

**TEST REPORT**

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PRODUCT EVALUATED: 3M™ Fire Barrier Water Tight Sealant 1003 SL 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

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Intertek has conducted testing for 3M on 3M™ Fire Barrier Water Tight Sealant 1003 SL 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

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### 3.1. SAMPLE SELECTION

Two samples of 3M™ Fire Barrier Water Tight Sealant 1003 SL 10 oz tube #98-0400-5276-1 (#m Canada part # XE-101409444-3) lot 092616-2 was bulk manufactured on Sept 26, 2016. The bulk material was packaged on Sept 26, 2016 in standard packaging for 10 oz finished cartridge. The samples were shipped by Juliet Henry on Oct 31, 2016. The sample arrived on Nov 4, 2016 in the Middleton Lab with ID Tracking number: MID1611041002-001.

### 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. Then ends of the trays were covered with low VOC tape. 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

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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 100.35 L with an inlet flow of 100.35 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. 20 inches of sample was used for the 100.35 L chamber so that there was a proportional increase in the sample size to that of the smallest chamber of 50L with a sample length of 10 inches. 10 inches is the maximum required length stated in section 3.4.1 of the standard for caulk preparation. The conditioning started on 11/4/2016 and was completed on 11/14/2016. The average temperature range was 23 °C +/- 2 and 50 +/- 5 %RH. The sampling started on November 15, 2016 and completed November 18, 2016. All GC and LC testing was completed by November 21, 2016.

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

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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 Formaldehyde was found at the 24 and 48 hour time points. 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 lintens 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 for the 24 hr sampling. 2 minute collection time for the 48 hour, and 1 minute collection time for 96 hour collection times. The sample time collections were adjusted to prevent GC column and TD tube overloading. 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/m<sup>3</sup>

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. 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**

No deviation to the standards. The results 48 hour are within 4% of the results at 96 hours.

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**4.2. RESULTS AND OBSERVATIONS**

Exposed surface area for the building scenarios

Private Office	m <sup>2</sup>	Classroom	m <sup>2</sup>
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 <sup>3</sup> h <sup>-1</sup> )	0.10035	0.10035
Flow rate of the outside ventilation are Q <sub>b</sub> (m <sup>3</sup> h <sup>-1</sup> )	20.7	191
Exposed surface area of the installed material in the building A <sub>B</sub> (m <sup>2</sup> )	55.6	278.4
Area Specific flow rate q <sub>A</sub> (m <sup>3</sup> h <sup>-1</sup> ) = Q <sub>b</sub> /A <sub>B</sub>	0.3723	0.6861
Volume (EIV), 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)	63.078	63.078

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):	24 hr	24 hr	
Compound	CAS Number	Retention Time	Area Count Sample	Area Count Background	Chamber Concentration C <sub>t</sub>	Chamber background concentration	Specific Emissions Factor at the sampling time (EF <sub>s</sub> )	Specific Estimated Building Concentration C <sub>bi</sub> for Target VOC using EF <sub>s</sub>	Specific Estimated Building Concentration C <sub>bi</sub> for Target VOC using EF <sub>s</sub>
name	number	minutes	No units	No units	(ug m <sup>3</sup> -3)	(ug m <sup>3</sup> -3)	ug-ft/g	(ug m <sup>3</sup> -3)	(ug m <sup>3</sup> -3)
2-Butanone oxime	96-29-7	11.039	208,260,450	0	54047.59	0	85.98	230.95	620.33
2- Butanone	78-93-3	9.431	10,102,231	0	2628.78	0	4.18	11.23	30.17
Total Unknown VOC	na	na	6,112,581	0	358.89	0	0.57	1.53	4.12
Total VOCs	na	na	224,475,262	0	57035.26	0	90.74	243.72	654.62

						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	CAS Number	Retention Time	Area Count Sample	Area Count Background	Chamber Concentration C <sub>t</sub>	Chamber background concentration	Specific Emissions Factor at the sampling time (EF <sub>s</sub> )	Specific Estimated Building Concentration C <sub>bi</sub> for Target VOC using EF <sub>s</sub>	Specific Estimated Building Concentration C <sub>bi</sub> for Target VOC using EF <sub>s</sub>
name	number	minutes	No units	No units	(ug m <sup>3</sup> -3)	(ug m <sup>3</sup> -3)	ug-ft/g	(ug m <sup>3</sup> -3)	(ug m <sup>3</sup> -3)
2-Butanone oxime	96-29-7	10.91	112,966,768	0	81520.50	0	129.69	348.35	935.65
2- Butanone	78-93-3	9.408	8,660,449	0	5625.53	0	8.95	24.04	64.57
Total Unknown VOC	na	na	3,636,072	0	530.51	0	0.84	2.27	6.09
Total VOCs	na	na	125,263,289	0	87676.54	0	139.48	374.65	1006.31

