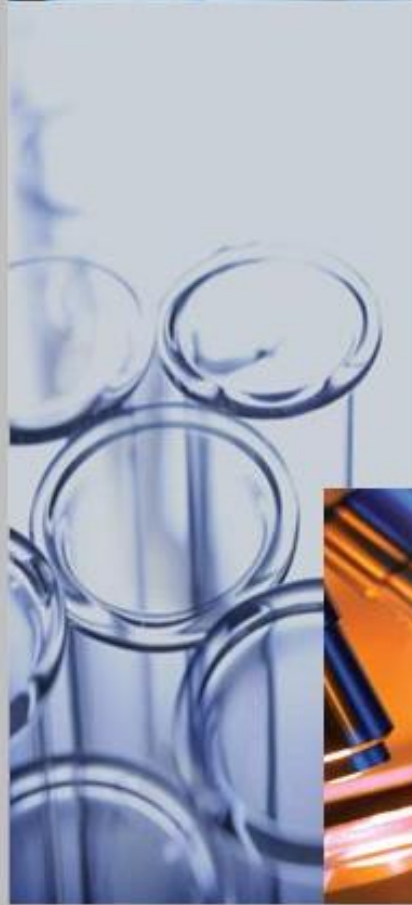




## CONFIDENTIAL REPORT

### DryWired

*Prepared By:*  
**Avomeen Analytical Services**  
4840 Venture Drive  
Ann Arbor, MI 48108  
Date: June 17, 2015



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## Off-gassing testing

Thank you for contacting Avomeen Analytical Services for off-gassing testing. Following are the results, methodology, and data associated with our analysis of the sample.

**Table 1:** Sample Description

Avomeen Sample ID	Sample Description
042415DR5858	3x3 piece of 4 mm flat glass coated with Nanotint

## Executive Summary

The goal of this analysis was to determine off-gassing on the Nanotint coated glass material.

The analysis revealed less than 5 ppm (detection limit) outgassing from the Nanotint coated sample (042415DR5858) into both channels (FID and MSD). Off-gassing analysis was performed at 140°F (60°C).

## Analytical Testing

### Initial Observations

The sample was received for analysis on April 24th, 2015. The sample was a piece of glass. A photograph of the samples "As Received" can be found in Figure 1.



**Figure 1:** Photograph of the Samples "As Received"

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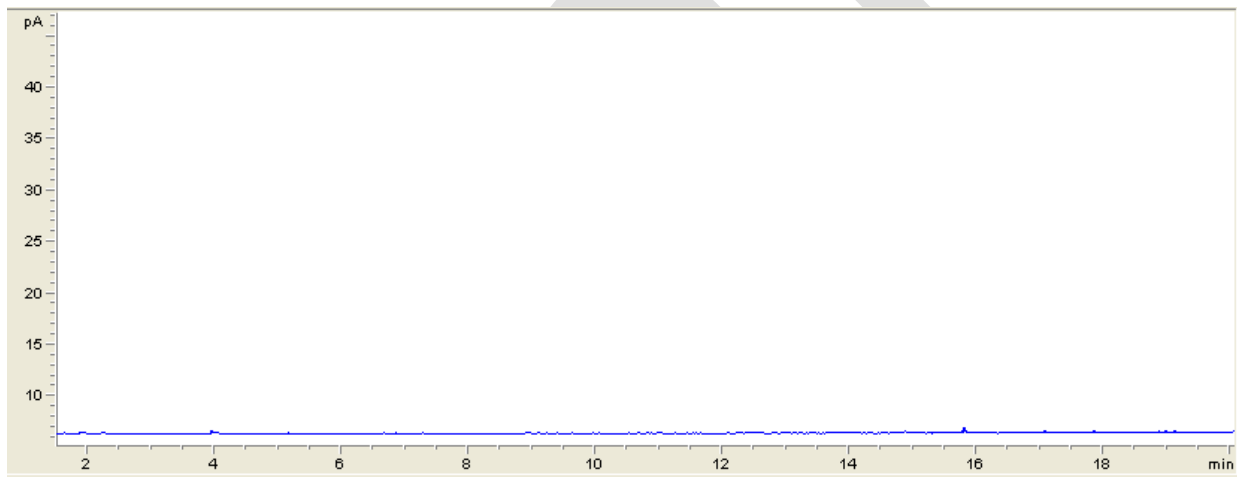
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**GC-FID-MS profiling**

**Table 2:** GC-FID-MS method for the determination of the VOC 60°C (140°F)

GC-FID-MS Conditions				
System	Agilent 6890N			
Column	DB-1, 30 m x 0.32 mm, 1 µm			
Carrier gas	Helium, 50 cm/sec			
Gradient	Time, min	Temperature, °C	Rate, °C/min	Time, min
	0	40	0	5
	5	40	10	26
	31	300	0	10
Injection	SPME, 100 µm PMDS			
Detection	FID and MSD			

The analysis revealed less than 5 ppm (detection limit) outgassing from the Nanotint coated sample (042415DR5858) into both channels (FID and MSD). Off-gassing analysis was performed at 140°F (60°C). (See Table 2 for summary of method, Figure 2 for chromatogram, Figure 3 for calibration curve, Table 3 for calibration table.)



