



December 30, 2020

Mr. Bernard Davis
Engineer/IT Director
Mincey Marble Manufacturing, Inc.
1940 New Harvest Road
Gainesville, GA 30507

**Subject: Compliance Report per California Department of Public Health Standard Method Version 1.2
Traditional Ceramic Tile Panel
MAS Project No.: 2000734**

Dear Mr. Davis:

Materials Analytical Services, LLC is pleased to submit this report with results of VOC emissions testing from a Traditional ceramic tile panel.

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 Traditional ceramic tile panel is compliant with the performance standards established for low VOC-emitting materials under the CDPH, the Collaborative for High Performance Schools (CHPS), and the LEED v4.1 programs. Qualified project uses of this product may be eligible for credit points under the CHPS and LEED programs.

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: 2020.12.30 12:20:57 -05'00'

Manager, Emissions Group

Christina Le
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Analytical Chemist

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

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Testing Cert. #2925.01



EMISSIONS COMPLIANCE TEST

California Dept. of Public Health Standard Method Version 1.2
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: Traditional Ceramic Tile Panel	MAS Assigned ID: 2000734
Manufacturer: Mincey Marble Manufacturing, Inc. Gainesville, GA	Product Description: ceramic tile Approx.: 6" x 6"
Manufacture Date: December 1, 2020	Testing Period: December 3 – 17, 2020
Collection Date: December 1, 2020	In-Chamber Sampling Dates: Dec. 14 @ 24 hrs.; Dec. 15 @ 48 hrs.; Dec. 17 @ 96 hrs.
Shipping Date: December 1, 2020	Date of Sample Analysis: Dec. 17 – 29, 2020
Laboratory Arrival Date: December 3, 2020	Age of Sample at Testing: 2 days



Traditional Ceramic Tile Panel as tested

To prepare the sample for chamber testing, the back and edges of the tile were sealed with aluminum tape with an approximate one-quarter inch overlap of tape onto the sample, and 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 a Traditional Ceramic Tile in Residential Shower Settings

VOC Name	Calculated Emission Factor (µg/m ² hr)	Predicted Airborne Concentration (µg/m ³)*	Maximum Concentration Limits (µg/m ³)	Testing Comment
		Residential		
Total VOCs (TVOC)	380	57	NA	NA
Formaldehyde ^{1,2}	30	4.5	9	Compliant
Acetaldehyde ^{1,2}	4.3	0.65	70	Compliant
Isopropanol	<2.9	<0.44	3500	Compliant
1,1-dichloroethylene	<2.9	<0.44	35	Compliant
Methylene chloride ²	<2.9	<0.44	200	Compliant
Carbon disulfide ^{1,2}	<2.9	<0.44	400	Compliant
MTBE ²	<2.9	<0.44	4000	Compliant
Vinyl acetate ²	<2.9	<0.44	100	Compliant
Hexane ²	<2.9	<0.44	3500	Compliant
Chloroform ^{1,2}	<2.9	<0.44	150	Compliant
2-methoxyethanol ¹	<2.9	<0.44	30	Compliant
1,1,1-trichloroethane ²	<2.9	<0.44	500	Compliant
Benzene ^{1,2}	<2.9	<0.44	1.5	Compliant
1-methoxy-2-propanol	<2.9	<0.44	3500	Compliant
Carbon tetrachloride ^{1,2}	<2.9	<0.44	20	Compliant
Ethylene glycol ²	<2.9	<0.44	200	Compliant
1,4-dioxane ^{1,2}	<2.9	<0.44	1500	Compliant
Trichloroethylene ^{1,2}	<2.9	<0.44	300	Compliant
Epichlorohydrin ^{1,2}	<1.5	<0.23	1.5	Compliant
2-ethoxyethanol ¹	<2.9	<0.44	35	Compliant
n,n-dimethylformamide ²	<2.9	<0.44	40	Compliant
Toluene ^{1,2}	<2.9	<0.44	150	Compliant
2-methoxyethanol acetate ¹	<2.9	<0.44	45	Compliant
Tetrachloroethylene ^{1,2}	<2.9	<0.44	17.5	Compliant
Chlorobenzene ²	<2.9	<0.44	500	Compliant
Ethylbenzene ^{1,2}	<2.9	<0.44	1000	Compliant
m & p-xylene ²	<2.9	<0.44	350	Compliant
Styrene ^{1,2}	140	21	450	Compliant
2-ethoxyethyl acetate ¹	<2.9	<0.44	150	Compliant



o-xylene ²	<2.9	<0.44	350	Compliant
Phenol ²	<2.9	<0.44	100	Compliant
1,4-dichlorobenzene ^{1,2}	<2.9	<0.44	400	Compliant
Isophorone ²	<2.9	<0.44	1000	Compliant
Naphthalene ^{1,2}	<1.5	<0.23	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 bathroom settings are compliant with the CDPH Standard Method v1.2 maximum concentration limits.
- The Traditional ceramic tile is compliant with the performance standards established for low-emitting materials under the Collaborative for High Performance Schools (CHPS) 2019 Core Criteria 3.0 EQ C6.1.6 Ceiling & Wall Systems. Under the CHPS standard testing of ceramic tile is not required to obtain CHPS credits.
- By virtue of compliance with CDPH Standard Method, the tile 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/m³ or less.

Qualified project uses of the Traditional ceramic tile and all bracketed products (see Appendix C) may be eligible for credit points under the CHPS and LEED programs.