						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	CAS Number	Retention Time	Area Count Sample	Area Count Background	Chamber Concentration C <sub>t</sub>	Chamber background concentration	Specific Emissions Factor at the sampling time (EF <sub>s</sub> )	Specific Estimated Building Concentration C <sub>bi</sub> for Target VOC using EF <sub>s</sub>	Specific Estimated Building Concentration C <sub>bi</sub> for Target VOC using EF <sub>s</sub>
name	number	minutes	No units	No units	(ug m <sup>3</sup> -3)	(ug m <sup>3</sup> -3)	ug-ft/g	(ug m <sup>3</sup> -3)	(ug m <sup>3</sup> -3)
2-Butanone oxime	96-29-7	10.498	50,191,345	0	72,447.23	0	115.26	309.57	831.52
2- Butanone	78-93-3	9.421	7,917,948	0	10,280.30	0	16.35	43.93	117.99
Total Unknown VOCs	na	na	5,100,960	0	1,476.63	0	2.35	6.31	16.95
Total VOCs	na	na	63,210,253	na	84,204.16	na	133.96	359.81	966.46

**4.3. EXAMINATION OF RESULTS**

The results are based on the use of 63.1 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 ½ inch deep by ½ inch wide channel of aluminum with a 100.35 liter VOC

chamber.

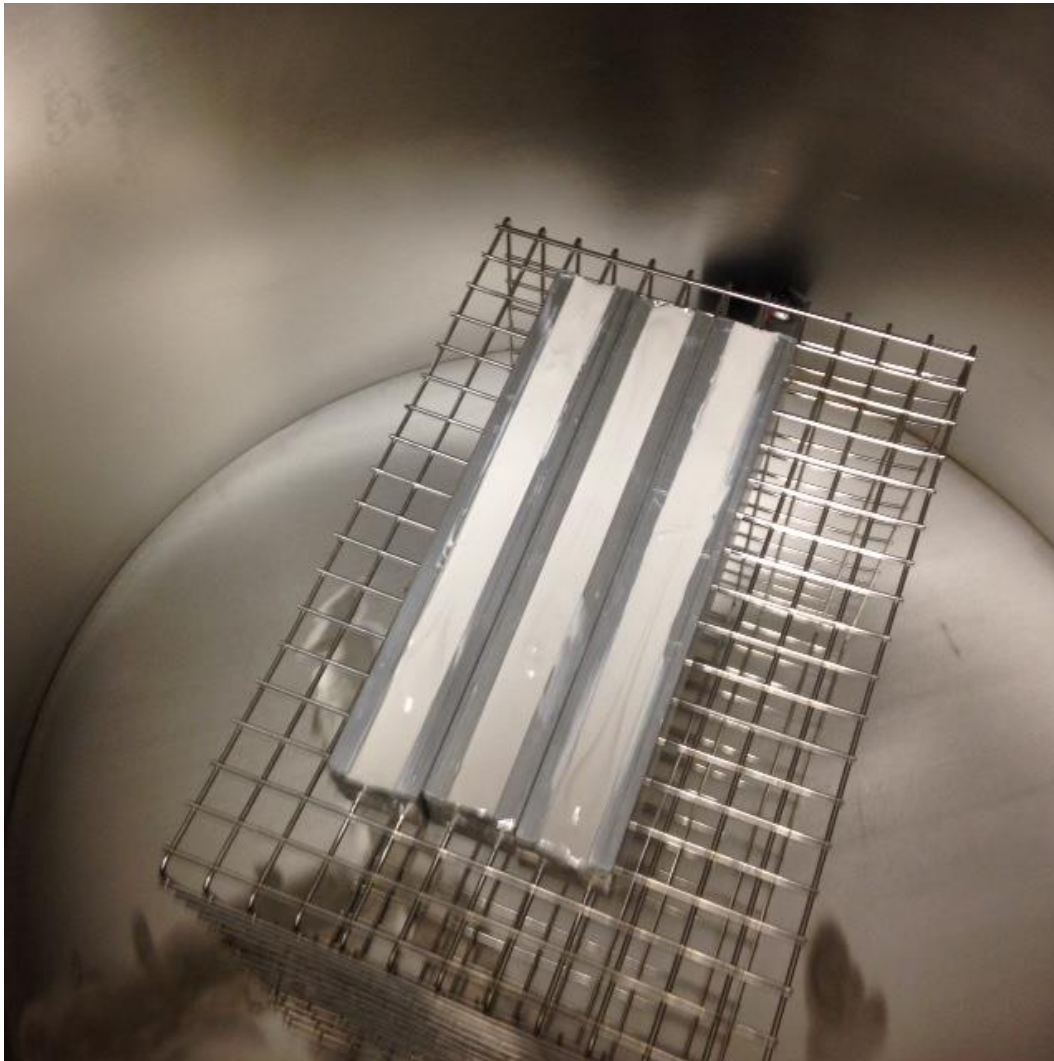
Two Compounds were identified at the 96 hour collection time point. 2-Butanone CAS# 78-93-3 and 2-Butanone Oxime CAS # 96-29-7. All of compounds are not target CREL VOCs.

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

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Photo of tested sample:



## 6 Conclusion

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Intertek has conducted testing for 3M, on 3M™ Fire Barrier Water Tight Sealant 1003 SL 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 1003 SL 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**  
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**Chemist**

Reviewed by:

Mark Crawford  
**Chemist Team Lead**

## 7 Revision Summary

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DATE	SUMMARY
November 22, 2016	Original date of report

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