

mahlum

03 NOVEMBER 2018
A4LE LEARNINGSAPES

Material Transparency and Healthier Choices:

Building Local Advocacy with Global Impact



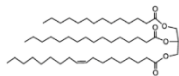
03 NOVEMBER 2018
A4LE LEARNINGSAPES

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Chemistry of STARBUCKS®



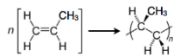
Milk

Milk is a 3-4% emulsion of 100-nm butterfat droplets in water. About 98% of these fat droplets are mixtures of triglycerides (a glycerol molecule plus three fatty acids). Adding just a tiny concentration of these fat droplets by adding milk to the coffee gives it a shiny appearance.



Vanilla Syrup

Vanillin, shown above, is mostly responsible for the aroma of vanilla beans. Used in desserts, coffees, sweets and medicines worldwide, real vanilla extract is now in extremely high demand. Vanilla syrup lacks the chemical complexity of natural vanilla, but comes at a tiny fraction of the cost of real vanilla extract!



Re-useable \$1 polypropylene cup

New Starbucks® reusable cups and their lids are made from 100% polypropylene, which, in addition to being easily recycled, is completely inert even at 100°C. You can be rest-assured that nothing harmful leeches into your coffee even at Starbucks® boiling-hot serving temperatures!



Composition of Starbucks' reusable cups
Source: Starbucks.com

Venti® Cappuccino with whole milk and vanilla syrup



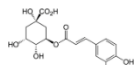
Caffeine ~225 mg

Bitter-tasting stimulant present in high quantities in coffee. Plants produce caffeine as a natural pesticide; humans use it as a stimulant. Caffeine is the world's most widely-consumed psychoactive substance, and is highly addictive. Caffeine stimulates nerves by counteracting adenosine, which is a nerve activity suppressant. Drinking caffeine causes a short, sharp increase in your blood pressure.



Theobromine

This addictive aphrodisiac compound is a product of caffeine metabolism in the body. It increases heartbeat, and dilates blood vessels, reducing blood pressure. Also found in very high concentrations in chocolate.



Chlorogenic acid

Ester of caffeic acid and (-)-quinic acid. Prevents oxidative stress damage in mice and reduces inflammation in humans. It has been suggested that chlorogenic acid is responsible for the laxative effect of prunes, and partly for that of coffee.



When you **change** the way you look at things,
the things you look at **change**.

-Max Planck

HOW SUBSTANCES MOVE FROM BUILDING MATERIALS INTO HUMAN BODIES

Once substances have migrated out of building materials, people can come in contact with them through inhalation, ingestion, or dermal absorption (Figure 2-3). This contact is referred to as exposure.



USGBC Better Building
Materials Guide 2014

Seattle Public Schools,
Cascadia Elementary School



Acknowledge



Demand Transparency

To understand our choice and make good decisions.

Declare.

Your Product Your Company

Final Assembly: City, State, Country

Life Expectancy: 000 Years

End of Life Options: Recyclable (42%), Landfill

End-of-life options: take-back programs, salvageable or reusable in its entirety, recyclable (%); landfill; hazardous waste.

Ingredients:

Your First Ingredient (Locally Sourced Location, ST), **Sustainably Sourced Ingredient** (Location, ST), **Non-toxic Item** (Location, ST), **Living Building Challenge Red List***, **Another Component**, **US EPA Chemical of Concern**, **Last Ingredient**

Ingredient are reported by component. Ingredients without restriction appear in grey; **Red List chemicals appear in dark orange; EPA COC and REACH chemicals appear in light orange.** (Reported raw material extraction locations are listed in parenthesis.)

Living Building Challenge Criteria:

XXX-0000

EXP. 11/11/2011

VOC Content: 0.00 mg/m³ VOC Emissions: CDPH Compliant

Declaration Status

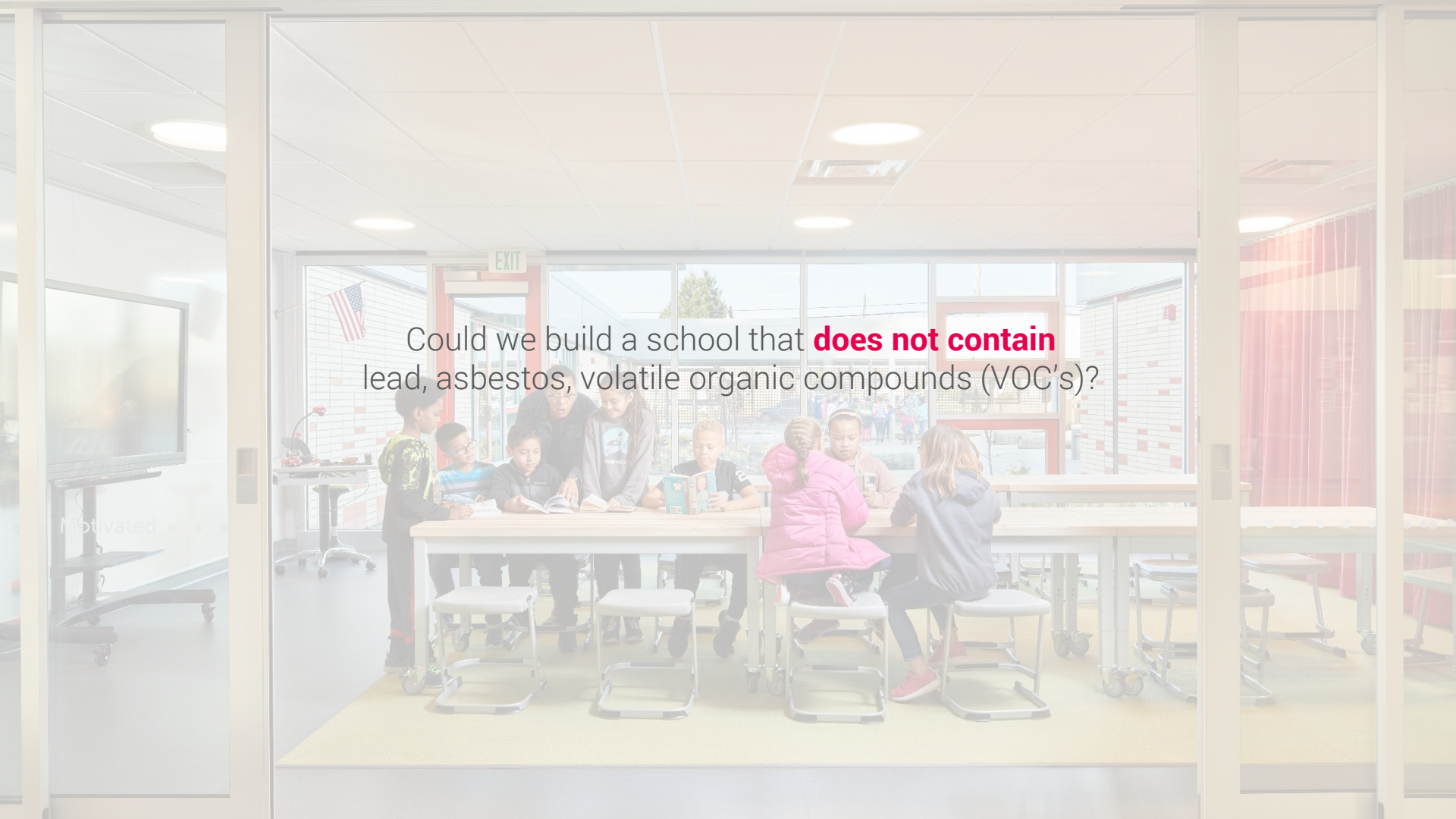
- ☐ LBC Red List Free
- ☒ LBC Compliant
- ☐ Declared

Declare Identifier for company and product, valid for 12 months.

VOC Information and CDPH Compliance.

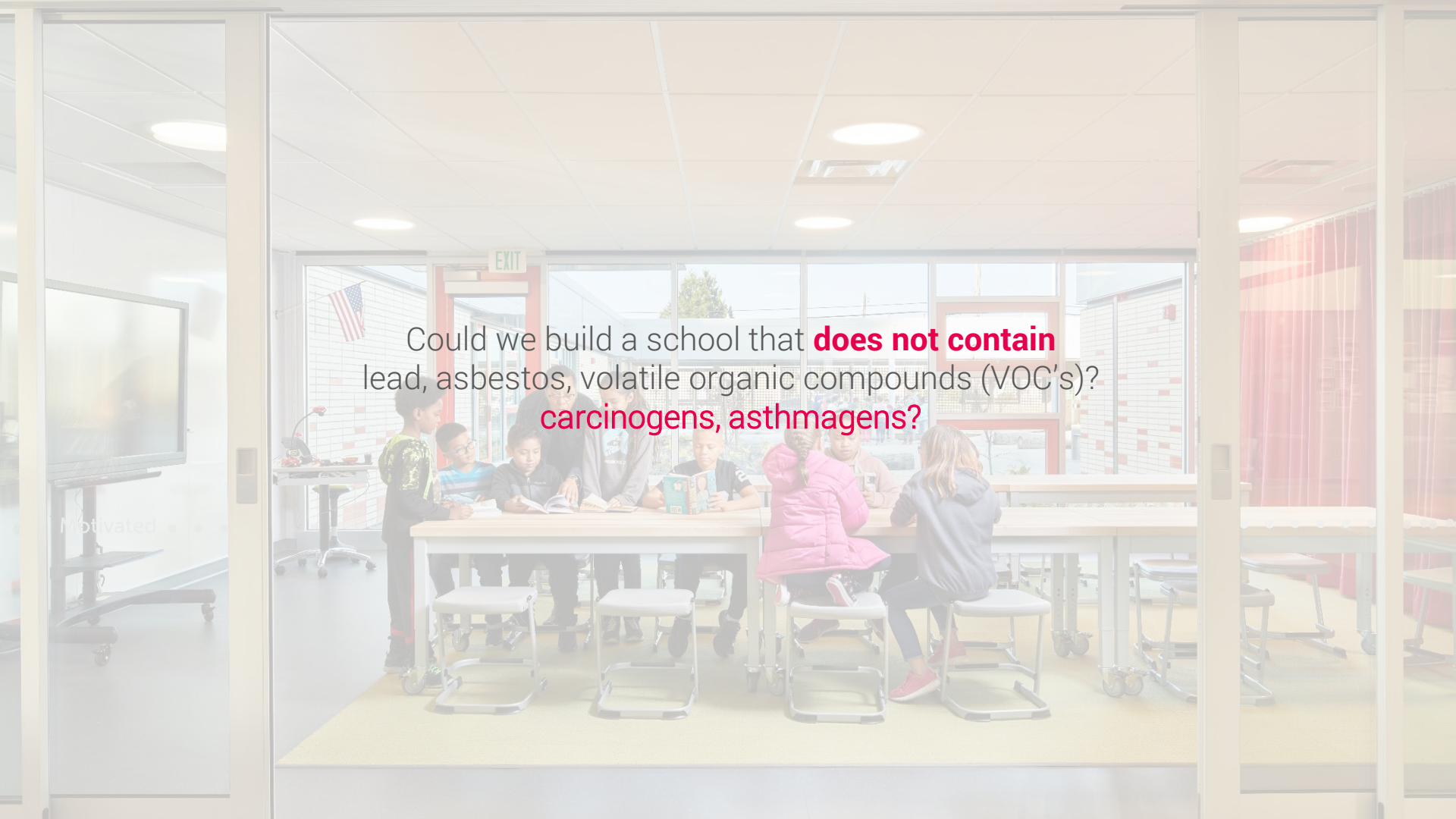
Verification that product complies with Living Building Challenge Red List.

MANUFACTURER RESPONSIBLE FOR LABEL ACCURACY
INTERNATIONAL LIVING FUTURE INSTITUTE™ declareproducts.com

A photograph of a classroom scene viewed through a glass partition. In the center, a teacher and several young students are gathered around a light-colored wooden table. The teacher, a woman with dark hair, is leaning over the table, pointing at an open book. The students, of various ethnicities, are also looking at the book or other materials on the table. Some are sitting on small white stools, while others are standing. The classroom has large windows in the background, letting in natural light. An American flag is visible on the left side of the room. The ceiling has recessed circular lights. The floor is covered with a yellow carpet. The overall atmosphere is educational and collaborative.

