



LABORATORIO CERAMICO SEBASTIAN CARPI
COLEGIO OFICIAL DE INGENIEROS INDUSTRIALES DE CASTELLÓN

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: CERAMICA RIBESALBES, S.A.
ADDRESS: Crta Onda- Ribesalbes, km 3,300
CITY: ONDA (Castellon)
TEST REPORT Nº: 54.502
PAGE Nº: 1 / 13
DATE OF TEST REPORT: 21/07/2015
DATE OF RECEIPT OF THE SAMPLE: 03/07/2015
DATE OF TESTS PERFORMANCE: 03 - 21/07/2015
NUMBER OF TILES SUPPLIED: 50

DESCRIPTION OF THE SAMPLE:

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

TEST PERFORMED:

- UNE-EN-ISO 10545-2 and DETERMINATION OF DIMENSIONS.
ERRATUM:
- 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 10545-7 : DETERMINATION OF RESISTANCE TO SURFACE ABRASION.
GLAZED TILES.
- 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.
- 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.
This report must not be reproduced in part without the written permission of Laboratory.
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: CERAMICA RIBESALBES

Date: 21/07/2015

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

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2 and Erratum:1998**)

* 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>
<u>L1</u>	200.7	200.6	200.3	200.1	200.4	200.9	200.1	200.1	200.4	201.0
<u>L2</u>	200.8	200.6	200.5	200.4	200.5	201.1	200.2	200.5	201.0	201.1
<u>L3</u>	200.7	200.4	200.4	200.6	200.4	201.0	200.3	200.5	201.1	201.0
<u>L4</u>	200.4	200.2	200.0	200.1	200.2	200.7	199.9	200.2	200.4	200.6
<u>Average measurements (mm)</u>										
<u>Length</u>	200.7	200.5	200.3	200.3	200.4	200.9	200.1	200.3	200.7	200.9
<u>Deviations from the work size</u>										
<u>D_{Lw}</u> (%)	0.35	0.25	0.15	0.15	0.20	0.45	0.05	0.15	0.35	0.45
<u>D_{Lw}</u> (mm)	0.7	0.5	0.3	0.3	0.4	0.9	0.1	0.3	0.7	0.9
<u>Deviations from the average size of the sample (%)</u>										
<u>D_{Lm}</u>	0.10	0.00	-0.10	-0.10	-0.05	0.20	-0.20	-0.10	0.10	0.20

* Average length of the sample: **200.5 mm**

* Maximum deviations of the average measurements form the work size: **0.45 %**

* Maximum deviations of the average measurements form the work size: **0.9 mm**

* Maximum deviations of the average measurements from the average size of the sample:
0.20 % / -0.20 %

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

Note: In calculating the deviations, the work size is assumed by the laboratory.



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Petitioner: CERAMICA RIBESALBES

Date: 21/07/2015

DETERMINATION OF DIMENSIONS

*** MEASUREMENTS OF THICKNESS ***

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2 and Erratum:1998**)

* Work size thickness: **8.0 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>
<u>G1</u>	8.0	8.1	8.0	8.1	8.0	8.0	8.0	8.2	8.1	8.1
<u>G2</u>	8.1	8.0	8.1	8.1	8.1	8.1	8.2	8.3	8.1	8.2
<u>G3</u>	8.3	8.2	8.2	8.3	8.3	8.2	8.3	8.3	8.2	8.4
<u>G4</u>	8.2	8.2	8.2	8.3	8.3	8.2	8.2	8.3	8.3	8.3
<u>Average thickness (mm)</u>	8.2	8.1	8.1	8.2	8.2	8.1	8.2	8.3	8.2	8.3
<u>Deviation from the work size thickness (%)</u>	2.50	1.25	1.25	2.50	2.50	1.25	2.50	3.75	2.50	3.75
<u>Deviation from the work size thickness (mm)</u>	0.2	0.1	0.1	0.2	0.2	0.1	0.2	0.3	0.2	0.3

* Average thickness of the sample: **8.2 mm**

* Maximum deviation of the thickness from the work size thickness: **3.75 %**

* Maximum deviation of the thickness from the work size thickness (mm): **0.3 mm**

* Deviations uncertainty: **U= ± 1.25 % ; U= ± 0.1 mm (k=2)**

Note: In calculating the deviations, the work size thickness has been chosen by the laboratory.



