Air Quality Sciences

September 5, 2012

Mr. Markus Raves
Surteco Canada Ltd.
230 Orenda Rd
Brampton, Ontario L6T1E9
CANADA

Subject: AQS Project 90304, Out-of-Scope Profile Study Test Results

Dear Markus:

Thank you for choosing Air Quality Sciences, Inc. (AQS), an ISO 17025 accredited testing laboratory, for your analytical needs. Attached to this letter are out-of-scope profile study test results, including predicted room concentrations.

Sample Description	Predicted Levels Compared to GREENGUARD IAQ Criteria		
	TVOC	Formaldehyde	Total Aldehydes
WL 50 Lite Bache 660 N	X	✓	✓

✓ - meets criteria; ✓* - meets within 25%; X - over criteria

Sample Description	Predicted Levels Compared to GREENGUARD Children & Schools Criteria			
	TVOC	Formaldehyde	Total Aldehydes	CREL/TLV Issues
WL 50 Lite Bache 660 N	✓	✓	✓	---

✓ - meets criteria; ✓* - meets within 25%; X - over criteria

Please note included is a comparison of this product's GREENGUARD Children & Schools formaldehyde level to the CA CREL of 7.3 ppb (9 µg/m³), the CA Specification 01350 guidance value, effective January 1, 2012. By January 1, 2013, all GREENGUARD Children & Schools products will be required to meet this lower formaldehyde limit.

AQS appreciates your business. Soon you will be contacted by your GREENGUARD Program Account Manager, Eugene Smith (678) 444-4068.

Please keep in mind that all information obtained as part of the out-of-scope profile study testing is confidential as per the signed Testing Agreement.

Sincerely,

Allyson McFry

Allyson M. McFry
Chemistry Laboratory Director

Attachment: AQS Report No. 90304-30

2211 Newmarket Parkway
Atlanta, GA 30067
770-933-0638 • Fax 770-933-0641

Air Quality Sciences

Released by Air Quality Sciences, Inc.
Date Prepared: September 5, 2012
AQS Project #: 90304
AQS Report #: 90304-30

GREENGUARD CERTIFICATION TEST

for

SURTECO CANADA LTD.

Certification Category: SURFACING MATERIALS
Test Product Description: WL 50 Lite Bache 660 N

2211 Newmarket Parkway
Atlanta, GA 30067
770-933-0638 • Fax 770-933-0641

An ISO 17025 Accredited IAQ Firm
This test is accredited and meets the requirements of ISO/IEC 17025 as verified by ANSI-ASQ National Accreditation Board/ACLASS.
Refer to certificate and scope of accreditation AT-1297.

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EXECUTIVE SUMMARY

PROJECT DESCRIPTION

Air Quality Sciences, Inc. (AQS) is pleased to present the results of its indoor air quality (IAQ) evaluation of a **Surfacing Materials** product identified as "WL 50 Lite Bache 660 N." AQS conducted this study using a GREENGUARD product evaluation test protocol (1) following the requirements of The GREENGUARD Environmental Institute's (GEI) Product Certification Program, ASTM Standard D 5116, and the United States Environmental Protection Agency (USEPA) (2-4). Testing of the product was conducted using standard environmental chamber operating conditions as presented in Table 1. The edgebanding was delivered to AQS by the manufacturer as presented in the Chain of Custody description in Appendix 1.

The edgebanding was monitored for emissions of total volatile organic compounds (TVOC), formaldehyde, total aldehydes, and other individual volatile organic compounds (IVOCs) over a 168 hour exposure period. These emissions were measured and the resultant air concentrations were determined for each of the potential pollutants. Air concentration predictions were computer modeled based on the GEI Requirements, which include a standard room loading and ASHRAE Standard 62.1-2010 ventilation conditions (5). Product loading is based on a standard baseboard usage (2.7 m^2) in a 32 m^3 room. Results were compared to current emission levels as required by the GREENGUARD IAQ standard (6). Results for the GREENGUARD Children & Schools certification program are included as Appendix 4.

RESULTS

Emissions data and expected air concentrations are given in Tables 2-4, detected individual volatile organic compounds are listed in Table 5, and individual aldehydes are listed in Table 6. Appendix 3 presents supplemental emissions information on individual VOCs, which may be requested by certain purchasing programs.

The edgebanding identified as "WL 50 Lite Bache 660 N" qualifies as low-emitting; it meets all of the emission level requirements of the GREENGUARD Certification Program[SM] as indicated below.

