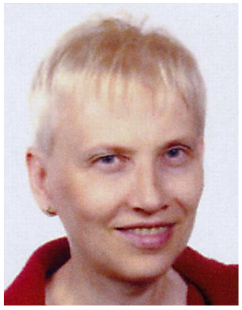
# FLOORINGS IN BUILDINGS FROM LIFETIME POINT OF VIEW



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## Summary

Flooring and its surfacing fulfils a function for walking and mobile traffic. That is stressed by a long-term operation and it requires adequate maintenance. Its premature depreciation can be influenced by the design of cleaning zones in disposal solution, by economical clear-ability and often maintenance. This paper deals with the assessment of wooden and textile floorings from their durability and maintenance point of view.

**Keywords:** Wooden floorings, textile floorings, lifetime, clear-ability, cleaning zone, surfacing, maintenance rate, lifetime

## 1 Introduction

Lifetime of buildings put into practice not only in building structures but also in interiors. First of all floorings, further soffit, facings and complementary elements have the decisive role in them.

It is necessary to distinguish at floorings if they are realized on the natural or artificial basis. Further it is necessary to respect their maintenance and recycling with corresponding guarantee which continues with a subsequent lifetime.

From these reasons it is suitable to assess the following groups of floorings:
- Floorings on the wooden basis
- Textile carpets
- Elastic floorings on the PVC and vinyl basis and linoleum

## 2 Floorings on the wooden basis

Wooden floorings can be divided according to structure into following groups:
- Massive,
- More-layer glued with plywood core
- Laminated with core of fireboard

All these types can be put by the floating form or by solid contact gluing to base respecting technological process of work.

The often applied types of flooring are:
- Floorboards and strip flooring,
- Block flooring,
- Mosaic parquets the most often square horizontal plan.

Mechanical and physical properties (compression strength, abrasion resistance, hardness etc.) are decisive for wooden floorings of massive character. It is possible to distinguish from density point of view wood from the following wood species:
- very hard – hornbeam, palisander, guajac (usually exotic wood species),
- hard – maple, oak, walnut, beech, cherry, elm etc.,
- middle hard – pine, larch, chestnut etc.),
- soft – spruce, fir, birch, alder etc. used especially for internal plywood core for massive and laminated floorings.

It is necessary to complete that hardness of massive wood is influenced in addition by the following factors:
- wood of leafy and coniferous trees,
- difference of climatic conditions,
- high-rise position and signification of soil in place of growth,
- difference in wooden growth ring,
- exploitation in summer or winter period.

Upper laminated layers are based on the principle of several glued foils with the xylograph of various wood species. They resist to mechanical stress, first of all to the point and central load, spots and moisture on their surface. Structure of laminated flooring enables to reduce their thickness in comparison with massive types.

## 2.1 Surfacing of wooden floorings

Wood surfaces can be protected by following finishing:

**Combination oil – wax:** Non-hardened or hardened oils on the basis of natural or synthetic resins with prescribed contents of solvent use at their application. Their function consist in the impregnation of surfaces ensure the resistance of wood to mechanical stress and usual chemical influences. On the contrary wax makes the maintenance of wooden surfaces easer and it emphasizes wood figure;

**Emails dilutable by water:** They are of organic origin, the most often on the polyurethane basis or hybrid type with acrylate compound. The prove high resistance in abrasion and to usual detergents;

**Melamine resins with cellulose compounds:** Resins can be transparent or they include pigments with wide spectrum of hues. First of all they excel by their resistance to moisture and to exceeded mechanical stress.

All given finishes reduce a pollution rate, they repel water and they increase operation safety. Lifetime of wooden hard floorings is approximately twice longer than at the floorings with wooden soft massive. It is possible to consider with durability within 30 and 40 years at right maintenance.

### 2.2 Maintenance and cleaning of wooden floorings

In proposal of disposal in entrance spaces it is essential to consider from architectural point of view individual cleaning zones which block preventively a pollution transport from exterior to interior.

