



**COLEGIO OFICIAL DE INGENIEROS INDUSTRIALES
"LABORATORIO SEBASTIAN CARPI"**

C.I.F.: Q - 4670001- I

AVENIDA DEL MAR, Nº 46 – 12003 CASTELLÓN

TEL: 964 208 583 – FAX: 964 723 141

www.laboratoriocarpi.com



TEST REPORT

PETITIONER: REVIGLASS, S.A.

ADDRESS: Ctra Tolosa-Azpeitia, km 8

CITY: BIDANIA (Gipuzkoa)

TEST REPORT Nº: 55.832

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DATE OF TEST REPORT: 02/03/2017

DATE OF RECEIPT OF THE SAMPLE: 14/02/2017

DATE OF TESTS PERFORMANCE: 14/02/ - 01/03/2017

NUMBER OF TILES SUPPLIED: 845

DESCRIPTION OF THE SAMPLE:

Glass mosaic, 25 mm x 25 mm. Ref.:

-- **PS-53 (Cordón Poliuretano)** --

Code laboratory: 54-17

TEST CARRIED OUT:

- UNE-EN-ISO 10545-3 : DETERMINATION OF WATER ABSORPTION.
- UNE-EN-ISO 10545-5 : DETERMINATION OF IMPACT RESISTANCE BY MEASUREMENT OF COEFFICIENT OF RESTITUTION.
- UNE-EN-ISO 10545-7 : DETERMINATION OF RESISTANCE TO SURFACE ABRASION. GLAZED TILES.
- UNE-EN-ISO 10545-12 : DETERMINATION OF FROST RESISTANCE.
- UNE-EN-ISO 10545-13 : DETERMINATION OF CHEMICAL RESISTANCE.
- UNE-EN-ISO 10545-14 : DETERMINATION OF RESISTANCE TO STAINS.
- UNE 67101 and 1M : DETERMINATION OF SCRATCH HARDNESS ACCORDING TO MOHS.

José A. Estibález Catalán
MANAGER

The samples and his description have been chosen by the petitioner.

The reported results relate only to the samples tested.

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The uncertainties have been evaluated according to recommendations of the document ISO/TAG5/WGE : June 95.

The expanded uncertainties indicated in this report are based on a standard uncertainty multiplied by a coverage factor k=2 wich a normal distribution provides a level of confidence of about 95 %.



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Petitioner : REVIGLASS

Date : 02/03/2017

DETERMINATION OF WATER ABSORPTION

DESCRIPTION OF THE SAMPLE.-

Glass mosaic, 25 mm x 25 mm. Ref.:

-- **PS-53 (Cordón Poliuretano)** --

Code laboratory : 54-17

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 3:1997**)

* Water absorption for each tile (**Boiling method “E_b”**):

Tile	Water absorption (E_b) (%)
1	0.1
2	0.1
3	0.1
4	0.0
5	0.1

* Average water absorption of the sample: **0.1 %**

* Measurement uncertainty: **U = ± 0.1 % (k=2)**

* Average value uncertainty: **U = ± 0.1 % (k=2)**



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Date : 02/03/2017

DETERMINATION OF IMPACT RESISTANCE BY MEASUREMENT OF COEFFICIENT OF RESTITUTION

DESCRIPTION OF THE SAMPLE.-

Glass mosaic, 25 mm x 25 mm. Ref.:

-- **PS-53 (Cordón Poliuretano)** --

Code laboratory : 54-17

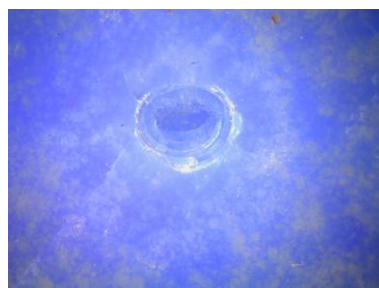
RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 5:1998**)

<u>Test specimen</u>	<u>Coefficient of restitution</u>
1	0.86
2	0.87
3	0.85
4	0.84
5	0.88

* Average coefficient of restitution: **0.85**

* Measurement uncertainty: **U = ± 0.03 (k=2)**

* Observations: Small circular cracks appear around the impact zone.





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Date : 02/03/2017

DETERMINATION OF RESISTANCE TO SURFACE ABRASION
*** GLAZED TILES ***

DESCRIPTION OF THE SAMPLE.-

Glass mosaic, 25 mm x 25 mm. Ref.:

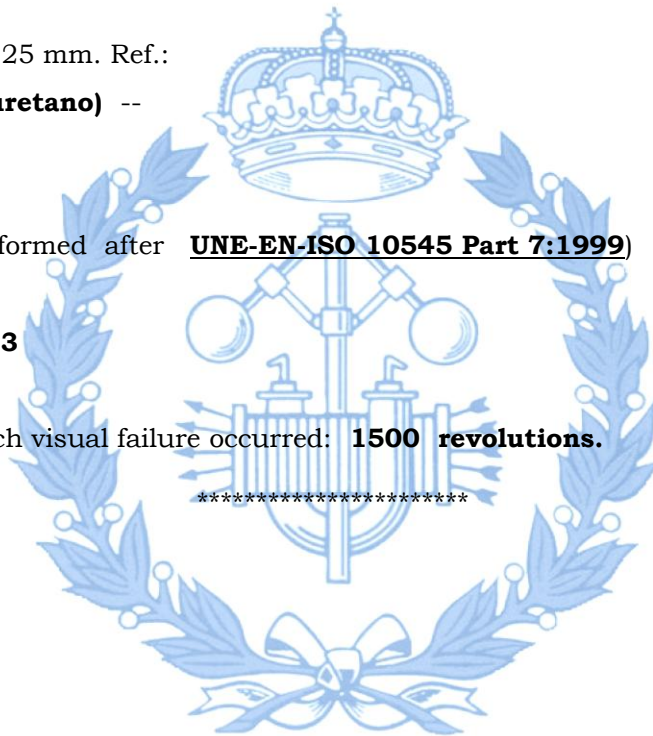
-- **PS-53 (Cordón Poliuretano)** --

Code laboratory: 54-17

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 7:1999**)

