



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

CITY: CASTELLÓN

TEST REPORT Nº: 59.060

PAGE Nº: 1 / 15

DATE OF TEST REPORT: 16/04/2021

DATE OF RECEIPT OF THE SAMPLE: 07/04/2021

DATE OF TESTS PERFORMANCE: 07 – 16/04/2021

NUMBER OF SAMPLES SUPPLIED: 50

DESCRIPTION OF THE SAMPLE: (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

TEST CARRIED OUT:

- UNE-EN-ISO 10545-2 : DETERMINATION OF DIMENSIONS AND SURFACE QUALITY.
- UNE-EN-ISO 10545-3 : DETERMINATION OF WATER ABSORPTION.
- UNE-EN-ISO 10545-4 : DETERMINATION OF MODULUS OF RUPTURE AND BREAKING STRENGTH.
- UNE-EN-ISO 10545-8 : DETERMINATION OF LINEAR THERMAL EXPANSION.
- UNE-EN-ISO 10545-9 : DETERMINATION OF RESISTANCE TO THERMAL SHOCK.
- UNE-EN-ISO 10545-11 : DETERMINATION OF CRAZING RESISTANCE. GLAZED TILES.
- UNE-EN-ISO 10545-13 : DETERMINATION OF CHEMICAL RESISTANCE.
- UNE-EN-ISO 10545-14 : DETERMINATION OF RESISTANCE TO STAINS.
- ANNEX: PICTURE OF TESTED SAMPLE.



DETERMINATION OF DIMENSIONS
*** MEASUREMENTS OF LENGTH AND WIDTH ***

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2:2019**)

* Work size: **200 mm x 200 mm**

<u>Tile</u>	<u>Individuals measurements (mm)</u>									
	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
L₁	200.4	200.5	200.4	200.3	200.3	200.2	200.3	200.3	200.6	200.3
L₂	200.1	200.4	200.3	200.3	200.1	200.1	200.1	200.2	200.3	200.1
L₃	200.2	200.1	200.2	200.2	200.2	199.8	199.9	200.2	200.2	199.9
L₄	200.2	200.1	200.0	200.0	200.2	199.8	199.8	199.9	200.1	199.8
	<u>Average measurements (mm)</u>									
Length	200.2	200.3	200.2	200.2	200.2	200.0	200.0	200.2	200.3	200.0
	<u>Deviations from the work size</u>									
D_{Lw} (%)	0.10	0.15	0.10	0.10	0.10	0.00	0.00	0.10	0.15	0.00
D_{Lw} (mm)	0.2	0.3	0.2	0.2	0.2	0.0	0.0	0.2	0.3	0.0
	<u>Deviations from the average size of the sample</u>									
D_{Lm} (%)	0.00	0.05	0.00	0.00	0.00	-0.10	-0.10	0.00	0.05	-0.10
D_{Lm} (mm)	0.0	0.1	0.0	0.0	0.0	-0.2	-0.2	0.0	0.1	-0.2

* Average length of the sample: **200.2 mm**

* Maximum deviations of the average measurements form the work size: **0.15 % (0.3 mm)**

* Deviations uncertainty: **U= ± 0.05 % ; U= ± 0.1 mm (k=2)**



DETERMINATION OF DIMENSIONS
*** MEASUREMENTS OF THICKNESS ***

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2:2019**)

* Work size thickness: **7.0 mm**

Measurements of thickness (mm)											
<u>Tile</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>	
G1	7.2	7.2	7.2	7.3	7.2	7.2	7.2	7.3	7.4	7.3	
G2	7.3	7.3	7.3	7.3	7.3	7.2	7.2	7.3	7.3	7.3	
G3	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
G4	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	7.0	
Average thickness (mm)	7.1	7.1	7.1	7.2	7.1	7.1	7.1	7.2	7.2	7.2	
Deviation from the work size thickness	(%)	1.43	1.43	1.43	2.86	1.43	1.43	1.43	2.86	2.86	2.86
	(mm)	0.1	0.1	0.1	0.2	0.1	0.1	0.1	0.2	0.2	0.2

* Average thickness of the sample: **7.1 mm**

* Maximum deviation of the thickness from the work size thickness: **2.86 % (0.2 mm)**

