OSTTHÜRINGISCHE
MATERIALPRÜFGESELLSCHAFT
für Textil und Kunststoffe mbH
Breitscheidstraße 97
07407 Rudolstadt-Schwarza

GRABOPLAST | FLOOR COVERING MANUFACTURERS LTD.
Mrs. Tünde Váradi
16/b Fehérvári St.
H-9023 Györ

your message from	your reference	our reference	telephone number	date
28.10.2016		4.5/B27-A1/2016	03672 379-521	09.12.2016

TEST REPORT

1. Gerneral

test report number:	4.5/B27-A1/2016	
client:	GRABOPLAST Floor Covering Manufacturers Ltd., Mrs. Váradi	
test item:		**internal laboratory number**
sample 1	Grabo Fortis, untreated	2789
sample 2	Grabo Fortis, treated	2790
sample drawing:	by client	
test aim:	„Plastics - Evaluation of the action of microorganisms“ acc. to DIN EN ISO 846:1997, method C	
date of receipt:	04.11.2016	
processing period:	09.11. – 07.12.2016	
processor:	Mrs. C. Stengel, Mrs. Dr. J. Bauer	
subcontractor:	none	
test method:	1) acc. to DIN EN ISO 846:1997	
comment:	no	
report execution:	4	
Report distribution:	1 copy for client 1 copy for OMPG mbH	

The tests were carried out between the current date and the report date. The results of the measurements and analysis refer exclusively to the test samples. This test report is only valid with the signature of the laboratory director or his representative legal. It may only be fully reproduced. Copying of excerpts require a written approval of the laboratory.

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2. Test method

Test method description:

Materials, which can be metabolized by microorganisms are determined by incubation together with bacteria or fungi on Carbon-deficient nutrient media. Visual inspection is carried out to evaluate microbial growth next to and on the samples. For testing the resistance of the material against bacteria, method C is recommended.

Material and test conditions:

test organism:	***Escherichia coli* DSM 1576**	
samples: sample 1	Grabo Fortis, untreated	**2789**
sample 2	Grabo Fortis, treated	**2790**
dimension of sample material	50 x 50 x 2mm	
Nutrient media & cultivation: **pre-incubation** **medium for inoculation** **incubation**	 in tryptone soy bouillon (TSB, Carl Roth) at 37°C and 110 rpm buffer solution mineral salt agar (MSA), 29°C plate-count-agar, 37°C	
inoculation cell number	**$6{,}05 \cdot 10^4$ cfu/ml** (shall be 2-8 x 10^4 cfu/ml)	

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Method:

Preparation of inoculum:
- cultivation of *E. coli* in TSB for 24h and 110 rpm
- adjusting to $1 \cdot 10^6$ cfu/ml in sterile buffer solution by OD_{630nm} and dilution
- for verification of colony forming units (cfu) 100µl of decadic serial dilution were plated on PCA in triplicate

Inoculation of samples:
- melted MSA was adjusted to 55°C
- 5ml inoculum were added to 95ml MSA
- 15ml inoculated MSA were poured into petri dishes
- 5 test specimens per sample were applied directly to the still liquid MSA
- leaving until solidified
- additional 15ml of inoculated MSA were poured into the plates until complete covering of samples

Growth control:
- 100µl of inoculum were plated on PGA and incubated for 24-48h by 29°C

Sterile control
- 15ml MSA without inoculum were poured into petri dishes
- 5 test specimen per sample were applied
- test specimen were covered with 15 ml MSA (w/o inoculum)

Standard clima
- additional 5 test specimen were kept in petri dishes without any nutrient agar by standard clima (23 °C, 50 % rH)

Incubation:
- plates were incubated at 29 ± 1 °C and 90 % rH until visual bacterial growth was detected, max. 4 weeks

Assessment criteria:

Growth intensity	Asessment
0	no observable growth neither by naked eye nor microscopy
1	visible growth only with microscopy
2	visible growth up to 25% sample surface
3	visible growth up to 50% sample surface
4	extensive growth on more than 50 % sample surface
5	strong growth on whole sample surface

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3. Test results

Test results are shown in table 1.

Table 1: Visual assessment of bacterial growth

sample no.	inoculated samples	sterile samples	growth intensity
2789			1
2790			1

4. Assessment

For sample "Grabo Fortis, untreated" (2789) and "Grabo Fortis, treated" (2790) no enhanced bacterial growth on the edge of the samples could be observed and therefore they do not serve as a nutrient source for *E. coli* DSM 1576. In some cases slightly growth of different microorganisms occurred in places, but this can be explained as contamination from non-sterile samples.

Likewise, no growth inhibition could be observed on the edge of the samples and thus no antibacterial activity can be concluded.

Alltogether the samples show good resistance to the bacterium *E. coli*.

Rudolstadt, 09.12.2016

Dr. Janine Bauer
Head of laboratory