June 17, 2021
Revised June 18, 2021

Ms. Gemma Mantilla
Plant Engineer
International Marble, LLC
304 Bell Park Drive
Woodstock, GA 30188

Subject: **Emissions Compliance Report per California Department of Public Health Standard Method Version 1.2 - Revised**
Mastercast™ Contemporary Tub & Shower Surround
MAS Project No.: 2100397

Dear Ms. Mantilla:

Materials Analytical Services, LLC is pleased to submit this report with results of VOC emissions testing from an application of a Mastercast™ Contemporary Tub & Shower Surround. This report was revised to correct the modeling scenario to residential settings from classroom and office settings in the conclusions section.

MAS conducted this test in accordance with the California Department of Public Health (CDPH) *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2*. This testing protocol was implemented to bracket similarly formulated, lower emitting products under a single test.

Based on the test results, the Mastercast™ Contemporary Tub & Shower Surround is compliant with the performance standards established for low-emitting materials under the CDPH and LEED v4.1 programs. Qualified project uses of this product may be eligible for credit points under the LEED program.

MAS is pleased to have been of service to you. If you have any questions or comments, or if we can be of further assistance, please contact us.

Sincerely,

Materials Analytical Services, LLC

Robert D. Schmitter
Digitally signed by Robert D. Schmitter
DN: cn=Robert D. Schmitter, c=US, o=Materials Analytical Services, LLC, email=bschmitter@mastest.com
Date: 2021.06.18 09:46:40 -04'00'

Manager, Emissions Group

Christina Le
Digitally signed by Christina Le
DN: cn=Christina Le, c=US, o=MAS, email=cle@mastest.com
Date: 2021.06.18 09:58:16 -04'00'

Analytical Chemist

Appendices: Appendix A – General Testing Parameters and Data
Appendix B – Chain-of-Custody
Appendix C – Compliant and Bracketed Products

Materials Analytical Services, LLC - ATLANTA
Corporate Headquarters
3945 Lakefield Court · Suwanee, GA 30024
(770) 866-3200 · Fax (770) 866-3259

ACCREDITED
Testing Cert. #2925.01

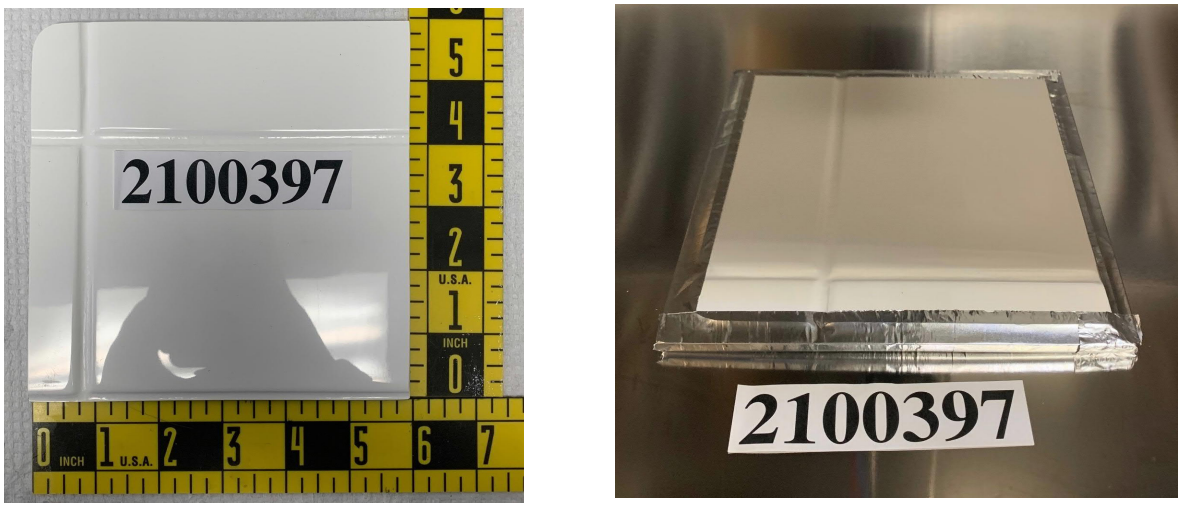
EMISSIONS COMPLIANCE TEST

California Department of Public Health Standard Method Version 1.2
Cultured Tile Evaluation

SAMPLE DESCRIPTION & TESTING PARAMETERS

Sample specifics as described in the chain-of-custody (see Appendix B) and a timeline of milestones dates relative to sampling and analysis are summarized below.

