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zertifiziert nach
DIN EN ISO 9001 : 2008

Test report PB 18121 U*)

Client:	ETS Europe BVBA Herentalsebaan 406/Unit D1 Belgium, 2160 Wommelgem
Object:	Examination measurements to determine the volume resistivity of floor coatings
Products:	inorganic floor coatings
Indication:	ECO RAPID SL, ECO RESIST, ECO RAPID SL + ECO HYDRO SIL, ECO SIL
Editors / person in charge:	Dipl.-Ing. Steffen Schiecke Dipl.-Ing. Henry Sackmann
Testing equipment:	Testing Setup for measuring the volume restistance according to DIN EN 1081:1998 Method A
Date of delivery:	02.04.2015
Testing Date:	30.04.2015

This report contents of 5 pages including cover page.

*) These test report is a transcription of test report 1531 from the 07.05.2015. Changes are the new client designation and the new product name for the tested material.

Weimar, 06.11.2018

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1 Task / Implementation

The task was to measure the volume resistivity of floor coatings according to "Method A" of the standard DIN EN 1081: 1998.

Three samples of the following floor coatings are produced and delivered by the client:

- ECO RAPID SL
- ECO RESIST
- ECO RAPID SL + ECO HYDRO SIL
- ECO SIL

Deviating from the standard, the floor coatings were applied by the client to steel panels of size 450 x 500 mm² as areas of 400 x 400 mm² (example see Figure 1). For each material variant, 3 test specimens were delivered.
The layer thicknesses of the applied floor coatings can be seen in Table 1.

Table 1: Thicknesses of the applied floor coatings

material variation	thickness
ECO RAPID SL	6 mm
ECO RAPID SL + ECO HYDRO SIL	6 mm
ECO RESIST	6 mm
ECO SIL	4 mm

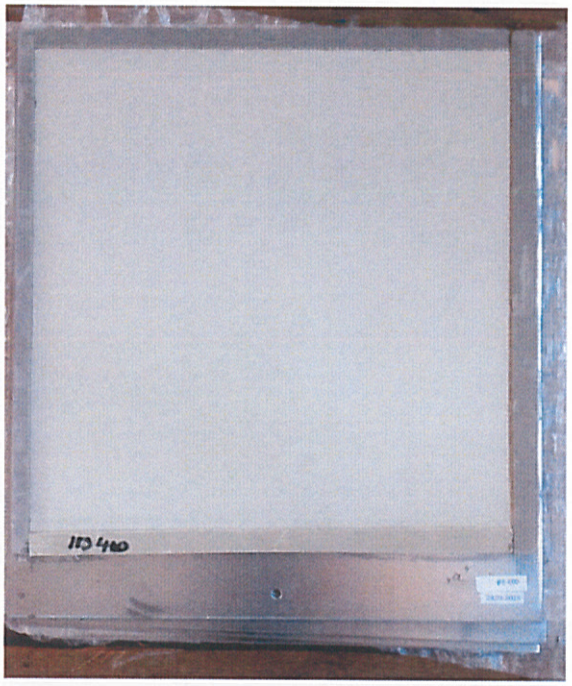

Figure 1: test specimen

The test specimens were dried in accordance with DIN 1081 in 96 hours at a temperature of 40 ± 2 ° C in a convection oven. The samples were then stored for 72 hours at 23 ± 2 ° C and a relative humidity of 50 ± 5%.

For the determination of the volume resistivity, the current flowing through the device under test at an applied DC voltage of 100 V was measured.

The required contact resistance results from the applied voltage and the measured current by the following calculation:

$$R = \frac{U}{I}$$ Equation 1

by : R: volume resistivity [Ω]
U: Voltage [V]
I: amperage [A]

The measurements were carried out according to DIN EN 1081 with a 3-foot electrode at three different positions of the floor coating.

The 3-foot electrode has been loaded with a weight force of 300 N.

The measurement values were determined 15 seconds after switching on the measuring voltage and start of load.

Climatic conditions during the measurements:

Temperature: 21 °C
Humidity: 48 % rF

2 Measurement

For the measurements of the volume resistivity two precision laboratory measuring instruments were used, which were used for the current and voltage measurements. Both devices have a digital display. The measuring instruments are calibrated traceable.
Figure 2 shows the used measuring setup of the "correct current" measurement.