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Date: 21/07/2015

DETERMINATION OF DIMENSIONS

*** MEASUREMENTS OF STRAIGHTNESS OF SIDES ***

DESCRIPTION OF THE SAMPLE.-

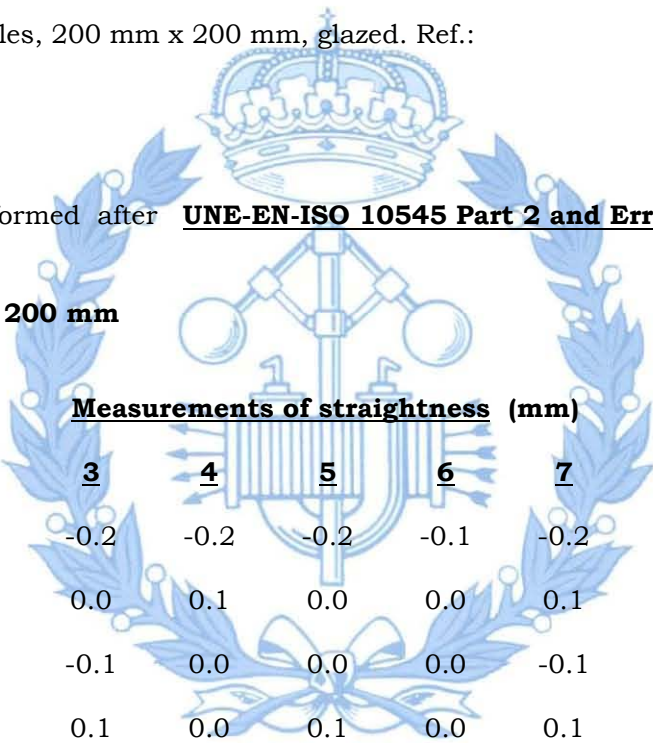
Dry – pressed ceramic tiles, 200 mm x 200 mm, glazed. Ref.:

-- **ANTIGUA GRIS** --

Code lab.: 229-15

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2 and Erratum:1998**)

* 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>	-0.2	-0.2	-0.2	-0.2	-0.2	-0.1	-0.2	-0.1	-0.1	-0.2
<u>R2</u>	0.0	0.0	0.0	0.1	0.0	0.0	0.1	0.1	0.1	0.1
<u>R3</u>	-0.1	0.0	-0.1	0.0	0.0	0.0	-0.1	0.0	-0.1	0.0
<u>R4</u>	0.1	0.1	0.1	0.0	0.1	0.0	0.1	0.0	0.0	0.1

* Maximum deviation from straightness, related to the work size: **0.05 % / -0.10 %**

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



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Date: 21/07/2015

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

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2 and Erratum:1998**)

* 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>	-0.2	-0.2	-0.2	0.1	-0.2	-0.1	0.0	0.1	0.0	-0.2
<u>O2</u>	-0.3	-0.1	-0.3	-0.4	-0.1	-0.3	-0.3	-0.4	-0.6	-0.2
<u>O3</u>	0.3	0.3	0.3	0.0	0.2	0.2	0.2	0.1	0.0	0.3
<u>O4</u>	0.2	0.1	0.3	0.3	0.1	0.3	0.2	0.3	0.7	0.1

* Maximum deviation from rectangularity, related to the work size: **0.35 % / -0.30 %**