Product Name: Mastercast™ Contemporary Tub & Shower Surround	**MAS Assigned ID:** 2100397
Manufacturer: International Marble, LLC Woodstock, GA	**Product Description:** cultured marble tile Approx. 6" x 6"
Manufacture Date: May 17, 2021	**Testing Period:** May 28 – June 11, 2021
Collection Date: May 17, 2021	**In-Chamber Sampling Dates:** June 8 @ 24 hrs.; June 9 @ 48 hrs.; June 11 @ 96 hrs.
Shipping Date: May 17, 2021	**Date of Sample Analysis:** June 14 – 15, 2021
Laboratory Arrival Date: May 18, 2021	**Age of Sample at Testing:** 11 days



Mastercast™ Contemporary Tub & Shower Surround as received (left) and tested (right)

The sample was taped to a stainless steel plate using aluminum tape with an approximate one-quarter inch overlap of tape onto the sample. The sample was placed inside one of MAS's small-scale emissions chambers.

Sample conditioning, collection of samples, and analysis of compounds of interest were conducted in accordance with the California Department of Public Health (CDPH) *Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers Version 1.2*, for comparison to the Leadership in Energy and Environmental Design (LEED) standard, and the Collaborative for High Performance Schools (CHPS) criteria for low emitting materials. Appendix A presents general testing parameters and data.

TEST RESULTS

To compare the chamber-derived data to the standards established under the CDPH Standard Method an emission factor for the tested sample is calculated based on the 96-hour test point data following ten days of in-chamber conditioning. This emission factor is used to predict airborne concentrations of target compounds in a CDPH-defined single-family residence panel system shower enclosure with dimensions of 60" long, 48"deep and 96" high (worst case) with a total surface area of 19 square meters (two showers), as allowed in Section 4.3.6 of the standard. Table I presents the results of the modeled data.

Table I
Comparison of Emission Factors and Predicted 96-Hour Airborne Concentrations from the Mastercast™ Contemporary Tub & Shower Surround to CDPH Concentration Limits in a Residential Setting

VOC Name	Calculated Emission Factor ($\mu g/m^2hr$)	Predicted Airborne Concentration ($\mu g/m^3$)*	Maximum Concentration Limits ($\mu g/m^3$)	Testing Comment
		Residential		
Total VOCs (TVOC)	50	1.9	NA†	NA
Formaldehyde[1,2]	<3.2	<0.10	9	Compliant
Acetaldehyde[1,2]	<4.3	<0.17	70	Compliant
Isopropanol	<2.9	<0.11	3500	Compliant
1,1-dichloroethylene	<2.9	<0.11	35	Compliant
Methylene chloride[2]	<2.9	<0.11	200	Compliant
Carbon disulfide[1,2]	<2.9	<0.11	400	Compliant
MTBE[2]	<2.9	<0.11	4000	Compliant
Vinyl acetate[2]	<2.9	<0.11	100	Compliant
Hexane[2]	<2.9	<0.11	3500	Compliant
Chloroform[1,2]	<2.9	<0.11	150	Compliant
2-methoxyethanol[1]	<2.9	<0.11	30	Compliant
1,1,1-trichloroethane[2]	<2.9	<0.11	500	Compliant
Benzene[1,2]	<2.9	<0.11	1.5	Compliant
1-methoxy-2-propanol	<2.9	<0.11	3500	Compliant
Carbon tetrachloride[1,2]	<2.9	<0.11	20	Compliant
Ethylene glycol[2]	<2.9	<0.11	200	Compliant
1,4-dioxane[1,2]	<2.9	<0.11	1500	Compliant
Trichloroethylene[1,2]	<2.9	<0.11	300	Compliant
Epichlorohydrin[1,2]	<1.5	<0.006	1.5	Compliant
2-ethoxyethanol[1]	<2.9	<0.11	35	Compliant
n,n-dimethylformamide[2]	<2.9	<0.11	40	Compliant
Toluene[1,2]	<2.9	<0.11	150	Compliant
2-methoxyethanol acetate[1]	<2.9	<0.11	45	Compliant
Tetrachloroethylene[1,2]	<2.9	<0.11	17.5	Compliant
Chlorobenzene[2]	<2.9	<0.11	500	Compliant
Ethylbenzene[1,2]	<2.9	<0.11	1000	Compliant
m & p-xylene[2]	<2.9	<0.11	350	Compliant
Styrene[1,2]	3.0	0.12	450	Compliant
2-ethoxyethyl acetate[1]	<2.9	<0.11	150	Compliant
o-xylene[2]	<2.9	<0.11	350	Compliant
Phenol[2]	<2.9	<0.11	100	Compliant