* Deviations uncertainty: **U= ± 1.43 % ; U= ± 0.1 mm (k=2)**



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 n°: 59.060
 Page n° : 4 / 15

DETERMINATION OF DIMENSIONS

*** MEASUREMENTS OF STRAIGHTNESS OF SIDES ***

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2:2019**)

* Work size: **200 mm x 200 mm**

Measurements of straightness (mm)

<u>Tile</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
<u>R1</u>	0.0	0.0	0.0	0.1	0.1	0.1	0.1	0.1	0.1	0.1
<u>R2</u>	0.1	0.0	0.1	0.1	0.2	0.1	0.1	0.2	0.1	0.1
<u>R3</u>	0.0	-0.1	0.0	0.0	0.0	0.0	0.1	0.0	0.1	0.1
<u>R4</u>	0.1	0.1	0.1	0.1	0.1	0.1	0.2	0.2	0.2	0.2

* Maximum deviation from straightness, related to the work size:

0.10 % / -0.05 % (0.2 mm / -0.1 mm)

* Deviations uncertainty: **U= ± 0.03 % ; U= ± 0.1 mm (k=2)**



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 n°: 59.060
 Page n° : 5 / 15

DETERMINATION OF DIMENSIONS
*** MEASUREMENTS OF RECTANGULARITY ***

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2:2019**)

* Work size: **200 mm x 200 mm**

Measurements of rectangularity (mm)

<u>Tile</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
<u>O1</u>	-0.1	-0.1	0.0	0.0	0.0	-0.2	-0.2	-0.1	-0.1	-0.1
<u>O2</u>	-0.4	-0.2	-0.3	-0.3	0.0	-0.3	-0.2	-0.3	-0.1	-0.2
<u>O3</u>	0.2	0.7	0.5	0.4	0.1	0.7	0.6	0.5	0.5	0.6
<u>O4</u>	-0.2	-0.3	-0.2	-0.1	-0.2	-0.3	-0.2	-0.1	-0.3	-0.3

* Maximum deviation from rectangularity, related to the work size:

0.35% / -0.20 % (0.7 mm / -0.4 mm)

* Deviations uncertainty: **U= ± 0.03 % ; U= ± 0.1 mm (k=2)**



DETERMINATION OF DIMENSIONS

*** MEASUREMENTS OF SURFACE FLATNESS ***

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2:2019**)

* Work size: **200 mm x 200 mm**

* Diagonal calculated from the work size: **282.8 mm**

<u>Measurements of centre curvature (mm)</u>										
<u>Tile</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
CC1	0.3	0.6	0.4	0.6	0.3	0.2	0.3	0.6	0.4	0.3
CC2	0.4	0.6	0.5	0.6	0.4	0.4	0.4	0.6	0.3	0.4
CC3	0.3	0.6	0.4	0.6	0.3	0.2	0.3	0.6	0.4	0.3
CC4	0.4	0.6	0.5	0.6	0.4	0.3	0.4	0.6	0.3	0.4

<u>Measurements of edge curvature (mm)</u>										
<u>Tile</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
CL1	0.1	0.4	0.2	0.4	0.1	0.1	0.2	0.4	0.2	0.1
CL2	0.1	0.0	0.1	0.0	0.1	-0.1	-0.1	-0.1	0.0	0.0
CL3	0.1	0.3	0.2	0.3	0.2	0.1	0.1	0.4	0.2	0.2
CL4	0.1	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.1	0.1

<u>Measurements of warpage (mm)</u>										
<u>Tile</u>	<u>1</u>	<u>2</u>	<u>3</u>	<u>4</u>	<u>5</u>	<u>6</u>	<u>7</u>	<u>8</u>	<u>9</u>	<u>10</u>
A1	-0.2	-0.2	-0.3	0.0	-0.2	-0.3	-0.2	0.0	0.0	-0.2
A2	0.1	0.1	0.1	-0.1	0.1	0.2	0.1	-0.1	-0.1	0.1
A3	-0.2	-0.1	-0.3	0.0	-0.2	-0.4	-0.3	-0.1	0.0	-0.3
A4	0.1	0.1	0.1	0.0	0.1	0.2	0.1	0.0	-0.1	0.1

* Maximum centre curvature, related to the diagonal: **0.21 % (0.6 mm)**

* Maximum edge curvature, related to the work size: **0.20 % / -0.05 % (0.4 mm / -0.1 mm)**