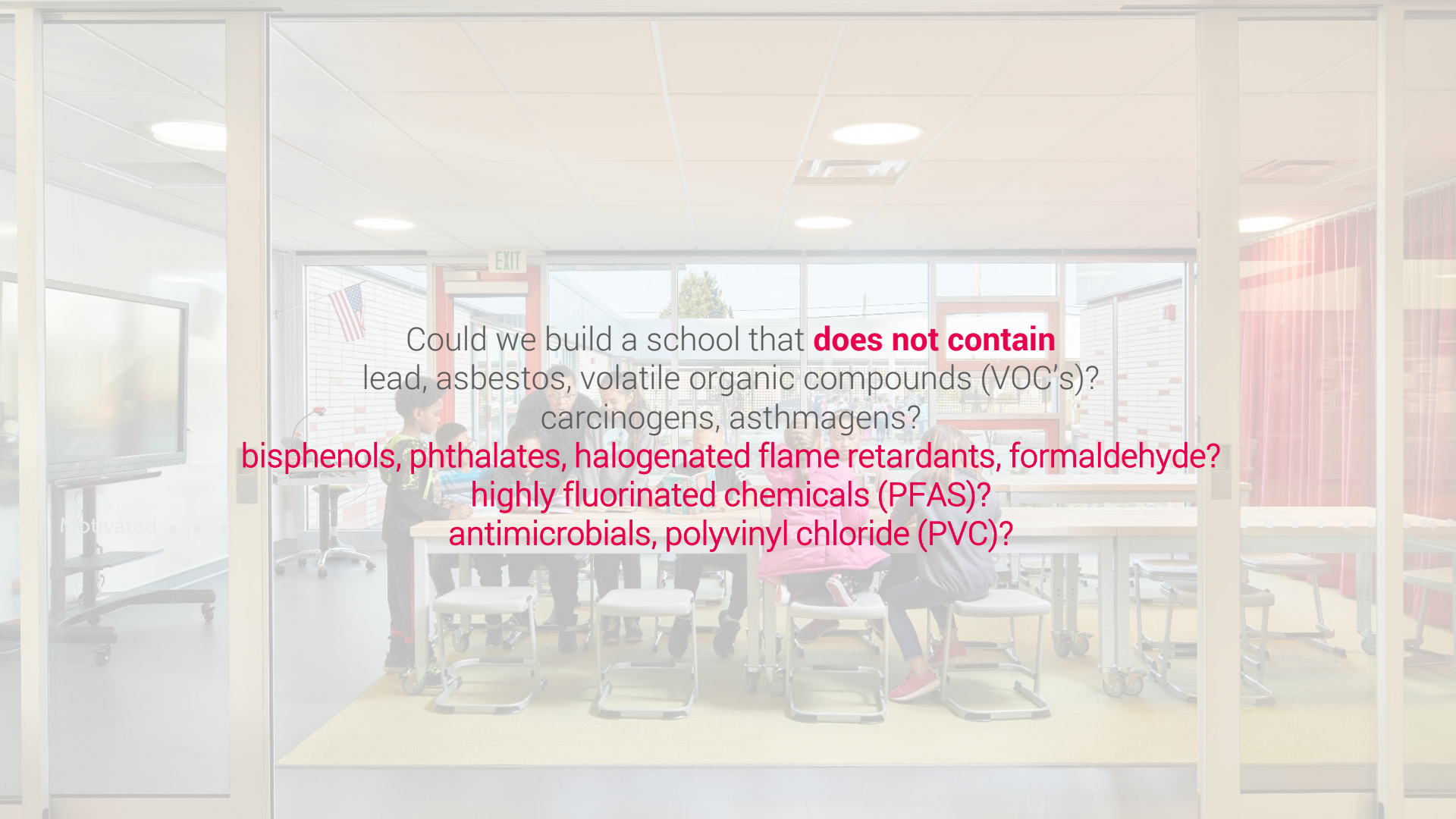
Could we build a school that **does not contain**
lead, asbestos, volatile organic compounds (VOC's)?

Motivated • • •

A photograph of a classroom interior. A teacher, a woman with dark hair, is standing and leaning over a long wooden table, interacting with a group of about eight young students. The students are sitting on white plastic chairs with wheels. Some are looking at books or papers on the table. The classroom has large windows in the background, an American flag on the left, and an 'EXIT' sign above a doorway. The floor is yellow. The image is overlaid with a semi-transparent white box containing text.

Could we build a school that **does not contain**
lead, asbestos, volatile organic compounds (VOC's)?
carcinogens, asthmagens?

Motivated • • •

A photograph of a classroom with several children and an adult sitting at tables. The room has large windows, a flag, and a whiteboard. Overlaid on the image is text in black and red asking if schools can be built without certain chemicals.

Could we build a school that **does not contain**
lead, asbestos, volatile organic compounds (VOC's)?
carcinogens, asthmagens?

bisphenols, phthalates, halogenated flame retardants, formaldehyde?
highly fluorinated chemicals (PFAS)?
antimicrobials, polyvinyl chloride (PVC)?

IMPACT

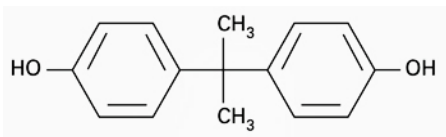
Although children are only 24 percent of the population, they are **100 percent of our future.**

-Ed Markey

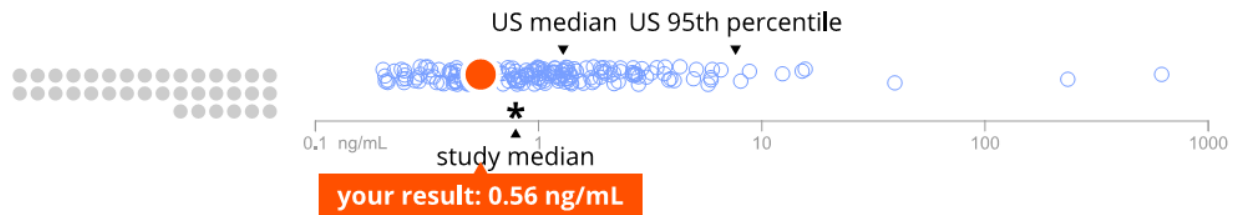


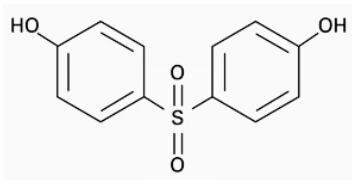
Future-Proof

Can we protect human health by selecting materials that are inherently safer?

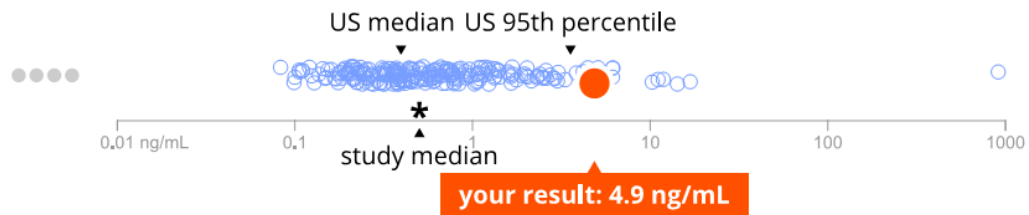


BPA (bisphenol A)





BPS (bisphenol S)



SIXCLASSES.ORG
GREEN SCIENCE POLICY INSTITUTE

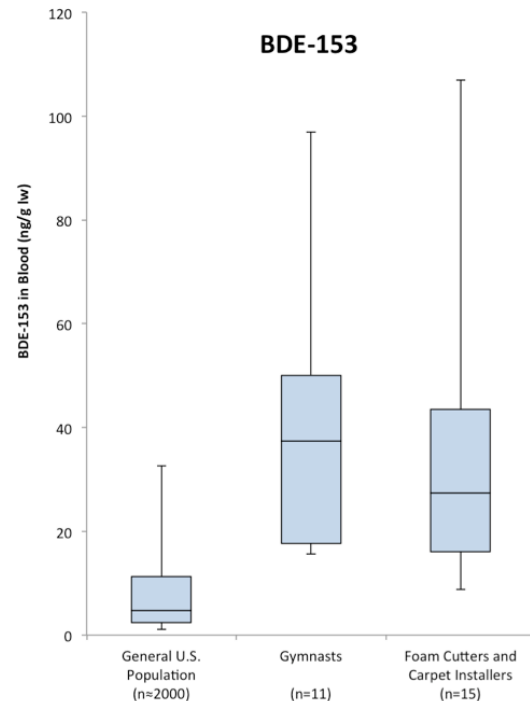




FOAM REMOVAL

"Competitive **gymnasts** can be exposed to high levels of flame retardants through the foam-containing equipment (pit cubes, landing mats, etc) used in gyms. In a study of 11 collegiate gymnasts, levels in blood were **4-6 times higher** compared to the general population, and similar to an occupationally exposed population of foam cutters and carpet installers."

SGA found a new foam supplier and became the first gym in the United States to replace all of their loose foam with flame retardant-free foam.

[FR in Gyms](#)[FR in Gymnasts](#)[Health Effects](#)[Take Action](#)[Resources](#)[FAQ](#)[Stay Updated](#)

The Gymnast Flame Retardant Collaborative

addressing concerns regarding flame retardants in gymnastics equipment

15,000

A photograph of a classroom scene viewed through a glass partition. In the center, a group of students and an adult are gathered around a long wooden table. Some students are sitting on white chairs, while others are standing. They appear to be engaged in a reading or learning activity. The room has large windows in the background, letting in natural light. An American flag is visible on the left wall. The ceiling has recessed circular lights. The number '15,000' is superimposed in large, bold, blue font across the middle of the image.

Motivated • • •



15,000

hours typically spent in a classroom upon graduating high school
<https://schools.forhealth.org>

Industry Impact

In the year 2016, we designed or built more than 2 million ft²

900 billion ft² of new and re-built buildings will be constructed in cities worldwide over the next twenty years

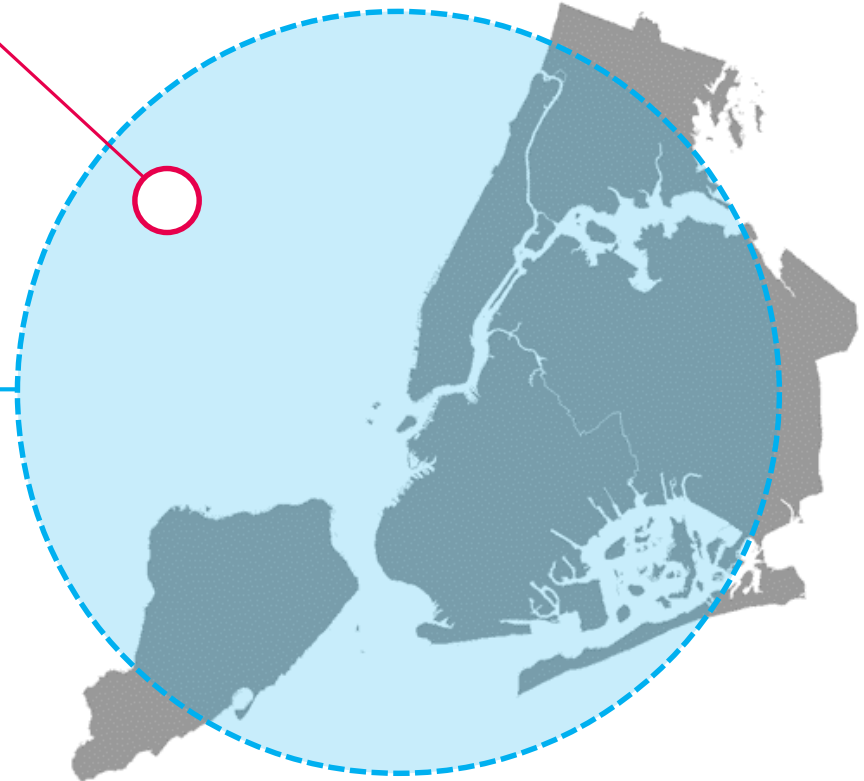
this equates to **an entire New York City** every 47 days

UN Habitat, State of the World's Cities 2010/2011;

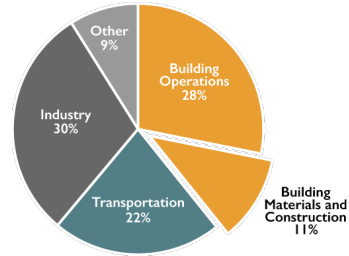
McKinsey Global Institute, Urban World; Cities and the rise of the consuming class, 2012

