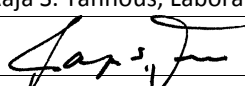


**BERKELEY ANALYTICAL**  
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**Product Sample Formaldehyde Emissions**

**Customer & Building Product Sample Information**

Report Certification	
Report number	579-007-01A-Feb2516
Report date	Feb 25, 2016
Certified by (Name/Title)	Raja S. Tannous, Laboratory Director
Signature	
Date	February 25, 2016

Standards	
Test method	ASTM D6007
Analytical method	ASTM D5197
Preparation/Configuration	None, back-to-back configuration, CARB SOP 9/13/2013

Customer Information	
Manufacturer or organization	Hallmark Hardwoods
City/State/Country	Ontario, CA USA
Contact name/Title	Rudy Sambrano
Phone number	909-947-7736

Product Sample Information	
Manufacturer (if not customer)	Same as above
Product name / Number	Silverado / SP6ROSB1
Product category	Wood Flooring (09 64 00)
Core type	HWPW
Manufacturing location or mill	not provided
Date sample manufactured	Apr 1, 2015
Date sample collected	not provided
Sample selected & collected by	Customer
Date sample received by lab	Feb 11, 2016
Sample shipped / stored in	Vapor barrier
Condition of received sample	OK
Lab sample tracking number	<b>579-007-01A</b>
Conditioning start date & duration	Feb 16, 2016; 168 hours
Test start date & duration	Feb 23, 2016; 1 days (18 hours)

**Formaldehyde Concentration Test Result**

**Test Results** – The measured formaldehyde chamber concentration and the concentration adjusted to standard conditions of 25 °C and 50% relative humidity are presented in Table 1.

**Table 1.** Test results. Measured and standardized formaldehyde concentration (ppm)

Compound	Elapsed Time (h)	Chamber Concentration ( $\mu\text{g}/\text{m}^3$ )	Chamber Concentration (ppm)	Standardized Concentration (ppm)	Meets CARB Phase 2 Standard?*
Formaldehyde	18	15.6	0.013	0.013	Yes

\*CARB Phase 2 standard for corresponding composite wood core material (Table 2)

**CARB Phase 2** – The California Air Resources Board (CARB) Phase 2 formaldehyde emission standards are published in Final Regulation Order, Airborne Toxic Control Measure to Reduce Formaldehyde Emissions from Composite Wood Products, Section 93120.2 Table 1, Title 17, California Code of Regulations. The emission standards are standardized chamber concentrations for composite wood core materials measured by primary method ASTM Standard Method E-1333. Secondary test method ASTM Standard Method D6007 has been shown to produce equivalent results. CARB Phase 2 formaldehyde emission standards are reproduced in Table 2.

**Table 2.** CARB Phase 2 Formaldehyde Emission Standards in parts-per-million (ppm)

Composite Wood Core Material	Phase 2 Effective Date	Specified Q/A Test Ratio (m/h)	Phase 2 Emission Standard (ppm)
Hardwood plywood (HWPW)	7/1/2012	1.173	$\leq 0.05$
Particleboard (PB)	1/1/2011	1.173	$\leq 0.09$
Medium Density Fiberboard (MDF)	1/1/2011	1.905	$\leq 0.11$
Thin MDF <8mm thick	1/1/2012	1.905	$\leq 0.13$

**Test Standards & Procedures**

**Test Protocol Summary\*** – Formaldehyde emission testing is performed following ASTM Standard Method D6007. As employed herein, ASTM D6007 is a quality control test as defined by CARB. Particleboard and hardwood plywood panels (veneer core and composite core) are tested with an area-specific airflow rate (Q/A) = 1.173 m/h. MDF/HDF and thin MDF (<8mm thick) are tested with Q/A = 1.905 m/h. The specimen is placed directly into the conditioning environment and maintained at specified temperature and relative humidity (RH) conditions for the specified period. Conditioning formaldehyde concentration is  $\leq 0.1$  ppm. At the end of this period, the specimen is transferred to a small-scale chamber. Chamber parameters for the test are shown in Table 3.

Sampling and analysis for formaldehyde are performed following ASTM Standard Method D5197. Sample is collected at end of test period at 0.6 L/m for 60 min. The test result is determined as chamber formaldehyde concentration in parts-per-million (ppm) as shown in Calculation and Comments section. Measured chamber concentration is corrected to standard conditions of 25 °C and 50% RH. Chamber background formaldehyde concentration is  $\leq 0.002$  ppm unless otherwise noted.

\*All standards identified in this section are included in Berkeley Analytical's scope of ISO/IEC17025 accreditation, Testing Laboratory TL-383, International Accreditation Service, [www.iasonline.org](http://www.iasonline.org)

**Test Standards & Procedures, Continued**

- 1) **Test Specimen Preparation** – Product sample was tested as received. Two pieces of specimen were cut to size from sample. Pieces were stacked together in back-to-back configuration. Aluminum tape was used to seal edges, leaving two wood surfaces exposed for testing. Test results are specific to the test item.

