

Bellaterra : July 4th, 2011
 File number : 11/3240-1711
 Petitioner reference : **REVI GLASS S.A.**
 NIF: A20094777
 Ctra.de Tolosa - Azpeitia, km. 8
 20496 Bidegoyan, Guipúzcoa

REPORT OF TESTS

Register number: 11/1711

RECEIVED MATERIAL:

On June 3rd, 2011, have been received in Applus a sample of GLASS MOSAIC, in panels of 335 x 335 mm, formed by tiles of dimensions 25 x 25 x 5 mm, and with the following reference according to the petitioner:

GLASS MOSAIC of 25 x 25 x 5 mm

REQUESTED TESTS:

- Determination of resistance to surface abrasion for glazed tiles. UNE-EN ISO 10.545-7/99.
- Determination of water absorption. UNE-EN ISO 10.545-3/97.
- Determination of scratch hardness of surface according to Mohs. UNE 67.101/85 and 1st Mod. 92. (a)
- Determination of resistance to stains. UNE-EN ISO 10.545-14/98.
- Determination of chemical resistance. UNE-EN ISO 10.545-13/98.
- Determination of impact resistance by measurement of coefficient of restitution. UNE-EN 10.545-5/97
- Determination of frost resistance. UNE-EN ISO 10.545-12/97.

(a) The client requests this test UNE 67101:1985 and 67101/1M: 1992. Currently this standard is obsolete canceled and not being replaced by another.

DATE OF TESTS: from 06/06/2011 to 27/06/2011.

RESULTS: To see attached pages



Firmado digitalmente por Juan Martinez Egea

Responsible for Construction Materials
 LGAI Technological Center S.A.



Firmado digitalmente por Miguel Maria Ayala Moran

Technician Responsible
 LGAI Technological Center S.A.

The results specified in this document refer only to the material received in the Applus and tested according to the presented indications. The uncertainty expanded of the measurement has been expressed as typical uncertainty of measurement multiplied by a factor of coverage k=2 that, for a normal distribution, corresponds to a probability of approximately 95%. The typical uncertainty of measurement has decided in conformity with EAL-R2. The current designation of EAL-R2 is EA-4/02.

Statement Responsible LGAI APPLUS-Technological Center, SA, Registration No. L0600054, the RD410/2010, D.257/2003 and Law 25/2009. Query: <http://www.gencat.cat> or http://www.codigotecnico.org/web/galerias/archivos/RG_LECCE_rev_0-2_julio-2010.xl

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 The present document is a translation of the report n°11/3240-1711. In case of dispute, the valid is the spanish version

Page 1 - The present document consists of 6 pages of which 0 are attachments.

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REVI GLASS S.A.	GLASS MOSAIC of 25 x 25 x 5 mm

RESULTS:**Water absorption (UNE-EN ISO 10545-3:1997)**

Test sample	Dry mass (g)	Saturated mass (g)	Absorption (%)
1	5,9270	5,9271	0,002
2	6,0308	6,0310	0,003
3	5,5625	5,5626	0,002
4	5,9401	5,9402	0,002
5	6,1351	6,1352	0,002
6	6,0747	6,0749	0,003
7	5,7119	5,7120	0,002
8	5,7836	5,7837	0,002
9	6,1821	6,1822	0,002
10	5,8176	5,8178	0,003
Average			0,002

Uncertainty : ±0,27

Scratch hardness of surface according to Mohs (UNE 67.101/85 and 1st Mod. 92)

Test sample	Hardness
1	4 (Fluorite)
2	4 (Fluorite)
3	4 (Fluorite)

NOTE: Currently this standard is void and obsolete, being replaced by another.

Resistance to stains (UNE-EN ISO 10545-14:1998)

Agentes de manchas	Classification
Green in light oil (Cr_2O_3)	Class 5 The stain caused could be removed with hot water (55°C)
Alcoholic iodine solution	Class 5 The stain caused could be removed with hot water (55°C)
Olive oil	Class 5 The stain caused could be removed with hot water (55°C)

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Chemical resistance (UNE-EN ISO 10545-13:1998)

The cylinders have been sealed over the enamelled side of the test samples, for later to put in the test solutions up to 20 mm.