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



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Date: 21/07/2015

DETERMINATION OF DIMENSIONS
*** MEASUREMENTS OF SURFACE FLATNESS ***

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 2 and Erratum:1998**)

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

* Diagonal calculated from the work size: **282.8 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>
CC1	0.9	0.6	0.5	0.5	0.4	0.4	0.4	0.6	0.3	0.7
CC2	0.7	0.5	0.4	0.4	0.1	0.3	0.1	0.4	0.1	0.5
CC3	0.8	0.5	0.5	0.5	0.4	0.3	0.4	0.6	0.3	0.7
CC4	0.7	0.5	0.3	0.4	0.1	0.3	0.1	0.4	0.2	0.5

<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	0.3	0.3	0.3	0.2	0.1	0.2	0.3	0.3	0.2	0.2
CL2	0.6	0.5	0.2	0.4	0.3	0.3	0.2	0.3	0.2	0.4
CL3	0.2	0.2	0.1	0.1	0.1	0.1	0.1	0.1	0.0	0.1
CL4	0.6	0.3	0.2	0.5	0.0	0.3	0.2	0.3	0.2	0.4

<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	0.2	0.2	0.6	0.1	0.6	0.4	0.3	0.4
A2	-0.2	-0.1	-0.2	-0.2	-0.6	0.0	-0.5	-0.4	-0.3	-0.3
A3	0.2	0.1	0.2	0.2	0.6	0.1	0.5	0.4	0.3	0.3
A4	-0.2	-0.1	-0.2	-0.2	-0.5	0.0	-0.5	-0.3	-0.2	-0.3

* Maximum centre curvature, related to the diagonal: **0.32 %**

* Maximum edge curvature, related to the work size: **0.30 %**

* Maximum warpage, related to the diagonal: **0.21 % / -0.21 %**

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

Note: In calculating the deviations, the work size is assumed by the laboratory.



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Petitioner: CERAMICA RIBESALBES

Date: 21/07/2015

DETERMINATION OF WATER ABSORPTION

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

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	6.3
2	6.6
3	6.5
4	7.2
5	6.9
6	6.8
7	6.6
8	6.8
9	6.3
10	6.3

* Average water absorption of the sample: **6.6 %**

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

* Average value uncertainty: **U = ± 0.5 % (k=2)**



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Date: 21/07/2015

DETERMINATION OF MODULUS OF RUPTURE AND BREAKING STRENGTH

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 4:2015**)

* 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	1340.6	1205.4	33.9
2	1341.6	1203.8	33.9
3	1276.9	1144.1	32.2
4	1315.2	1178.9	33.2
5	1320.1	1186.9	32.5
6	1290.7	1157.5	32.6
7	1303.4	1170.7	33.0
Average	1313	1178	33

* Measurement uncertainty: $U_F = 15.8 \text{ N}$; $U_S = 15.6 \text{ N}$; $U_R = 1.0 \text{ N/mm}^2$ ($k=2$)

* Average value uncertainty: $U_F = 24 \text{ N}$; $U_S = 23 \text{ N}$; $U_R = 2 \text{ N/mm}^2$ ($k=2$)