Develop speedometers

To better understand your impact

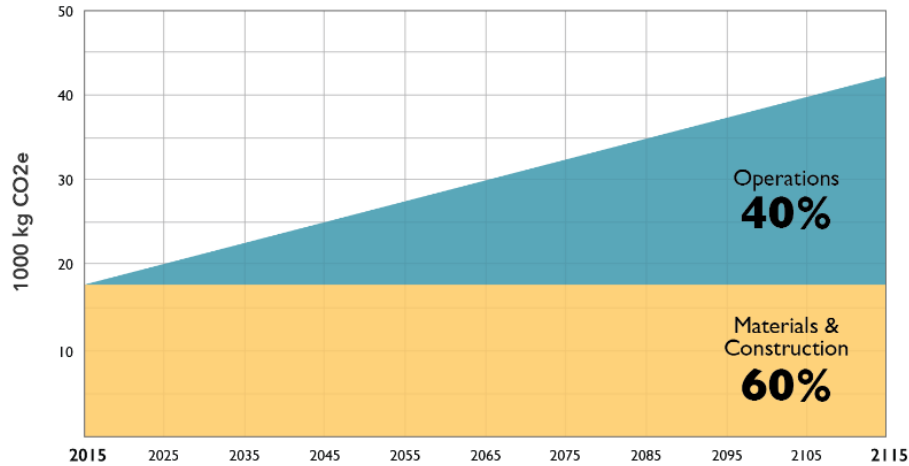


Global CO₂ Emission by Sector



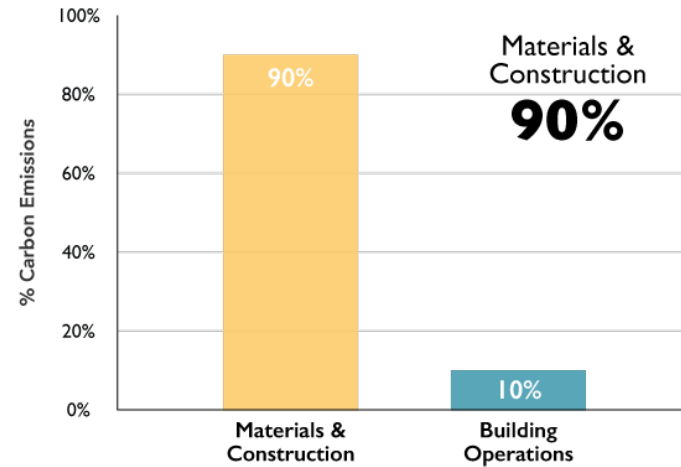
Source: © 2018 2030, Inc. / Architecture 2030. All Rights Reserved.

Carbon Emissions Typical High Performance Commercial Building



Source: © 2018 2030, Inc. / Architecture 2030. All Rights Reserved.

Building Sector CO₂ Emissions New Construction: 2015-2050



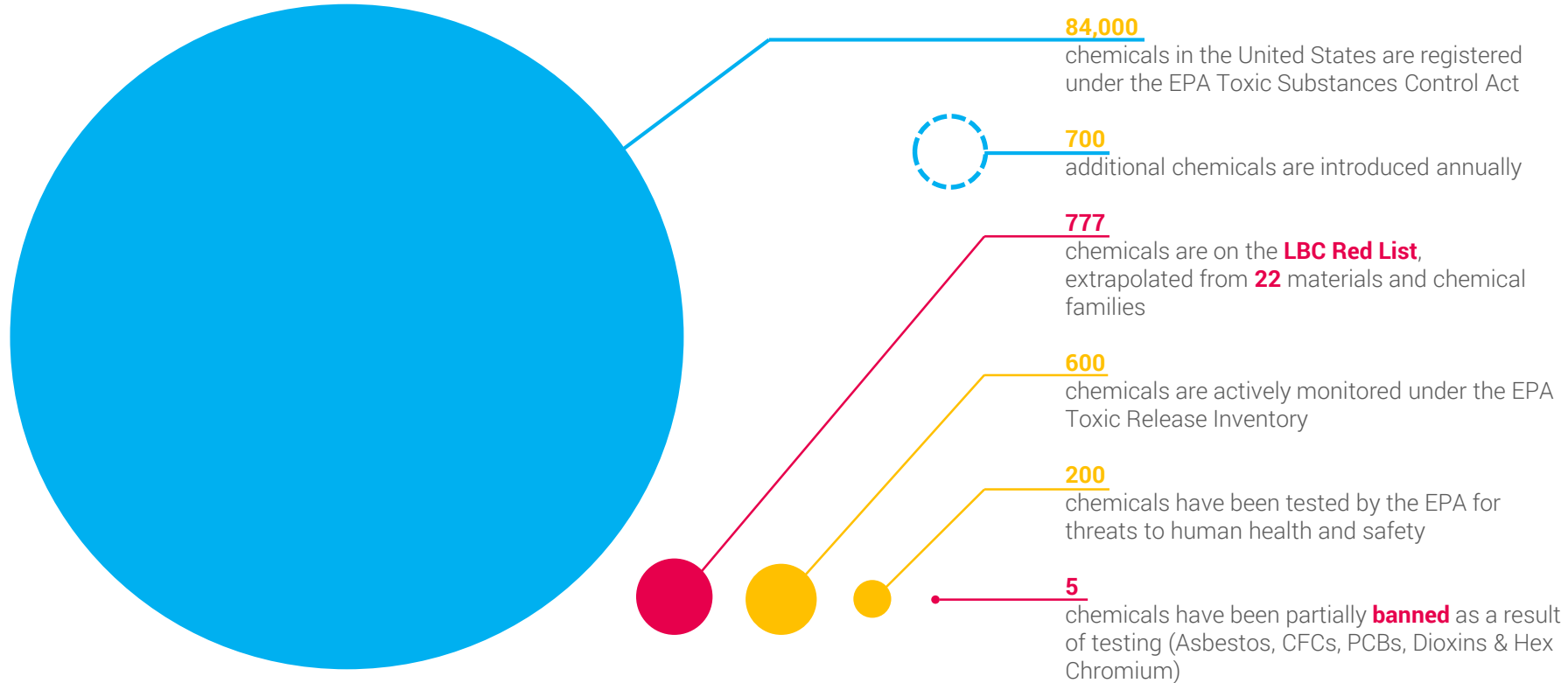
Source: © 2018 2030, Inc. / Architecture 2030. All Rights Reserved.

Embodied Impacts

Looking beyond energy efficiency



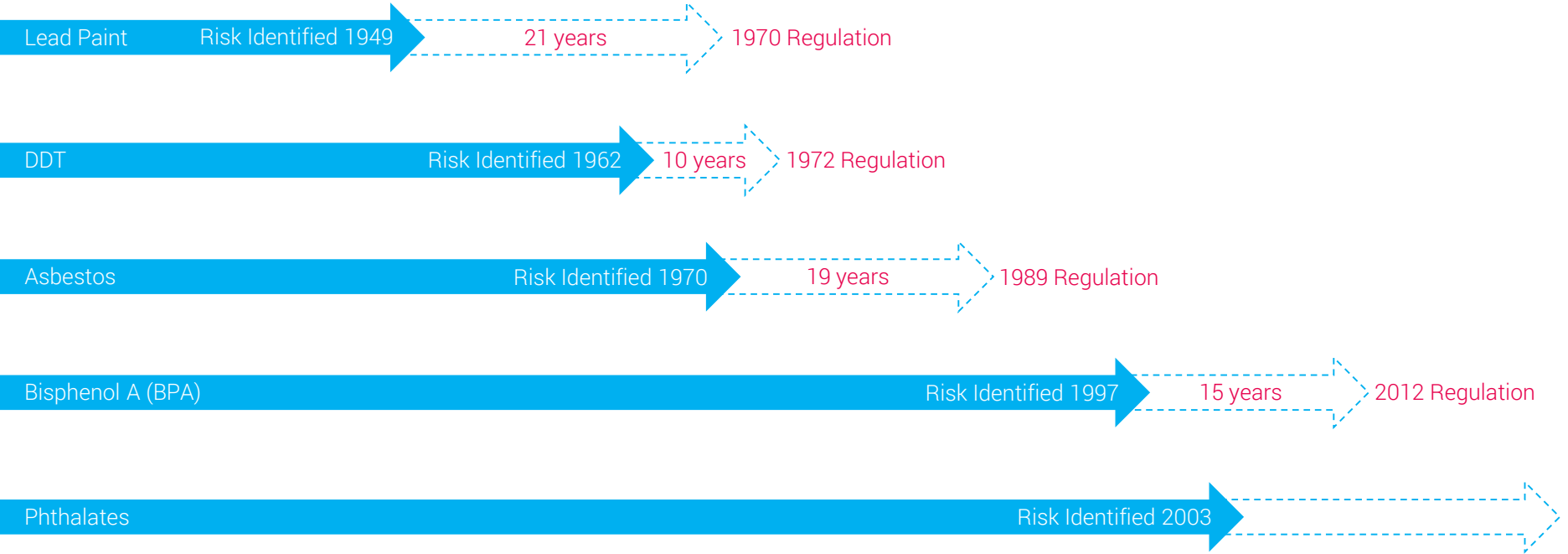
Chemical Regulation



How is chemical safety regulated?

Precautionary Principle: Even in the face of scientific uncertainty, action should be taken to prevent harm

Chemical Regulation



Regulations are minimums

A building built to code is the **worst** building allowed by law

INVENTORY

Architects have a greater ability to **improve public health** than medical professionals

-Dr. Claudia Miller



USG Eclipse - acoustic ceiling tiles
HPD2.0 label
titanium dioxide
occupational carcinogen

Benjamin Moore UltraSpec 500 - paint
C2C3.1 Silver label

Soltis 99 fabric - window shades
no ingredient label, UL Greenguard
PVC, PET, phthalates
reproductive & developmental toxicants

Abet Laminati - plastic laminate
no ingredient label
40% proprietary resins including phenol
& melamine formaldehyde
nervous system impacts

Mannington Infinity - carpet
HPD2.0 label
PVC backing, phthalates
reproductive & developmental toxicants

Mannington MGuard 718 - carpet adhesive
no ingredient label
VOCs
nervous system impacts, cancer

Noraplan Sentica - rubber flooring
no ingredient label

Joy Carpeting – FF&E area rugs
no ingredient label & fails California Prop-65
halogenated flame retardants
perfluorochemical stain repellents
anti-microbial additives
thyroid disruption, reproductive problems





Mannington Infinity - carpet
HPD2.0 label
PVC backing, phthalates
reproductive & developmental toxicants

Mannington MGuard 718 - carpet adhesive
no ingredient label
VOCs
nervous system impacts, cancer




Understanding Labels

Infinity - tile by Mannington Mills

Health Product Declaration v2.0
created via: HPDC Online Builder

CLASSIFICATION: 09 68 13.00 FINISHES: TILE CARPETING

PRODUCT DESCRIPTION: PRODUCTS COVERED IN THIS HEALTH PRODUCT DECLARATION (HPD) ARE A BROAD VARIETY OF CARPET STYLES AND COLORS MANUFACTURED BY MANNINGTON COMMERCIAL, BACKED WITH OUR INFINITY® MODULAR TILE (24 X 24) BACKING SYSTEM AND MADE WITH EITHER NYLON 6.6 OR NYLON 6 YARN. THE FIBER IN THESE PRODUCTS (PRODUCT WEAR LAYER) IS CONSTRUCTED USING NYLON 6.6 OR NYLON 6 YARN THAT IS EITHER SOLUTION DYED, YARN DYED, SPACE DYED, OR A COMBINATION OF THESE METHODS. INFINITY MODULAR IS A VINYL COMPOSITE BACKING THAT IS ENGINEERED FOR STRONG PERFORMANCE, EXCELLENT TUFT BIND, AND DIMENSIONAL STABILITY. IT CONTAINS PRE-CONSUMER RECYCLED CONTENT AND IS FULLY RECYCLABLE VIA LOOP®, A MANNINGTON PROGRAM THAT RECLAIMS POST-CONSUMER CARPET AND RECYCLES IT INTO NEW CARPET BACKING (INFINITY® RE), AS WELL AS HARD SURFACE PRODUCTS. LIKE MOST MANNINGTON COMMERCIAL BACKING SYSTEMS, THESE PRODUCTS ARE CERTIFIED AS ENVIRONMENTALLY PREFERABLE PRODUCTS TO NSF/ANSI 140:2012 SUSTAINABILITY ASSESSMENT FOR CARPET, TO THE GOLD LEVEL, AND MANUFACTURED IN THE USA IN AN ISO 14001 REGISTERED FACILITY.