Classification of domestic cleaning products test:

Test solution	Classification	Observations
ammonium chloride 100 g/l	GA	No visible effects. Classification according stripe pencil test. The pencil line is removed with a damp cloth

Classification of swimming pools salts test:

Test solution	Classification	Observations
sodium hypochloride 20 g/l	GA	No visible effects. Classification according stripe pencil test. The pencil line is removed with a damp cloth

Classification of acids and alkalis test:

Weak concentrations:

Test solution	Classification	Observations
hydrochloric acid 3% (v/v)	GLA	No visible effects. Classification according stripe pencil test. The pencil line is removed with a damp cloth
citric acid 100 g/l	GLA	No visible effects. Classification according stripe pencil test. The pencil line is removed with a damp cloth
potassium hydroxide 30 g/l	GLA	No visible effects. Classification according stripe pencil test. The pencil line is removed with a damp cloth

Strong concentrations:

Test solution	Classification	Observations
hydrochloric acid 18% (v/v)	GHA	No visible effects. Classification according stripe pencil test. The pencil line is removed with a damp cloth
lactic acid 5% (v/v)	GHA	No visible effects. Classification according stripe pencil test. The pencil line is removed with a damp cloth
potassium hydroxide 100 g/l	GHA	No visible effects. Classification according stripe pencil test. The pencil line is removed with a damp cloth

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Frost resistance (UNE-EN ISO 10545-12:1997)

10 entire tiles have been submitted, previously dried and later saturation in water, to the test according to UNE-EN ISO 10545-12/97, with cycles of frost-defrost, in chamber with forced air lowering the temperature of the tiles down to -5 °C and, after 15 minutes, submerging the tiles into the water up to +5 °C, maintaining this temperature during 15 minutes.

Completed all 100 cycles, NO damages are observed by ocular inspection in the tiles submitted to the test.

Test sample (N°)	Initial absorption (%)	Final absorption (%)	Visible damages after the test
1	0,002	0,002	No damages observed
2	0,000	0,002	No damages observed
3	0,000	0,000	No damages observed
4	0,000	0,002	No damages observed
5	0,000	0,000	No damages observed
6	0,002	0,000	No damages observed
7	0,000	0,002	No damages observed
8	0,000	0,000	No damages observed
9	0,000	0,002	No damages observed
10	0,000	0,002	No damages observed
11	0,000	0,002	No damages observed
12	0,000	0,002	No damages observed
13	0,000	0,000	No damages observed
14	0,000	0,002	No damages observed
15	0,000	0,000	No damages observed
16	0,002	0,003	No damages observed
17	0,000	0,002	No damages observed
18	0,002	0,000	No damages observed
19	0,002	0,002	No damages observed
20	0,000	0,000	No damages observed

Number of tiles with damages after all 100 cycles	0
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Resistance to surface abrasion (UNE-EN ISO 10545-7:1999)

Test carried out according to PEI method, damp way abrasion.
 Abrasion stage at failure: 1500 revolutions.
 Classification:

CLASS 3

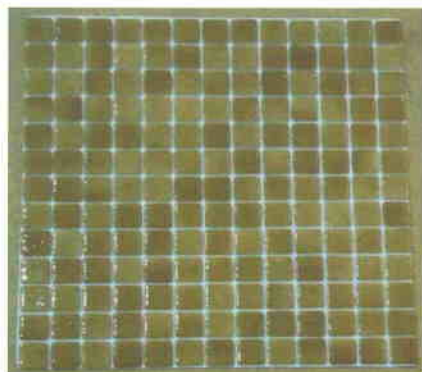
According to Annex N of this standard exists only as a guide the following classification and should not be used to give precise specifications for product specific requirements:

Class 3: Flooring in areas over which you walk with normal footwear and more frequently with small amounts of dirt (kitchens, hallways, corridors, balconies, loggias and terraces). This does not apply to footwear abnormal: for example, boots with nails.

Determination of impact resistance by measurement of coefficient of restitution. (UNE-EN ISO 10545-5:1998)

Test sample (N°)	Height of the rebound of the ball, leaving it to fall down from a height of 1 m over the seen face (cm)	Defects observed (after the impact with the ball)	Coefficient of restitution (e)
1	40,0	the impact is marked	0,632
2	39,5	the impact is marked	0,628
3	42,0	the impact is marked	0,648
4	41,0	the impact is marked	0,640
5	41,5	the impact is marked	0,644
Average			0,639

Photograph of the sample:



Quality Service Guarantee

Applus+ guarantees that this service has been carried out in conformity with our Quality and Sustainability Service complying with contract conditions and legal standards.

If you have any suggestion it is very welcome. We would thank you for any relevant comment. Please, send an email to our Quality Manager's address: satisfaccion.cliente@appluscorp.com