They can be graduate according rate of transport into three following groups:
- Self-cleaning
- For rough pollution
- With very fine pollutions

The finishes in these zones are composed of mats of rubber, polyamide and polyethylene fibres etc. located into metallic frame, as the case may be with caoutchouc base. It is necessary to realize that dust parts and fragments (e.g. mud, small stones and humid particles) can increase costs for maintenance of floorings within 7 and 8 years about 85-90 %. The liquidation of pollutions is possible to realize by vacuum-clean with the subsequent water cleaning with addition of detergents.

Cleaning process runs at all types of wooden floorings in three phases:
- by the exhaustion of rough pollutions dry,
- by the exhaustion of fine pollutions and dust dry,
- by wiping of humid mop.

## 3 Textile carpets

Textile carpets are to use in interiors with requirements of:
- comfort feeling,
- environment intimacy,
- acoustic background – influence.

They can be used all-planary with direct gluing to floor base or on counter-sliding net in the function of solitaire. Their durability is influenced by the following factors:
- back finish ensuring a dimension stability,
- load-bearing material with sheaved number for fibre giving a fibre density on 1 $m^2$,
- type of fibre - structure treatment,
- section and weight of fibre [$g.m^{-2}$],
- height of fibre,
- electrostatic behaviour of surface.

We distinguish from fibre origin point of view the following groups:
- Natural vegetable (e.g. cotton, jute, coconut and sisal fibre) and animal (wool, natural silk etc.)
- Synthetic (chemical origin) – e.g. polyamide, polyester, polypropylene etc.
- Combined – they make up mixtures and they improve total properties of surfaces

The weaving system and its realization shares a durability of carpets – either by hand or by machine even sewed or stabbed.

The used fibres can be sheared, cut or looped, namely of this section:
- round full or hollow,
- round triangulated with ducts of teflon treatment – this type proves the most perfect cleaning.

The first-quality textile floorings can retain their function in the course of right and regular maintenance within 20-25 years.

## 4 Elastic floorings on the basis of PVC, vinyl and linoleum

These floorings include the following types:
- Homogenous – either in usual carrying out or safety,
- Heterogenous – of layer character with put in glass fleece or foam vinyl pad,
- Linoleums on jute stabilization base.

Synthetic floorings of organic origin include in their structure fillers, softeners, stabilizing agent and pigments. The fillers are located first of surface where they ensure safety against slide.

Linoleums produce from natural recycling sources and their parts are:
- Linseed oil
- Resin
- Wood and cork flour
- Limestone
- Natural pigments
- Jute

At plastic coatings it is not to neglect from maintenance point of view electrostatic properties in relation to the linking of dust particles on their surface. The surface is smoother the less fine pollutions settle on it. On the second hand smooth surface constitute a slide risk of interior – users. This problem is already solved by hardened polyurethane surface which makes maintenance easer and that operates by anti-shear effects in addition. While plastic floorings clean by wet way (detergents) the vacuum-clean with the subsequent humid wiping only uses to the cleaning of linoleum. This process is caused by special antistatic surface treatment on the basis of water dispersion.

In comparison with wooden floorings this type of floorings does not prove so high point load – resistance. Only plastic coatings with carborundum granulation in their homogenous structure help this lack to remove. The elastic coating floorings can retain their function in the course of right and regular curing within 20-30 years.

## 5 Conclusions

The right and regular maintenance has the essential influence on the lifetime of floorings. If we compare all types of assessed floorings only wooden massive floorings by grinding with relevant surface treatment can extend their lifetime. The other types of floorings exchange singly.

In course of lifetime assessment must be kept in priority the following system:

- the cleaning zone accumulate rough pollutions,
- the choice of right flooring type from stress point of view,
- the grinding system of surface in dependence on surface treatment and structure of flooring.

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