GREENGUARD Acceptable IAQ Criteria		168 Hour Product Measurement	Product Compliance for IAQ
TVOC	≤ 0.25 mg/m³	0.28 mg/m³	No
Formaldehyde	≤ 0.025 ppm	< 0.001 ppm	Yes
Total Aldehydes	≤ 0.05 ppm	< 0.001 ppm	Yes
4-Phenylcyclohexene	≤ 0.0033 mg/m³	< 0.001 mg/m³	Yes
Individual VOCs	all ≤ 1/10 TLV*	----------	Yes

* All individual VOCs detected met the criteria of less than 1/10 the ACGIH established threshold limit values (TLVs) (ref. 16).

PRODUCT EVALUATION METHODOLOGIES

ENVIRONMENTAL CHAMBER

The edgebanding was tested in a small sized environmental chamber 0.0867 m^3 in volume, and chemical emissions were analytically measured. Environmental chamber operation and control measures used in this study complied with GREENGUARD Method and Laboratory Quality Requirements and ASTM Standard D 5116. The chamber used is manufactured from stainless steel, and its interior is polished to a mirror-like finish to minimize contaminant adsorption. Air flow through the chamber enters and exits through an aerodynamically designed air distribution manifold also manufactured of stainless steel. Supply air to the chamber is stripped of formaldehyde, VOCs, and other contaminants, so that any contaminant backgrounds present in the empty chamber fall below strict levels (< 10 µg/m^3 TVOC, < 10 µg/m^3 total particles, < 2 µg/m^3 formaldehyde, and < 2 µg/m^3 for any individual VOC). AQS chambers are process controlled and are equipped with a continuous data acquisition system for verification of the operating conditions of air flow, temperature, and humidity.

Air supply to the chamber was maintained at a temperature of 23ºC ± 2ºC and relative humidity at 50% ± 5%. The air exchange rate was 1.00 ± 0.05 air change/hour (ACH). Environmental chamber study parameters are presented in Table 1.

ANALYTICAL MEASUREMENTS

Selected Aldehydes

Emissions of selected aldehydes including formaldehyde were measured following ASTM D 5197 and USEPA Method TO-11A, measurement by HPLC, or high performance liquid chromatography (1, 7, 8). Solid sorbent cartridges with 2,4-dinitrophenylhydrazine (DNPH) were used to collect formaldehyde and other low-molecular weight carbonyl compounds in chamber air. The DNPH reagent in the cartridge reacted with collected carbonyl compounds to form the stable hydrazone derivatives retained by the cartridge.

The hydrazone derivatives were eluted from a cartridge with HPLC-grade acetonitrile. An aliquot of the sample was analyzed for low-molecular weight aldehyde hydrazone derivatives using reverse-phase high-performance liquid chromatography (HPLC) with UV detection. The absorbances of the derivatives were measured at 360 nm. The mass responses of the resulting peaks were determined using multi-point calibration curves prepared from standard solutions of the hydrazone derivatives. Measurements are reported to a quantifiable level of 0.1 µg based on a standard air volume collection of 45 L.

Volatile Organic Compounds

VOC measurements were made using gas chromatography with mass spectrometric detection (GC/MS). Chamber air was collected onto a solid sorbent which was then thermally desorbed into the GC/MS. Instrumentation included a sample concentrator (Perkin Elmer Model TurboMatrix ATD or TurboMatrix 650), a Hewlett-Packard/Agilent 6890 or 7890 Series Gas Chromatograph and a Hewlett-Packard/Agilent 5973 or 5975 Mass Selective Detector (GC/MS). The sorbent collection technique, separation, and detection analysis methodology has been adapted from techniques presented by the USEPA and other researchers. The technique follows USEPA Compendium Method TO-17 and ASTM D 6196 and is generally applicable to C_6 - C_{16} organic chemicals with boiling points ranging from 35ºC to 250ºC (1, 8-12). Measurements are reported to a quantifiable level of 0.04 µg based on a standard air volume collection of 18 L.

Individual VOCs were separated and detected by GC/MS. The TVOC measurements were made by adding all individual VOC responses obtained by the mass spectrometer and calibrating the total mass relative to toluene. Individual VOCs were identified using AQS' specialized indoor air mass spectral database and quantitated using multipoint calibration standards, if available. Other compounds were identified with less certainty using a general mass spectral library available from the National Institute of Standards and Technology (NIST). Calibration is typically based on toluene equivalent unless an authentic standard is available. This library contains mass spectral characteristics of more than 75,000 compounds as made available from NIST, the USEPA and the National Institutes of Health (NIH). A match is first sought in the AQS database, which includes data for the gas chromatographic retention time of the compound in addition to the mass spectrum. This additional information, along with the use of spectra generated on AQS equipment, makes confidence in identifications made from the AQS database higher than in identifications made using only the NIST/USEPA/NIH mass spectral library.

