

TEST REPORT

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PRODUCT EVALUATED: 3M™ Fire Barrier Water Tight Sealant 3000 WT 10 oz tubes

EVALUATION PROPERTY: CDPH Specification 01350 v1.1: Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers v1.1

Report of for compliance with the applicable requirements of the following criteria: CDPH Specification 01350 v1.1: Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers v1.1 and LEED v4.

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2 Introduction

Intertek has conducted testing for 3M on 3M™ Fire Barrier Water Tight Sealant 3000 WT 10 oz tubes. Testing was conducted following the standard methods of CDPH Specification 01350 v1.1: Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers v 1.1.

3 Test Samples

3.1. SAMPLE SELECTION

Two sample of 3M™ Fire Barrier Water Tight Sealant 3000 WT 10 oz tube #98-0400-5503-4 lot 072016-4 was bulk manufactured on 7/20/2016. The bulk material was packaged on 7/25/2016 in standard packaging for 10 oz finished cartridge. The samples were shipped by Guy Verrall on 8/18/2016. The sample arrived on 8/24/2016 in the Middleton Lab with ID Tracking number: MID1608240821-001.

3.2. SAMPLE AND ASSEMBLY DESCRIPTION

The sample was placed in a ½ inch wide by ½ inch deep channel into one aluminum tray cut to about 10 inches long. The empty metal channels were weight. The tube was inserted into the applicator gun. The applicator tip was cut to produce about a ½ inch bead of material. About 100g of material was dispensed and discarded. The sample was placed in the tray holders using a single smooth stroke of the gun. Any excess caulk was wiped from the exterior of the channel holder. The metal channels were reweighed after applying the caulk to determine the number of grams of wet caulk per linear meter of ½ inch bead. The sample was immediately transferred to the environmental chamber and the date and time recorded. See appendix 1 for the photo of the sample.

4 Testing and Evaluation Methods

Testing was in accordance with CDPH Specification 01350 v1.1: Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers v1.1.

Testing for the private office, and classroom scenario with Floors, Ceiling and walls, and around windows and doors. The chamber volume is 50.0 L with an inlet flow of 50.0 L/hour. The load factor is based on the total surface area of the system in the standard environment, where the product is applied as stated in section 4.3.6 of the standard. 10 inches is the maximum required length stated in section 3.4.1 of the standard for caulk preparation. The conditioning started on 9/2/2016 and was completed on 9/12/2016. The average temperature range was 23 °C +/- 2 and 50 +/- 5 %RH. The sampling started on 9/13/2016 and completed 9/16/2016. All GC and LC testing was completed by 10/13/2016.

The VOC for the LC sampling was collected on Sep-Pak DNPH-Silica Cartridges. Collection was performed at 50 ml/min for 5 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 24, 48 and 96 hours within the time limitations specified in the standard. Only Formaldehyde is determined at

the 24 and 48 hour time point. 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 packing material. Collection was performed at 50 ml/min for 5 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.

Direct injection of toluene was used with at least 5 different concentrations was used for determining the concentration of the unknown VOCs. The LOQ for toluene was determined to be 0.008044 ug/m³

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. Standard Cures of the known compounds of Butanone CAS# 78-93-3 and 2-Butanone Oxime CAS # 96-29-7. The MS spectra and retention time were used to verify the known compounds. Toluene standard curve was used for methanol. The total VOC report will be the sum of the unknown using toluene standard curve and known VOC using the appropriate standard curve for the known compound.

4.1.1. Deviation from Standard Method

A GC/MS instrument contamination of the column resulted in the 24 hour collection unusable. An alternate time point at 72 hours was added to the sampling to verify that the sample was constant or declining as stated in section 8.5 of the standard. It was found that the TVOC were constant (less than 4% difference between the TVOC area counts) at the 48 and 72 hour time point and therefore, the 48 and 72 hour time point will be reported.

