August 15, 2007

Mr. Jakes Hawkes
Dauphin
300 Myrtle Avenue
Boonton, NJ 07005

Phone No.: (973) 263-1100

jhawkes@dauphin.com

Subject: **Report of BIFMA X7.1 Emission Testing**
Teo Visitor Chair
MAS Project No. M 44249

Dear Mr. Hawkes:

Materials Analytical Services, LLC. (MAS) is pleased to submit this report for emissions testing relative to potential VOC off-gassing from the **Teo Visitor Chair** sample submitted for analysis by Dauphin on July 31, 2007. This report summarizes our testing procedures and the results of our analytical measurements.

This project was conducted in general accordance with the BIFMA M7.1 standard scope of work, which you authorized. Based on our test results, the subject sample submitted for analysis meets the **BIFMA X7.1 performance standard** set for seating/office chairs to be classified as low-emitting products. As such, the **Teo Visitor Chair** is eligible for **LEED's Commercial Interiors EQ 4.5 credit**. Further, by successful conformance with the BIFMA standard, the **Teo Visitor Chair** also meets the criteria of **MAS Certified Green®**.

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 to you, please do not hesitate to contact us.

Sincerely,
MATERIALS ANALYTICAL SERVICES, LLC

Martin R. Bennett
Senior Consultant

Randy Stapleton
Analytical Chemist

MANUFACTURER / SAMPLE DESCRIPTION

On July 31, 2007, Dauphin submitted a sample of their Teo Visitor Chair to Materials Analytical Services, Inc. (MAS) for emissions testing. The chair was delivered to our Suwanee, Georgia office via Federal Express Ground Service arriving in the manufacturer's standard shipping container comprised of a sealed outer cardboard box containing the submitted product in an inner sealed plastic bag under chain-of-custody. The manufacturer and sample specifics as described in the accompanying chain-of custody are summarized below:

Manufacturer: Dauphin
300 Myrtle Avenue
Boonton, NJ 07005

Phone: 973-263-1100 ext 118

Product Name: Teo Visitor Chair
Number of Samples: 1

Part Number	Model / Description
TO9370	Teo Visitor Chair

Manufacture Date: July 27, 2007
Collection Date: July 27, 2007
Shipping Date: July 27, 2007
Laboratory Arrival Date: July 31, 2007

SAMPLE HANDLING

Upon arrival of samples to the laboratory each was assigned a specific lab sample ID for tracking purposes. Sample ID's and a timeline of milestone dates for each of the sample are summarized below:

Lab Assigned ID	Manufacturer's Product ID	Sample Description	Test Date - Duration
M44249	Teo Visitor Chair	Orange Fabric Upholstered Arm Chair w/ Chrome Tubular Frame	8/4/07-8/11/07

EMISSIONS TESTING CONDITIONS

Per American Seating's request the subject sample was sampled and analyzed in accordance with the Business and Institutional Furniture Manufacturer's Association (BIFMA) M7.1 2005 *Standard Test Method for Determining VOC Emissions from Office Furniture Systems, Components and Seating*. Under the provisions of this method, testing consisted of the following procedural steps:

- Specific procedures for specimen receiving, handling, and preparation
- 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 23 ± 3°C and 50% ± 15% RH.
- Sample placement within MAS's large (1000 ft^3) stainless steel emission chamber (interior volume – 28.3 m^3) and conditioning for 72 hours. Air flow into the chamber is maintained for a minimum of 168 hours at the following specifications: Ventilation Rate = 4.2 cfm, temperature = 23 ± 1°C, Relative Humidity = 50 ± 5% RH.
- Collection of air samples at 72 and 168-hours following sample conditioning. Air samples are collected from the large chamber exhaust port utilizing mass flow controllers calibrated at 200 cc/min for TVOC and at 300 cc/min for aldehydes.
- Tenax TA® tubes are used for VOC analysis which is 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 which is performed using HPLC using a modified NIOSH 2016 method.
- Instrument calibration and identification of the target list of VOCs for quantification by GC/MS (refer to attached Appendix from BIFMA M7.1-2005)

For quality assurance purposes, background samples were collected prior to running each of the product samples. The results of the emissions tests are summarized in the tables on the following page:

Table Ia
Concentration of VOCs between n-C_6 and n-C_{16}
Measured by GC/MS in (µg/m^3)

VOC Name	72nd hour				168th hour			
	#1	#2	Mean	% diff.	#1	#2	Mean	% diff.
4-PC	<1.3	<1.3	<1.3	0	<1.3	<1.3	<1.3	0
Total Aldehydes	<1.3	<1.3	<1.3	0	<1.3	<1.3	<1.3	0
$TVOC_{Toluene}$	15	15	15	0	12	10	11	20

Table Ib
Concentration of Formaldehyde and Acetaldehyde
Measured by HPLC in (µg/m^3)

VOC Name	72nd hour				168th hour			
	#1	#2	Mean	% diff.	#1	#2	Mean	% diff.
Formaldehyde	21	21	21	0	17	17	17	0
Acetaldehyde	<2.8	<2.8	<2.8	0	<2.8	<2.8	<2.8	0

Table II
Calculated Emission Factors for Identified VOCs, $TVOC_{sum}$, and $TVOC_{Toluene}$, Formaldehyde and Acetaldehyde in (µg/h/unit) and Power-Law Model Coefficients

VOC Name	Emission Factor		Power-law Model Coefficients for $E=a\ t^{-b}$	
	72nd hour	168th hour	a	b
4-PC	<4.6	<4.6	NA	NA
Total Aldehydes	149	120	520.6	0.366
$TVOC_{Toluene}$	109	80	520.6	0.366
Formaldehyde	149	120	431.7	0.249
Acetaldehyde	<20	<20	NA	NA

Table III

Predicted Concentrations in a Typical Office Environment of a Single Office Workstation System* in (µg/m^3)

VOC Name	Based on the Measured Data UNITS		Based on the Power-Law Model Prediction
	72nd hour (3 days)	168th hour (7 days)	336th hour (14 days)
4-PC	<0.61	<0.61	<0.61
Total Aldehydes	9.9	8.0	6.8
$TVOC_{Toluene}$	7.3	5.3	4.1
Formaldehyde	9.9	8.0	6.8
Acetaldehyde	<1.3	<1.3	<1.3

(*Assuming a ventilation rate of 4.17 L/s (8.84 cfm) for a typical open plan environment or 9.63 L/s (20.4 cfm) for a typical office environment as defined by BIFMA M7.1-2005 section 6.5)

CONCLUSIONS

Based on the emissions test data, MAS offers the following findings:

- The measured concentrations of $TVOC_{Toluene}$, Formaldehyde, Total Aldehydes and 4-Phenylcyclohexane released from the tested chair are below the BIFMA specified emission limits set for seating:

Chemical Contaminant	Emissions Limits System Furniture
$TVOC_{Toluene}$	≤0.5 mg/m^3 or ≤ 500 µg/ m^3
Formaldehyde	≤50 ppb or ≤ 61 µg/ m^3
Total Aldehydes	≤100 ppb
4-Phenylcyclohexane	≤0.0065 mg/m^3 or ≤ 6.5 µg/ m^3

As such the Teo Visitor Chair is in compliance with the BIFMA x7.1-2005 criteria.

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

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