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, Mincey Marble Manufacturing, Inc., 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 $23 \pm 2^\circ\text{C}$ and a relative humidity of $50\% \pm 15\%$.
- 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 °C
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*-C₅) and hexadecane (*n*-C₁₇) 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-C₅ and n-C₁₇ Measured by GC/MS*

Sample Interval (hours)	TVOC Concentration (µg/m ³)	TVOC Emission Factor (µg/m ² h)
24	230	540
48	200	460
96	160	380

*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 ($\mu\text{g}/\text{m}^3$)	Emission Factor ($\mu\text{g}/\text{m}^2 \text{ h}$)
24	Formaldehyde	18	43
48	Formaldehyde	15	36
96	Formaldehyde	13	30
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 ($\mu\text{g}/\text{m}^3$)	Emission Factor ($\mu\text{g}/\text{m}^2 \text{ h}$)
100-42-5	styrene	58	140
100-52-7	benzaldehyde	40	93
20780-53-4	benzene, (epoxyethyl)-, (r)-	29	69
78-93-3	2-butanone	10	24
122-78-1	benzeneacetaldehyde	5.8	14
591-24-2	cyclohexanone, 3-methyl-	2.4	5.6
110-82-7	cyclohexane	1.8	4.2
98-86-2	ethanone, 1-phenyl-	1.3	3.0
108-95-2	phenol	<1.2	<2.8
No other IVOCs were detected 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



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

Georgia Department of Public Health
 Standard Method (section 01350)
 Emission Testing
 Chain-of-Custody

Client Information
Company: Mincey Marble Manufacturing
Street Address: 1940 New Harvest Road
City/State: Gainesville, Georgia
Zip/Postal Code: 30507
Country: USA
Contact Name: Bernard Davis
Title: Engineer/Technology Manager
Phone Number: 678.997.2460
Fax Number:
Email Address: bdavis@minceymarble.com

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

Sample Details
Unique Sample ID (if applicable): n/a
Product Name & Catalog #:
Product Type: Ceiling/Wall Panels <input checked="" type="checkbox"/> , Flooring <input type="checkbox"/> , Trim <input type="checkbox"/> , Wall Paint <input type="checkbox"/> , Wall Coverings <input type="checkbox"/> , Thermal Insulation <input type="checkbox"/> , Adhesives <input type="checkbox"/> , Ceiling Tiles <input type="checkbox"/> , Other <input type="checkbox"/>
Date of Product Manufacturing Completion: 1 Dec 2020
Sample Location: Factory <input checked="" type="checkbox"/> , Warehouse <input type="checkbox"/> , Production Stack/Roll <input type="checkbox"/> , Container <input type="checkbox"/>
Sample Submitted by: Bernard Davis
Date of Sample Shipment: 1 Dec 2020
Number of Boxes or Pallets: (1)

Shipping Details
Packed By: Juan Contreras
Shipping Date: 1 Dec 2020
Carrier/Airbill Number:

Testing Specifications (per MAS) check appropriate test below
<input type="checkbox"/> R&D (custom): Specify Details
<input type="checkbox"/> 24-hour Comparative R&D Test
<input type="checkbox"/> 72-hour Comparative R&D Test
<input type="checkbox"/> 14-day CDPH Compliance Test
<input type="checkbox"/> CARB Formaldehyde Test

Construction Details (as applicable)
Covering Type: Fabric <input type="checkbox"/> (Primary Fiber type: _____), Vinyl <input type="checkbox"/> , Leather <input type="checkbox"/>
Plastic Type(s): Nylon <input type="checkbox"/> , PVC <input type="checkbox"/> , PE <input type="checkbox"/> , PP <input type="checkbox"/> , PU <input type="checkbox"/> , PS <input type="checkbox"/> , PC <input type="checkbox"/> , ABS <input type="checkbox"/> , Acrylic <input type="checkbox"/> , Lexan <input type="checkbox"/>
Substrate Type(s): MDF <input type="checkbox"/> , Particle Board <input type="checkbox"/> , Plywood <input type="checkbox"/> , Solid Wood <input type="checkbox"/> , Other <input checked="" type="checkbox"/>
Outer Finish Type(s): Oil Base <input type="checkbox"/> , Water Base <input type="checkbox"/> , Catalyzed/Conversion Var <input type="checkbox"/> , Polyurethane <input type="checkbox"/> , Plastic Laminate <input type="checkbox"/> , Melamine <input type="checkbox"/> , UV <input type="checkbox"/> , Other <input checked="" type="checkbox"/>
Foam Type: Polyurethane <input type="checkbox"/> , Memory <input type="checkbox"/> , Latex <input type="checkbox"/> , Evlon <input type="checkbox"/> , High Resilience <input type="checkbox"/> , High Density <input type="checkbox"/>
Paint Type: Latex <input type="checkbox"/> , Oil <input type="checkbox"/> , Low VOC <input checked="" type="checkbox"/> , No VOCs <input type="checkbox"/> , PowderCoat <input type="checkbox"/> , Chrome <input type="checkbox"/>

Special Notes or Comments from Manufacturer:

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
		<i>S. J. ...</i>	MAS	12-3-20



APPENDIX C

CDPH, LEED, and CHPS Compliant Products Mincey Marble Manufacturing, Inc.

Shower Panels

Contemporary	Diamond	Evolution	Reflections
Old World Classic	Simulated Tile	Traditional*	Vintage
Vision	Disney Panels	MISC Panels	

Shower Pans

Rectangular	Square	Curved Front	Trench Drain	Custom
Roll-In	Neo Angle	Walk In	Other	

* 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.