**Table 3.** Chamber conditions for test

Parameter	Symbol	Units	Value
Tested specimen exposed area	$A_S$	$m^2$	0.057
Chamber volume	$V_C$	$m^3$	0.067
Inlet gas flow rate	$Q_C$	$m^3/h$	0.067 (0.064-0.070)
Area-specific airflow rate	$Q_C/A_S$	$m/h$	1.17
Temperature		$^{\circ}C$	25
Relative humidity		%	50.6
Test period duration		h	18

**Photographs of Tested Product Specimen**

**Photo Documentation** – The product sample specimen is photographed following specimen preparation. The top and bottom faces of the specimen are photographed.



**Calcalaton and Comments**

**Equation Used in Calculation** – Chamber concentration is converted from  $\mu\text{g}/\text{m}^3$  to ppm, using Equation 1:

$$C = (M \times 24.47) / (V \times 30.03) / 1000 \quad (1)$$

where:

C = Formaldehyde parts-per-million in air, ppm,

M = Mass of formaldehyde in sample,  $\mu\text{g}$ ,

V = Volume of air sample at standard conditions (25 °C, 101 kPa), L,

30.03 = Molecular weight of formaldehyde,

24.47 =  $\mu\text{L}$  of formaldehyde gas in 1  $\mu\text{mol}$  at 25 °C, 101 kPa, and

1000 = Conversion factor.

Calculated formaldehyde concentration is rounded to nearest 0.01 ppm. Measured concentration is adjusted to standard conditions of 25 °C and 50% RH using conversion factors in ASTM Standard Method D6007, Annex Tables A1.1 and A2.1, respectively.

**Comments:** None

**END OF REPORT**

**Customer Information**

Company: Hallmark Floors  
 Street Address: 2360 S. Archibald Ave.  
 City/State/Zip(postal code): Ontario, CA 91761  
 Country: USA  
 Contact Name & Title (for reporting): Rudy Sambrano  
 Contact Phone/Fax Numbers: 909-947-7736 / 909-947-7776  
 Contact E-mail Address: rudys@hallmarkhardwoods.com  
 Financially Responsible Co.: Hallmark Floors

**Manufacturer (if different from customer)**

Company: same as above  
 City/State/Country:  
 Contact Name/Title:  
 Phone Number/E-mail Address:

**Sample Details**

Product Commercial Name\*: Silverado  
 Product Commercial Part No.: SP6ROSB1  
 Manufacturer Lot / Batch No. \*: 0414393  
 Date Manufactured \*: April 2015  
 Product Category & Use \*: hardwood floors  
 Sample Construction Material \*: wood  
 Plant Name & Location \*:  
 Collection Location within Plant :  
 Date & Time Collected\* :  
 Number of Sample Pieces \*: 2 of each      Photo(s) of Collection Location:  Yes  
 Sample Collected by \*: Rudy Sambrano  
 Phone/Fax Numbers\*: 909-947-7736 / 909-947-7776  
 E-mail Address\*: rudys@hallmarkhardwoods.com

**Shipping Details**

Packed & Shipped By: Rudy Sambrano  
 Shipping Date : Feb. 9, 2016  
 Carrier/Airbill Number : Shipped UPS

**Sample Handling**

Relinquished By	Received By*	Signature	Date	Company
	ALICE HURMIG	<i>[Signature]</i>	2-11-16	BKA

**Chain of Custody for ASTM D6007 Emission Test**

A Separate COC must be completed for EACH product/material sample  
 A link to Berkeley Analytical's Terms & Conditions is included in this workbook. By submitting samples, customer acknowledges and accepts these terms & conditions unless a prior written contract is in effect.

Berkeley Analytical Quotation Number:  
 Purchase Order (enter company & number): Hallmark Floors PO Carblitest

**Requested Test**

Test Method to be performed: ASTM D6007  
 Test results acceptance criterion: CARB ATCM Phase 2  
 Test schedule: 7-day Conditioning, 20-hrs Test  
 Shorter conditioning time request? 2-hr or other:  Yes  No      If Yes total hrs:  
 TPC Certification Test? 7-day Cond., 20-hrs Test:  Yes  No      If Yes TPC #:

**For Berkeley Analytical Use:**

Report ID:  
 Billing Reference:  
**Customer Instructions for Sample Prep., Test Type, schedule, etc.**  
 Small-scale, composite wood Formaldehyde emission screening test or TPC Certification test by ASTM D6007 with sampling and analysis by ASTM D5197. Deconstruction of finished product following CARB SOP if required. CARB Phase 2 acceptance criterion, 7 days conditioning unless shorter time is specified followed by chamber test with sampling for formaldehyde in 16 to 20 hours interval.

**Customer Request for Laboratory Certificate of Compliance**

Indicate if you are ordering a Laboratory Certificate of Compliance:  Not Applicable  
 Berkeley Analytical's laboratory test results are specific to the tested item. Claims made by the customer regarding the broader representativeness of the test results are the sole responsibility of the customer.

**Customer Authorizes Laboratory to Submit Copies of Test Report to:**

Contact/E-mail Address:  
 Organization:  
 Contact/E-mail Address:  
 Organization:

**For Berkeley Analytical Use Only**

Condition of Shipping Package:  
 Condition of Sample:  
 Lab Tracking Number: 579-007-01A