Sensitile Systems®
materials as dynamic as light

The Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources was performed by Intertek using Sensitile Terrazzo tiles in accordance with the standard methods of California Specification 01350.

Having a vast selection of materials that use the same component material configuration but differ only in the internal optical patterns makes individual testing for each, redundant and unnecessary. The test material was carefully selected to be representative of the “worst case scenario” of Terrazzo slab & tile products as a whole.

The test report, #102369956MID-001b of California Specification 01350, dated May 31, 2016, by Intertek Verification Center covers the following:

- Sensitile Terrazzo™
- Terrazzo Lumina™
- PIXA™
- StoneLight™

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TEST REPORT

REPORT NUMBER: 102369956MID-001b
ORIGINAL ISSUE DATE: May 31, 2016
REVISED DATE: na

EVALUATION CENTER
Intertek
Verification Center
8431 Murphy Dr
Middleton, WI 53562

RENDERED TO:

Kaitlin Morris
Sensitile Systems
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PRODUCT EVALUATED: Sensitile Terrazzo

EVALUATION PROPERTY: California Specification 01350: Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers

1 Table of Contents

2 Introduction

Intertek has conducted testing for Sensitile Systems on Sensitile Terrazzo Testing was conducted following the standard methods of California Specification 01350: Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers. This evaluation began May 5, 2016 and was completed May 31, 2016.

3 Test Samples

3.1. SAMPLE SELECTION

The sample product Sensitile Terrazzo was collected at 1735 Homes Rd., Ypsilanti, WI and shipped on 4/13/2016 at by Kaitlin Morris to the testing facility at Middleton Wisconsin. The sample arrived on 4/14/2016 in good condition. ID Tracking number: MID1604140929-001

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The sample was removed from the bag and removed from the aluminum foil. The samples were prepared by the client by placing the material into a provided stainless steel tray 250 by 200 by 38 mm.

4 Testing and Evaluation Methods

Testing was in accordance with California Specification 01350: Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers.

Testing was determined using the private office scenario with all of the floors (Ceilings). The testing started on May 5, 2016 and completed May 19, 2016. All GC and LC testing was completed by May 26, 2016. The chamber volume is 50L with an inlet flow of 50L/hour. . The average temperature range was 23 ^{o}C +/- 2 and 50 +/- 5 %RH.

The VOC for the LC sampling was collected on Sep-Pak DNPH-Silica Cartridges. Collection was performed at 50 ml/min for 20 minutes using a vacuum pump with a mass flow meter. The Sep-Pak DNPH-Silica Cartridges were stored in the refrigerator until eluted according to the manufactures instructions into 5 ml of ACN. The samples were collected at 96 hours within the time limitations specified in the standard. The Sep-Pak DNPH-Silica Cartridges samples were run on Shimadzu HPLC system using a Waters Symetry C18 5um 3.9 x 150 column. A gradient profile was used to run the standard Aldehyde/Ketone –DNPH Mix.

For the HPLC testing, no target VOCs were found at the 96 hr time point. No quantification was required using the standard with minimum of a 5 point curve. A check standard was run during the samples to verify system suitability.

The VOC for the GC/MS was collected on Thermo Desorption (TD) tubes Atas GL (A100054) fritted linters filled with Tenax GR TA packing material. Collection was performed at 50 ml/min for 20 minutes using a vacuum pump with a mass flow meter. The TD tubes were verified to be clean before testing. The samples were collected at 24, 48, and 96 hours within the time

limitations specified in the standard, and tested the same day. The samples were run on Shimadzu GC/MS with an ATAS GL High Performance injector for the TD tubes. A Restek Rtx-VMS 40 meter, 0.18 mm ID, 1um df was used.

For determining TVOC direct injection of toluene was used with at least 5 different concentrations.

Standard Curves diluted with toluene were performed in triplicate for each standard. The standard was run with the same GC temperature profile as the TD tubes.

The LOQ for toluene was determined to be 0.004022 ug/m^3. Area count below this concentration will be reported as present but not quantifiable.

A standard curve with 1-Butanol (CAS# 71-36-3) and Butyl glycol (CAS# 111-76-2) with a minimum of 5 points was made for the determination of 1-butanol, Butyl glycol, Butyl diglycol. Butyl glycol will be the substitute standard for Butyl diglycol (CAS#112-34-5) because a standard could not be found.

4.1.1. Deviation from Standard Method

There were no deviations from the test standard.