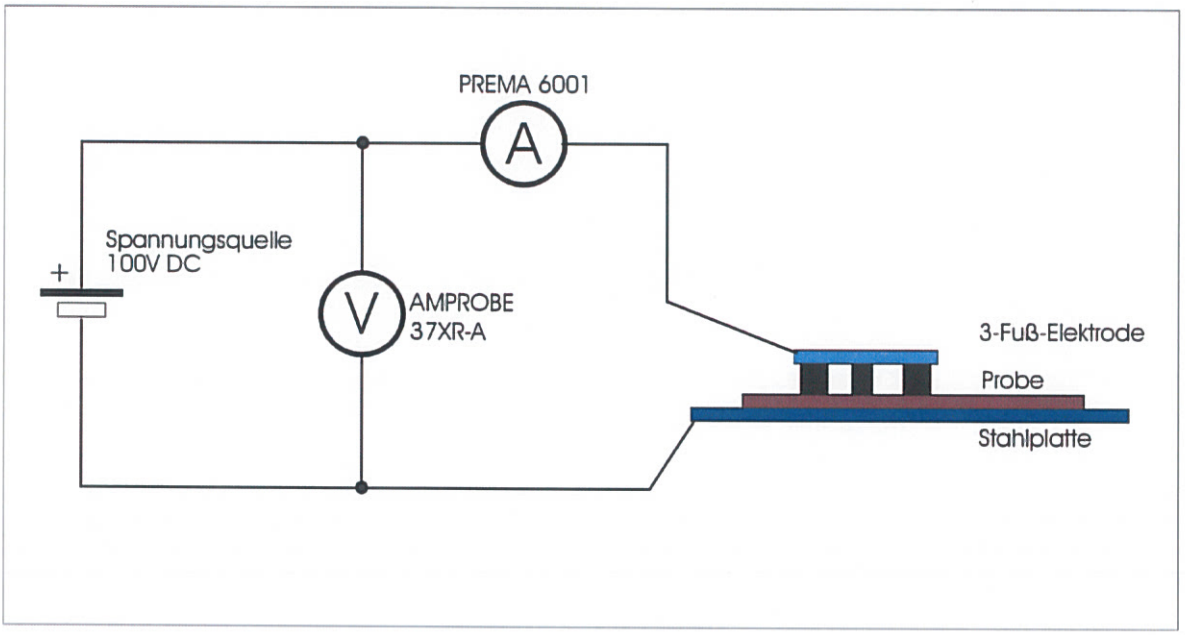

Figure 2: measuring setup

The measuring chain was checked before and after measurements of the volume resistance of the floor coatings by means of control measurements on 1 MΩ and 10 MΩ resistors.

3 Presentation of results

The following table shows the determined measurement results and the calculated volume resistances (1 MΩ = 106 Ω).

Table 2: Results

Specimen	Measurement 1 Amperage in mA	Measurement 2 Amperage in mA	Measurement 3 Amperage in mA	Measurement 4 Amperage in mA	Contact Resistance in MOhm
RAPID SL - A	0,000100	0,000119	0,000120	0,000113	885,0
RAPID SL - B	0,000122	0,000141	0,000146	0,000136	733,5
RAPID SL - C	0,000172	0,000197	0,000176	0,000182	550,5
RESIST - A	0,000144	0,000149	0,000162	0,000152	659,3
RESIST - B	0,000145	0,000180	0,000179	0,000168	595,2
RESIST - C	0,000172	0,000177	0,000182	0,000177	565,0
RAPID SL + HYDRO SIL - A	0,000233	0,000245	0,000262	0,000247	405,4
RAPID SL + HYDRO SIL - B	0,000177	0,000227	0,000208	0,000204	490,2
RAPID SL + HYDRO SIL - C	0,000305	0,000428	0,000279	0,000337	296,4
SIL - A	0,034800	0,070000	0,089000	0,064600	1,548
SIL - B	0,342000	0,369000	0,682000	0,464333	0,215
SIL - C	0,020200	0,049300	0,072100	0,047200	2,119

4 Evaluation of measurement

According to the BG regulations for safety and health at work BGR 132 a ground leakage resistance <100 MΩ is required.

DIN EN 61 340-5-1 requires an earth leakage resistance of <1000 MΩ. The material ECO SIL fulfills the requirements of both directives in the respective applied layer thicknesses.

The materials ECO RAPID SL, ECO RESIST und ECO RAPID SL + ECO HYDRO SIL fulfil the requirement according DIN EN 61 340-5-1.

The results refer exclusively to the specimens which were tested.

End of report.