AIR CONCENTRATION DETERMINATIONS

Emission rates of formaldehyde, total aldehydes, and TVOC were used in a computer model to determine potential air concentrations of the pollutants. The computer model used the measured emission rate changes over the one-week time period to determine the change in air concentrations that would accordingly occur.

The emission factor can be modeled according to a first-order decay:

$$EF_m = EF_0 e^{-kt}$$

where,
EF_m = modeled emission factor (µg/m²·hr) or (µg/unit·hr)
EF_0 = initial emission factor (µg/m²·hr) or (µg/unit·hr)
k = rate constant (hr^{-1})
t = time (hr)

or a power law decay:

$$EF_m = EF_0 t^{-k}$$

where,
EF_m = modeled emission factor (µg/m²·hr) or (µg/unit·hr)
EF_0 = initial emission factor (µg/m²·hr) or (µg/unit·hr)
k = rate constant (hr^{-1})
t = time (hr).

Regression analysis was used to determine the model that best fits the data. The use of least squares fitting, a mathematical procedure for finding the best-fitting curve to a given set of points by minimizing the sum of the squares of the offsets of the points from the curve, dictates the appropriate model for the given product.

The model measurements were made with the following assumptions: air within open office areas of the building is well-mixed at the breathing level zone of the occupied space; environmental conditions are maintained at 50% relative humidity and 23ºC (73ºF); there are no additional sources of these pollutants; and there are no sinks or potential re-emitting sources within the space for these pollutants. Ventilation and occupancy parameters were those provided in ASHRAE

Standard 62.1-2010.

The constant emission factor (as determined at 168 hour) is used to determine compliance with the GREENGUARD Criteria by calculating an exposure concentration. The predicted exposure concentrations ($C_{P,t}$) (µg/m³) are calculated from the modeled emission factors as:

$$C_{P,t} = EF_{m,t}\left(\frac{A}{V}\right)\left(\frac{1}{N}\right)$$

where,

$C_{P,t}$	=	predicted exposure concentration at time t (µg/m³)
$EF_{m,t}$	=	modeled emission factor at time t (µg/m²·hr) or (µg/unit·hr)
A	=	product area exposed in room (m² or unit) = 2.7 m²
V	=	room volume (m³) = 32 m³
N	=	room air change per hour (hr^{-1}) = 0.72 hr^{-1}

If data are to be used in determining compliance to the GREENGUARD Children & Schools and/or GREENGUARD Select standards, the 168 hour data are modeled according to the appropriate model(s) as outlined in GGPS.002 (13) and/or GGPS.007 (14), respectively. Data are presented in a supplemental Children & Schools and/or Select report(s) based on the VOC emissions in this test report.

QUALITY CONTROL PROCEDURES FOR ENVIRONMENTAL CHAMBER EVALUATIONS

Air Quality Sciences, Inc. is an ISO 17025 accredited testing firm with defined and executed internal and third party verification programs encompassing emission test methods and low level pollutant measurements. AQS' quality control/assurance plan is designed to ensure the integrity of the measured and reported data obtained during its product evaluation studies. This QC program encompasses all facets of the measurement program from sample receipt to final review and issuance of reports. As an ISO 17025 accredited firm, AQS' product control, testing, data handling, and reporting protocols and procedures are standardized and controlled. AQS participates in proficiency and accreditation measurement programs for VOC and emission testing as required by the State of California, Germany Ministry of Health's Blue Angel Program, Workplace Analysis Proficiency Scheme (WASP) and GREENGUARD Certification Programs. Quality Assurance is maintained through AQS' computerized data management system (ADM). An electronic "paper trail" for each analysis is also maintained and utilized to track the status of each sample, and to store the results. A complete quality report can be provided upon request and all test data and analysis procedures are available on site for customer review.

Chamber Evaluations

One of the most critical parameters in AQS' product evaluations is the measurement of ultratrace levels of gaseous chemicals, typically in the ppb air concentration range. This necessitates a very rigidly maintained effort to control background contributions and contamination. These contributions must be significantly less than those levels being measured for statistically significant data to be obtained. AQS addresses this control in many directions including chamber construction materials, air purification and humidification, sampling materials and chemicals, sample introduction, and analysis.

Supply air purity is monitored on a weekly basis, using identical methodology to the chamber testing. The supply air is assured to contain less than 10 µg/m³ TVOC, < 10 µg/m³ total particles, < 2 µg/m³ formaldehyde, and < 2 µg/m³ for any individual VOC. Preventative maintenance ensures supply air purity, and corrective action is taken when any potential problems are noted in weekly samples. Supply air filter maintenance is critical for ensuring the purity of the chamber supply air. Chamber background samples are obtained prior to product exposure to ensure contaminant backgrounds meet the required specifications prior to product exposure. Results of this monitoring are maintained at AQS and available for on-site inspection.

