



PRODUCT TESTING SERVICE

100 Clemson Research Blvd. □ Anderson, SC 29625 □ Tel (864) 646-TILE □ Fax (864) 646-2821

TCNA TEST REPORT NUMBER:

TCNA-172-13

PAGE: 1 OF 1

TEST REQUESTED BY:

Vidrepur of America
Attn: Paul Medina
2301 NW 84th Ave.
Miami, FL 33122

TEST SUBJECT MATERIAL:

Identified by client as: **“Lux collection”**

TEST DATE:

4/17/2013 - 4/18/2013

TEST PROCEDURE:

ASTM C1378: “Determination of Resistance to Staining”

- One glass tile specimen cut to minimum size of 2" x 2" was tested for each test solution.
- The specimens were exposed to the test solutions for 24 hrs at 74°F.

Cleaning Procedures	
A	running hot water 5 min
B	hand cleaning w/ weak cleaner
C	mechanical cleaning w/ strong cleaner
D	24hr. Immersion in suitable solvent (3% HCl, 20%KOH, Acetone)

TEST RESULTS:

Staining Agent	Visual Test (Affected?)	Cleaning Procedure
Contrasting Grout	No	A
Carbon Lamp Black	No	A
Waterproof Ink (Black)	No	A
Washable Ink	No	A
Potassium Permanganate Solution, 1%	No	A
Methylene Blue Solution, 1%	No	A

[According to ANSI A137.1, the subject tile received a Class A classification.]

4/26/2013

Dr. Jyothi Rangineni
Research Scientist

Testing Services: testing@tileusa.com □ Literature Orders: literature@tileusa.com □ Web Site: www.tileusa.com

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TEST DATE: 4/17/2013 - 4/18/2013

TEST PROCEDURE: ASTM C650: "Resistance of Ceramic Tile to Chemical Substances"
-One (1) 2" x 2" glass specimen was tested for each test solution.
-The specimens were exposed to the test solutions for 24 hrs at 74°F.

TEST RESULTS:

Test Solution	Visual Test (Affected?)	Pencil Test (Affected?)
Common Household and Cleaning Chemicals		
Acetic acid, 3% (v/v)	No	NA
Acetic acid, 10% (v/v)	No	NA
Ammonium chloride, 100 g/L	No	NA
Citric acid solution, 30 g/L	No	NA
Citric acid solution, 100 g/L	No	NA
Lactic acid, 5% (v/v)	No	NA
Phosphoric acid, 3% (v/v)	No	NA
Phosphoric acid, 10% (v/v)	No	NA
Sulfamic acid, 30 g/L	No	NA
Sulfamic acid, 100 g/L	No	NA
Swimming Pool Chemicals		
Sodium hypochlorite solution, 20 mg/L	No	NA
Acids and Bases		
Hydrochloric acid solution, 3% (v/v)	No	NA
Hydrochloric acid solution, 18% (v/v)	No	NA
Potassium hydroxide, 30 g/L	No	NA
Potassium hydroxide, 100 g/L	No	NA

According to ANSI A137.2, the subject tile received a **Class A** classification.

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TEST DATE:

4/18/2013 – 4/19/2013

TEST PROCEDURE:

ASTM C424: “Crazing Resistance of Fired Glazed Whitewares by Autoclave Treatment”

-Ten (10) specimens were inspected prior to testing.
-The specimens were subjected to one (1) cycle of steam pressure at 150 psi for one (1) hour (according to ANSI A137.2).
-Waterproof black India ink was used to assist in visualizing defects.

TEST RESULTS:

All ten (10) specimens showed no evidence of crazing after completing one cycle of 150 psi steam pressure.

Observations

Specimen 1	No crazing
Specimen 2	No crazing
Specimen 3	No crazing
Specimen 4	No crazing
Specimen 5	No crazing
Specimen 6	No crazing
Specimen 7	No crazing
Specimen 8	No crazing
Specimen 9	No crazing
Specimen 10	No crazing

[The ANSI A137.2 Specification for Glass Tile states: “tiles shall pass one cycle of steam pressure at 150 psi and shall show no evidence of crazing.”]

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4/18/2013 – 4/19/2013

TEST PROCEDURE:

ASTM C373: “Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products”

- Five (5) specimens were tested.
- The specimens were subjected to a five-hour boil and 24 hour soak to room temperature.

TEST RESULTS:

The average water absorption of five (5) specimens was: **0.41%**. This value classifies the subject material as ***Impervious*** (with a water absorption of less than 0.5 percent).

