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Berkeley Analytical Associates
Air Quality Research and Analysis
814 harbour Way South, Suite 6
Richmond, CA 94804-3612
Tel: 510-236-2325
Fax: 510-236-2335

February 20, 2004

Rendered by Manufacturer for
Acoustical Surfaces Inc.
123 Columbia Court North, Suite 201
Chaska, MN 55318

Re: Section 01350 Emission Test Results, Ultratouch Cotton Insulation, BLP11027-F

Dear Mr. Tonkinson:

Ultratouch Cotton Insulation, was tested by our laboratory to determine its emissions of toxic volatile organic chemicals (VOCs) of concern. The test was conducted using the procedures described in Section 01350 of the Material Specifications adopted by the Collaborative for High Performance Schools (CHPS).

Calculations were performed using the parameters given below for a standard classroom to estimate the concentrations of VOCs of concern resulting from the use of your product in a classroom environment. The results of the test and the calculated concentrations for the standard classroom are presented in our attached report, EMIT11O4, 02/19/04.

Ventilation Rate 0.90 air changes per	Building Volume 231 m^3 or	Surface Area Covered by Product 94.6 m^2 of wall area
hour (volume fraction 0.9)	(40x24x8.5 ft 8,160 ft^3)	

Your Ultratouch Cotton Insulation meets the Section 01350 requirements for use in a classroom with the above parameters.

Sincerely,

Alfred T. Hodgson
Research Director

Attachment: Laboratory report

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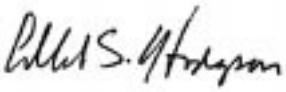
BERKELEY ANALYTICAL ASSOCIATES
815 Harbour Way South, Suite 6
Richmond, CA 94804
Ph. 510-236-2325; Fax 510-236-2335
E-mail BerkeleyAnalyticalatt.net

MATERIAL VOC EMISSION TEST RESULTS
Page 1, Manufacturer, Client, Project & Specimen Information

Laboratory Certification

Report number/Date	EMIT1104, 2/19/04
Protocol	Section 01350
Original report number & date if recalculation	
Certified by (Name/Title)	Alfred T. Hodgson, Research Director
Signature	
Date .2/20/04	

Manufacturer Information

Manufacturing Company	Rendered by Manufacturer for
City/State/Country	Acoustical Surfaces Inc. Chaska, MN 55318 U.S.A.
Contact name/Title	Steve Anderson Sr, President
Phone number	1-800-448-3134
Product name/Number	Ultratouch Cotton Insulation (Softsounds)
Product category/Subcategory	Insulation
Manufacturer's ID	BLP11027-F
Date manufactured	1/20/04
Date collected	1/20/04
Date shipped	1/23/04

Client Information (if different)

Organization	
City/State/Country	
Contact name/Title	
Phone number	

Architectural Project Information (Section 01350)

Organization	LAUSD
City/State/Country	Los Angeles, CA
Project name	Low Emitting Schools Initiative
Type of building	School
Contact name/Title	John Zinner, Zinner Consultants
Phone number	310-828-463

Specimen Information

Date received	1/28/04
Laboratory tracking number	205001
Specimen preparation	Cut specimen from center of panel
Conditioning period start date & duration	1/30/04, 10 days
Test period start date & duration	2/9/04, 96 hours

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Page 2, Pass/Fail/Summary, Summary, Chamber Conditions, Building Parameters

Summary - The protocol used to perform this VOC emission test is given under Laboratory Certification, Page 1. Scientific Certification Systems Low Emitting Material tests and Project-Specific Section 01350 (Special Environmental Requirements) tests are conducted following the full Section 01350 guidelines with prior conditioning of the test specimen as given for the Collaborative for High Performance Schools (CHPS) program (refer to http://www.chps.net).

Table 1. Pass/fail results of emission test for identified VOCs with chronic RELs. Only VOCs detected above quantitation limits are reported. If no VOCs are listed in Table 1, the material passes the Section 01350 VOC emission requirements.

% REL Substance	Standard CAS No.	Hypothetical pg m^{-3}	Other Classroom	Office	Building
Formaldehyde	50-00-1	16.5	**Pass**	**Pass**	na

Table 2. Chamber conditions for 96-h test period

Parameter	Symbol	Units	Value
Material exposed area	A_c	m^2	0.0316
Chamber volume	V	m^3	0.067
Loading ratio	L_c	m^2 m^3	0.47
Inlet gas flow rate	Q	m3 h^{-1}	0.067 ± 0.003
Ventilation rate	a_c	h^{-1}	1.0 ± 0.05
Temperature		°C	23 ± 1
Relative humidity		%	50 ± 5