 **Section 1: Summary**

CONTENT INVENTORY

Threshold per material	Residuals and impurities considered in	Based on the selected Content Inventory Threshold:
<input type="radio"/> 100 ppm	<input type="radio"/> see Section 2: Material Notes	Characterized..... <input checked="" type="radio"/> <input type="radio"/>
<input checked="" type="radio"/> 1,000 ppm	<input type="radio"/> see Section 5: General Notes	Are the Percent Weight and Role provided for all substances? Yes No
<input type="radio"/> Per GHS SDS		Screened..... <input checked="" type="radio"/> <input type="radio"/>
<input type="radio"/> Per OSHA MSDS		Are all substances screened using Priority Hazard Lists with results disclosed? Yes No
<input type="radio"/> Other		Identified..... <input checked="" type="radio"/> <input type="radio"/>
		Are all substances disclosed by Name (Specific or Generic) and Identifier? Yes No

CONTENT IN DESCENDING ORDER OF QUANTITY

Summary of product contents and results from screening individual chemical substances against HPD Priority Hazard Lists and the GreenScreen for Safer Chemicals®. The HPD does not assess whether using or handling this product will expose individuals to its chemical substances or any health risk. Refer to Section 2 for further details.

MATERIAL | SUBSTANCE | RESIDUAL OR IMPURITY GREENSCREEN SCORE | HAZARD TYPE

INFINITY - MODULAR TILE | LIMESTONE; CALCIUM CARBONATE **LT-UNK** NYLON 6.6 **LT-UNK** NYLON 6.6 **LT-UNK** BIS(2-ETHYLHEXYL) TEREPHTHALATE **BMS** POLYVINYL CHLORIDE (PVC) **LT-UNK** RES ETHYLENE VINYL ACETATE POLYMER (EVA) **LT-UNK** POLY(VINYL CHLORIDE-CO-METHYL METHACRYLATE) **LT-UNK** GLASS / MINERAL FIBER **LT-UNK** 1,2-CYCLOHEXANEDICARBOXYLIC ACID, 1-BUTYL 2-(PHENYLMETHYL) ESTER POLYETHYLENE TEREPHTHALATE (PET) **LT-UNK** FIBER LUBRICANTS **UNK** ACRYLIC POLYMER **UNK** QUARTZ **LT-1** CAN CARBON BLACK **LT-1** CAN POLAR ACID ESTER OF LONG CHAIN ALCOHOL **UNK** POLYPROPYLENE **LT-UNK** RES POLYETHYLENE **LT-UNK**

Number of GreenScreen BM-4/BM3 contents..... 1
Contents highest concern GreenScreen Benchmark or List translator Score..... LT-1
Nanomaterial..... No

INVENTORY AND SCREENING NOTES:



Section 2: Content in Descending Order of Quantity

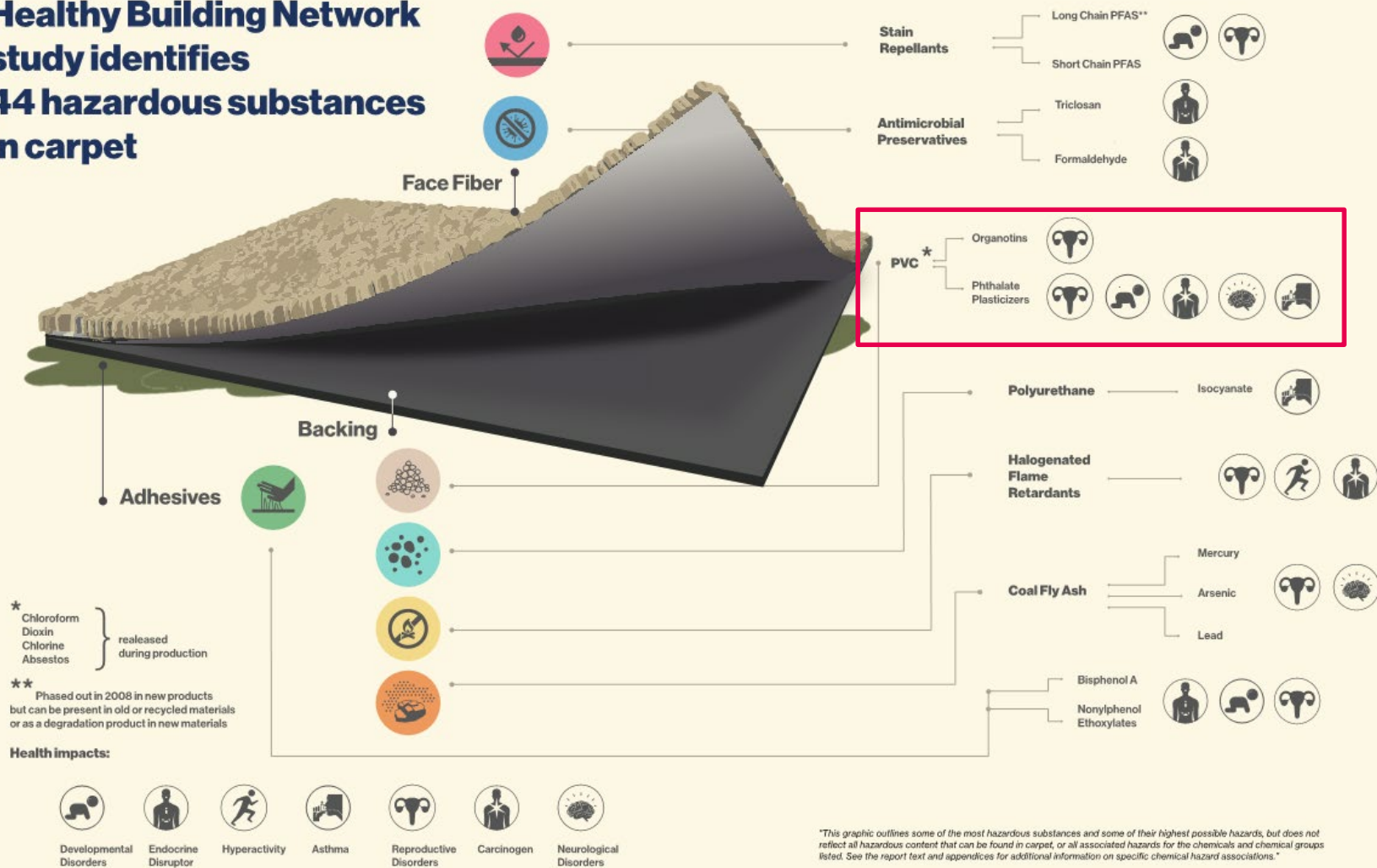
This section lists materials in a product and the substances in each material based on the Inventory Threshold for each material. If residuals or impurities from the manufacturing or extraction processes are considered for a material, these are inventoried and characterized to the extent described in the Material and/or General Notes. Chemical substances are screened against the HPD Priority Hazard Lists for human and environmental health impacts. Screening is based on best available information; "Not Found" does not necessarily mean there is no potential hazard associated with the product or its contents. More information about Priority Hazard Lists and the GreenScreen can be found online: www.hpd-collaborative.org and www.greenscreenchemicals.org.

Infinity - modular tile		%: 100.0000		HPD URL:	
Inventory Threshold: 1000 ppm		Residuals Considered: Yes			
Material Notes:					
POLYVINYL CHLORIDE (PVC)		ID: 9002-86-2			
%: 4.0000 - 9.0000 GS: LT-UNK		RC: None NANO: NO ROLE: Secondary Backing - Polymer			
QUARTZ		ID: 14808-60-7			
%: Impurity/Residual		GS: LT-1	RC: None	NANO: NO	ROLE: Impurity/Residual
HAZARDS: AGENCY(IES) WITH WARNINGS:					
CANCER	IARC	Group 1 - Agent is Carcinogenic to humans			
CANCER	US CDC - Occupational Carcinogens	Occupational Carcinogen			
CANCER	CA EPA - Prop 65	Carcinogen (form-specific or based on limited exposure pathways)			
CANCER	IARC	Group 1: Agent is carcinogenic to humans - inhaled from occupational sources			
CANCER	US NIH - Report on Carcinogens	Known to be Human Carcinogen (respirable size - occupational setting)			
CANCER	MAK	Carcinogen Group 1 - Substances that cause cancer in man			
SUBSTANCE NOTES: This is a naturally occurring impurity in mined calcium carbonate. The health warnings above are derived from one or more material "hazard" lists chosen by the HPD Collaborative and many of these lists were not developed to provide exposure-based health information. The warning is not an indication that the presence of the material poses increased risk to human health under normal conditions of product use.					
CARBON BLACK		ID: 1333-86-4			
%: 0.0000 - 1.0000		GS: LT-1	RC: None	NANO: NO	ROLE: Primary Backing, Secondary Backing - Pigment

HPD = Health Product Declaration

Understand what is inside to make informed decisions

Healthy Building Network study identifies 44 hazardous substances in carpet



Benjamin Moore UltraSpec 500 - paint
C2C3.1 Silver label
ILFI Declare label



Understanding Labels

CRADLE TO CRADLE
PRODUCTS
INNOVATION
INSTITUTE

LICENSED MARKS:



Cradle to Cradle Certified™ Silver

THE LICENSED MARKS IDENTIFIED ABOVE MAY BE LICENSED TO:

Benjamin Moore & Co.

FOR THE BELOW LISTED CERTIFIED PRODUCTS ASSOCIATED WITH THE NAME:

Ultra Spec® 500 Waterborne Interior Paint


Cradle to Cradle Products Innovation Institute

ISSUE DATE
20 January 2016

CERTIFICATION #
2763

EXPIRATION DATE
19 January 2018

LEAD ASSESSMENT BODY:
MBDC



Only the following products are considered Certified Product(s) within the scope of this certification and the associated Trademark License Agreement:

Ultra Spec® 500 Waterborne Interior Paint in the following versions:
Flat, Low-Sheen, Eggshell, Semi-Gloss, Gloss, and Primer

Base formulation only; tints/colorants certified separately. Product packaging meets banned list requirements but has not been assessed to determine certification level.

Declare.

Ultra Spec® 500 Interior Eggshell Finish N538
Benjamin Moore & Co.

Final Assembly: Johnstown, NY, USA
Life Expectancy: 10 Years
End of Life Options: Take Back Program; Landfill (40%)

Ingredients:

Thinner: Water; **Binder:** Acrylic Polymer; **Color Pigment:** Titanium Dioxide; **Extender Filler:** Limestone, Nepheline Syenite; **Extender Pigment:** Kaolin Calcined; **Coalescing Agent:** Triethylene Glycol Bis(2-Ethylhexanoate); **Additive:** Styrene-Acrylic Copolymer, Polyethylene Glycol, Hexanoic Acid Dihydrazide, Isooctanol Phosphate Potassium Salt, Sodium (C14-16) Olefin Sulfonate; **Impurity:** Silica Amorphous, Aluminum Hydroxide, Acetone; **Thickener:** Hydroxyethyl Cellulose; **Defoamer:** Petroleum Distillates; **Surfactant:** Alcohols, C9 - 11 Ethoxylated, Tridecyl Alcohol, Ethoxylated, Phosphated, Ammonium Salts, Sodium Lauryl Ether Sulfate

Living Building Challenge Criteria:







BEN-0015 VOC Content: 0 g/L	EXP: 07/01/2017 VOC Emissions: CDPH Compliant
Declaration Status	<input checked="" type="checkbox"/> LBC Red List Free
	<input type="checkbox"/> LBC Compliant
	<input type="checkbox"/> Declared

MANUFACTURER RESPONSIBLE FOR LABEL ACCURACY
INTERNATIONAL LIVING FUTURE INSTITUTE™ declareproducts.com

Celebrate successes

Reward manufacturers that disclose - write specs requiring their competitors to

Understanding Labels

 <div>CRADLE TO CRADLE CERTIFIED^{CM} PRODUCT SCORECARD</div>					
BRONZE					
QUALITY CATEGORY	BASIC	BRONZE	SILVER	GOLD	PLATINUM
 MATERIAL HEALTH				✓	
 MATERIAL REUTILIZATION			✓		
 RENEWABLE ENERGY & CARBON MANAGEMENT		✓			
 WATER STEWARDSHIP			✓		
 SOCIAL FAIRNESS				✓	
OVERALL CERTIFICATION LEVEL		✓			

<http://www.c2ccertified.org/get-certified/product-certification>



Quality is defined by five criteria categories:

MATERIAL HEALTH

Product ingredients are inventoried throughout the supply chain and evaluated for impact on human and environmental health. The criteria at each level build towards the expectation of eliminating all toxic and unidentified chemicals and becoming nutrients for a safe, continuous cycle.



