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TEST REPORT

Nr. 3125a-02-2003/PR

Client: LOCK-TILE BELGIUM NV
ECOLOC NV
B-2960 Brecht
Belgium

Content: Report of the findings of the test to determine the level of electric resistance and electrostatic behaviour, including electrostatic behaviour during the walking test, in order to assess electrostatic charge build–up in persons in contact with synthetic floor covering tiles

Requested by: Mr Patriek Stoop
on behalf of and at the request of
LOCK-TILE BELGIUM NV
ECOLOC NV
B-2960 Brecht

Floor covering: LOCK-TILE® tiles
with textured surface
500 x 500 x 7 mm
10 "CONSTAT" test 2.5% tiles

Date: 27-02-2003

Drawn up in triplicate: 1 original
2 copies

Number of pages: 14
Annex: reference sample

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Richard A. Kille
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27.02.2006-07-05
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Ref.:3125a/2003

PRELIMINARY NOTES

Following submission of the LOCK-TILE® tiles from LOCK-TILE BELGIUM NV/ECOLOC NV in B-2960 Brecht Mr Patriek Stoop, as the authorized agent of LOCK-TILE BELGIUM NV/ECOLOC NV, authorized the undersigned expert, Richard A. Kille from IFR Cologne, by telephone to test the tiles labelled "CONSTAT 2.5%" to establish the level of electric resistance and electrostatic behaviour and then to subsequently draw up this

TEST REPORT

which is hereby provided in writing in triplicate (1 original and 2 copies)

PROCEDURE DOCUMENTATION

The following were used for the execution of the tests/trials and for drawing up this test report:

* DIN EN 1081 "Elastic floor coverings; determining electric resistance", April 1998 edition

* DIN EN 1815 "Elastic and textile floor coverings; evaluation of electrostatic behaviour, German version EN 1815:1997", January 1998 edition

The test was carried out in the technical laboratory of IFR Cologne in accordance with point 6.3 of DIN 1815 "Procedure B, on-the-spot test".

Identity of the products tested

The specifications were supplied by the client.

Material:	100% synthetic, homogenous
Tile size:	500 x 500 mm
Thickness:	7.0 mm
Structure:	lightly roughened (10 tiles) studded (10 tiles)
Weight:	approx. 8 kg/m²
Special labelling:	10 "CONSTAT Test 2.5%" tiles

1.0 Test procedure

1.1. Test preparation

In accordance with the standards referred to above, the synthetic floor covering tiles were stored in an average air-conditioned laboratory atmosphere of 50% relative humidity and 21°C and tested according to that requested regarding the levels of electric resistance and electrostatic behaviour.

1.2. Testing equipment

1.2.1 Measuring electric conductivity/resistance

The level of electric resistance is measured using the HM 307 K high-ohmic measuring device.
The levels of the electric resistances (R_o/R_3, R_d/R_1 and R_e/R_2) of conductive floor coverings, adhesive films and floor constructions are measured with this testing device.

The testing device detects resistance levels between 10^4 and 10^{16} Ω.

Measurement results were displayed both analogue and digitally so that errors in reading the results in combination with a set control resistance are therefore excluded.

1.2.2 Measuring electrostatic behaviour in the walking test

In accordance with the measurement principle of capacitance voltage division for measuring high-ohmic voltage, the so-called ÖTI (Austrian Textile Research Institute) static meter is used in combination with the hand-held sensor during the walking test to measure the electrostatic behaviour of floor coverings.

The voltage in kV, with simultaneous testing of polarity, is measured over two measurement ranges.