4.2. RESULTS AND OBSERVATIONS

NQ = Not Quantifiable

Private Office (Floors)				
Total VOCs		24 hr	48 hr	96 hr
Emissions Factor (EF_{Ai}) (ug m^-2 h^-1)		0.6135	0.5465	0.2994
Inlet flow rate Q (m^3 h^-1)		0.05	0.05	0.05
Chamber Concentration Cit (ug m^-3)		0.613	0.547	0.299
Chamber background concentration (ug m^-3)		0.0000	0.0000	0.0000
Exposed projected surface area of the test specimen in the chamber Ac (m^2)		0.0500	0.0500	0.0500
Estimated Building Concentration $C_{iB\ (ug\ m^{-3})}$	EFAi/qA=	0.3305	0.2944	0.1613
Area Specific flow rate w A (m h^-1)= Qb/AB	Qb/AB=	1.8565	m h^-1	
Flow rate of the outside ventilation are Qb (m^3 h^-1)	Qb=	20.7	m^3 h^-1	
Exposed surface area of the installed material in the building AB (m^2)	AB=	11.15	m^2	

Private Office (Floors)				
1-Butanol (CAS #71-36-3)		24 hr	48 hr	96 hr
Emissions Factor (EF_{Ai}) (ug m^-2 h^-1)		0.2058	0.1684	0.1234
Inlet flow rate Q (m^3 h^-1)		0.05	0.05	0.05
Chamber Concentration Cit (ug m^-3)		0.206	0.168	0.123
Chamber background concentration (ug m^-3)		0.0000	0.0000	0.000
Exposed projected surface area of the test specimen in the chamber Ac (m^2)		0.0500	0.0500	0.0500
Estimated Building Concentration $C_{iB\ (ug\ m^{-3})}$	EFAi/qA=	0.1109	0.0907	0.0665
Area Specific flow rate w A (m h^-1)= Qb/AB	Qb/AB=	1.8565	m h^-1	
Flow rate of the outside ventilation are Qb (m^3 h^-1)	Qb=	20.7	m^3 h^-1	
Exposed surface area of the installed material in the building AB (m^2)	AB=	11.15	m^2	

Private Office (Floors)				
Butyl glycol (CAS #111-76-2)		24 hr	48 hr	96 hr
Emissions Factor (EF_{Ai}) (ug m^-2 h^-1)		0.0982	0.0820	0.0793
Inlet flow rate Q (m^3 h^-1)		0.05	0.05	0.05
Chamber Concentration Cit (ug m^-3)		0.098	0.082	0.079
Chamber background concentration (ug m^-3)		0.0000	0.0000	0.000
Exposed projected surface area of the test specimen in the chamber Ac (m^2)		0.0500	0.0500	0.0500
Estimated Building Concentration $C_{iB\ (ug\ m^{-3})}$	EFAi/qA=	0.0529	0.0442	0.0427
Area Specific flow rate w A (m h^-1)= Qb/AB	Qb/AB=	1.8565	m h^-1	
Flow rate of the outside ventilation are Qb (m^3 h^-1)	Qb=	20.7	m^3 h^-1	
Exposed surface area of the installed material in the building AB (m^2)	AB=	11.150000	m^2	

Private Office (Floors)				
Butyl Diglycol (CAS #112-34-5)		24 hr	48 hr	96 hr
Emissions Factor (EF_{Ai}) (ug m^-2 h^-1)		0.2843	0.2722	0.0927
Inlet flow rate Q (m^3 h^-1)		0.05	0.05	0.05
Chamber Concentration Cit (ug m^-3)		0.284	0.272	0.093
Chamber background concentration (ug m^-3)		0.0000	0.0000	0.000
Exposed projected surface area of the test specimen in the chamber Ac (m^2)		0.0500	0.0500	0.0500
Estimated Building Concentration $C_{iB\ (ug\ m^{-3})}$	EFAi/qA=	0.1531	0.1466	0.0499
Area Specific flow rate w A (m h^-1)= Qb/AB	Qb/AB=	1.8565	m h^-1	
Flow rate of the outside ventilation are Qb (m^3 h^-1)	Qb=	20.7	m^3 h^-1	
Exposed surface area of the installed material in the building AB (m^2)	AB=	11.15	m^2	

Private Office (Floors)				
Unknown at 7.0		24 hr	48 hr	96 hr
Emissions Factor (EF_{Ai}) (ug m^-2 h^-1)		0.0065	0.0058	NQ
Inlet flow rate Q (m^3 h^-1)		0.05	0.05	0.05
Chamber Concentration Cit (ug m^-3)		0.00652	0.00579	NQ
Chamber background concentration (ug m^-3)		0.0000	0.0000	0.000
Exposed projected surface area of the test specimen in the chamber Ac (m^2)		0.0500	0.0500	0.0500
Estimated Building Concentration $C_{iB\ (ug\ m^{-3})}$	EFAi/qA=	0.0035	0.0031	NQ
Area Specific flow rate w A (m h^-1)= Qb/AB	Qb/AB=	1.8565	m h^-1	
Flow rate of the outside ventilation are Qb (m^3 h^-1)	Qb=	20.7	m^3 h^-1	
Exposed surface area of the installed material in the building AB (m^2)	AB=	11.15	m^2	

