



PRODUCT PERFORMANCE TESTING LABORATORY

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November 8, 2017

Interstyle Ceramic & Glass
Attn: Mike Hauner
3625 Brighton Avenue
Burnaby, BC V5A 3H5
Canada

Dear Mike Hauner,

Tile Council of North America has tested the samples you submitted. Test report TCNA-0971-17 is enclosed. If you have any questions or concerns, please contact us.

Best Regards,

TILE COUNCIL OF NORTH AMERICA, INC.

Nicole Spandley
Laboratory Engineer
Enclosures

TCNA TEST REPORT NUMBER: TCNA-0971-17 **PAGE:** 1 OF 4

TEST REQUESTED BY: Interstyle Ceramic & Glass

TEST METHOD: ASTM C373-17: “Standard Test Methods for Determination of Water Absorption and Associated Properties by Vacuum Method for Pressed Ceramic Tiles and Glass Tiles and Boil Method for Extruded Ceramic tiles and Non-tile Fired Ceramic Whiteware Products”

Informal Test Method Description: This test method covers procedures for determining water absorption, bulk density, apparent porosity, and apparent specific gravity of non-tile fired unglazed whiteware products, glazed or unglazed ceramic tiles, and glass tiles. The water absorption, reported here, is expressed as a percent, the relationship of the mass of water absorbed to the mass of the dry specimen.

This summary is provided for the reader’s convenience and is not a complete description of the method. See ASTM C373 for all method details and information.

TEST SUBJECT MATERIAL: Identified by client as: “**Glazed Earthenglass X-10300.1**”
Approximate Size as Received: 2"x4"

TEST DATE: 10/30/2017

TEST PROCEDURE NOTES:

- Sample prep: Five (5) tiles were cut according to section 4.2 of ASTM C373-16.
- Samples were dried to a constant mass at a temperature of 150°C and cooled to room temperature in a desiccating unit.
- Samples were subjected to vacuum of 91 ± 5 kPa for 30 minutes. While maintaining the vacuum, water was added to the tank to fully submerge the specimens. The vacuum was then released and the pressure vessel was allowed to return to atmospheric pressure. Once at atmospheric pressure the test specimens were allowed to soak for 15 minutes.
- Saturated mass of the samples was measured after the 15 minute soak period.
- Water absorption is calculated by using the following formula: $(M - D)/D \times 100$ Where; D is the constant dry mass; M is the saturated mass

TEST RESULTS:

	Water Absorption (%)
Sample 1	2.8 %
Sample 2	4.9 %
Sample 3	1.8 %
Sample 4	5.7 %
Sample 5	5.8 %
Average	4.2 %

COMMENTS: None





TCNA TEST REPORT NUMBER: TCNA-0971-17 **PAGE:** 2 OF 4

TEST REQUESTED BY: Interstyle Ceramic & Glass

TEST SUBJECT MATERIAL: Identified by client as: “**Glazed Earthenglass X-10300.1**”

TEST METHOD: ASTM C373-17: “Standard Test Method for Water Absorption, Bulk Density, Apparent Porosity, and Apparent Specific Gravity of Fired Whiteware Products”

TILE CLASSIFICATION*:

Class	Requirement
Impervious	Water absorption less than or equal to 0.5%
Vitreous	Water absorption more than 0.5 % and less than or equal to 3.0%
Semi-vitreous	Water absorption more than 3.0 % and less than or equal to 7.0%
Non-vitreous	Water absorption more than 7.0 % and less than or equal to 20.0%

ANSI SPECIFICATIONS*:

ANSI standard	Tile Type	Specification
ANSI A 137.1 (Ceramic Tile)	Mosaic Tile	Shall be impervious (porcelain), vitreous, semi-vitreous, or non-vitreous depending on the class.
ANSI A 137.1 (Ceramic Tile)	Quarry Tile	Shall be classified as impervious (porcelain), vitreous, or semi-vitreous with the water absorption not exceeding 5.0 percent
ANSI A 137.1 (Ceramic Tile)	Pressed Floor Tile	Shall be classified as vitreous, semi-vitreous, or non-vitreous
ANSI A 137.1 (Ceramic Tile)	Porcelain Tile	Shall be impervious
ANSI A 137.1 (Ceramic Tile)	Glazed Wall Tile	Shall be classified as non-vitreous
ANSI A 137.2 (Glass Tile)	All Glass Tile	Shall be impervious
ANSI A137.3 (Gauged Tile)	All Gauged Tile and Panels/Slabs	Shall be impervious

**For more detailed information, refer to ANSI A137.1 Specifications for Ceramic Tile, ANSI A137.2 Specifications for Glass Tile, and ANSI A137.3 Specifications for Gauged Porcelain Tiles and Gauged Porcelain Tile Panels/Slabs*



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IMAGE OF PRODUCT TESTED:



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11/8/2017

Nicole Spandley
Laboratory Engineer



TCNA TEST REPORT NUMBER: TCNA-0971-17 **PAGE:** 1 OF 3

TEST REQUESTED BY: Interstyle Ceramic & Glass

TEST METHOD: ASTM C484 – 99 (2014): “Thermal Shock Resistance of Glazed Ceramic Tile”

Informal Test Method Description: This test method covers the determination of the resistance to thermal shock of glazed ceramic tiles under normal conditions of use. This test method consists of determining the thermal shock resistance of ceramic tile by cycling a sample ten times between the temperatures of $15 \pm 5^{\circ}\text{C}$ ($59 \pm 9^{\circ}\text{F}$) and $145 \pm 5^{\circ}\text{C}$ ($293 \pm 9^{\circ}\text{F}$). This test method includes two procedures, with and without immersion, for tile with a water absorption less than or equal to 10% and tiles with a water absorption greater than 10%, respectively. After completing ten cycles, the tiles are inspected for any damage as a result of the cycling.