MATERIAL REUTILIZATION

Products are designed either to biodegrade safely as a biological nutrient or to be recycled into new products as a technical nutrient. At each level continued progress must be made towards increasing the recovery of materials and keeping them in continuous cycles.



RENEWABLE ENERGY AND CARBON MANAGEMENT

The criteria at each level build towards the expectation of carbon neutrality and powering all operations with 100% renewable energy.



WATER STEWARDSHIP

Processes are designed to regard water as a precious resource for all living things. At each level, progress is made towards cleaning up effluent to drinking water standards.



SOCIAL FAIRNESS AND BIODIVERSITY

Company operations are designed to celebrate all people and natural systems and progress is made towards having a wholly beneficial impact on the people and the planet.

Celebrate successes

Reward manufacturers that disclose - write specs requiring their competitors to

Understanding Labels

The below table contains the full assessment report for the product disclosed at 1000 ppm.

Material	CAS Number	Role	%	Result				Comment
				MFG	Install	Use	End of Use	
Water	7732-18-5	Vehicle	35%-65%					Little to no risk across all product phases
Calcium Carbonate	1317-65-3	Extender Pigment	0%-25%					Little to no risk across all product phases
Titanium Dioxide	13463-67-7	Pigment	0%-20%	I				Inhalative risk during paint manufacture. Manufacturer has insured proper PPE and other measures in place to eliminate inhalation risk. Low to no risk in the remaining use phases
Resins	Proprietary	Resin	10%-25%					Monomer is highly toxic but it should be fully reacted in final paint product. Low risk during weekend of use but will remain "C" overall
Other Extender Pigments	Proprietary	Extender Pigments	0%-5%	I				Carcinogenic via inhalation. Once in liquid paint, there are no more risks
Additives	Proprietary	Additives	<3%	I				High aquatic toxicity. Care should be taken during MFG and Install not to release into natural water system. Moderately toxic via inhalation in MFG stage.
Styrene Acrylic Polymer	Proprietary	Opaque Polymer	0%-3%					Styrene is carcinogenic and demonstrates endocrine disruption potential. Manufacturer has strict requirements for low residual monomer so cured resin will have low risk in use and end of use but still a concern in supplychain/mfg
Coalescent	Proprietary	Coalescent	0%-2%					Little to no risk across all product phases
Preservative	Proprietary	Active and In-can Preservatives	<0.2%	I	I	I	I	Carries H318 label (causes serious eye damage) as well as the H400 and H410 labels (Very toxic to aquatic life, very toxic to aquatic life with long lasting effects) EU - Priority Endocrine Disruptors - Category 1 - In vivo evidence of Endocrine Disruption Activity DHS Acute toxicity category 3 (oral) and category 2 (inhalation)

Good rating, minimally concern
Moderately problematic concern found
Problematic concern found. The combination of the hazard and potential exposure leads to some caution for some uses and/or applications.
Cannot be fully assessed due to either lack of complete formulation, or lack of toxicological information for one or more ingredients.
Highly problematic material containing one or more chemicals classified as CMR and having a plausible route of exposure.



Product Lens

a materials health assessment

COMPANY AND PRODUCT INFO

Issued to	Sherwin-Williams
For the Products	ProMar 200 Zero VOC – B20, B21, B24, B26, B30, B31 B41 Series *Assessment is limited to base formula and does not include tint.
Description	Professional painters have it all with ProMar® 200 Zero VOC Interior Latex Paint. A complete professional line that not only has zero VOCs, but is also available in six sheens and every color. All while delivering maximum productivity with exceptional durability and touch up.
Certification Period	June 2016 – June 2018
Assessor	MBDC basis methodology v3.0*

Qualifications

- LEED BDPO Credit: Material Ingredients Option 1 ☒ Qualifies for as 1 product
- LEED BDPO Credit: Material Ingredients Option 2 ☐ Qualifies for 100% of cost

MATERIALS / INGREDIENTS INFORMATION

The following table represents the top 99% of the material ingredient disclosure and ratings. For the full ingredient disclosure information, please see the table on the reverse side.

Materials	Result			
	Supply Chain/ MFG	Install	Use	End of Use
Water				
Calcium Carbonate				
Titanium Dioxide	I			
Other Extender Pigments	I			
Resins				
Additives	I			
Styrene Acrylic Polymer				



Other Achievements



Exposure Indicator

D = Dermal, Skin
I = Inhalation, air
O = Oral, mouth

*No indicator means no potential exposure scenario identified

Color Ratings

Low or mild hazard identified and/or potential exposure
Moderate hazard identified and/or potential exposure
Problematic concern found. The combination of the hazard and potential exposure leads to some caution for some uses and/or applications.
Cannot be fully assessed due to either lack of complete formulation, or lack of toxicological information for one or more ingredients.
Highly problematic material containing one or more chemicals classified as CMR and having a plausible route of exposure.

UL Product Lens

Look at hazards from cradle to grave

Go to ul.com/spg to view the full, detailed materials ingredient list

Sherwin Williams

www.sherwin.com

douglas.p.mazeffa@sherwin.com

216-515-5922

*Methodology based on Cradle to Cradle Certified™ Product Material Health Assessment Methodology v3.0





LEARNER

INSTALLER

A person is kneeling on a floor, installing a square carpet tile. The tile has a dark, speckled pattern. The person's hands are visible, holding the tile and a black rectangular object, possibly a piece of tape or a tool. The floor is made of concrete, and there are some white marks on it. The person is wearing a dark blue shirt and blue jeans.

MANUFACTURER



CHOICE

When it comes to our **collective ecological goals**, the swarm rules might boil down to: **know your impacts, favor improvements** and **share what you learn**.

-Daniel Goleman, Ecological Intelligence

Making The Right Choice

Your decisions matter.

Focus on products that are fully disclosed.

Optimize your selections to deliver the most impact.

Balance decisions against project goals and client needs.



DISCLOSURE TRANSPARENCY INVENTORY

A full **Public Inventory** of all contents to a specified level in an industry adopted format

SCREENING RESTRICTED SUBSTANCE LIST (RSL)

Ingredients are **Screened** against list of known chemicals of concern; regrettable substitutions

ASSESSMENT

Impacts to human and environmental health are **Assessed**

OPTIMIZATION























Material is **Optimized** by design to eliminate hazards throughout lifecycle

MATERIAL

BUILDING

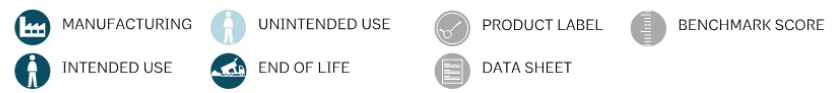
INSTITUTION



SCHEME	Cradle to Cradle v3	GreenScreen full assessment	UL Product Lens	HPD v2	Declare
INTENT	Multi-attribute assessment, of which material health is part, based on C2C design principles.	Hazard benchmark derived from hazard evaluation for 18 health/ environmental endpoints.	Hazard disclosure and exposure indicators across four phases of the product lifecycle.	Ingredient disclosure and hazard screening. Open standard shaped by an inclusive group.	Ingredient disclosure, hazard screening against LBC red list, material sourcing info, end-of-life fate.
SCOPE	Product level	Chemical level	Product level	Product level	Product level
CHEMICAL INVENTORY					
LIST-BASED SCREENING					LBC Red List only
ASSESSMENT					
OPTIMIZATION					
RISK					
HAZARD ASSESSMENT					LBC Red List only
EXPOSURE PREDICTION					
ADOPTION					
LEED					
WELL					
LBC					
LIFECYCLE PHASES	  	  	   	  	  
INPUTS + OUTPUTS					
DISCLOSURE LEVEL	100 ppm	100 ppm	100 to 1,000 ppm	100 to 10,000 ppm	100 ppm
PUBLIC DATA AVAILABILITY	Intellectual property protected by C2C.	When used for LEED, parallel to HPD.	Intellectual property protected by UL.	Role, amt, and hazard must be disclosed	Two exception paths for intellectual property.
REPORTING FORMAT					 
VERIFICATION	Third-party verified	Third-party verified	Third-party verified	Third-party optional	Self-declared

- **Inventory** of all chemicals within a material
- Ingredients **screened** against list of known chemicals of concern
- Impacts to human and environmental health are **assessed**
- Material is **optimized** by design to eliminate hazards

KEY



AIA / ARUP
Prescription For Healthier Building
Materials: A Design & Implementation Protocol - 2018

Database tools

Sustainable Minds Transparency Catalog

Red2Green

Manufacturer websites!



Building certification programs

Washington State Sustainable Schools Program (WSSP)








Collaborative for High Performance Schools (CHPS)

LEED v4

WELL

ILFI Living Building Challenge (LBC)



	LEED.	+
	Declare.	+
	Environmental Product Declarations.	+
	Health Product Declarations.	+
	mindful Materials.	+
	FloorScore.®	+
	CRI Green Label Plus.®	+



LEED® v4 for Building Design and Construction (BD+C) Credits Guide for Owens Corning® Products

Product lists and credit contribution by construction type is featured below. The key details the qualifying construction type(s) for each credit.

SS	EA		MR						EQ			
Heat Island Reduction	Minimum Energy Performance	Optimize Energy Performance	Construction and Demolition Waste Management Planning	Building Life-Cycle Impact Reduction	Building Product Disclosure and Optimization - Environmental Product Declarations	Building Product Disclosure and Optimization - Sourcing of Raw Materials	Building Product Disclosure and Optimization - Material Ingredients	Construction and Demolition Waste Management	Minimum Acoustical Performance	Low-Emitting Materials	Thermal Comfort	Acoustic Performance
SSc5	EAp2	EAc2	MRp2	MRc1	MRc2	MRc3	MRc4	MRc5	EQp3	EQc2	EQc5	EQc6

MOVEMENT



Public Policy & Position Statement – The Practice

The AIA advocates for programs, policies, and practices that inform an holistic approach to selecting and using building materials.

Materials significantly affect human and ecosystem health, well-being, climate, and social equity. Architects' ability to understand life-cycle impacts is fundamental to the art, craft, and science of architecture and to making positive material choices that support a healthy, prosperous world.

The AIA supports transparent, clear information on the content of building materials and furthermore urges manufacturers to develop materials that are free of toxic substances, minimize greenhouse gas emissions, and are environmentally and socially responsible.

- AIA –2017

Code of Ethics – Canon VI / Obligations to the Environment

Members should recognize and acknowledge the professional responsibilities they have to promote sustainable design and development in the natural and built environments and to implement energy and resource conscious design.

Ethical Standard 6.3 Building Materials:

Members should **select and use building materials to minimize exposure to toxins** and pollutants in the environment to promote environmental and human health and to reduce waste and pollution.

- AIA 2018

Transparency is the new normal

Everyone involved in the building project could have access to information on health impacts

AIA Materials Industry Forum Summary Report

November 8, 2017

Attendees

PRACTITIONERS

Jay Hindmarsh, AIA - Mahlum
 Brian Kaplan, AIA - SOM
 Cynie Linton, AIA - Kalin Associates
 Russell Perry, FAIA - SmithGroup
 Lona Rerick, AIA - ZGF
 Jackie Santa Lucia, AIA - Hacker Architects
 Raphael Sperry - Arup

BUILDING PRODUCT MANUFACTURERS

Rachel Berman - MechoSystems
 Tim Conway - Shaw
 Mikhail Davis - Interface
 Casey Johnson - Forbo Flooring Systems
 Mike Johnson - 3form
 Christian Kofod - Roxul
 Doug Mazeffa - Sherwin-Williams Co
 Ian McCarthy - Imperial Paints dba ECOS Paints
 Teresa McGrath - Valspar
 Amir Sekhavit - superior essex
 Jon Smieja - Andersen Corporation
 Gale Tedhams - Owens Corning
 Howard Williams - Howard Williams Consulting

DATABASE VENDORS

Ryan Dick - GIGA
 Michael Shahriari - ecomedes
 Terry Swack - Sustainable Minds

RELATED INDUSTRY PROFESSIONALS

Michael Heinsdorf - Avitru
 Keith Killpack - SCS Global Services
 Kathryn Rogers - Silent Spring Institute
 John Ullman - Harvard University

AIA STAFF

Paola Capio
 Luke Diorio
 Michele Russo
 Julia Siple, AIA
 Melissa Wackerle
 Matthew Welker, Assoc. AIA

FACILITATOR

Nadav Malin

2017 Greenbuild, Boston

On a Wednesday afternoon during Greenbuild, about 40 professionals representing different roles within the building industry gathered with the following purpose:

To: Identify barriers to increased transparency and purchasing based on the health and environmental impact of building products and to identify opportunities for cross-disciplinary collaboration to overcome those barriers;

In a way that is: Collaborative, engaging, fun, empowering, and increases trust among the participants;

So that: People and ecosystems, including those within the built environment and those affected by its supply chain, can thrive.