4.2. RESULTS AND OBSERVATIONS

Exposed surface area for the building scenarios

Private Office	m ²		Classroom	m ²
net wall	33.4		net wall	94.6
ceiling	11.1		Walls and Ceiling	183.8
Floors	11.1			
Total surface	55.6		Total surface	278.4

Testing Scenario:	Private Office	Standard Classroom
Product Quantities:	Floors, Ceiling and walls, and around windows	Floors, Ceiling and walls, and around windows and doors
Inlet flow rate Q (m ³ h ⁻¹)	0.05	0.05
Flow rate of the outside ventilation are Q _b (m ³ h ⁻¹)	20.7	191
Exposed surface area of the installed material in the building A _B (m ²)	55.6	278.4
Area Specific flow rate q _A (m ³ h ⁻¹) = Q _b /A _B	0.3723	0.6861
Volume (EFV), length (EFL), mass (EFM) or unit specific mission rate (ug m-3h-1, ug kg-1 or ug h-1 per unit) by substituting the appropriate parameter used to quantify the material specimen (See section 3.10.1.3 of the standard)	60.984	60.984

Specified Units for the specified emission factor: g/linear foot of 1/2 caulk

								Testing Scenario:	Private Office	Standard Classroom
								Product Quantities:	Floors, Ceiling and walls, and around windows and doors	Floors, Ceiling and walls, and around windows and doors
								Sampling Time (hrs):	48 hr	48 hr
Compound name	CAS Number	Retention Time	Area Count Sample	Area Count Background	Chamber Concentration	Chamber background concentration	Specific Emissions Factor at the sampling time (EF _s)	Specific Estimated Building Concentration C _b for Target VOC using EF _s	Specific Estimated Building Concentration C _b for Target VOC using EF _s	
	number	minutes	No units	No units	(ug m ⁻³)	(ug m ⁻³)	g/linear foot of 1/2 caulk	(ug m ⁻³)	(ug m ⁻³)	
2-Butanone oxime	96-29-7	11.182	154,503,348	0	44829.62	0	36.59	98.28	263.99	
2-Butanone	78-93-3	9.42	8,359,321	0	2176.52	0	1.78	4.79	12.87	
Ethanol	64-17-5	8.063	3,698,792	0	219.76	0	0.18	0.48	1.30	
Total Unknown VOC	na	na	5,985,004	0	351.53	0	0.29	0.77	2.08	
Total VOCs	na	na	172,546,465	0	47377.44	0	38.84	104.34	280.24	

								Testing Scenario:	Private Office	Standard Classroom
								Product Quantities:	Floors, Ceiling and walls, and around windows and doors	Floors, Ceiling and walls, and around windows and doors
								Sampling Time (hrs):	72 hr	72 hr
Compound name	CAS Number	Retention Time	Area Count Sample	Area Count Background	Chamber Concentration	Chamber background concentration	Specific Emissions Factor at the sampling time (EF _s)	Specific Estimated Building Concentration C _b for Target VOC using EF _s	Specific Estimated Building Concentration C _b for Target VOC using EF _s	
	number	minutes	No units	No units	(ug m ⁻³)	(ug m ⁻³)	g/foot	(ug m ⁻³)	(ug m ⁻³)	
2-Butanone oxime	96-29-7	11.169	144,601,635	0	41773.92	0	34.25	91.99	247.10	
2-Butanone	78-93-3	9.406	7,004,056	0	1824.85	0	1.50	4.02	10.79	
Ethanol	64-17-5	8.029	3,702,842	0	219.99	0	0.18	0.48	1.30	
Total Unknown VOC	na	na	5,635,910	0	331.41	0	0.27	0.73	1.96	
Total VOCs	na	na	160,944,443	0	44150.18	0	36.20	97.23	261.15	

								Testing Scenario:	Private Office	Standard Classroom
								Product Quantities:	Floors, Ceiling and walls, and around windows and doors	Floors, Ceiling and walls, and around windows and doors
								Sampling Time (hrs):	96 hr	96 hr
Compound name	CAS Number	Retention Time	Area Count Sample	Area Count Background	Chamber Concentration	Chamber background concentration	Specific Emissions Factor at the sampling time (EF _s)	Specific Estimated Building Concentration C _b for Target VOC using EF _s	Specific Estimated Building Concentration C _b for Target VOC using EF _s	
	number	minutes	No units	No units	(ug m ⁻³)	(ug m ⁻³)	g/linear foot of 1/2 caulk	(ug m ⁻³)	(ug m ⁻³)	
2-Butanone oxime	96-29-7	10.989	62,719,757	0	18,158.80	0	14.89	39.99	107.41	
2-Butanone	78-93-3	9.382	3,816,679	0	997.780	0	0.82	2.20	5.90	
Ethanol	64-17-5	7.963	1,663,168	0	102.429	0	0.08	0.23	0.61	
Total Unknown VOCs	na	na	1,610,515	0	99,394	0	0.08	0.22	0.59	
Total VOCs	na	na	69,810,119	0	19,358,405	0	15.87	42.63	114.51	