1,4-dichlorobenzene[1,2]	<2.9	<0.11	400	Compliant
Isophorone[2]	<2.9	<0.11	1000	Compliant
Naphthalene[1,2]	<1.5	<0.06	4.5	Compliant

* Assumes a single family home with a floor area of 2,272 square feet and two full bathrooms with a ventilation rate of 0.23 h^{-1} as defined by CDPH/EHLB/Standard Method V.1.2
† TVOC is not included as a target compound in the CDPH Standard, but is reported as part of the requirements of the Standard.
1 Compound included on Cal/EPA OEHHA Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65) list
2 Compound included on Cal/EPA ARB list of Toxic Air Contaminants (TAC)

CONCLUSIONS

Based on the emissions test data, MAS offers the following findings and conclusions:

- Predicted airborne concentrations of the CDPH target compounds at the 14-day test point in residential settings are compliant with the CDPH Standard Method v1.2 maximum concentration limits.
- By virtue of compliance with CDPH Standard Method, the Mastercast™ Contemporary Tub & Shower Surround is compliant with LEED v4.1 EQ Credit: Low-Emitting Materials VOC emissions evaluation criteria. In accordance with LEED v4.1 reporting requirements, the estimated TVOC concentrations are 0.5 mg/m^3 or less.

Qualified project uses of the Mastercast™ Contemporary Tub & Shower Surround may be eligible for credit points under the LEED program.

Note: all data, including but not limited to raw instrument files, calibration fits, and quality control checks used to generate the test results are available to the client upon request.

LIMITATIONS

This report is for the exclusive use of Materials Analytical Services, LLC's client, International Marble, LLC, and is provided pursuant to the agreement between MAS and its client. MAS's responsibility and liability are limited to the terms and conditions of the agreement. If other parties wish to rely on this report, please contact MAS so an agreement on the terms and conditions for its use can be established prior to the use of this information. MAS assumes no liability to any party, other than the client in accordance with the agreement, for any loss, expense or damage caused by the use of this report. This report shall not be reproduced, except in full, without the written approval of Materials Analytical Services, LLC. The observations and test results contained in this report are relevant only to the sample tested and the bracketed products listed. This report by itself does not imply that the material(s) or product(s) tested or bracketed is/are or ever has/have been certified by a MAS certification program, nor does it confer certification of any kind upon the material(s) or product(s) tested or bracketed.

Emissions generally decay over time, and the representativeness of the analytical data reported is directly dependent upon the age and conditions under which the tested sample was received.