The planning team had also identified several desired outcomes:

- Prioritized list of barriers to transparency in building products
- Clearly defined strategies for collaborating to overcome those barriers.
- An assessment as to the value of and interest in continued collaboration to address the barriers.

We came away with a short list of **high priority barriers** to product transparency and optimization, along with a handful of strategies for addressing each one. The barriers are:

- Education: across the industry, people are not well informed about these issues.
- Quality & reliability of information: disclosures vary widely in their accuracy and comprehensiveness
- Lack of technical standardization: various disclosure formats and programs have inconsistent requirements.
- Lack of products with transparency documentation: designers, contractors, and owners struggle to find products that meet their goals, such as LEED v4, WELL, and Living Building Challenge
- Lack of ROI for investing transparency documentation: manufacturers that do invest in transparency and optimization don't consistently get rewarded with more sales, at least as far as they know.

We also identified a **handful of actions** or initiatives that could help remove those barriers. Some of them will require a long-term engagement, while others might be achievable in the short term.

The **hard stuff**:

- Develop policies at the municipal, state, or federal level that provide incentives for purchasing optimized products and those with disclosure documentation. California's new [Buy Clean California law](#) is a good example of such a policy.
- Consolidate information on products with disclosure documentation and optimization into one mega transparency database, or establish the standards that would allow this type of information to flow easily among existing databases and tools.
- Simplify "the ask" from architects and make it more consistent.

The **easier stuff**:

- Promote independently verified data and recognize it as higher quality. This could be an important way to counter the plethora of poor quality data that is now in the market. There is also an unfortunate tendency for less comprehensive disclosure documents to be have fewer "flagged" ingredients, thereby rewarding less conscientious manufacturers.
- Document the "soft ROI": develop a clear way for manufacturers to find out when their products have been specified (or, better yet, purchased) due to their transparency and/or optimization.
- Tell the "why" story through multiple channels. If we don't talk about why this is important, people won't get behind it.
- Distribute AIA's existing resources supporting this effort, including the Materials Transparency and Legal Risk white paper and the Healthier Materials Protocol.
- Reward high quality education programs through programs such as AIA's CE Quality Education.

Prescription for Healthier Building Materials:

A Design and Implementation Protocol

Spring 2018

Frances Yang, SE, LEED AP BD+C, WELL AP

Sara Tepfer, MS Architecture, BS Chemistry



FIGURE 2

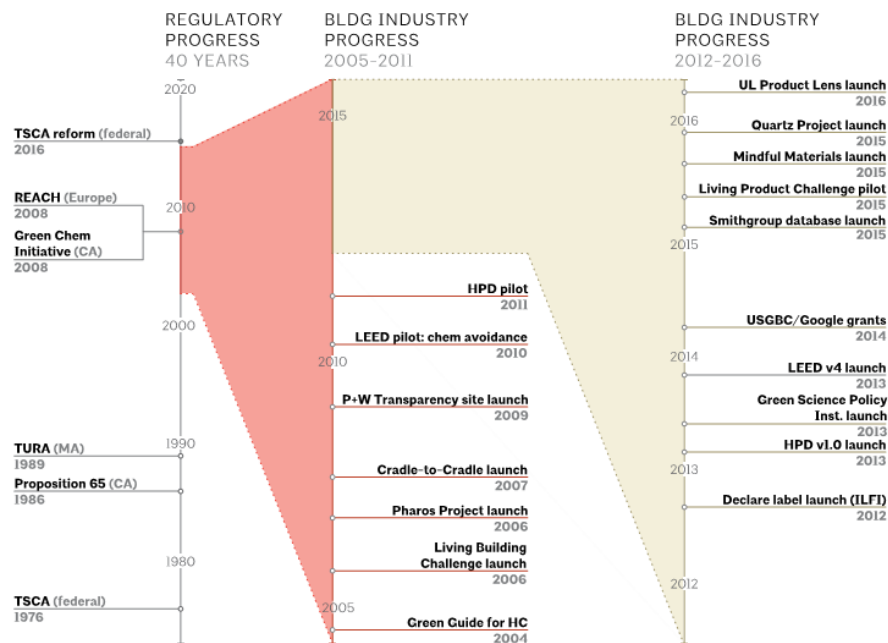


FIGURE 2

Credit: US regulatory and building industry chemical initiatives: 1976-2016.

SOURCE

S. Tepfer, 2016.

MITHÜN



nbbj



Point32

integrus
architecture

OLSON KUNDIG

LMN

ZGF
DAVIDE GUNDEL PRADCO ARCHITECTS LLP

bassetti
architects

MILLER HULL



PERKINS
+ WILL

GGLO
DESIGN

Sellen

WOOLLINS
GERMAN

Ankrom Moisan

mahlum

McCOOL
CARLSON
GREEN



MATERIALS QUICK REFERENCE

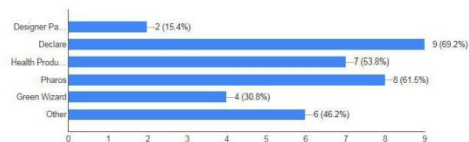
Welcome to the
Healthy Materials Collaborative!

Human and environmental health issues for materials are an increasingly significant concern for the building industry. Efforts to move the market to adopt both transparency around their ingredients and use of healthier materials can be a complicated process involving many organizations, terms and verification systems.

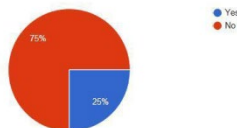
This quick reference sheet is designed to help simplify some of the most common and effective tools and vocabulary around the healthy materials movement.

We invite your participation in joining us in this effort. For more information, please visit healthymaterial.org.

What materials transparency database tools do you currently use?



Do these tool provide the resources you need?



Engaging Our Peers

Embrace open-source platforms to share resources and successes



LEED V4 CREDITS

HPD HEALTH PRODUCT DECLARATION

In order to meet the LEED requirements using this credit, all known hazards for intentional and residual ingredients to 1,000 parts per million (ppm) need to be disclosed. When looking at your product's HPD, the minimum residual disclosure of 1,000ppm box should be checked and full disclosure of known hazards should say "yes". Seeing these 2 boxes checked on the HPD will confirm that the product will comply with the LEED Material Ingredient credit option 1.

EPD ENVIRONMENTAL PRODUCT DECLARATION

In life cycle assessment (LCA), EPD is an internationally standardized, third party verification quantifying the environmental impact of a product or system. EPD's communicate the environmental performance of products and services based LCA. An EPD can provide the product ingredients and environmental impacts that happen during the entire life cycle of a product. It conveys information like raw material extraction, energy use, air, soil and water contamination, water use and waste generation.

LEED V4 IEQ

The Low-Emitting Materials credit LEED v4 contains significant improvements in rewarding the choice of healthy materials in order to reduce concentrations of chemical contaminants that can damage air quality, human health, productivity, and the environment. This credit includes requirements for product manufacturing as well as project teams. It covers volatile organic compound (VOC) emissions in the indoor air and the VOC content of materials.

DECLARE LABEL DEVELOPED BY INTERNATIONAL LIVING FUTURE INSTITUTE (ILFI)

Declare is a product labeling program that relies on the Living Building Challenge (LBC) Red List as its primary basis for material evaluation. ILFI created the Red List to eliminate some of the most toxic materials from LBC projects, while helping to eliminate the need for these chemicals and improve the market. There are currently 22 chemicals listed on the Red List.

In creating a Declare label for a product, a manufacturer must disclose all of that product's intentionally added constituent chemicals to the designated 100 parts per million (ppm) reporting threshold. Additionally, the manufacturer must report the extent to which that product is compliant with the Red List. The three compliance levels are:

LBC RED LIST FREE

which means that the product is free of all Red List ingredients

LBC COMPLIANT

which means that the product contains some chemicals that ILFI has designated as temporary Red List exceptions

DECLARED

which means that the product is not compliant with the Red List or its temporary exceptions but the manufacturer has disclosed the product's full ingredients.

April 25, 2018

CLOSING THE LOOP ON PRODUCT TRANSPARENCY

Dear Design Community Member,

We, as members of the building product manufacturing community, truly appreciate and applaud the many letters and requests for product transparency that we have received from concerned members of the Architecture and Design Community these past five years. Around 35 signatories from some of the world's biggest and most influential firms encouraged us each to continue on our sustainability journey with product transparency, accelerating a transformation in the manufacturing industry. The industry would not be where it is today without such advocacy and encouragement.

As responsible members of a community, you asked us each to tell you what was in our products and what impacts our products have in terms of human and environmental health and sustainability.

WE RESPONDED, IN A BIG WAY

The manufacturers represented in this letter hold a total of:
500 Material Ingredient Reports (e.g. Declare labels, C2C, MHC, HPDs)
1200 Environmental Impact Reports (e.g. LCAs, EPDs)
6 Certified Living Products
Covering more than 25 product categories and 3400 product lines

We are united in a common goal to ensure that high performing, healthy, sustainable and affordable building materials **are the rule, not the exception.**

This is where your help is crucial.

A letter was important to open a dialogue and increase the sharing of information. Transparency has created a platform upon which to have productive conversations with the Architecture and Design community and consumers at large. Now that we have each responded, it is important to evolve and deepen the conversation. Information about where and why our products are being selected now needs to flow back to the manufacturing community.

Significant costs are incurred to develop new materials and implement new, more sustainable products. Manufacturers must invest in data management, employee, supplier and stakeholder engagement, R+D, and capital investment. Each manufacturer, like every business, must demonstrate return on these sustainability investments. **The manufacturing industry has shown that transparency and innovation are possible: now we need to hear that it matters to you, and that it has an impact on your choices and purchasing decisions.**

We need your feedback to justify continued reinvestment and expansions in sustainability efforts. It is time to close this transparency loop, together.

EACH OF US COMMIT TO

- Continue **building sustainability practices** into manufacturing and material selection.
- Continue to **invest in product transparency** measures and programs.
- **Use common platforms** for product information to make it easier to specify products with preferable environmental attributes.
- **Prioritize suppliers** that support our transparency and environmental impact reduction efforts.
- **Educate** internally at our companies, and externally in our supply chains, about the importance of transparency and sustainable products.
- **Walk the talk** through encouraging the specification of transparent products in our **own buildings, factories, and purchasing programs.**

WE EACH ASK YOU TO

- **Specify products** that are transparently disclosed and have reduced human and environmental health impacts whenever possible.
- **Advocate to customers** for programs like Living Building Challenge, LEED and WELL, that value transparency, material health and reduced environmental impacts, and create market demand.
- **Tell us** which tools and databases you want to use to find our products, and reach out separately to let us know *when and why* you specified our products.
- Continue to **send us letters** as well (they go a long way).
- **Consider all product categories**, including those that go beyond what you can see, touch and feel in a building; they also have significant impact.
- Distribute this letter at your own firms and continue internal education to **ensure that this message reaches the individuals who specify products on a daily basis.**

This work and the conversation surrounding it will continue to evolve, and we are merely scratching the surface on this first step. We each thank you again for your bold pursuit of sustainability in the built environment, and look forward to being fierce advocates for creating healthy, sustainable buildings.

Sincerely,

The Living Product 50

A group of leading manufacturers collaborating to transform the materials economy through transparency, green chemistry, supply chain innovation, and industry awareness.



Yes!

And we want to hear back from you!



Columbia Sportswear | Macklemore & The OutDry ECO Jacket

630,307 views

1.2K 602 SHARE SAVE ...

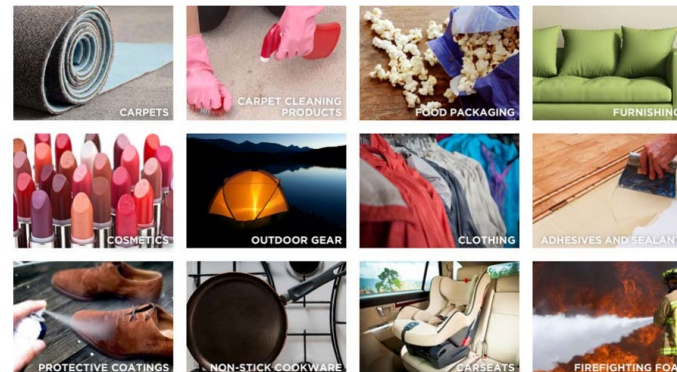
PFASs / PFCs / PFOA / PFOS / C8 = “forever chemicals”

More than 3,000 individual PFASs may have entered the market. Use sparingly.



