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Micropumping[®]



**Determination of alternate vertical movements
on the structure of ProVent underlay and
joints of the parquet/laminate floor.**

Contact: **PEPI RER SIA** Parka iela 25, Valka
LV – 4701, Latvija
Phone: +371 64707024
Fax: +371 64707025
E-mail: info@pepirer.lv
www.pepirer.lv

Task: **Determination of the impact of alternate vertical movements on the structure of ProVent underlay and the joints of the parquet/laminate floor.**

Sample: Parquet and laminate floor underlay ProVent. Sample size 1000x1200

Performance of the task: With ProVent there is a distinct verification that the alternate vertical movements in the joints of parquet/laminate floor, while walking, does not cause any structural change what-so-ever in the underlay material.

The specific alternate movements were investigated by applying micrometers and using 100kg load which was loaded and unloaded by using motor rotor with a crank gear.

For the research was used following materials and equipment:

Materials:

- even concrete
1200x1000x40mm
dry, surface plane and even
- Underlay:
ProVent.
Sample size 1000 x 1200, thickness 3,2mm.
- Laminate:
ELESGO '32 President', (Germany).
six planks
Plank size: 195 x1195 x 7mm

Equipment:

- Five standart micrometers 67784
movment max.10mm
accuracy 0.01mm
- Three phase induction motor ECHTOP:
NO 5124908;
frame MS801-48B5; kW 0,55; Hp 0.75.
- Rotor MOTOVARIO:
NO 5274528;
type H A42;
29.5 rpm; 110N/m; fs=0.8; i=30.5 .
- Excenter 25mm.
Lift up and let down progression ~22mm.

Performance:

The test was performed by laying the sample between flat concrete and laminate(area 1000x1200mm). The micrometers were placed against the laminate joints and subsequently the sample was loaded and unloaded with 100kg load. The vertical (up and down) movements were duly measured after 100; 1000; 2000; 5000; 10 000; 25 000; 50 000; 75 000; 100 000 cycles directly after taken the 100kg load off. One cycle: 100kg full loading and unloading 1/min 29.5 (attachment no 1/ picture 1 and 2).

Results:

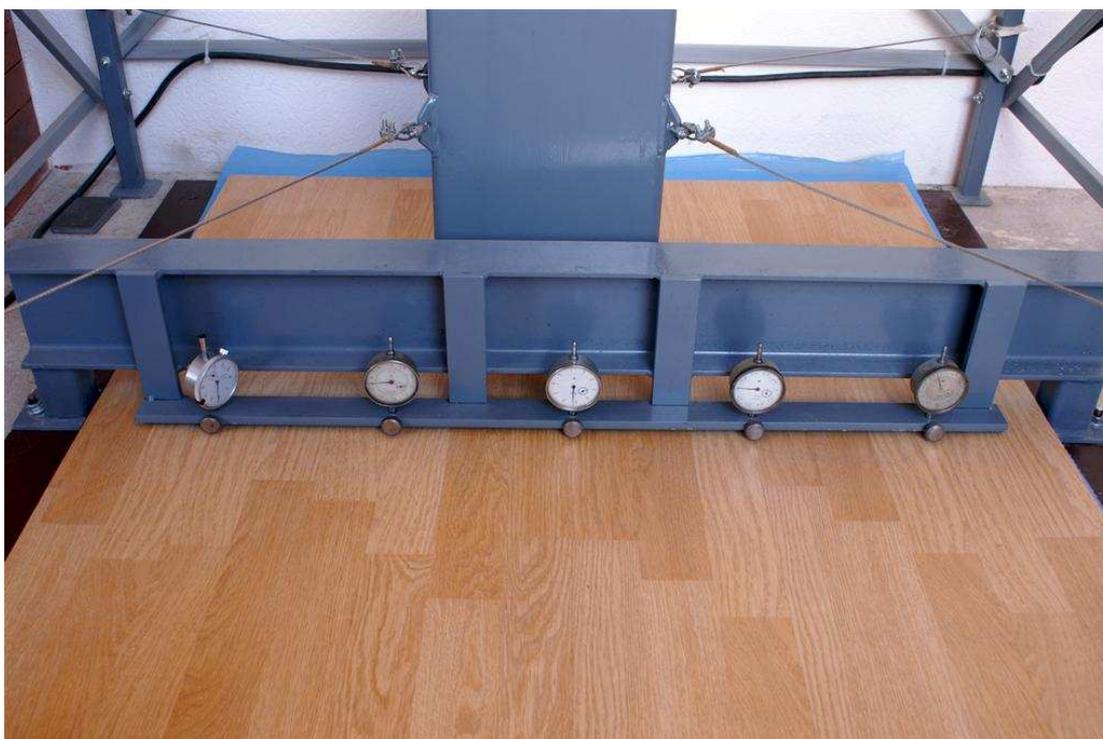
The results of the vertical movements test are listed in table no 1. and table no 2.