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Date: 21/07/2015

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

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

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

* Classification: **Class 4**

* Abrasion stage at which visual failure occurred: **2100 revolutions.**





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Date: 21/07/2015

DETERMINATION OF CRAZING RESISTANCE

*** GLAZED TILES ***

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

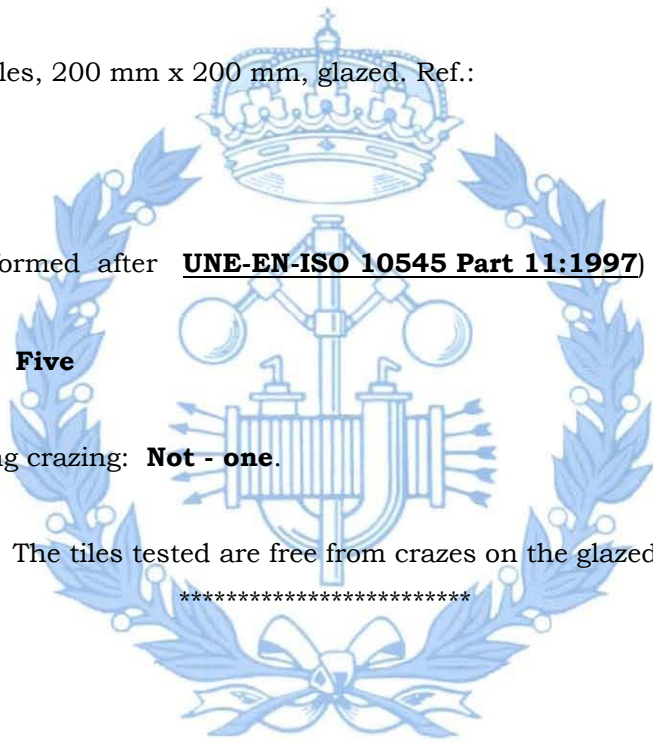
Code lab.: 229-15

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 11:1997**)

* Number of tiles tested: **Five**

* Number of tiles showing crazing: **Not - one.**

* Description of crazing: The tiles tested are free from crazes on the glazed surface.





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DETERMINATION OF CHEMICAL RESISTANCE

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

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</u> (Low concentrations) - Hydrochloric Acid	GLA	- No visible effects.
- Citric Acid	GLA	- No visible effects.
- Potassium Hydroxide	GLA (V)	- Slight change in appearance.
* <u>Acids and Alkalis</u> (High concentrations) - Hydrochloric Acid	GHA (V)	- Slight change in appearance.
- Lactic Acid	GHA	- No visible effects.
- Potassium Hydroxide	GHA (V)	- Slight change in appearance.



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DETERMINATION OF RESISTANCE TO STAINS

DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

RESULTS.- (Test performed after **UNE-EN-ISO 10545 Part 14:1998**)

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

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

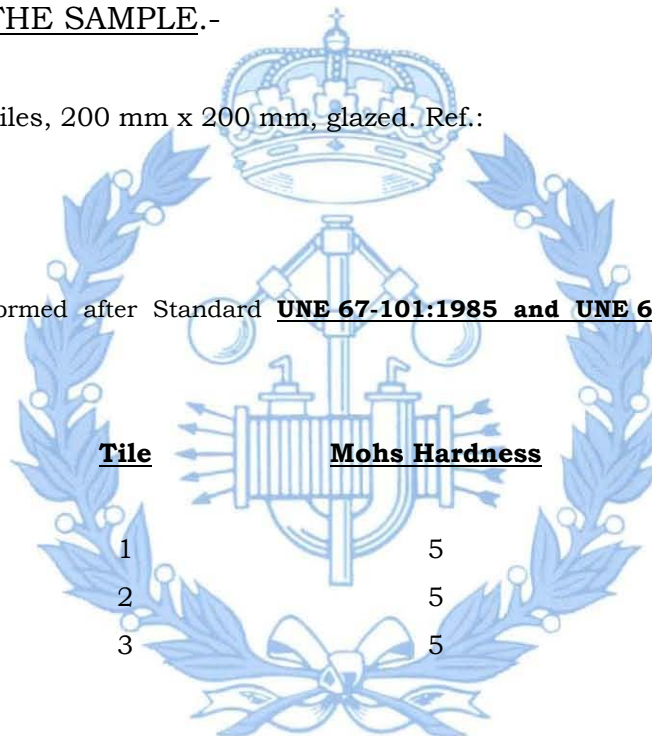
DESCRIPTION OF THE SAMPLE.-

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

-- **ANTIGUA GRIS** --

Code lab.: 229-15

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



Tile

Mohs Hardness

1

5

2

5

3

5