All environmental chamber procedures are in accordance with ASTM D 6670 (15) and D 5116, and the GREENGUARD test method is strictly followed so that all data quality objectives are met.

Various measures are routinely implemented in a product's evaluation program. These include but are not limited to:

appropriate record keeping of sample identifications and tracking throughout the study;

calibration of all instrumentation and equipment used in the collection and analysis of samples;

validation and tracking of all chamber parameters including air purification, environmental controls, air change rate, chamber mixing, air velocities, and sample recovery;

analysis of spiked samples for accuracy determinations;

duplicate analyses of 10% of all samples evaluated and analyzed;

multi-point calibration and linear regression of all standardization;

analysis of controls including chamber backgrounds, sampling media, and instrumental systems.

VOC and Aldehyde Measurements

Precision of TVOC and aldehyde analyses is assessed by the relative standard deviation (%RSD) from duplicate samples, defined as the standard deviation of each data set divided by the mean multiplied by 100. VOC accuracy is based on recovery of toluene mass spiked onto sorbent material. QC data on TVOC measurements conducted for the 12 month period ending July 31, 2012, showed an average precision measurement of 5.5% RSD based on duplicate measurements and 101.1% recovery based on toluene spikes. Aldehyde accuracy is based on Workplace Analysis Proficiency Scheme (WASP) formaldehyde proficiency test results. QC data on total aldehyde measurements (including formaldehyde) for the 12 month period ending July 31, 2012, showed an average precision measurement of 2.3% RSD based on duplicate measurements and an average accuracy of 2.6% RPD based on WASP results. Performance audits have been conducted on-site at AQS by the U.S. Environmental Protection Agency for several industry test programs. They are favorable and are open for review at AQS. Third party proficiency and round robin testing for low level VOCs for national and international programs are continuously conducted and reported in AQS' quarterly Quality Assurance Report, available to all customers.

TABLE 1

ENVIRONMENTAL CHAMBER STUDY PARAMETERS
SURTECO CANADA LTD.
PRODUCT 90304-O0350AA

Product Description:	SURFACING MATERIALS; WL 50 Lite Bache 660 N (one-sided area = 0.0174 m^2) Product Documentation Sheet with photograph (Appendices 1 and 2)
Product Loading:	0.20 m^2/m^3
Test Conditions:	1.0 ± 0.05 ACH 50 % RH ± 5% RH 23°C ± 2°C
Test Period:	08/17/12 - 08/24/12
Pollutant Emissions Evaluated:	Total Volatile Organic Compounds Individual Volatile Organic Compounds Formaldehyde Target List Aldehydes
Test Description:	The product was received by AQS on 08/15/12 as packaged and shipped by the customer. The package was visually inspected and stored in a controlled environment immediately following sample check-in. Just prior to loading, the product was unpackaged and prepared for the required loading to expose the top surface side only. The sample was placed inside the environmental chamber, and tested according to the specified protocol.

Environmental chamber test following ASTM D 5116 in a 0.09 ± 0.007 m^3 chamber.

TABLE 2

SUMMARY OF TVOC EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS

PRODUCT 90304-O0350AA; SURFACING MATERIALS; WL 50 LITE BACHE 660 N

ELAPSED EXPOSURE HOUR*	EMISSION FACTOR µg/m²•hr	PREDICTED AIR CONCENTRATION** µg/m³
6	9,170	1,070
24	5,420	636
48	4,000	473
72	3,700	398
96	3,190	352
168	2,230	278
Power Law Decay Constant = k_T = 0.426		

*Exposure hours are nominal (± 1 hour).
**Prediction based on a standard baseboard usage (2.7 m²) in a room with ASHRAE 62.1-2010 ventilation conditions (32 m³ in volume and 0.72 ACH).
BQL = Below quantifiable level of 0.04 µg based on a standard 18 L air collection volume.

TABLE 3

SUMMARY OF FORMALDEHYDE EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS

PRODUCT 90304-O0350AA; SURFACING MATERIALS; WL 50 LITE BACHE 660 N

ELAPSED EXPOSURE HOUR*	EMISSION FACTOR µg/m²•hr	PREDICTED AIR CONCENTRATION**	
		µg/m³	ppm
6	BQL	< 1	< 0.001
24	BQL	< 1	< 0.001
48	BQL	< 1	< 0.001
72	BQL	< 1	< 0.001
96	BQL	< 1	< 0.001
168	BQL	< 1	< 0.001

*Exposure hours are nominal (± 1 hour).
**Prediction based on a standard baseboard usage (2.7 m²) in a room with ASHRAE 62.1-2010 ventilation conditions (32 m³ in volume and 0.72 ACH).
BQL = Below quantifiable level of 0.1 µg based on a standard 45 L air collection volume.

