautiful if it complicates you of doing your work for example when you are cleaning (Figure 9.). It can be stated that wearing of the floors has been more a functional problem than an aesthetic one.



**Figure 9:** The wooden floor of Viikki Church is regularly machine washed but only some moisture is absorbed in the floor.

Besides the wearing of the wooden floors, the floors have of course also been soiled during the years and it is impossible to have them look like new ones with the existing cleaning methods. Still, it can be asked should a wooden floor look like a new one when time goes by. In figures 10. and 11. we can see the difference between a worn floor and a newly sanded floor.



**Figure 10:** The floor before it had been sanded. The small round marks are caused by the spikes of the anti-slip pads people use on the shoes when it is slippery during winter time in Finland.



**Figure 11:** The floor after it had been sanded the first time after fifteen years. If the floor will be sanded regularly, it is impossible that the surface would start to patinate as the old wooden floor. On the other hand also the used dimensions are smaller than in the past.

## 6 CONCLUSIONS

In this study patina has been examined and the difference between patina, soil and wearing discussed. The wooden floor of Petäjävеси Old Church is a beautiful example of patination. The wearing of the young wooden floor in Viikki Church has instead caused debate throughout the life cycle of the floor.

It is impossible to know for sure how the floor of the Viikki church will begin to patinate and how the floor will look like during decades, as well as what kind the patinate result will be. It may be that it will look very different

from of what the floor of Petäjavesi Old Church does today. Probably it will not look the same because the dimensions of the floor planks were much larger in the old durable wooden floors. In addition to that the wood material used in past was usually denser in average.

One viewpoint is to think what the wearing and patination of wooden floors bring to architecture and the way we experience it. Could the qualities of wood that are considered problems, such as marks of use and inhomogeneity, also be considered as positive signs of the naturalness of the material. Thinking in this way, the characteristics typical of wood would be precisely those that connect people with nature and thereby affect the experience of the space and material.

However, the main question remains – what is the balance between soil, wearing and patina. How much can both be tolerated, and can they even be completely separated from each other.

It is not known if the wearing of the floor will turn to patina during time. On the other hand, patina is not only aging but also marks of use and wear on the surface. The question remains how much wearing can be tolerated in a new building to obtain patination in the future. This study shows that aging and patination of wooden floors, especially new ones, is a wide and sometimes also complex combination of people's opinions, traditions, and maintenance concerns.

## ACKNOWLEDGEMENT

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