



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

April 12, 2017

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

Dear Mr. Huang,

Tile Council of North America has tested the samples you submitted. Test report TCNA-0290-17 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-0290-17 **PAGE:** 1 OF 4

TEST REQUESTED BY: MS International, Inc.

TEST METHOD: ANSI A137.1-2012 Section 9.6.1: “Wet Dynamic Coefficient of Friction (DCOF)”

Informal Test Method Description: This test method covers the measurement of dynamic coefficient of friction of ceramic tile or other surfaces under the wet condition using the BOT 3000 device.

This summary is provided for the reader’s convenience and is not a complete description of the method. See ANSI A137.1 Section 9.6.1 for all method details and information.

TEST SUBJECT MATERIAL: Identified by client as: **“Water Color 12x24”**
 Approximate Size as Received: 12"x24"
 Product Color: Not Provided

TEST DATE: 4/6/2017

TEST PROCEDURE NOTES:

- Sample Prep: Samples cut to 12"x12" for testing.
- The tiles were cleaned with Renovator #120 prior to testing.
- Three (3) pieces of tile were tested in all four directions with 10" long measurements.
- The SBR sensor was verified using a standard tile prior to testing. The DCOF measurement on the standard tile was 0.28, within the required range.
- Testing was performed under wet conditions using 0.05% SLS water
- Testing was conducted under laboratory conditions at approximately 70°F and 50% relative humidity using a calibrated BOT 3000E device (calibration due: 10/3/2017).
- After testing the SBR sensor was verified again according to the procedure. The DCOF measurement on the standard tile after testing was 0.30, within the required range.

TEST RESULTS:

The individual and average DCOF data for each tile were as follows:

| Direction | Tile 1 | Tile 2 | Tile 3 |
|----------------|--------|--------|--------|
| Direction 1 | 0.52 | 0.51 | 0.54 |
| Direction 2 | 0.53 | 0.50 | 0.54 |
| Direction 3 | 0.51 | 0.50 | 0.51 |
| Direction 4 | 0.54 | 0.52 | 0.53 |
| Average | 0.53 | 0.51 | 0.53 |

COMMENTS: None



TCNA TEST REPORT NUMBER: TCNA-0290-17 **PAGE:** 2 OF 4

TEST REQUESTED BY: MS International, Inc.

TEST SUBJECT MATERIAL: Identified by client as: “Water Color 12x24”

TEST METHOD: ANSI A137.1-2012 Section 9.6.1: “Wet Dynamic Coefficient of Friction (DCOF)”

IMAGE OF PRODUCT TESTED:





TCNA TEST REPORT NUMBER: TCNA-0290-17 **PAGE:** 3 OF 4

TEST REQUESTED BY: MS International, Inc.

TEST SUBJECT MATERIAL: Identified by client as: “Water Color 12x24”

TEST METHOD: ANSI A137.1-2012 Section 9.6.1: “Wet Dynamic Coefficient of Friction (DCOF)”

ANSI SPECIFICATIONS:

According to the ANSI A137.1 standard for ceramic tile, "Unless otherwise specified, tiles suitable for level interior spaces expected to be walked upon when wet shall have a wet DCOF of 0.42 or greater when tested using SLS solution as per the procedure in section 9.6.1. However, tiles with a DCOF of 0.42 or greater are not necessarily suitable for all projects. The specifier shall determine tiles appropriate for specific project conditions, considering by way of example, but not in limitation, type of use, traffic, expected contaminants, expected maintenance, expected wear, and manufacturers' guidelines and recommendations."

This paragraph is excerpted from Section 6.2.2.1.10 of the standard. For the complete section, including necessary information for specifiers, this section can be viewed and downloaded at no cost at http://www.tcnatile.com/images/pdfs/COF_excerpt_from_ANSI_A137.1-2012_release_date_November_2012.pdf

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





TCNA TEST REPORT NUMBER:

TCNA-0290-17

PAGE: 4 OF 4

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 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.

4/12/2017

Nicole Spandley
Laboratory Engineer