TABLE 4

SUMMARY OF TOTAL ALDEHYDE EMISSION FACTORS AND PREDICTED AIR CONCENTRATIONS

PRODUCT 90304-O0350AA; SURFACING MATERIALS; WL 50 LITE BACHE 660 N

ELAPSED EXPOSURE HOUR*	EMISSION FACTOR µg/m²•hr	PREDICTED AIR CONCENTRATION**	
		µg/m³	ppm
6	203	24	0.013
24	30.4	4	0.002
48	BQL	< 1	< 0.001
72	BQL	< 1	< 0.001
96	BQL	< 1	< 0.001
168	BQL	< 1	< 0.001

*Exposure hours are nominal (± 1 hour).
**Prediction based on a standard baseboard usage (2.7 m²) in a room with ASHRAE 62.1-2010 ventilation conditions (32 m³ in volume and 0.72 ACH).
BQL = Below quantifiable level of 0.1 µg based on a standard 45 L air collection volume.

TABLE 5

EMISSION FACTORS OF IDENTIFIED INDIVIDUAL VOLATILE ORGANIC COMPOUNDS
µg/m²•hr

PRODUCT 90304-O0350AA; SURFACING MATERIALS; WL 50 LITE BACHE 660 N

CAS NUMBER	COMPOUND IDENTIFIED	ELAPSED EXPOSURE HOUR					
		6	24	48	72	96	168
108-05-4	Acetate, vinyl (Acetic acid ethenyl ester)†	1,700	910	457	354	89.7	
108-94-1	Cyclohexanone	698	474	361	369	303	213
17302-11-3	Nonane, 3-ethyl	679	407	314	286	260	183
62183-55-5	Octane, 3-ethyl-2,7-dimethyl*	505	301	226	204	194	138
17312-55-9	Decane, 3,8-dimethyl*	433	250	188	165	159	110
13475-82-6	Heptane, 2,2,4,6,6-pentamethyl	422	409	351	476	316	264
13150-81-7	Decane, 2,6-dimethyl	343	202	149	142	127	92.2
106-42-3	Xylene (para and/or meta)†	342	184	128	107	93.2	47.3
2847-72-5	Decane, 4-methyl	338	195	143	133	119	81.7
62016-14-2	Octane, 2,5,6-trimethyl*	330	197	151	140	126	88.2
1120-21-4	Undecane	303	172	127	111	107	72.8
112-40-3	Dodecane	263	144	110	96.2	95.2	66.3
52670-34-5	Octane, 2,3,6,7-tetramethyl-*	258	145	109	96.2	92.7	65.8
6975-98-0	Decane, 2-methyl	257	151	113	104	94.7	68.3
1632-70-8	Undecane, 5-methyl*	226	135	98.7	102	89.2	67.3
17312-54-8	Decane, 3,7-dimethyl-*	217	126	95.7	88.2	80.2	56.8
17302-36-2	5-Ethyldecane*	192	105	80.7	53.3	62.3	37.9
57-55-6	1,2-Propanediol (Propylene glycol)	190	92.7	61.8	42.9	40.9	23.9
17312-53-7	Decane, 3,6-dimethyl*	186	109	81.7	74.8	69.8	49.3
13151-35-4	Decane, 5-methyl*	180	108	79.7	70.3	65.8	44.9
17312-72-0	Heptane, 4,4-dipropyl*	168	98.2	71.3	63.3	60.3	40.4
7045-71-8	Undecane, 2-methyl	163	89.7	69.8	60.3	59.3	42.4
17312-76-4	Undecane, 6,6-dimethyl*	163	91.2	69.3	73.8	57.8	39.9
95-47-6	Xylene, ortho†	152	81.2	59.3	61.3	46.4	28.4
62016-33-5	Octane, 2,3,6-trimethyl*	146	98.2	72.8	73.3	60.3	44.4
62016-37-9	Octane, 2,4,6-trimethyl*	136	74.3	56.3	48.8	44.9	29.4
54166-32-4	Octane, 2,6,6-trimethyl*	133	79.7	60.3	52.8	51.3	34.9
62016-30-2	Octane, 2,3,3-trimethyl-*	129	72.8	52.8	48.8	43.4	29.4
17302-28-2	Nonane, 2,6-dimethyl*	107	62.3	48.3	42.4	38.9	26.9
2884-06-2	Nonane, 2,3-dimethyl*	100	59.3	44.4	40.4	37.4	25.9
100-41-4	Benzene, ethyl†	99.7	51.8	37.4	29.4	27.4	13.5