The individual results of water absorption were as follows:

- Specimen 1: 0.33%
- Specimen 2: 0.52 %
- Specimen 3: 0.43 %
- Specimen 4: 0.47 %
- Specimen 5: 0.32 %

[The ANSI A137.2 specification states that Glass Tile shall be impervious.]

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TEST SUBJECT MATERIAL:

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TEST DATE:

4/22/2013

TEST PROCEDURE:

MOHs Scratch Hardness

-Three whole tiles were tested.

-The tiles were tested using a Deluxe Hardness Pick Set from Mineralab, LLC. The following minerals are used as standard:

- 1 – Talc
- 2 – Gypsum
- 3 – Calcite
- 4 – Fluorite
- 5 – Apatite
- 6 – Feldspar
- 7 – Quartz
- 8 – Topaz
- 9 – Corundum
- 10 – Diamond

TEST RESULTS:

The Mohs Scratch Hardness was determined to be:
7 - Quartz.

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TEST SUBJECT MATERIAL: Identified by client as: **“Lux Collection”**

TEST DATE: 4/22/2013

TEST PROCEDURE: ASTM C1028: “Standard Test Method for Determining the Static Coefficient of Friction of Ceramic Tile and Other Like Surfaces by the Horizontal Dynamometer Pull-Meter Method”

-A Chatillon DFIS 100 digital force gauge was used to measure each pull in pounds-force.

-A 3 x 3 x 1/8-inch piece of Neolite was used as the sensor.

TEST RESULTS: The average static coefficient of friction of four (4) pulls on each tile was as follows:

	<u>As Received</u>	<u>After Cleaning</u>
<u>Tile 1</u>		
Dry	0.78	0.78
Wet	0.53	0.52
<u>Tile 2</u>		
Dry	0.76	0.77
Wet	0.52	0.52
<u>Tile 3</u>		
Dry	0.76	0.77
Wet	0.52	0.52

The average static coefficient of friction of twelve (12) pulls was as follows:

	<u>As Received</u>	<u>After Cleaning</u>
Dry	0.77	0.77
Wet	0.52	0.52

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TEST PROCEDURE:

ASTM C648: “Standard Test Method for Breaking Strength of Ceramic Tile”

- Ten (10) whole unglazed tiles were tested.
- The tiles were loaded at a rate of 1000 pounds per minute.
- A ball bearing triangular support was used to hold the tiles during loading.
- Testing was performed on an Instron Universal Tester, model #3385-H

TEST RESULTS:

The average breaking strength of ten (10) tiles was: **218 lbf.**

The individual results of breaking strength are as follows:

Specimen 1: 217 **lbf**
Specimen 2: 203 **lbf**
Specimen 3: 169 **lbf**
Specimen 4: 225 **lbf**
Specimen 5: 253 **lbf**
Specimen 6: 195 **lbf**
Specimen 7: 249 **lbf**
Specimen 8: 245 **lbf**
Specimen 9: 190 **lbf**
Specimen 10: 231 **lbf**

[The ANSI A137.2 Specification for Glass Tile states that the average breaking strength shall be 250 lbf or greater for fused or low temperature mosaic glass tile or 350 lbf or greater for cast mosaic glass tile.]

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TEST PROCEDURE: ANSI A137.2 Section 7.9: “Test Method for Determining Thermal Shock Resistance of Glass Tile”

-When tested per ASTM 373 the water absorption of the tile was found to be Impervious

-Five whole tiles were subjected to ten cycles of thermal shock per section 8.2 (immersion test) of ASTM C484 except the high end temperature was set to 160±9°F per ANSI A137.2 section 7.9.

-The test specimens were inspected for failure using a solution of methylene blue prior to cycle one and immediately following cycle ten.

TEST RESULTS: All five (5) specimens showed no evidence of visual defects after completing ten cycles of thermal shock.

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TEST PROCEDURE: ANSI A137.2 Section 7.6: “Test Method for Mounting Variations”

- Two sheets were evaluated according to section 7.6 of ANSI A137.2.
- The sheets of mosaic glass tile had 312 grout joints each.
- For standard fused mosaic glass tile the allowable deviation from nominal joint size stated in ANSI A137.2 is “as reported”. The nominal joint size for this material is 1/16”.

TEST RESULTS:

	# of Grout Joints Outside of Compliance
Sheet 1	All grout joints were within ± 0.50 mm from nominal
Sheet 2	All grout joints were within ± 0.50 mm from nominal

Note: There are no specific requirements in ANSI A137.2 for mounting variation of standard mosaic tiles. For more details regarding the allowable deviation from nominal joint size see Tables 5, 6, and 7 of ANSI A137.2.

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