APPENDIX A

GENERAL TESTING PARAMETERS AND DATA

Under the provisions of the testing method referenced in this report, testing consisted of the following procedural steps:

- Storage of test specimens in original shipping containers prior to emissions testing for up to 10 days in a ventilated and conditioned room maintained at a temperature of 23 ± 2°C and a relative humidity of 50% ± 15%.
- For quality assurance purposes the emission chamber was cleaned and air purged prior to testing. Air samples were collected and analyzed from the chamber exhaust prior to loading to establish background levels.
- Collection of air samples at method-specified intervals from the chamber exhaust port utilizing mass flow controllers calibrated at 180 cc/min for VOCs and 150 cc/min for aldehydes.
- Tenax TA® tubes are used for VOC analysis performed by thermal desorption gas chromatography/mass spectrometry (TD-GC/MS) using a modified EPA TO-17 method. Samples are also collected on DNPH tubes for aldehyde analysis performed using high performance liquid chromatography (HPLC) using a modified NIOSH 2016 method. All samples are drawn and analyzed in duplicate.
- Instrument calibration, analysis of quality control samples and quantitation of the CDPH target list of 35 chemicals of concern, and reporting and speciation of top 10 tentatively identified compounds.

The operating parameters for the small-scale emissions chamber used for this project included:

Parameter	Value	Parameter	Value
Chamber Volume	0.053 m^3	Area Specific Flow Rate	2.4 m/h
Loading Factor	0.425 m^2/m^3	Temperature	23 ± 1 ºC
Air Exchange Rate	1.0 ± 0.05 h^{-1}	Relative Humidity	50 ± 5%

Total volatile organic compounds (TVOC) are defined as the compounds eluting between hexane (*n*-C_5) and hexadecane (*n*-C_{17}) and in this protocol quantified as toluene. Table A-I presents the measured concentration and emission factor of TVOC at each of the three sampling intervals.

Table A-I
Total Volatile Organic Compounds (TVOC) between n-C_5 and n-C_{17} Measured by GC/MS*

Sample Interval (hours)	TVOC Concentration (µg/m^3)	TVOC Emission Factor (µg/m^2 h)
24	56	130
48	16	38
96	21	49

*TVOC values are background corrected

Table A-II presents measured concentrations and emission factors of formaldehyde and acetaldehyde at each of the three sampling intervals.

Table A-II
Formaldehyde and Acetaldehyde Concentrations and Emission Factors as Measured by HPLC

Sample Interval hours	Target Compound	Concentration (µg/m^3)	Emission Factor (µg/m^2 h)
24	Formaldehyde	<1.4	<3.2
48	Formaldehyde	<1.4	<3.2
96	Formaldehyde	<1.4	<3.2
24	Acetaldehyde	<1.8	<4.3
48	Acetaldehyde	<1.8	<4.3
96	Acetaldehyde	<1.8	<4.3

Table A-III present the individual volatile organic compounds (IVOC) identified by GC/MS after 96 hours.

Table A-III
Speciation of Tentatively Identified IVOCs* by GC/MS after 96 hours

CAS Number	Tentatively Identified Compounds	Concentration (µg/m^3)	Emission Factor (µg/m^2 h)
112-31-2	decanal	2.6	6.1
100-42-5	styrene	1.3	3.0
No other IVOCs were identified above laboratory instrument detection limits			

*All IVOCs detected were identified using the average response factor of toluene calibration standards. The sum concentration of IVOC's does not necessarily correlate with the TVOC concentration under the analytical conditions.

APPENDIX B

Chain-of-Custody

2100397

Materials Analytical Services LLC
3945 Lakefield Court
Suwanee, Georgia 30024
Phone: 770-866-3200
Fax: 770-866-3259

California Department of Public Health (CDPH)

Standard Method (section 01350)

Emission Testing
Chain-of-Custody

Client Information	
Company:	International Marble, LLC
Street Address:	304 Bell Park Dr.
City/State:	Woodstock, GA
Zip/Postal Code:	30188
Country:	United States
Contact Name:	Gemma Manilla
Title:	Plant Engineer
Phone Number:	770 928 2252
Fax Number:	–
Email Address:	gemma@imitoday.com