This summary is provided for the reader’s convenience and is not a complete description of the method. See ASTM C484 for all method details and information.

TEST SUBJECT MATERIAL: Identified by client as: “**Glazed Earthenglass X-10300.1**”
Approximate Size as Received: 2”x4”

TEST DATE: 10/31/2017

TEST PROCEDURE NOTES:

- Sample prep: None
- The method states to report the water absorption of the material according to ASTM C373. The water absorption was 4.2%
- Five tiles were subjected to ten cycles of thermal shock per section 8.2 (immersion test).
- The test specimens were inspected for failure using a solution of methylene blue prior to testing and immediately following cycle ten.

TEST RESULTS:

	Visible Defects? (Yes/No)	Observations
Specimen 1	No	No visible defects
Specimen 2	No	No visible defects
Specimen 3	No	No visible defects
Specimen 4	No	No visible defects
Specimen 5	No	No visible defects

COMMENTS: None



TCNA TEST REPORT NUMBER: TCNA-0971-17 **PAGE:** 2 OF 3

TEST REQUESTED BY: Interstyle Ceramic & Glass

TEST SUBJECT MATERIAL: Identified by client as: **“Glazed Earthenglass X-10300.1”**

TEST METHOD: ASTM C484 – 99 (2014): “Thermal Shock Resistance of Glazed Ceramic Tile”

ANSI SPECIFICATIONS*:

ANSI standard	Tile Type	Specification
ANSI A 137.1 (Ceramic Tile)	Mosaic Tile (glazed tile only)	The glaze shall show no failure and the body shall show no evidence of disintegration.
ANSI A 137.1 (Ceramic Tile)	Quarry Tile (glazed tile only)	The glaze shall show no failure and the body shall show no evidence of disintegration.
ANSI A 137.1 (Ceramic Tile)	Pressed Floor Tile (glazed tile only)	The glaze shall show no failure and the body shall show no evidence of disintegration.
ANSI A 137.1 (Ceramic Tile)	Porcelain Tile (glazed tile only)	The glaze shall show no failure and the body shall show no evidence of disintegration.
ANSI A 137.1 (Ceramic Tile)	Glazed Wall Tile (glazed tile only)	The glaze shall show no failure and the body shall show no evidence of disintegration.

**For more detailed information, refer to ANSI A137.1 Specifications for Ceramic Tile*

IMAGE OF PRODUCT TESTED:





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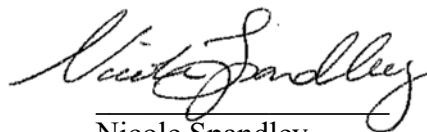
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 11/8/2017

Nicole Spandley
Laboratory Engineer



TCNA TEST REPORT NUMBER: TCNA-0971-17 **PAGE:** 1 OF 3

TEST REQUESTED BY: Interstyle Ceramic & Glass

TEST METHOD: ASTM C424-93 (2012): "Crazing Resistance of Fired Glazed Whitewares by Autoclave Treatment"

Informal Test Method Description: This test method covers the determination of the crazing resistance of fired glazed whitewares using the autoclave treatment and under the conditions specified in the test method. Crazing is visually observed with the aid of dye or ink after the autoclave treatment.

This summary is provided for the reader's convenience and is not a complete description of the method. See ASTM C424 for all method details and information.

TEST SUBJECT MATERIAL: Identified by client as: "Glazed Earthenglass X-10300.1"
Approximate Size as Received: 2"x4"

TEST DATE: 10/30/2017

TEST PROCEDURE NOTES:

- Sample prep: None
- Ten (10) glazed samples were tested
- Methylene blue ink was applied to the samples prior to the autoclave treatment to detect pre-existing defects.
- ASTM C424 test method requires the samples to be examined after autoclave treatment starting at 50 psi and increasing by increments of 50 psi until crazing is observed or 250 psi. The samples were placed in an autoclave and subjected to a steam pressure of 150 psi for 1 hr to evaluate compliance with ANSI A137.1.
- Samples were removed from the autoclave and cooled down to room temperature before examination of failures.
- Methylene blue ink was applied to the samples and visual examination for crazing failure was conducted. Only those defects observed by the naked eye were considered

TEST RESULTS:

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

COMMENTS: None



TCNA TEST REPORT NUMBER: TCNA-0971-17 **PAGE:** 2 OF 3

TEST REQUESTED BY: Interstyle Ceramic & Glass

TEST SUBJECT MATERIAL: Identified by client as: “**Glazed Earthenglass X-10300.1**”

TEST METHOD: ASTM C424-93 (2012): “Crazing Resistance of Fired Glazed Whitewares by Autoclave Treatment”

ANSI SPECIFICATIONS*:

ANSI standard	Tile Type	Specification
ANSI A 137.1 (Ceramic Tile)	Pressed Floor Tile	Tiles shall pass one cycle of steam pressure at 150 psi and shall show no evidence of crazing
ANSI A 137.1 (Ceramic Tile)	Porcelain Tile	Tiles shall pass one cycle of steam pressure at 150 psi and shall show no evidence of crazing
ANSI A 137.1 (Ceramic Tile)	Glazed Wall Tile	Tiles shall pass one cycle of steam pressure at 150 psi and shall show no evidence of crazing
ANSI A 137.2 (Glass Tile)	All Glass Tile	Tiles shall pass one cycle of steam pressure at 150 psi and shall show no evidence of crazing

**For more detailed information, refer to ANSI A137.1 Specifications for Ceramic Tile and ANSI A137.2 Specifications for Glass Tile*

IMAGE OF PRODUCT TESTED:





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