



Moisture Flow Through Different Floor Structures and Its Influence on Floor Coverings

Citation

Wahlman, J., Suonketo, J., & Lindberg, R. (2000). Moisture Flow Through Different Floor Structures and Its Influence on Floor Coverings. In O. Seppänen, & J. Säteri (Eds.), *Healthy Buildings 2000, Microbes, Moisture and Building Physics, Proceedings , Vol 3, August 6-10, 2000, Espoo, Finland* (pp. 133-134). Helsinki: SIY Indoor Air Information.

Year

2000

Version

Publisher's PDF (version of record)

Link to publication

[TUTCRIS Portal \(http://www.tut.fi/tutcris\)](http://www.tut.fi/tutcris)

Published in

Healthy Buildings 2000, Microbes, Moisture and Building Physics, Proceedings , Vol 3, August 6-10, 2000, Espoo, Finland

Copyright

This publication is copyrighted. You may download, display and print it for Your own personal use. Commercial use is prohibited.

Take down policy

If you believe that this document breaches copyright, please contact cris.tau@tuni.fi, and we will remove access to the work immediately and investigate your claim.

MOISTURE FLOW THROUGH DIFFERENT FLOOR STRUCTURES AND ITS INFLUENCE ON FLOOR COVERINGS

Jyrki Wahlman¹, Jommi Suonketo¹, Ralf Lindberg¹

¹ Tampere University of Technology, Laboratory of Structural Engineering

ABSTRACT

Undesirable moisture damages have occurred in Finnish concrete floors during last years. Moisture damage may result, if moisture content becomes critical for a certain material of an exposed floor structure. The duration time of the exposure is an other significant factor.

One reason for moisture damages may be the moisture flow inside floor structures caused by environmental and structural factors. Humidity on the upper layers of the floor structure may increase so that moisture damages may occur there. The big difference in permeability properties between different floorings is supposed to have an effect on this phenomena.

The aim of this study is to find out the effect of certain structural factors and environmental conditions on moisture flow inside the floor structure.

In this study, an apparatus is developed, in which the desired climatic conditions in both sides of the specimen can be obtained. Materials and some other properties of the specimens are varied systematically to find out the effect of each of them at a time on the moisture conditions (moisture distribution) of the whole structure.

KEYWORDS: concrete, design, emissions, floor, material, moisture, structure

INTRODUCTION

The moisture damages in concrete floors can be seen e.g. as indoor air troubles, loss of bond strength of floor coverings or as visual disadvantages. Also the microbial growth may be possible in some cases.

The advanced technology makes it possible to measure humidity very accurately *in situ*. The aim of the measurements is to make sure that the floor structure is dry enough to cover so that moisture damages could be avoided. Moisture related problems are still quite common when building new houses or renovating old ones. So, it is important to study which factors have an effect on moisture distribution inside a structure after the covering.

In this study, the changes of moisture distribution in the floor structure particularly after covering the floor, is studied. The moisture distribution just beneath the flooring is especially interesting.

METHODS

In this study 16 specimens (concrete floor slabs) are cast into PVC chambers in which the climatic conditions such as RH and temperature can be controlled. Half of the specimens will be made of K30 concrete and the others of so called NP40 concrete with lower w/c ratio.

After curing the concrete specimens, all the layers used in real floor structures, such as primer, smoothing compound, glue and flooring, will be installed. One of these layers will be made so that there is a mistake which effect on moisture flow will be studied by comparing the faulty structure to a faultless one. Also the effect of extra moisture exposure, thermal difference and different flooring type will be studied in the same way.

Temperature and moisture distribution and moisture flow through the specimens are measured continuously using computerized system and electrical RH/T probes.

RESULTS AND DISCUSSION

The study is in progress and the results are not yet available. Previous studies have shown that differences between water vapour permeability properties of different types of floorings are relatively big (Fig.1). The significance of these differences will be found out during this study.

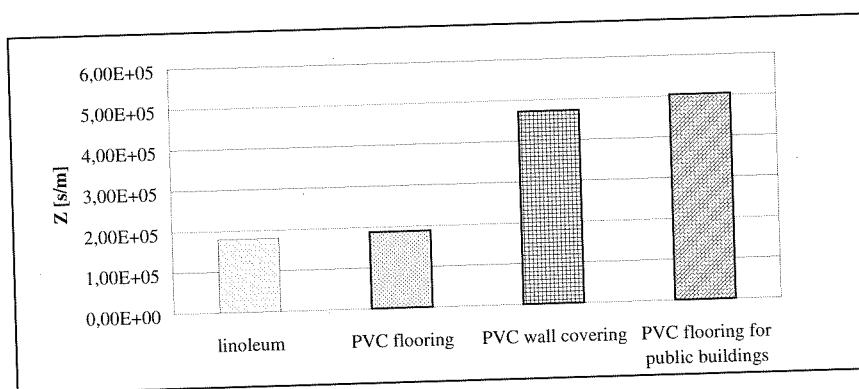


Figure 1. An example of differences between water vapour resistance of different covering materials [1].

The results of this study can be used when developing floor coverings for concrete floors. It is also possible to evaluate how well the existing moisture measuring techniques take into account the effect of different factors on moisture distribution after covering the floor.

ACKNOWLEDGEMENTS

The study has started in the beginning of the year 1999 and will be reported in the middle of the year 2001. The financers of the study are the National Technology Agency (Tekes), Akzo Nobel Deco Oy, Lohja Rudus Oy, Optiroc Oy, Upofloor Oy and Vaisala Oy.

REFERENCES

1. Pauku, E. 1999. Lattiapäällysteiden kosteusominaisuuksia (in Finnish). Master's thesis. Tampere university of technology, Department of civil engineering.