* Maximum warpage, related to the diagonal: **0.07 % / -0.14 % (0.2 mm / -0.4 mm)**

* Deviations uncertainty: **U= ± 0.03 % ; U= ± 0.1 mm (k=2)**



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 n°: 59.060

Page n° : 7 / 15

DETERMINATION OF SURFACE QUALITY

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

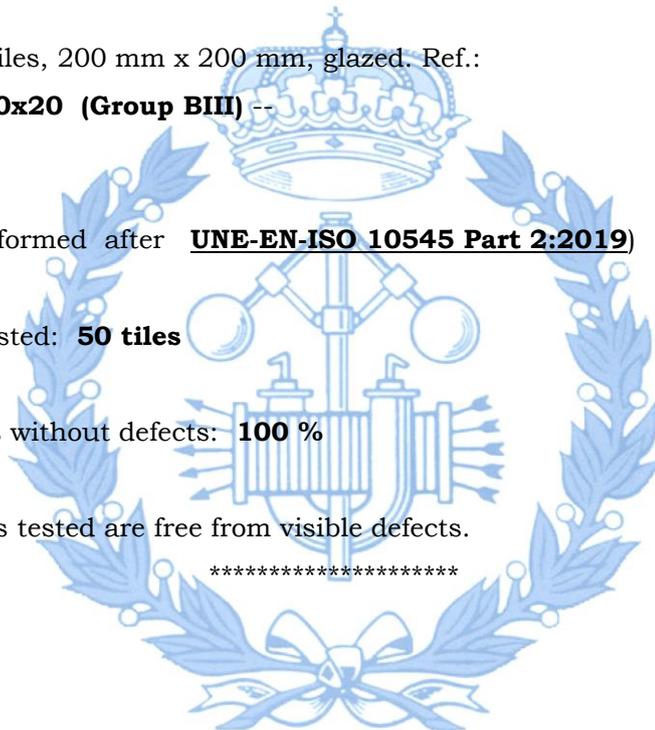
Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2:2019**)

* The number of tiles tested: **50 tiles**

* The percentage of tiles without defects: **100 %**

* Observations: The tiles tested are free from visible defects.





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 n°: 59.060

Page n° : 8 / 15

DETERMINATION OF WATER ABSORPTION

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 3:2018**)

* We have tested specimens of 100 mm x 200 mm, obtained by cutting.

* Water absorption for each specimen:

Specimen	Water absorption (E_v) (%)
1	17.6
2	16.0
3	15.9
4	17.2
5	16.0

* Average water absorption of the sample: **16.5 %**

* Measurement uncertainty: **U = ± 0.4 % (k=2)**

* Average value uncertainty: **U = ± 0.9 % (k=2)**



DETERMINATION OF MODULUS OF RUPTURE
AND BREAKING STRENGTH

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 4:2019**)

* Parameters: $l_2 = 180 \text{ mm}$; $l_1 = 10 \text{ mm}$; $t = 5 \text{ mm}$; $d = 20 \text{ mm}$

<u>Tile</u>	<u>Breaking load "F"</u> (N)	<u>Breaking strength "S"</u> (N)	<u>Modulus of rupture "R"</u> (N/mm ²)
1	589.0	529.6	22.1
2	645.8	580.4	23.4
3	643.9	578.6	24.1
4	641.9	577.4	24.1
5	649.7	583.6	22.8
6	651.7	585.9	22.9
7	663.5	595.9	22.5
Average	641	576	23

* Measurement uncertainty: $U_F = 7.7 \text{ N}$; $U_S = 7.7 \text{ N}$; $U_R = 0.9 \text{ N/mm}^2$ (k=2)

* Average value uncertainty: $U_F = 20 \text{ N}$; $U_S = 18 \text{ N}$; $U_R = 1 \text{ N/mm}^2$ (k=2)



**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 nº: 59.060

Page nº : 10 / 15

DETERMINATION OF LINEAR THERMAL EXPANSION

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 8:2014**)

<u>Specimen</u>	<u>Coefficient of linear thermal expansion (from 30 °C to 100 °C)</u>
1	6.3 x 10 ⁻⁶ /°C
2	6.3 x 10 ⁻⁶ /°C

* Measurement uncertainty: **U = ± 0.3 x 10⁻⁶/°C (k=2)**

* **Observations:** The dimensions of the test specimens are: P₁ = 50.55 x 4.64 x 5.66 mm and P₂ = 50.46 x 4.72 x 5.52 mm.