CAS NUMBER	COMPOUND IDENTIFIED	ELAPSED EXPOSURE HOUR					
		6	24	48	72	96	168
2980-69-0	Undecane, 4-methyl*	97.7	55.3	41.4	38.4	35.9	25.9
62016-34-6	Octane, 2,3,7-trimethyl*	83.2	47.8	36.4	32.9	30.4	21.4
13151-34-3	Decane, 3-methyl	66.3	34.9	26.9	24.4	23.4	15.9
17312-80-0	Undecane, 2,4-dimethyl	65.3	43.4	30.4			
17302-27-1	Nonane, 2,5-dimethyl*	59.3	35.4	26.9	25.4	22.4	15.5
1002-43-3	Undecane, 3-methyl*	52.3	29.9	21.9			
556-67-2	Cyclotetrasiloxane, octamethyl	42.4	23.4	18.4	17.9	15.9	11.5
17301-30-3	Undecane, 3,8-dimethyl*	33.9	14.0	13.0			
111-55-7	1,2-Ethanediol, diacetate (Ethylene glycol diacetate)	32.9	16.4				
294-62-2	Cyclododecane*	27.9	15.9	10.0			
17312-82-2	Undecane, 4,6-dimethyl*	27.4	16.4	11.0			
17312-57-1	Dodecane, 3-methyl*	25.4	13.0				
4704-31-8	Vinyl decanoate*	22.4	14.5	12.0			
124-18-5	Decane†	21.9	11.5				
629-50-5	Tridecane	21.4	11.5				
17301-94-9	Nonane, 4-methyl	20.9	10.5				
3050-69-9	n-Caproic acid vinyl ester*	17.4					
1560-97-0	Dodecane, 2-methyl*	16.4					
111-84-2	Nonane	14.0					
5911-04-6	Nonane, 3-methyl	13.0					
1678-82-6	Cyclohexane, 1-methyl-4-isopropyl, trans	12.5					
15869-85-9	Nonane, 5-methyl	12.5					
61141-72-8	Dodecane, 4,6-dimethyl*	12.0					
629-59-4	Tetradecane	11.0					
17301-23-4	Undecane, 2,6-dimethyl	10.0					

*Indicates NIST/EPA/NIH best library match only based on retention time and mass spectral characteristics.
†Denotes quantified using multipoint authentic standard curve. Other VOCs quantified relative to toluene.
Quantifiable level is 0.04 µg based on a standard 18 L air collection volume.

TABLE 6

EMISSION FACTORS OF TARGET LIST ALDEHYDES
µg/m²•hr

PRODUCT 90304-O0350AA; SURFACING MATERIALS; WL 50 LITE BACHE 660 N

CAS NUMBER	COMPOUND IDENTIFIED	ELAPSED EXPOSURE HOUR					
		6	24	48	72	96	168
4170-30-3	2-Butenal	BQL	BQL	BQL	BQL	BQL	BQL
75-07-0	Acetaldehyde	**203**	**30.4**	BQL	BQL	BQL	BQL
100-52-7	Benzaldehyde	BQL	BQL	BQL	BQL	BQL	BQL
5779-94-2	Benzaldehyde, 2,5-dimethyl	BQL	BQL	BQL	BQL	BQL	BQL
529-20-4	Benzaldehyde, 2-methyl	BQL	BQL	BQL	BQL	BQL	BQL
620-23-5 /104-87-0	Benzaldehyde, 3- and/or 4-methyl	BQL	BQL	BQL	BQL	BQL	BQL
123-72-8	Butanal	BQL	BQL	BQL	BQL	BQL	BQL
590-86-3	Butanal, 3-methyl	BQL	BQL	BQL	BQL	BQL	BQL
50-00-0	Formaldehyde	BQL	BQL	BQL	BQL	BQL	BQL
66-25-1	Hexanal	BQL	BQL	BQL	BQL	BQL	BQL
110-62-3	Pentanal	BQL	BQL	BQL	BQL	BQL	BQL
123-38-6	Propanal	BQL	BQL	BQL	BQL	BQL	BQL

BQL = Below quantifiable level of 0.1 µg based on a standard 45 L air collection volume.

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APPENDIX 1

CHAIN OF CUSTODY

GREENGUARD Environmental Institute
2211 Newmarket Parkway, Suite 110
Marietta, GA 30067 USA
1.800.427.9681
www.greenguard.org 10000194

Chain of Custody
for the GREENGUARD Product Certification Programs

GREENGUARD Environmental Institute

Project # 90304	CUM!A1099	☐ RUSH Confirm with Laboratory Contact prior to submitting product	Test Group: Edge banding – 01 Product Category & Subcategory: Surfacing Materials / Surfacing (Thin)

