



PRODUCT PERFORMANCE TESTING LABORATORY

100 Clemson Research Blvd., Anderson, SC 29625

Phone 864.646.8453 **Fax** 864.646.2821

Email testing@tcnatile.com **Web** www.TCNAtile.com

September 4, 2019

MS International, Inc.
Attn: Morgan Huang
2095 N Batavia Street
Orange, CA 92865
USA

Dear Morgan Huang,

Tile Council of North America has tested the samples you submitted. Test report TCNA-0743-19 is enclosed. If you have any questions or concerns, please contact us.

Best Regards,

TILE COUNCIL OF NORTH AMERICA, INC.

Damon McDowell
Laboratory Team Leader
Enclosures

TCNA TEST REPORT NUMBER: TCNA-0743-19 PAGE: 1 OF 4

TEST REQUESTED BY: MS International, Inc.

TEST METHOD: ASTM C373-18: "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: "ARIA Collection"
Approximate Size as Received: 12"x24"

TEST DATE: 8/29/2019

TEST PROCEDURE NOTES:

- Sample prep: Five (5) tiles were cut according to section 5.2 of ASTM C373-18.
- 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	0.2 %
Sample 2	0.2 %
Sample 3	0.4 %
Sample 4	0.2 %
Sample 5	0.2 %
Average	<u>0.2</u> %

COMMENTS: None

TCNA TEST REPORT NUMBER: TCNA-0743-19 **PAGE: 2 OF 4**

TEST REQUESTED BY: MS International, Inc.

TEST SUBJECT MATERIAL: Identified by client as: “ARIA Collection”

TEST METHOD: ASTM C373-18: “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*

TCNA TEST REPORT NUMBER:

TCNA-0743-19

PAGE: 3 OF 4

IMAGE OF PRODUCT TESTED:



DISCLAIMER AND LIMITATION OF LIABILITY

This report is provided for the sole use of the client and no one else. It is intended for professional use by a knowledgeable professional. If published by the client, it must be published in full, including this disclaimer and limitation of liability.

This report is not an endorsement, recommendation, approval, certification, or criticism by TCNA of any particular product or its application. TCNA recommends that anyone considering the use or installation of a particular product consult with the manufacturer or an industry professional for advice specific to the person's needs and consider any applicable laws, statutes, codes, or regulations relevant to the particular product. TCNA does not know all the different manners and applications in which a client's particular product might be used, and, therefore, it disclaims any and all duty to provide warnings or to further investigate the suitability of the use of a particular product in a particular situation.

Unless otherwise expressly stated, TCNA tested the specific test subject material provided by the client and identified in the lab report, as indicated by the client. TCNA does not independently verify the information provided by the client, and it makes no representation that similar results would be achieved with other, untested materials, even if such other materials purportedly have the same product name, are purportedly of the same or similar type of tile or product made by the client, or are purportedly from the same batch of tile or product. Nor does TCNA state that the date in this report is representative of production occurring at the same time or at any other time. Only the manufacturer may make that claim, based on sampling and quality control parameters beyond the knowledge and control of TCNA. TCNA does not provide any supervision, review, management, or quality control of any manufacturer's production.

TCNA makes no representation that the client's products are uniform or identical to the test subject material, that the test subject material is suitable for any particular use, application, or installation, or that it will exhibit the same properties when installed or used in a particular manner. The data provided





TCNA TEST REPORT NUMBER:

TCNA-0743-19

PAGE: 4 OF 4

in this report results from standardized laboratory testing performed under laboratory conditions. As such it does not represent all conditions under which the products may be used or subjected. For testing on actual materials being used or considered for a job site, contact TCNA for sampling provisions and possible testing.

This report is intended solely to provide the results of the test procedure stated above as performed on the test subject material provided by the client, and may not be relied on for any other purpose. TCNA MAKES NO OTHER REPRESENTATIONS OR WARRANTIES OF ANY KIND, WHETHER EXPRESS OR IMPLIED. ALL IMPLIED WARRANTIES, INCLUDING, WITHOUT LIMITATION, IMPLIED WARRANTIES OF MERCHANTABILITY, OR FITNESS FOR A PARTICULAR PURPOSE, ARE HEREBY EXPRESSLY DISCLAIMED. IN THE EVENT OF A DISPUTE CONCERNING THIS REPORT, THE EXCLUSIVE REMEDY FOR CLIENT SHALL BE FOR TCNA TO REPEAT THE TEST REQUESTED, BUT IN NO EVENT SHALL TCNA BE LIABLE FOR AN AMOUNT GREATER THAN THE AMOUNT IT RECEIVED FROM CLIENT FOR THE TEST. UNDER NO CIRCUMSTANCES WILL TCNA BE LIABLE TO CLIENT FOR ANY OTHER DAMAGES (NOR SHALL IT BE LIABLE TO ANY OTHER PERSON OR BUSINESS ENTITY FOR ANY DAMAGES), INCLUDING WITHOUT LIMITATION ANY AND ALL DIRECT, INDIRECT, SPECIAL, INCIDENTAL, CONSEQUENTIAL, OR EXEMPLARY DAMAGES, RESULTING, IN WHOLE OR IN PART, FROM ANY USE OF, REFERENCE TO, OR RELIANCE UPON THE REPORT, EVEN IF ADVISED OF THE POSSIBILITY OF SUCH DAMAGES. TCNA DISCLAIMS ALL LIABILITY TO ANY THIRD PARTY CONCERNING THIS REPORT. THE FOREGOING LIMITATION OF LIABILITY IS A FUNDAMENTAL ELEMENT OF TCNA'S AGREEMENT TO CONDUCT AND PROVIDE THE REPORT.

9/4/2019

Damon McDowell
Laboratory Team Leader