Table 3. Parameters used to calculate building VOC concentrations

			Wall Materials		Other
Parameter	Symbol	Units	Standard Classroom[a]	Typical Large Office Bldg[b]	Materials! Building
Material exposed area	A_B	m^2	94.6	na	na
Building volume	V_B	m^3	231	na	na
Ceiling height		m	2.59	na	na
Loading ratio	L_B	m^2 m^3	0.41	na	na
Ventilation rate	a_B	h^{-1}	0.9	na	na
Ventilated vol. fraction	vf_B		0.9	na	na
Vent. flow rate per area		$(m^3h^{-1})/M^2$	1.98	na	na

a.. Standard classroom, Table 13a, Building Material Emissions Study, California Dept. of Health Services, May 14, 2003

b. Volume & ceiling height from East End Project, Products Passed Section 01350, Calif. Integrated Waste Management Board. For floor & ceiling materials, 100% coverage is assumed. For wall materials, material exposed area is wall paint area for the building (http://www.ciwmb.ca.gov/Greenbuilding/Specs/EastEnd/)

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Page 3, Results of VOC Emission Test

Table 4. VOC emission test results*. Only VOCs detected above quantitation limits are reported. Individual VOCs with chronic RELs are listedfirst, followed by compounds on other lists of toxicants, followed by unlisted abundant compounds

Substance	CAS No.	Surro-gate?	Chronic REL pg m^{-3}	CARB TAC Cat.	Prop 65 List?	96-h Chamber Conc. pg m^{-3}	Emission Factor µg m^{-2} h^{-1}	Class-room Conc. µg m^{-3}	Office Conc. µg m^{-3}	Other Bldg. Conc. µg m^{-3}
TVOC		Yes				45.6	96.6	48.8	na	na
Formaldehyde	50-00-1		33	T-IIa	Yes	1.1	2.4	1.2	na	na
Acetic acid	64-19-7					296**	627	317	na	na

*Parameters and reported values are defined and explained in Table 6
**Acetic acid has low TVOC response; it's concentration exceeds TVOC concentration

Table 5. TVOC and formaldehyde 24- and 48-hour chamber concentrations

	Concentration, pg m^{-3}	
Substance	24-h	48-h
TVOC	115	34.9
Formaldehyde	LQ	LQ

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Page 4 , Definitions, Notes to Tables

Table 6. Definition of parameters and notes to tables

Parameter/Value	Definition
CAS No.	Chemical Abstract Service identification number for chemical substance
Surrogate?	"Yes" indicates compound was quantified by GC/MS total-ion-current (TIC) method using mixture of 12 common hydrocarbons as calibration reference
Chronic REL	Chronic Reference Exposure Level (REL) established by Cal/EPA Office of Environmental Health Hazard Assessment, Aug. 2003 and adopted by Section 01350 as target IAQ limit for building; for formaldehyde, IAQ limit is 33 µg m^{-3} rather than REL. No material may contribute more than 1/2 IAQ limit for any REL compound
CARB TAG Cat.	Toxic Air Contaminant (TAC) on Cal/EPA Air Resources Board list, Dec. 1999, with toxic category indicated
Prop 65 List?	"Yes" indicates compound is chemical known to cause cancer or reproductive toxicity listed by Calif. Safe Drinking Water and Toxic Enforcement Act of 1986 (Proposition 65), Feb. 2003
96-h Chamber Conc.	Measured chamber VOC concentration at final 96-h time point minus any analytical blank or blank concentration for empty chamber operated following same procedure. Lower limit of quantitation (LOQ) for individual VOCs on lists of toxicants is 2 µg m^{-3}, based on a 2 ng limit for a 1-liter sample. LOQ for TVOC is 20 µg m^{-3}. LOQ for formaldehyde and acetaldehyde is given below
Emission Factor	Mass of compound emitted per square meter of material per hour (calculations shown below). Reporting limits for emission factors are established by LOQ or reporting limit for chamber concentration and material's exposed surface area
Classroom/Office/Other Bldg. Conc.	Concentrations for standard school classroom, hypothetical office building, or specific project building calculated using parameters given in Table 3 (calculations shown below)
TVOC	Total Volatile Organic Compounds quantified by GC/MS TIC method using mixture of 12 common hydrocarbons as calibration reference
Formaldehyde & acetaldehyde	Volatile aldehydes quantified by HPLC following ASTM Method D 5197-97. LOQ for formaldehyde and acetaldehyde is approximately 1 pg m^{-3}.
Individual VOCs	Quantified by thermal desorption GC/MS following EPA Methods TO-1 and TO-17. Compound was quantified using multipoint calibration prepared with pure substance unless otherwise indicated (see Surrogate?). VOCs with chronic RELs are listed first, followed by other TAC and Prop. 65 compounds. Additional abundant VOCs at or above reporting limit of 5 µg m^{-3} are listed last. VOCs are listed inrder of decreasing volatility within each group
"<"	"Less than" concentrations established by LOQ
"LQ"	Indicates calculated value is below quantitation based on concentration LOQ
"na"	Not applicable

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Page 5, Equations Used in Calculations, Comments

Calculations – An emission factor (EF) in µg m^{-2} h^{-1} for a chamber test is calculated using Equation 1:

$$EF(Q(C - C_0)) / A_C \quad (1)$$

where C is the VOC chamber concentration (pg m^{-3}) and C_0 is the substrate or chamber blank VOC concentration (µg m^{-3}). The remaining parameters are defined in Table 2. A building concentration (C_B)in µg m^{-3} is calculated using Equation 2, and parameters are defined in Table 3.

$$C_B = (EF * A_B) / (V_B * vf_B * a_B) \quad (2)$$

Comments: None