Test Type	Analysis	Certification Type	Environments (for Select Certification only)
☐ Annual Certification Test Program Year ___	☐ TVOC, HCHO, and Total Aldehydes	☐ Indoor Air Quality	☐ Educational
☐ Quarterly Test Program Year ___ Quarter ___	☐ Full Speciation	☐ Children & Schools	☐ Residential
☐ Profile Study Test	☐ Additional Hour Points (specify)	☐ Select	☐ Healthcare
☒ Out-of-Scope Test	☒ Other (specify) 7 day decay test		☐ Commercial

Manufacturer Details

Name	Doellken -Weimar GmbH	City, State/Province, Zip/Postal Code	99428 Nohra b. Weimar
Street Address	Staggenallee 3	Country	Germany

Manufacturer Contact Details

Contact Name	Wolfgang Brenning	Phone Number	+49 3643 41 70 18
Title	Manager	E-Mail Address	wb@doellken-weimar.de

Product Details

Product ID\Name\Description (as it will appear on the report)	WL 50 life buche 660 N	Product Collected By	
Manufactured Date (mm/dd/yyyy)	13.08.2012	Collector's Signature	
Product Collection Location		Collector's Phone No.	
Product Collection Date/Time (mm/dd/yyyy hh:mm)		Number of Product Pieces	

Shipping Details

Packed By		Carrier	ups
Ship Date (mm/dd/yyyy)	8/13/12	Air Bill #	1Z6733820458110352
Ship to Laboratory:	Air Quality Sciences, Inc. 2211 Newmarket Parkway #106 Marietta, GA 30067 USA	Phone: 770-933-0638 Fax: 770-933-0641	

Signature Tracking Details

Relinquished By (Manufacturer)		Date & Time (mm/dd/yyyy hh:mm)	Signature

Post Testing Instructions

☐ Return Samples (information must be provided below for sample return)	☐ Discard sample(s) after testing
Return Shipper	Manufacturer's Shipping Acct #

Laboratory Receiving Details

Types of Containers:	each	Shipping Package Notes:	
Condition of Shipping Package	☒ Undamaged ☐ Damaged	Product Condition Notes:	
Condition of Product	☒ Acceptable ☐ Unacceptable		
Received by (Name)	JB	Signature	Date & Time: 13.08.12 8:00 AM

GG QF 016 R0

Released by Air Quality Sciences, Inc.
Date Prepared: September 5, 2012
AQS Project #: 90304
AQS Report #: 90304-30

APPENDIX 2

PHOTOGRAPH OF SAMPLE

PRODUCT 90304-O0350AA; SURFACING MATERIALS; WL 50 LITE BACHE 660 N

Released by Air Quality Sciences, Inc.
Date Prepared: September 5, 2012
AQS Project #: 90304
AQS Report #: 90304-30

APPENDIX 3

SUPPLEMENTAL EMISSIONS INFORMATION

The following chemicals as identified in the emissions from the edgebanding identified as "WL 50 Lite Bache 660 N" were found to exist on certain regulatory lists. This addendum only provides a statement regarding possible health effects associated with this compound and not the relative risks of exposure. Proper interpretation of the risks associated with exposure to a given regulated compound requires a more detailed evaluation of toxicological activity. You may be required to submit this information for certain purchasing programs. You may also use this information to assist in further product development efforts.

CAS NUMBER	COMPOUND	✓() = FOUND IN LISTING (CLASS)					
		CAL PROP. 65	NTP	IARC	CAL AIR TOXICS	CREL	TLV
75-07-0	Acetaldehyde	✓(1)	✓(2B)	✓(2B)	✓(IIA)	✓	✓
108-05-4	Acetate, vinyl (Acetic acid ethenyl ester)†			✓(2B)	✓(IIA)	✓	✓
100-41-4	Benzene, ethyl†	✓(1)		✓(2B)	✓(IIA)	✓	✓
108-94-1	Cyclohexanone			✓(3)			✓
111-84-2	Nonane						✓
1330-20-7	Xylenes (Total)†			✓(3)	✓(IIA)	✓	✓

†Denotes quantified using multipoint authentic standard curve

CAL Prop. 65: California Health and Welfare Agency, Proposition 65 Chemicals
1 = known to cause cancer
2 = known to cause reproductive toxicity

NTP: National Toxicology Program
2A = known to be carcinogenic to humans
2B = reasonably anticipated to be carcinogenic to humans

IARC: International Agency on Research of Cancer
1 = carcinogenic to humans
2A = probably carcinogenic to humans
2B = possibly carcinogenic to humans
3 = unclassifiable as to carcinogenicity to humans
4 = probably not carcinogenic to humans