Where are they found?

Highly fluorinated chemicals are used in carpets, cleaners, clothing, cookware, cosmetics, food packaging, furnishings, outdoor apparel, paints, papers, protective coatings and sealants, and firefighting foams. [Learn more](#) about products that may contain highly fluorinated chemicals.



TOXIC FLUORINATED CHEMICALS IN TAP WATER AND AT INDUSTRIAL OR MILITARY SITES

Contamination Sites

EPA Tap Water Detections

Public Water System with Detection of Fluorinated Chemicals

- Serving less than or equal to 30,000 people
- Serving between 30,001 and 60,000 people
- Serving more than 60,000 people

- Fluorinated Chemical Contamination Site

Source: Northeastern University - Social Science Environmental Health Research Institute, U.S. EPA Third Unregulated Contaminant Monitoring Rule

Public Water Supply Testing 2013-2016

System name: **DYER WATER DEPARTMENT**

PWSID: **IN5245011**

Population served: **16,277**

City served: **DYER**

County served: **LAKE**

State served: **IN**

PFOA/PFOS contaminant(s): **PFOS**

PFOA/PFOS detection: **No PFOA detection. 1 out of 4 PFOS samples detected an average of 19 ppt with a maximum of 78 ppt and a minimum of 0 ppt.**

Other contaminant(s): **PFHxS**

Other detections: **No PFHxA detection. 1 out of 4 PFHxS samples detected an average of 16 ppt with a maximum of 65 ppt and a minimum of 0 ppt. No PFNA detection. No PFBS detection.**

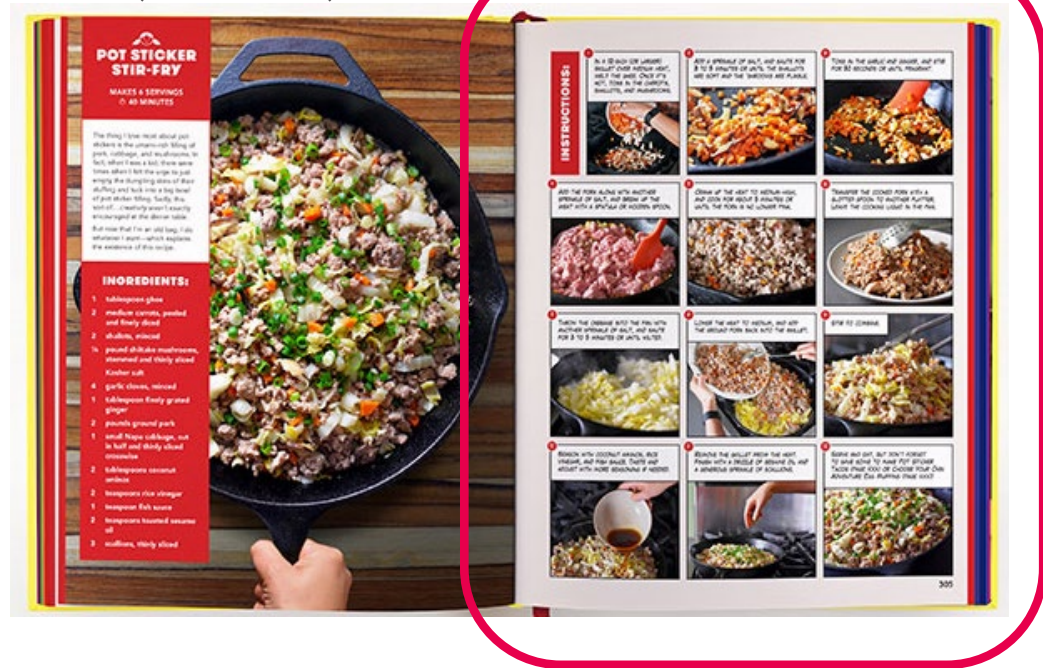
Source: EWG from (USEPA) Third Unregulated Contaminant Monitoring Rule

LOOK INWARD

Scientists have long known that when it comes to harm from **environmental exposures**, the **youngest children** often face the greatest **risk**.

-Gluckman PD, Hanson MA, Spencer HG, Bateson P

Drawings



Something In-between!



8. Manufacturers:
 - a. CertainTeed Corporation: www.certainteed.com.
 - b. Johns Manville: www.jm.com.
 - c. Owens Corning Corporation; EcoTouch PINK FIBERGLAS Insulation: www.ocbuildingspec.com/#sle.
 - d. Knauf Insulation: www.knaufinsulation.com

8.1, c D. Mineral Fiber Batt Insulation: Flexible or semi-rigid preformed batt or blanket, complying with ASTM C665 friction fit; unfaced flame spread index of 0 (zero) when tested in accordance with ASTM E84.

1. Flame Spread Index: 25 or less, when tested in accordance with ASTM E84.
2. Smoke Developed Index: 0 (zero), when tested in accordance with ASTM E84.
3. Thermal Resistance: R-value of _____
4. Thickness: _____ inch.
5. Formaldehyde Content: Zero.

6. Manufacturers:
 - a. Johns Manville; MinWool Sound Attenuation Fire Batts: www.jm.com/#sle.
 - b. Knauf Insulation; EcoBatt Insulation: www.knaufinsulation.com/#sle.
 - c. ROCKWOOL (ROXUL, Inc); AFB evo™: www.rockwool.com/#sle.
 - d. Thermafiber, Inc; SAFB FF: www.thermafiber.com/#sle.

2.6 SPRAY FOAMED-IN-PLACE INSULATION

CLARIFY OPEN VS. CLOSED CELL
USES + LOCATIONS? THEN DON'T

A. Medium-density, rigid or semi-rigid, closed cell polyurethane foam; foamed on-site, using blowing agent of water or non-ozone-depleting gas.

1. Aged Thermal Resistance (R-Value): 6.0 (deg F hr sq ft)/Btu, minimum
2. Surface Burning Characteristics: Flame spread / Smoke developed index of 25 / 450 maximum, when tested in accordance with ASTM E 84.

3. Manufacturers:
 - a. BASF Corporation; WALLTITE US Series Open Cell: www.spf.basf.com.
 - b. Dow Corning; Product Froth Pak; www.dow.com

2.7 ACCESSORIES

SOMETIMES IN 072500

I think always in 072500
on R204 recommendation

A. Sheet Vapor Retarder Polyimide film vapor retarder for use with unfaced, vapor permeable glass fiber insulation in wall and ceiling cavities. Material has a permeance of 1 perm or less when tested to ASTM E 86, dry cup method and increases to greater than 10 perms using the wet cup method.

1. Manufacturer: CertainTeed Corp.; MemBrain, The SMART Vapor Retarder: www.certainteed.com.
2. Fire Hazard Classification, ASTM E 84:
 - a. Maximum Flame Spread Index: 20
 - b. Maximum Smoke Developed Index: 55

B. Interior Vapor Retarder: Modified polyethylene/polyacrylate (PE/PA) film reinforced with polyethylene terephthalate (PET) fibers, 12 mils, 0.012 inch thick.

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Document Issue 1 Issue Date: day/month/year

PAGE 5 OF 8

Crowd sourcing

Establishing best practices, removing bad actors

What is Thermal Insulation?

1. While stopping heat flow is the goal for the wall of a refrigerator...a building faces a different task: to provide a **comfortable interior environment** as the exterior environment goes through large changes in temperature and solar radiation.
2. We don't really care about making **buildings** comfortable. We care about making **people** comfortable.
3. The paradox of insulation materials is that the very best insulation we can imagine would be literally, **nothing**.
-Z Smith (Eskew+Dumez+Ripple)

Board Insulation

Cavity Wall CI, Stem wall, Foundation, Under-slab
Fiber, Foam

Batt / Blanket Insulation

Cavity Wall, Soffit, Roof
Fiber (Glass or Mineral)

Acoustic Insulation

Specialty function

Spray / Blown Insulation

Cellulose, Foam

Accessories

Vapor Retarder



How do we specify Thermal Insulation?

01 81 13 – Sustainable Design Requirements

Product and building certification system performance goals, checklists, scorecards and forms

07 21 00 – Thermal Insulation

07 5X 00 – Roofing

Board and tapered insulation systems part of a single-ply or built-up roofing system

09 21 16 – Gypsum Board Assemblies

Interior partition insulation

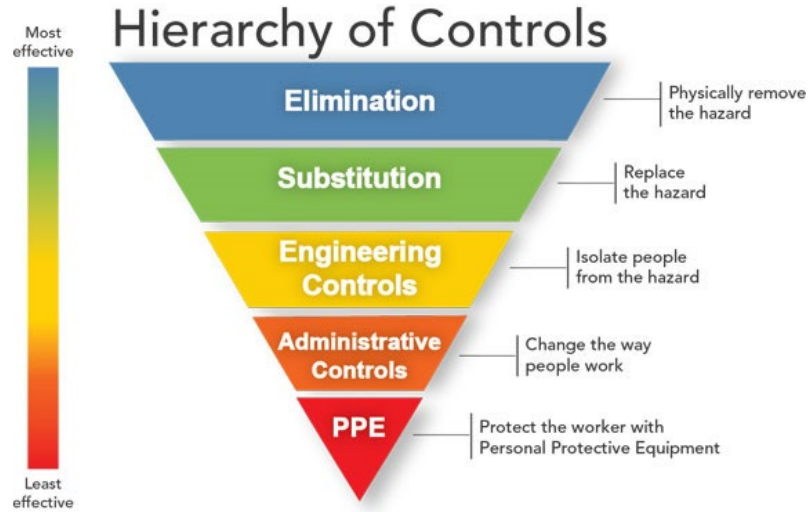
See also:

Division 22 & 23 piping, ductwork & equipment, Metal decking acoustical systems, Structural topping slab/radiant systems, Firestopping systems, EIFS, SIPS, ICFs, Sheathing, ACM/MCM Panels, Dampproofing & Waterproofing protection systems



Chemical Regulation

Centers for Disease Control and
Prevention / National Institute for
Occupational Safety & Health - 2015



Hazard x Exposure = **RISK**

Protecting resources

Designing for optimized solutions versus remediation



Material Impacts

General tools for ingredient disclosure and chemicals of concern

Healthy Building Network (HBN) HomeFree insulation product site

Quartz Project site

Perkins+Will Transparency site

Parsons Healthy Materials Lab insulation guide








BuildingGreen Guide to Insulation

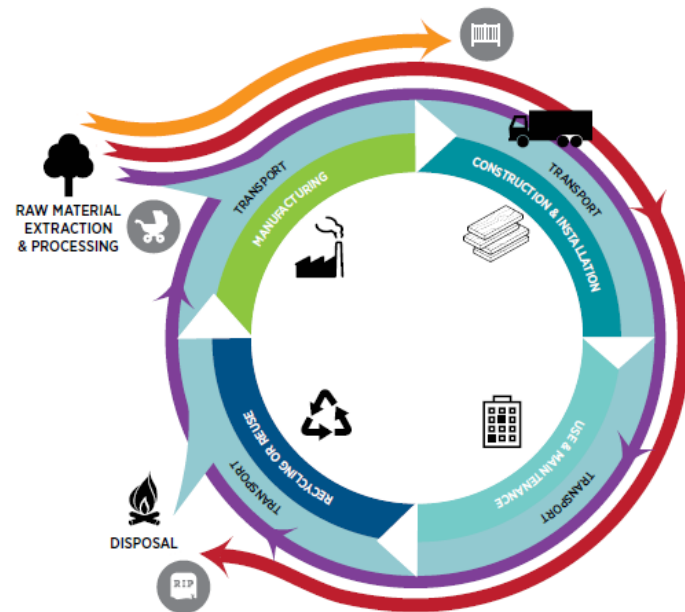
More?!

BuildingGreen Designer Pages, LEEDUser

Healthy Building Network (HBN), Data Commons, Pharos Project

Green Science Policy Institute, Six Classes

Insulation Type	R-value Per Inch*	Estimated Installed Cost Per ft² for R-19**		Vapor Permeability†	Air Barrier‡	Environmental Notes (see below for legend)
		Low end	High end			
FIBER, CELLULOSIC, AND GRANULAR						
Mineral wool	3.3	\$1.44	\$2.10	Class III: Semi-Permeable	Not an air barrier	   Choose low-emitting products
RIGID BOARDSTOCK						
Polyisocyanurate	6–6.5	\$3.20	\$3.65	Class II: Semi-Permeable Class I: Impermeable (Foil-faced)	Air barrier material	    High global warming potential for urethane-core SIPs Chlorinated flame retardant (otherwise fairly inert) Toxic manufacturing process



BuildingGreen

NEWS KNOWLEDGE BASE • CONSULTING PRODUCT GUIDANCE CONTINUING EDUCATION

HBN HomeFree insulation site

Avoid formaldehyde-based binders

Formaldehyde is a **potent carcinogen** and respiratory hazard, even at low levels. Fiberglass and mineral wool insulations have traditionally used these binders, but there now are often formaldehyde-free options.