1.3. Determining the levels of electric resistance

R_1 = contact resistance
R_3 = surface resistance

Determining electric resistance

temperature: 21.0°C	relative humidity: 50%	ref. 3125/2003
covering	CONSTAT test 2.5%	date: Wednesday, 29.01.2003

Measuring point	R_1 = contact resistance	Remark
1	4.4×10^5 Ω	1 V
2	4.8×10^5 Ω	1 V
3	8.5×10^5 Ω	1 V
4	7.0×10^5 Ω	1 V
5	6.5×10^5 Ω	1 V
6	6.5×10^5 Ω	1 V
7	7.0×10^5 Ω	1 V
8	9.5×10^5 Ω	1 V
9	3.6×10^5 Ω	1 V
10	9.0×10^5 Ω	1 V

Determining electric resistance

temperature: 21.0°C	relative humidity: 50%	ref. 3125/2003
covering	CONSTAT test 2.5%	date: Wednesday, 29.01.2003

Measuring point	R_3 = surface resistance	Remark
1	1.8×10^5 Ω	1 V
2	1.7×10^5 Ω	1 V
3	8.0×10^4 Ω	1 V
4	3.4×10^5 Ω	1 V
5	3.0×10^4 Ω	1 V
6	1.6×10^5 Ω	1 V
7	8.5×10^4 Ω	1 V
8	1.6×10^5 Ω	1 V
9	9.0×10^4 Ω	1 V
10	2.6×10^5 Ω	1 V

1.4 Testing transverse conductivity in the surface from tile to tile

In order to test transverse conductivity from tile to tile, both diagonally in the area of the cross joint and also in the transition area between the edges, surface resistance is measured by placing an electrode on one tile and a second electrode on the neighbouring tile so that transition resistance is recorded in the transition area between the dovetail connection.

The following values were recorded:

Determining electric resistance

temperature: 21.0°C	relative humidity: 50%	ref. 3125/2003
covering	CONSTAT test 2.5%	date: Wednesday, 29.01.2003

Measuring point	R_1 = contact resistance	Remark
1	2.2×10^9 Ω	100 V
2	3.0×10^9 Ω	100 V
3	2.2×10^9 Ω	100 V
4	2.5×10^9 Ω	100 V
5	2.9×10^9 Ω	100 V
6	2.0×10^9 Ω	100 V
7	2.1×10^9 Ω	100 V
8	2.1×10^9 Ω	100 V
9	2.4×10^9 Ω	100 V
10	1.7×10^9 Ω	100 V

2.0 Testing electrostatic behaviour in the walking test to evaluate electrostatic charge build–up in persons

To carry out the walking test the sandals were placed on the test surface and put on by the test person.

Then the test person gripped the hand-held electrode connected to the ÖTI static meter (closed their hand round it) and with the other hand touched an earth potential contact, in order to start walking with zero voltage.

The test person then walked backwards and forwards across the test sample with a regular step frequency of two steps per second, whereby after every step the sandals or feet were raised between 50 and 80 mm coplanarly above the surface of the floor covering and then lowered.

The peak voltage was recorded at this walking frequency. Afterwards the sandals were removed while still on the test sample and the test process then repeated.

Repetition occurred fives time so that the mean value of the electrostatic charge could be calculated from the single peak voltages recorded.

CONSTAT Test 2.5%
Mean value: 1,100 V

The recorded electrostatic charge build–up in persons shows that the synthetic floor covering in the "CONSTAT Test 2.5%" version is antistatic, as the electrostatic charge build–up in persons is clearly less than 2,000 V.

In accordance with the text of the DIN EN 1815 standard in annex A (for information purposes only) the following information, among other things, can consequently be inferred:

"…..
It was established that most people experience a discharge effect when they are charged with 3kV or higher.

The walking test was identified as being the most practical procedure for simulating, with specified test signals, the discharge effect.

If conditions on the spot are different, then test results will differ from those recorded in the laboratory.
….."

Thus in this case "Procedure B, on-the-spot testing", in accordance with DIN EN 1815 6.3, was chosen in IFR Cologne's technical laboratory in order to represent situations in practice.

Finally, it must be emphasised that the test carried out and the results contained in this test report refer only to the test materials made available.

The request made of IFR Cologne to carry out tests is thus complied with by expert Richard A. Kille.

Duplications, copies or publication of this test report drawn up in triplicate (1 original and 2 copies) require the revocable written permission of IFR Cologne.

IFR
Illegible signature
Richard A. Kille
Expert

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Annex
- reference sample

REFERENCE SAMPLE

LOCK-TILE® tile
"CONSTAT Test 2.5%"