California Air Toxics
I = Substances identified as Toxic Air Contaminants, known to be emitted in California, with a full set of health values reviewed by the Scientific Review Panel.
IIA = Substances identified as Toxic Air Contaminants, known to be emitted in California, with one or more health values under development by the Office of Environmental Health Hazard Assessment for review by the Scientific Review Panel.
IIB= Substances NOT identified as Toxic Air Contaminants, known to be emitted in California, with one or more health values under development by the Office of Environmental Health Hazard Assessment for review by the Scientific Review Panel.
III = Substances known to be emitted in California and are NOMINATED for development of health values or additional health values.
IVA = Substance identified as Toxic Air Contaminants, known to be emitted in California and are TO BE EVALUATED for entry into Category III.
IVBA =Substance NOT identified as Toxic Air Contaminants, known to be emitted in California and are TO BE EVALUATED for entry into Category III.
V = Substance identified as Toxic Air Contaminants, and NOT KNOWN TO BE EMITTED from stationary source facilities in California based on information from the AB 2588 Air Toxic "Hot Spots" Program and the California Toxic Release Inventory.
VI = Substances identified as Toxic Air Contaminants, NOT KNOWN TO BE EMITTED from stationary source facilities in California, and are active ingredients in pesticides in California.

CREL: California Office of Environmental Health's Hazard Assessment (OEHHA), Chronic Reference Exposure Levels
✓ = Found in Listing

ACGIH TLV American Conference of Governmental Industrial Hygienists Threshold Limit Values for Chemical Substances and Physical Agents.
✓ = Found in Listing.

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APPENDIX 4

TEST RESULTS FOR GREENGUARD CHILDREN & SCHOOLS CERTIFICATION

PREPARED FOR: SURTECO CANADA LTD.
PRODUCT: 90304-O0350AA; SURFACING MATERIALS; ; WL 50 LITE BACHE 660 N

COMPLIANCE WITH GREENGUARD CHILDREN & SCHOOLS STANDARD

GREENGUARD Acceptable IAQ Criteria		Product Measurement*	Product Compliance for IAQ
TVOC	≤ 0.22 mg/m³	0.11 mg/m³	Yes
Formaldehyde	≤ 0.0135 ppm/13.5 ppb	< 0.001 ppm/ < 1 ppb	Yes
Total Aldehydes	≤ 0.043 ppm/43 ppb	< 0.001 ppm/ < 1 ppb	Yes
1-Methyl-2-Pyrrolidinone	≤ 0.16 mg/m³	< 0.001 mg/m³	Yes
Individual VOCs	≤ 1/100 TLV and ≤ ½ chronic REL	See Below	Yes
Total Phthalates	≤ 0.01 mg/m³	nm	---

*Based on a standard baseboard usage (9.68 m²) in a 231 m³ classroom with 0.82 ACH.
nm = not measured

CHEMICALS FOUND WITH EXISTING TLV AND CHRONIC REL

CAS Number	Chemical	1/100 TLV[a] (µg/m³)	½ CA Chronic REL[b] (µg/m³)	Product Measurement (µg/m³)	Product Compliance for IAQ
100-41-4	Benzene, ethyl	870	1,000	1	Yes
108-94-1	Cyclohexanone	500	---	11	Yes
1330-20-7	Xylenes (Total)†	4,300	350	4	Yes

[a] American Conference of Governmental Industrial Hygienists. Threshold Limit Values for Chemical Substances and Physical Agents. Cincinnati, OH: ACGIH, 2012.
[b] http://www.oehha.ca.gov/air/allrels.html - Chronic Reference Exposure Levels (CRELs) Adopted by the State of California Office of Environmental Health Hazard Assessment (OEHHA), December 2008.

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Date Prepared: September 5, 2012
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AQS Report #: 90304-30

CALIFORNIA SPECIFICATION 01350 FORMALDEHYDE COMPARISON

PREPARED FOR: SURTECO CANADA LTD.
PRODUCT: 90304-O0350AA; SURFACING MATERIALS; WL 50 LITE BACHE 660 N

Effective January 2012: Compliance with California's Department of Public Health Formaldehyde Chronic REL, according to the emission testing method for California Specification 01350 or "Standard Method for the Testing and Evaluation of Volatile Organic Chemical Emissions from Indoor Sources Using Environmental Chambers," Version 1.1.

California Specification 01350 Acceptance IAQ Criteria (2012, V 1.1 Requirement)		Product Measurement	Product Compliance for Formaldehyde IAQ
Formaldehyde	≤ 7.3 ppb (≤ 9 µg/m³ or ≤ 0.0073 ppm)	< 1 ppb (< 0.001 ppm)	Yes

All products certified to the GREENGUARD Children & Schools Certification Program as of January, 2012 are assessed to the new CA CREL formaldehyde criteria and reported. The GREENGUARD Certification certificates will note if the products meet the new lower CREL. All manufacturers have until January 1, 2013 to meet this new level to remain certified under the GREENGUARD Children & Schools Certification Program.