No.	100kg	M01 (mm)	M02 (mm)	M03 (mm)	M04 (mm)	M05 (mm)
1	100cycles	0.00	0.15	0.18	0.16	0.02
2	1000cycles	-0.08	-0.15	-0.19	-0.16	-0.08
3	2000cycles	-0.08	-0.16	-0.19	-0.17	-0.09
4	5000cycles	-0.09	-0.17	-0.22	-0.18	-0.09
5	10000cycles	-0.11	-0.18	-0.23	-0.18	-0.10
6	25000cycles	-0.12	-0.19	-0.26	-0.19	-0.11
7	50000cycles	-0.13	-0.20	-0.28	-0.21	-0.12
8	75000cycles	-0.16	-0.23	-0.28	-0.23	-0.15
9	100000cycles	-0.18	-0.27	-0.32	-0.26	-0.17

Table no. 1: Measured results when 100kg loaded

No.	100kg	M01 (mm)	M02 (mm)	M03 (mm)	M04 (mm)	M05 (mm)
1	100cycles	0	0	0	0	0
2	1000cycles	0	-0,01	-0,03	-0,01	0
3	2000cycles	0	-0,02	-0,03	-0,02	-0,01
4	5000cycles	-0,02	-0,03	-0,04	-0,02	-0,03
5	10000cycles	-0,03	-0,05	-0,10	-0,05	-0,05
6	25000cycles	-0,03	-0,06	-0,11	-0,05	-0,05
7	50000cycles	-0,04	-0,06	-0,12	-0,06	-0,05
8	75000cycles	-0,05	-0,07	-0,12	-0,06	-0,06
9	100000cycles	-0,07	-0,09	-0,14	-0,08	-0,07

Table no. 2: Measured results when unloaded



- Measures at 21°C temperature
- Date: 04.02.09.-11.03.09.
- Location: 'PEPI RER' SIA, Parka iela 25, Valka, LV-4701, LATVIA

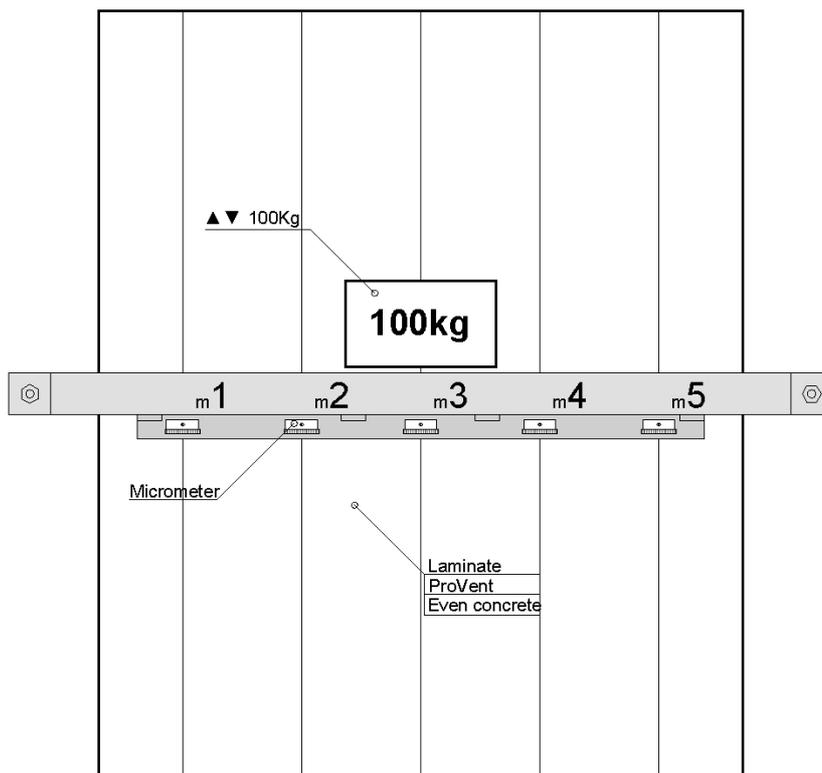
Conclusions:

- The ProVent underlay did not shrink observable under 100,000 repetitive loadings.
- Micropumping movements did not damage the laminate joints.
- The flooring maintained its original look and there was no apparent damage found in the laminate subsequent to the test.

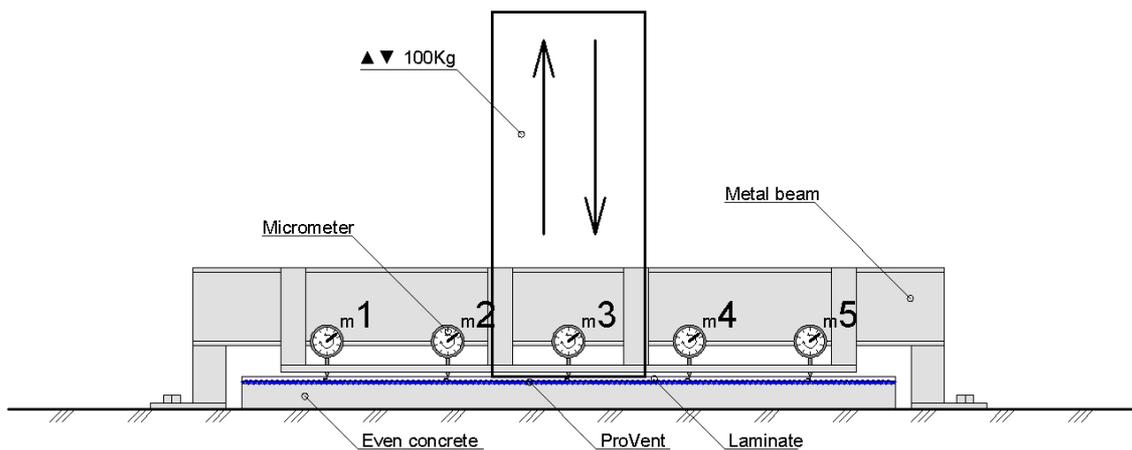
Imants Steins
Managing Director

Reinis Dorss
Research Scientist

Attachment 1:



Picture 1: The micrometers were placed against the laminate joints / top view



Picture 2: The micrometers were placed against the laminate joints / side view