**Figure 2:** GC-FID trace of headspace analysis of tinted glass sample

**Calibration:**

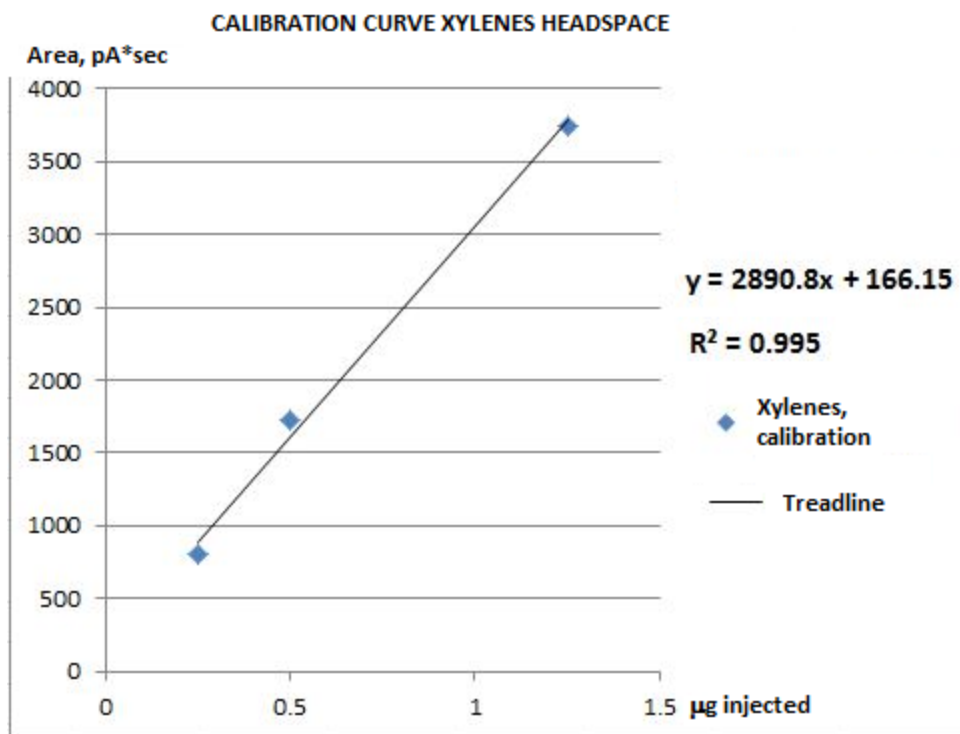
Xylene was used as a compound for calibration. Calibration table is shown in Table 3 and Calibration curve with the calibration equation is shown in the Figure 3.

**Table 3:** Calibration table (see Figure 3)

µg of xylenes injected	Repetition			Average Area, pA*sec
	1	2	3	
0.25	800	790	826	805
0.5	1703	1731	1721	1718
1.25	3740	3730	3756	3742

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**Figure 3:** Calibration curve (see Table 3)

### Description of Instrumentation Used

**Gas Chromatography (GC):** GC analysis is commonly used to separate and analyze vaporized volatile compounds. This system uses an inert gas to carry the sample through a separatory column, and then detects the retention time of different compounds in the column. Avomeen’s scientists often use gas chromatography to help in the identification of an unknown compound, or mixture of compounds. Avomeen’s Gas Chromatography capabilities include autosampling, flame ionization detection, and the use of a range of polar and non-polar columns.

**Gas Chromatography/Mass Spectroscopy (GC/MS):** GC/MS testing allows for the analysis of samples along multiple dimensions of chemical properties, providing specific identification of the different compounds separated during the GC analysis. The gas chromatograph separates a complex mixture into its individual components and delivers each one to the mass spectrometer. This analysis generates a chromatogram consisting of different peaks, one for each component of a mixture. The area of each peak is used to measure quantity. GC/MS analysis can be used both for qualitative and quantitative determinations of chemical composition.

**Solid-phase micro extraction (SPME):** is a sample preparation technique that involves the use of a fiber coated with an extracting phase, that can be a liquid (polymer) or a solid (sorbent), which extracts different kinds of analytes (including both volatile and non-volatile) from different kinds of media, which can be in liquid or gas phase. The quantity of analyte extracted by the fiber is proportional to its concentration in the sample as long as equilibrium is reached or, in case of short time pre-equilibrium, with help of convection or agitation. SPME is fast, simple and reliable technique that can be used without solvents, and detection limits can reach parts per trillion (ppt).

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## Wrap Up

Testing results relate only to items tested. Test report shall not be reproduced, except in full, without approval from Avomeen, LLC in writing.

Thank you for consulting with Avomeen Analytical Services. If you have any questions regarding this analysis, or if we can be of any further assistance, please call us at (800) 930-5450. Following the receipt of this final report, a final invoice indicating the remaining payment will be sent to you. We will safely and securely dispose of all samples and confidential information in our possession in 30 days, unless otherwise instructed by your company.

It has been a pleasure working with you and we look forward to serving you again.

Sincerely,

**Avomeen Analytical Services**

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