Testing Specifications (per MAS) check appropriate test below
☐ **R&D (custom)**: Specify Details
☐ **24-hour Comparative R&D Test**
☐ **72-hour Comparative R&D Test**
☑ **14-day CDPH Compliance Test**

Manufacturer Information (if different than client)
Company:
City/State/Country:
Contact Name/Title:
Phone Number:

Construction Details (as applicable)
Covering Type: Fabric ☐ (Primary Fiber type: None), Vinyl ☐, Leather ☐
Plastic Type(s): Nylon ☐, PVC ☐, PE ☐, PP ☐, PU ☐, PS ☐, PC ☐, ABS ☐, Acrylic ☐, Lexan ☐
Substrate Type(s): MDF ☐, Particle Board ☐, Plywood ☐, Solid Wood ☐, Other ☑
Outer Finish Type(s): Oil Base ☐, Water Base ☐, Catalyzed/Conversion Var ☐, Polyurethane ☐, Plastic Laminate☐, Melamine ☐, UV☐ , Other ☑
Foam Type: Polyurethane ☐, Memory ☐, Latex ☐, Evlon ☐, High Reslience ☐, High Density ☐ N/A
Paint Type: Latex ☐, Oil ☐, Low VOC ☐, No VOCs ☐, PowderCoat ☐, Chrome ☐ N/A

Sample Details	
Unique Sample ID (if applicable):	–
Product Name & Catalog #:	4x15 Stacked.
Product Type: Ceiling/Wall Panels ☐, Flooring ☐, Trim ☐, Wall Paint ☐, Wall Coverings ☐, Thermal Insulation ☐, Adhesives ☐, Ceiling Tiles ☐, Other ☑	
Date of Product Manufacturing Completion:	5/17/21
Sample Location: Factory ☐, Warehouse ☑, Production Stack/Roll ☐, Container ☐	
Sample Submitted by:	Gemma Manilla
Date of Sample Shipment :	5/17/21
Number of Boxes or Pallets:	1

Special Notes or Comments from Manufacturer:
The samples are tub and shower surrounds in cultured marble.

Shipping Details	
Packed By:	Gemma Manilla
Shipping Date:	5/17/21
Carrier/Airbill Number:	UPS

Laboratory Receipt (to be completed by Laboratory Representative)
Received By:
Received Date:
Condition of Shipping Package:
Condition of Sample:
Remarks:

Sample Handling

Relinquished By	Company	Received By	Company	Date/Time
Gemma Manilla	Int. Marble, LLC			5-18-21

SCANNED

APPENDIX C

CDPH and LEED Compliant Products

International Marble, LLC

Cultured Marble Products

Mastercast™ Tub & Shower Surrounds

Contemporary*	Diamond	Simulated Tile
Smooth	Textured	Vision

Litecast™ Cultured Marble Shower Bases

Curved Front	Custom	Regular	Roll In
Specialty	Square	Trench Drain	

Solidcast™ Solid Surface Shower Bases

Roll In	Trench Drain

Mastercast™ Accessories

Accessory Ledges & Amenities Hooks	Soap Dishes & Shampoo Shelves	Trim Sticks for Tub & Shower
Foot Rests	Window Sills	

Tubs

Adoni	Eco	Imperia	Neptune
Oceanus	Petit	Rosebud	Slipper

Basins

Ovalis 1	Ovalis 2	Ovalis 3

* Product tested as representative exemplar of products listed above. Claims of compliant products are made under the criteria in Section 8.3 of the CDPH Standard Method and/or Section 9.1 of ANSI/BIFMA M7.1-2011 (R2016).

Per ANSI/BIFMA and CDPH standards, products must be re-evaluated if significant changes to materials, processes, or the facility occur that affect the eligibility of the products for any credits available under these or other applicable standards. Regardless, the frequency of compliance assessment for ANSI/BIFMA shall not exceed three years. Third-party certification programs may require more frequent compliance testing.