* Classification: **Class 3**

* Abrasion stage at which visual failure occurred: **1500 revolutions.**





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Date: 02/03/2017

DETERMINATION OF FROST RESISTANCE

DESCRIPTION OF THE SAMPLE.-

Glass mosaic, 25 mm x 25 mm. Ref.:

-- **PS-53 (Cordón Poliuretano)** --

Code laboratory: 54-17

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 12:1997**)

* Number of tiles tested: **Ten.**

* Method used to impregnate the tiles: **Impregnation with water at pressure below of the atmospheric pressure.**

* The initial water content before the freeze-thaw test: **$E_1 = 0.1 \% \pm 0.1 \%$ (k=2)**

* The final water content after the freeze-thaw test: **$E_2 = 0.1 \% \pm 0.1 \%$ (k=2)**

* Number of damaged tiles after 100 cycles: **Not-one.**

* Description of defects after the freeze-thaw test: The tiles tested are free from visible defects.



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DETERMINATION OF CHEMICAL RESISTANCE

DESCRIPTION OF THE SAMPLE.-

Glass mosaic, 25 mm x 25 mm. Ref.:

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Code laboratory: 54-17

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 13:1998**)

* Number of test specimens used with each test solution: FIVE.

<u>Test solutions</u>	<u>Classification</u>	<u>Visual Changes</u>
* <u>Household chemicals</u> - Ammonium Chloride	GA	- No visible effects.
* <u>Swimming pool salts</u> - Sodium Hypochlorite	GA	- No visible effects.
* <u>Acids and Alkalis (Low concentrations)</u> - Hydrochloric Acid	GLA	- No visible effects.
- Citric Acid	GLA	- No visible effects.
- Potassium Hydroxide	GLA	- No visible effects.
* <u>Acids and Alkalis (High concentrations)</u> - Hydrochloric Acid	GHA	- No visible effects.
- Lactic Acid	GHA	- No visible effects.
- Potassium Hydroxide	GHA	- No visible effects.



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DETERMINATION OF RESISTANCE TO STAINS

DESCRIPTION OF THE SAMPLE.-

Glass mosaic, 25 mm x 25 mm. Ref.:

-- **PS-53 (Cordón Poliuretano)** --

Code laboratory: 54-17

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 14:2015**)

* Number of test specimens used with each test solution: FIVE.

<u>Staining Agents</u>	<u>Cleaning Procedure</u>	<u>Class</u>	<u>Observations</u>
* <i><u>Stains having tracing action (Pastes).</u></i> - Green staining agent in light oil.....	- Running hot water for five minutes. (Procedure A).	5	- Stain removed.
* <i><u>Stains having chemical / oxidizing action</u></i> - Iodine alcohol solution	- Running hot water for five minutes. (Procedure A).	5	- Stain removed.
* <i><u>Stains having filming action</u></i> - Olive oil	- Running hot water for five minutes. (Procedure A).	5	- Stain removed.

* Observations: The chromium oxide used as green staining agent have a grain size less than 80 microns, being the 50 % (m/m) of theirs down on 3 microns.



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DETERMINATION OF SCRATCH HARDNESS
ACCORDING TO MOHS

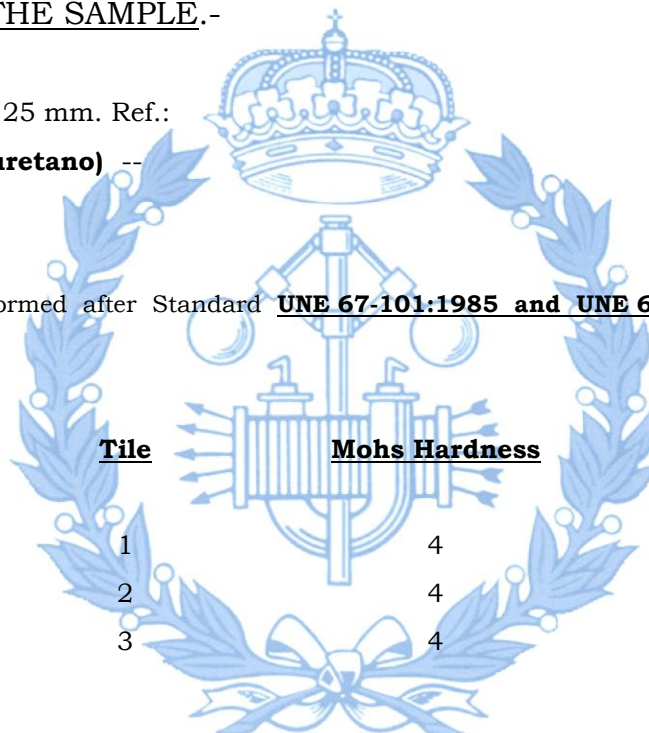
DESCRIPTION OF THE SAMPLE.-

Glass mosaic, 25 mm x 25 mm. Ref.:

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RESULTS.- (Test performed after Standard **UNE 67-101:1985 and UNE 67-101/1M:1992**) (*)



(*) Note: This standards are repealed since 18.03.2009.