Private Office (Floors)				
Unknown at 7.2		24 hr	48 hr	96 hr
Emissions Factor (EF_{Ai}) (ug m^-2 h^-1)		0.0062	0.0060	NQ
Inlet flow rate Q (m^3 h^-1)		0.05	0.05	0.05
Chamber Concentration Cit (ug m^-3)		0.00616	0.00600	NQ
Chamber background concentration (ug m^-3)		0.0000	0.0000	0.000
Exposed projected surface area of the test specimen in the chamber Ac (m^2)		0.0500	0.0500	0.0500
Estimated Building Concentration $C_{iB\ (ug\ m^{-3})}$	EFAi/qA=	0.0033	0.0032	NQ
Area Specific flow rate w A (m h^-1)= Qb/AB	Qb/AB=	1.8565	m h^-1	
Flow rate of the outside ventilation are Qb (m^3 h^-1)	Qb=	20.7	m^3 h^-1	
Exposed surface area of the installed material in the building AB (m^2)	AB=	11.15	m^2	

Private Office (Floors)				
Unknown at 9.6		24 hr	48 hr	96 hr
Emissions Factor (EF_{Ai}) (ug m^-2 h^-1)		0.0041	0.0037	NQ
Inlet flow rate Q (m^3 h^-1)		0.05	0.05	0.05
Chamber Concentration Cit (ug m^-3)		0.00412	0.00373	NQ
Chamber background concentration (ug m^-3)		0.0000	0.0000	0.000
Exposed projected surface area of the test specimen in the chamber Ac (m^2)		0.0500	0.0500	0.0500
Estimated Building Concentration $C_{iB\ (ug\ m^{-3})}$	EFAi/qA=	0.0022	0.0020	NQ
Area Specific flow rate w A (m h^-1)= Qb/AB	Qb/AB=	1.8565	m h^-1	
Flow rate of the outside ventilation are Qb (m^3 h^-1)	Qb=	20.7	m^3 h^-1	
Exposed surface area of the installed material in the building AB (m^2)	AB=	11.15	m^2	

Private Office (Floors)				
Unknown at 9.8		24 hr	48 hr	96 hr
Emissions Factor (EF_{Ai}) (ug m^-2 h^-1)		0.0043	0.0044	NQ
Inlet flow rate Q (m^3 h^-1)		0.05	0.05	0.05
Chamber Concentration Cit (ug m^-3)		0.004	0.004	NQ
Chamber background concentration (ug m^-3)		0.0000	0.0000	0.000
Exposed projected surface area of the test specimen in the chamber Ac (m^2)		0.0500	0.0500	0.0500
Estimated Building Concentration $C_{iB\ (ug\ m^{-3})}$	EFAi/qA=	0.0023	0.0024	NQ
Area Specific flow rate w A (m h^-1)= Qb/AB	Qb/AB=	1.8565	m h^-1	
Flow rate of the outside ventilation are Qb (m^3 h^-1)	Qb=	20.7	m^3 h^-1	
Exposed surface area of the installed material in the building AB (m^2)	AB=	11.15	m^2	

Private Office (Floors)				
Unknown at 10.3		24 hr	48 hr	96 hr
Emissions Factor (EF_{Ai}) (ug m^-2 h^-1)		0.0042	0.0040	0.0040
Inlet flow rate Q (m^3 h^-1)		0.05	0.05	0.05
Chamber Concentration Cit (ug m^-3)		0.00416	0.00401	0.00403
Chamber background concentration (ug m^-3)		0.0000	0.0000	0.000
Exposed projected surface area of the test specimen in the chamber Ac (m^2)		0.0500	0.0500	0.0500
Estimated Building Concentration $C_{iB\ (ug\ m^{-3})}$	EFAi/qA=	0.0022	0.0022	0.0022
Area Specific flow rate w A (m h^-1)= Qb/AB	Qb/AB=	1.8565	m h^-1	
Flow rate of the outside ventilation are Qb (m^3 h^-1)	Qb=	20.7	m^3 h^-1	
Exposed surface area of the installed material in the building AB (m^2)	AB=	11.15	m^2	

4.3. EXAMINATION OF RESULTS

A total of three known compounds -Butanol (CAS# 71-36-3) and Butyl glycol (CAS# 111-76-2), and Butyl diglycol (CAS#112-34-5) were found. These compounds are not currently listed as Target CREL VOCs. Five unknown compounds were found. Only one of the five unknown compounds is quantifiable at the 96 hour sampling. No low molecular weight aldehydes were found by the HPLC. A summary of the finding can be found in section 4.3 of the evaluation of the results. The total VOC for the estimated building concentration at 96 hr is 0.1613 ug/m^3.

5 Appendix A

Photo of tested sample:

6 Conclusion

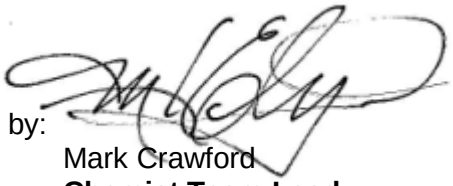
Intertek has conducted testing Sensitile Systems, on Sensitile Terrazzo, to evaluate Californian Specification 01350; Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers.

Sensitile Systems, on Sensitile Terrazzo, complies with limits specified in California Specification 01350 February 2010 for floors in the private office.

The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK
Reported by:

Bryan Bowman
Chemist



Reviewed by:
Mark Crawford
Chemist Team Lead

7 Revision Summary

DATE	SUMMARY
May 31 2016	Original date of report