



PRODUCT TESTING SERVICE

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

TCA TEST REPORT NUMBER: TCA-242-05

PAGE: 1 OF 1

TEST REQUESTED BY:

Ceramica Atlas, Ltd.
Attn: Victor Ribeiro
1901 NW 42 St.
Oakland Park, FL 33309

TEST SUBJECT MATERIAL:

Identified by client as: Onix Mosaic

TEST DATE:

10/7/05

TEST PROCEDURE:

ASTM C1027: "Standard Test Method for Determining Visible Abrasion Resistance of Glazed Ceramic Tile"
-4 x 4 inch specimens were cut from individual tiles.
-A Gabbrielli Abrasimeter W1 was used to abrade the tile.
-10% Hydrochloric acid was used to remove any metal oxide staining.

TEST RESULTS:

There was an apparent visual difference in gloss or color after **2100** revolutions when viewed in the viewing box by more than one technician. Thus, in accordance with the test procedure, the subject tile is given a **Class 4** rating.

Noah Chitty
Laboratory Manager

10/8/05
Date



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TCA TEST REPORT NUMBER: TCA-167-05

PAGE: 1 OF 1

TEST REQUESTED BY: Ceramica Atlas, Ltd.
Attn: Victor Ribeiro
1901 NW 42 St.
Oakland Park, FL 33309

TEST SUBJECT MATERIAL: Identified by client as: Onix Mosaic Tile


TEST DATE: 7/13/05-7/20/03

TEST PROCEDURE: ASTM C482: "Standard Test Method for Bond Strength of Ceramic Tile to Portland Cement"
-Five specimens were tested.
-The specimens were cured for seven days before testing.

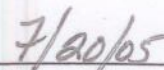
TEST RESULTS: The average bond strength of five (5) specimens was: **403** psi. All five (5) specimens exhibited *adhesive failure* between the tile and the Portland cement bond coat.

The individual results of bond strength were as follows:
Specimen 1: 440 psi
Specimen 2: 304 psi
Specimen 3: 431 psi
Specimen 4: 519 psi
Specimen 5: 325 psi

[The ANSI A137.1 Specification for Glazed Ceramic Mosaic Tile states: "the average bond strength of tile in the sample shall be **50 psi** or greater."]



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Attn: Victor Ribeiro
1901 NW 42 St.
Oakland Park, FL 33309

TEST SUBJECT MATERIAL: Identified by client as: Onix Mosaic Tile

TEST DATE: 6/23/05-6/24/05

TEST PROCEDURE: ASTM C373: "Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products"
-Five 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: **4.36%**. This value classifies the subject material as *semi-vitreous* (with a water absorption of more than 3.0 percent but less than 7.0 percent).

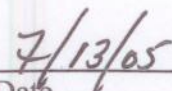
The individual results of water absorption were as follows:

Specimen 1: 4.00 %
Specimen 2: 4.03 %
Specimen 3: 4.78 %
Specimen 4: 3.95 %
Specimen 5: 5.02 %

[The ANSI A137.1 Specification for Glazed Ceramic Mosaic Tile states: "the tile in the sample shall be impervious for porcelain and shall be impervious or vitreous for natural clay ceramic mosaic tile."]



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Attn: Victor Ribeiro
1901 NW 42 St.
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TEST SUBJECT MATERIAL: Identified by client as: Onix Mosaic Tile

TEST DATE: 6/27/05

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.
-Internal calibration used in lieu of dry calibration factor.

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>
Tile 1: <u>Dry:</u>	<u>0.93</u>	<u>1.01</u>
<u>Wet:</u>	<u>0.64</u>	<u>0.66</u>
Tile 2: <u>Dry:</u>	<u>0.98</u>	<u>1.01</u>
<u>Wet:</u>	<u>0.73</u>	<u>0.71</u>
Tile 3: <u>Dry:</u>	<u>1.00</u>	<u>1.03</u>
<u>Wet:</u>	<u>0.68</u>	<u>0.73</u>

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

<u>Dry:</u>	<u>0.97</u>	<u>1.02</u>
<u>Wet:</u>	<u>0.69</u>	<u>0.70</u>



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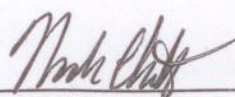
TEST REQUESTED BY: Ceramica Atlas, Ltd.
Attn: Victor Ribeiro
1901 NW 42 St.
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TEST SUBJECT MATERIAL: Identified by client as: Onix Mosaic Tile

TEST DATE: 6/27/05

TEST PROCEDURE: Mohs' Scratch Hardness
-Three whole tiles were tested.

TEST RESULTS: The Mohs' Scratch Hardness was determined to be: 9. (The Mohs' Scratch Hardness Scale runs from 1-talc to 10-diamond.)



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TEST SUBJECT MATERIAL: Identified by client as: Onix Mosaic Tile

TEST DATE: 6/27/05-6/28/05

TEST PROCEDURE: ASTM C1378: "Determination of Resistance to Staining"
-One specimen was tested for each test solution.
-The specimens were exposed to the test solutions for 24 hrs. at 74°F.
-**Cleaning procedure A: running hot water 5 min.**
-**Cleaning procedure B: hand cleaning w/ weak cleaner**
-**Cleaning procedure C: mechanical cleaning w/ strong cleaner**
-**Cleaning procedure D: 24hr. Immersion in suitable solvent (3% HCl, 20%KOH, Acetone)**

TEST RESULTS:

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



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TEST SUBJECT MATERIAL:

Identified by client as: Onix Mosaic Tile

TEST DATE:

6/24/05

TEST PROCEDURE:

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

- Ten whole tiles were tested.
- The tiles were loaded at a rate of 1000 pounds per minute.
- A ball bearing support system was used to hold the tiles during loading.


TEST RESULTS:

The average breaking strength of ten (10) tiles was: **383 lbf**.

The individual results of breaking strength are as follows:

- Specimen 1: **409 lbf**
- Specimen 2: **407 lbf**
- Specimen 3: **416 lbf**
- Specimen 4: **345 lbf**
- Specimen 5: **412 lbf**
- Specimen 6: **374 lbf**
- Specimen 7: **390 lbf**
- Specimen 8: **350 lbf**
- Specimen 9: **410 lbf**
- Specimen 10: **312 lbf**

[The ANSI A137.1 Specification for Glazed Ceramic Mosaic Tile states: "the average breaking strength shall be **250** pounds or greater."]



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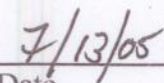
TEST PROCEDURE: ASTM C650: "Resistance of Ceramic Tile to Chemical Substances"
-One specimen was tested for each test solution.
-The specimens were exposed to the test solutions for 24 hrs. at 74°F.

TEST RESULTS:

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



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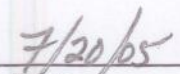
TEST DATE: 6/27/05-7/19/05

TEST PROCEDURE: ASTM C1026: "Standard Test Method for Measuring the Resistance of Ceramic Tile to Freeze-Thaw Cycling"
-Ten specimens were tested.
-The specimens were subjected to fifteen cycles of freeze-thaw consisting of freezing the tiles at 0°F for eight hours then thawing the tiles in water at 74°F.

TEST RESULTS: All ten (10) specimens showed **no** visible evidence of freeze-thaw damage after completing fifteen (15) cycles of freeze-thaw.



Noah Chitty
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