4.3. EXAMINATION OF RESULTS

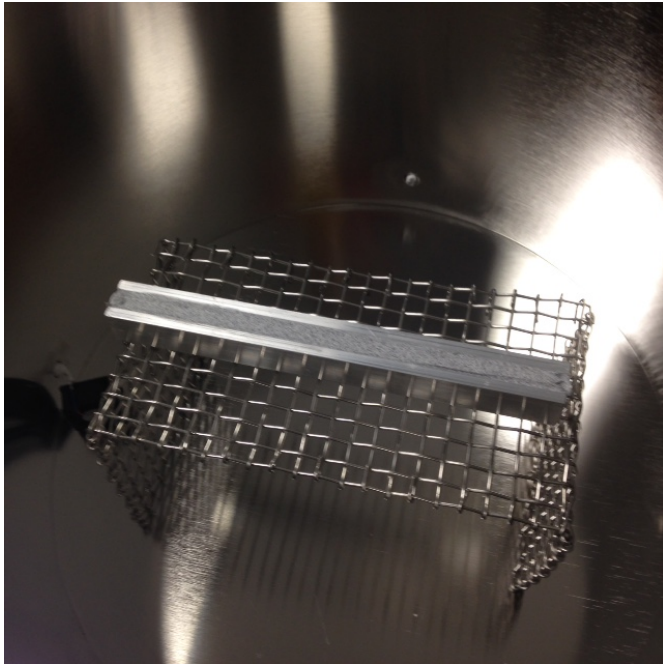
The results are based on the use of 61.0 g/linear foot of 1/2 caulk in a private office or standard classroom placing caulk on the parameters of using floors, ceilings walls and floors and around doors and windows. The amount of the VOC present in the room are based on the total surface area of the system in the standard environment, where the product is applied, using 20 inches of sample in a 1/2 inch deep by 1/2 inch wide channel of aluminum with a 100.35 liter VOC chamber.

Three Compounds were identified at the 96 hour collection time point. Ethanol CAS# 64-17-5 2-Butanone CAS# 78-93-3 and 2-Butanone Oxime CAS # 96-29-7. All of compounds are not target CREL VOCs.

No Formaldehyde or Acetaldehyde were found by HPLC analysis. No CRELs compounds were found. The summary for each testing scenario is listed in the result above in section 4.2.

5 Appendix A

Photo of tested sample:



6 Conclusion

Intertek has conducted testing for 3M, on 3M™ Fire Barrier Water Tight Sealant 3000 WT 10 oz tubes , to evaluate CDPH Specification 01350 v1.1; Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers v1.1.

3M™ Fire Barrier Water Tight Sealant 3000 WT 10 oz tube complies with limits specified in CDPH Specification 01350 v1.1 February 2010 for private office and classroom. The sample passed the LEED v4 for total VOC and Target Chemical listed in CDPH Standard Method v 1.1 Table 4-1.

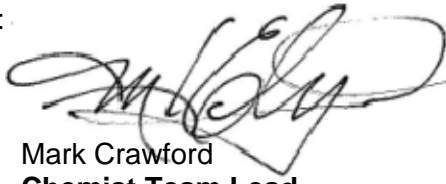
The conclusions of this test report may not be used as part of the requirements for Intertek product certification. Authority to Mark must be issued for a product to become certified.

INTERTEK
Reported by:



Bryan Bowman
Chemist

Reviewed by:



Mark Crawford
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7 Revision Summary

DATE	SUMMARY
Oct 24, 2016	Original date of report