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 n°: 59.060

Page n° : 11 / 15

DETERMINATION OF RESISTANCE TO THERMAL SHOCK

DESCRIPTION OF THE SAMPLE. - (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS. - (Test performed after **UNE-EN-ISO 10545 Part 9:2013**)

* Water absorption of the tiles: **More than 10 %**

* Type of test performed: **Without immersion.**

* Number of test specimens: **Five.**

* Number of test specimens with visible defects: **Not - one.**

* Observation: The tiles tested are free from visible defects.



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 n°: 59.060
 Page n° : 12 / 15

DETERMINATION OF CHEMICAL RESISTANCE

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 13:2017**)

* Testing method: Contact with the test surface.

<u>Test solutions</u>	<u>Classification</u>			<u>Visual Changes</u>
	<u>Specimen n°</u>			
	<u>1</u>	<u>2</u>	<u>3</u>	
* <u>Household chemicals</u> - Ammonium Chloride (100 g/l)	A	A	A	No visible effects. Lines pencil removed
* <u>Swimming pool salts</u> - Sodium Hypochlorite (20 mg/l)	A	A	A	No visible effects. Lines pencil removed
* <u>Acids and Alkalis (Low concentrations)</u> - Hydrochloric Acid (3% v/v)	LA	LA	LA	No visible effects. Lines pencil removed
- Citric Acid (100 g/l)	LA	LA	LA	No visible effects. Lines pencil removed
- Potassium Hydroxide (30 g/l)	LA	LA	LA	No visible effects. Lines pencil removed



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 n°: 59.060

Page n° : 13 / 15

DETERMINATION OF RESISTANCE TO STAINS

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

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.



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 n°: 59.060

Page n° : 14 / 15

CONCLUSIONS

DESCRIPTION OF THE SAMPLE.- (Information provided by client)

Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **BLANCO BRILLO 20x20 (Group BIII)** --

Code laboratory: 96-21

CONCLUSIONS.-

The results obtained in the test report accomplish the specifications of the Standard **ISO 13006:2018 (Annex L)** (Dry-pressed ceramic tiles, with water absorption **$E_v > 10 \%$** **Group BIa**).



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

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

AVENIDA DEL MAR, Nº 46 – 12003 CASTELLÓN

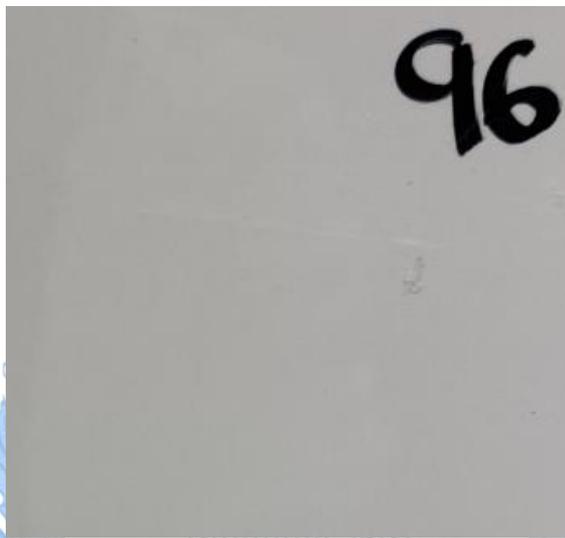
TEL: 964 208 583 – FAX: 964 723 141

www.laboratoriocarpi.com

Test report n°: 59.060

Page n° : 15 / 15

ANNEX: PICTURE OF TESTED SAMPLE



Colour and tone are only approximated



**José A. Estibález Catalán
MANAGER**

LIABILITY CLAUSES

- The samples and their description have been chosen by the petitioner
- The results contained in this report only refer to the material subjected to testing.
- Reproduction of this document is only permitted if done in full all pages included
- Electronically signed reports in digital form are considered to be an original document, as are copies electronic of it. Its printing on paper has no legal validity.
- 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 %.
- Laboratorio "Sebastian Carpi" guarantee the confidentiality of the content of the present report.