Check the type and source of recycled content

Fiberglass insulation often includes a high amount of **recycled content** (known as glass cullet), which comes mainly from recycled bottles. However, some glass cullet comes from recycled cathode ray tubes (CRTs), which release large amounts of lead into the environment during recycling. Look for fiberglass insulation products containing **60% or more post-consumer recycled content**.

Avoid foam insulation

Foamed products like polystyrene and spray polyurethane foam use **blowing agents** that are greenhouse gases. These gases contribute to **global warming**, and detract from these insulations' positive effects on climate change by saving energy. Foam insulation can also contains highly toxic **flame retardants**.



Insulation Hazard Spectrum

Cork

Blown-In Fiber Glass (Loose Fill, Dense Pack, and Spray-Applied)

Kraft-Faced and Unfaced Fiber Glass Batts

Unfaced Cellulose/Cotton Batts

Blown-In Cellulose (Loose Fill, Dense Pack, and Wet-Blown)

PSK or FSK-Faced Fiber Glass Batts or Blankets

Mineral Fiber Batts and Boards

Fiber Glass Board (Duct Insulation)

Polyisocyanurate

Expanded Polystyrene (EPS)

Extruded Polystyrene (XPS)





Spray Foam Insulation (SPF)

Perkins+Will – Transparency site

Precautionary List ⓘ

Browse substances of concern by project type, product type, CSI specifications, and hazards

PRECAUTIONARY LIST / WATCH LIST / SUNSET LIST

SEARCH SUBSTANCES	PROJECT AREA +	MASTERFORMAT +	PRODUCTS +	HEALTH HAZARDS +	ENVIRONMENTAL HAZARDS +
07 21 00 Thermal Insulation ✕	CLEAR ALL				
 <div>Antimicrobials - marketed health claim CASRN: Multiple*</div>	<div><input type="checkbox"/> 07 14 00 Fluid-Applied Waterproofing (21)</div> <div><input type="checkbox"/> 07 15 00 Sheet Metal Waterproofing (21)</div> <div><input checked="" type="checkbox"/> 07 21 00 Thermal Insulation (21)</div> <div><input type="checkbox"/> 07 21 13 Board Insulation (21)</div> <div><input type="checkbox"/> 07 21 29 Spray-Applied Insulation (21)</div> <div><input type="checkbox"/> 07 27 00 Air Barriers (21)</div> <div><input type="checkbox"/> 07 27 26 Fluid-Applied Membrane Air Barrier (21)</div> <div><input type="checkbox"/> 07 42 00 Wall Panels (21)</div> <div><input type="checkbox"/> 07 42 43 Composite Wall Panel (21)</div> <div><input type="checkbox"/> 07 46 00 Siding (21)</div>				
 <div>Urea-Formaldehyde CASRN: 9011-05-6 Formaldehyde</div>					
 <div>Antimony Trioxide CASRN: 1309-64-4 Flame Retardants</div>	 <div>Hexabromocyclododecane (HBCDD) CASRN: 3194-55-6, 25637-99-4 Flame Retardants</div>				

Flame Retardants

CASRN: Multiple*

Overview + Health

There are three general categories of flame retardant substances: halogenated, organophosphate, and mineral/others. Of highest concern are the halogenated type, because they are well documented as toxic, persistent, and/or bioaccumulative. The organophosphate group is somewhat less persistent and somewhat less bioaccumulative, and is sometimes touted as "safer" than the halogenated class; however, this type also has far less health data available. The third group, mineral/others, is the broadest grouping, and many in this group are of lowest concern—but some still are Benchmark 1 (for example, antimony trioxide), so for now best practice is to check each flame retardant chemical for its individual hazards.

GreenScreen Score

List Translator (LT-1): Likely Benchmark 1

GSPI Six Classes of Chemicals of Concern

Flame Retardants

Pathways of Exposure

Biomonitoring studies have found flame retardants in the blood and body tissues of nearly all Americans tested, with the highest levels in young children.[1] Diet is thought to be a secondary source of exposure in most cases.[2] The flame retardants emitted from factories,[3] washed down drains,[4] and leached from landfills[5] can accumulate in plants[6] and animals[7] that ultimately become our food.

Flame retardant chemicals are being found in all environmental matrices examined including air, water, soil sediment, and sewage sludge.

Green Building News

Up-to-date reports from GBA's news department



0
Helpful?

Mineral Wool Makers Dropping Formaldehyde Binders

Two manufacturers will begin making insulation with 'no added formaldehyde' later this year

POSTED ON MAY 4 2017 BY SCOTT GIBSON

Two manufacturers of mineral wool insulation have announced that they will stop using binders containing formaldehyde in at least some of their products, a move aimed at addressing long-standing health concerns and meeting tougher green certification requirements.

Roxul said that it would begin supplying an updated version of its light density AFB batt insulation[®], called AFB EVO, to North American distributors on July 1. Owens Corning also announced plans to introduce a formaldehyde-free version of its Thermafiber insulation later this year. The new products are intended to ease concerns among builders and specifiers about the off-gassing of formaldehyde, a chemical found in a variety of building and consumer products and listed as a human carcinogen.

Roxul said that AFB EVO "has been developed to meet the market demand of architects and building owners designing to no-added-formaldehyde specifications in forward-looking certifications such as LEED v4." Owens Corning[®], which didn't say exactly when the new version of Thermafiber would be available, also cited green building standards in its announcement.

Owens Corning was the first to develop a phenol formaldehyde binder for insulation in 1938, and it remained the industry standard for the next 70 years, according to an article posted by the Healthy Building Network[®]. Johns Manville shifted to an acrylic binder for fiberglass insulation in 2002, and the rest of the industry had followed suit by 2015. But until now, mineral wool producers had stayed with binders containing formaldehyde.



Roxul's AFB mineral wool insulation will be manufactured with a formaldehyde-free binder later this year. Owens Corning says it will offer a similar product. (Steel studs are thermal bridges, and should usually be insulated with a layer of continuous exterior insulation, not with batts installed between the studs. According to Roxul, which provided the photo, the photo shows "a very typical commercial interior partition wall application for AFB.")

HomeFree PRODUCTS NEWS PROJECTS FORUM EVENTS RESOURCES+ SPEC COLLECTION



Related Product News

Does Healthy SPF Exist?

In Summary: Spray Foam products marketed as being healthier may ...

Reevaluating Insulation Materials To Create Healthier Spaces

In Summary: Being thoughtful about which insulation materials ...

HBCD-free Styrofoam™ Insulation Coming to USA -- by Jim Vallette

By 2018, extruded polystyrene (XPS) insulation will be available in North America without ...

Insulation Hazard Spectrum

The Healthy Building Network has researched a variety of insulation products used in the interior walls, ceilings, and floors of a structure. We rank these products on a simplified spectrum below. Products appearing green are better options than those that appear red, and products that appear yellow are generally less preferable to those at the top, but better choices than those at the bottom.

Read more..

Cork

Blown-In Fiber Glass (Loose Fill, Dense Pack, and Spray-Applied)

Kraft-Faced and Unfaced Fiber Glass Batts

Unfaced Cellulose/Cotton Batts

Blown-In Cellulose (Loose Fill, Dense Pack and Wet-Blown)

PSK or FSK-Faced Fiber Glass Batts or Blankets

Mineral Fiber Batts and Boards

Fiber Glass Board (Duct Insulation)

Polyisocyanurate

Expanded Polystyrene (EPS)

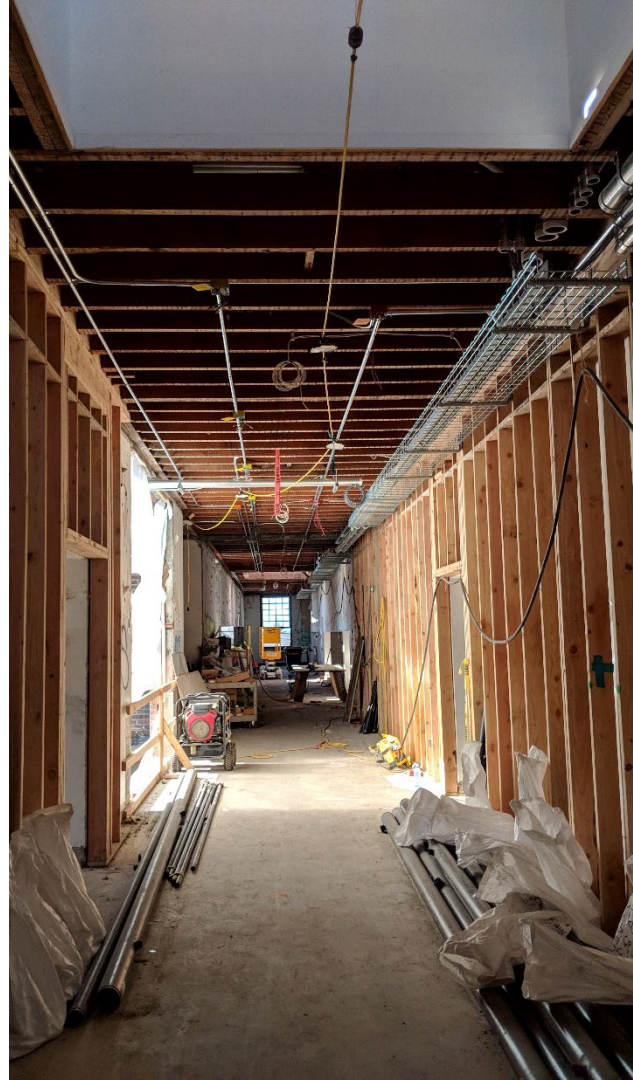
Extruded Polystyrene (XPS)

Spray Foam Insulation (SPF)

Urea phenol-formaldehyde can release **formaldehyde** (a carcinogen and asthmagen) over time

Technical Systems

Transparency & Disclosure





Thermafiber® UltraBatt™ FF Formaldehyde-Free Mineral Wool Insulation



Description

Thermafiber® UltraBatt® Formaldehyde-Free insulation batts are designed to provide excellent thermal insulation, fire resistance and noise control in residential and light commercial construction. UltraBatt® FF is more dense than traditional batts or rolls and is quick and easy to install. The new formaldehyde-free Thermafiber® light density products are especially appropriate for applications committed to indoor air quality. Thermafiber® UltraBatt® insulation FF is non-combustible, non-corrosive, non-deteriorating, and mold resistant.¹

Standards, Codes Compliance

NFPA 101	Class A rated interior finish
ASTM C 665	Non-Corrosive
ASTM E 136	Non-combustible as defined per NFPA Standard 220
ASTM E 84	Flame Spread 5, Smoke Developed 5
ASTM C 1338	Complies
UL Formaldehyde-Free	Validated
GreenGuard	Gold certified

Product Options

- Available in standard widths for both wood and steel stud framing

Recycled Content Options^{1,2}:

EPA Choice Fiber (US Government Buildings)	Minimum 75%
Standard Fiber	70%

1. Recycled content options other than standard must be specified at time of order.

Technical Data

Product Designation	Tested to ASTM E 84	
	Flame Spread	Smoke Developed
UltraBatt®	5	5

Installation

- Measure & cut
UltraBatt® insulation is easy to cut with a serrated knife for custom fitting around electrical boxes, pipes, duct-work, wiring, or between non-standard studs and joist.
- Squeeze & insert
UltraBatt® insulation is flexible and pliable; simply squeeze the sides to compress the insulation and insert into the desired wall.
- Release & expand
Once in place, UltraBatt® insulation naturally expands to fill in the space, creating a snug, custom fit.

Availability

	R-Value*	Sizes	Pieces/Bag	SqFt./Bag
Wood Stud Application	R15	3.5" x 15" x 47"	6	28.4
	R23	5.5" x 23" x 47"	4	45.0
	R30	7.1" x 15" x 47"	3	14.7
Steel Stud Application	R10	2.5" x 16" x 48"	8	42.7
	R15	3.5" x 16" x 48"	6	32.0
	R24	6" x 16" x 48"	4	21.3

*R-Value is a measure of insulating ability. "R" means resistance to heat flow. The higher the "R" Value, the greater the insulation power.



Technical Systems

Transparency & Disclosure



Thermafiber



ENGAGE

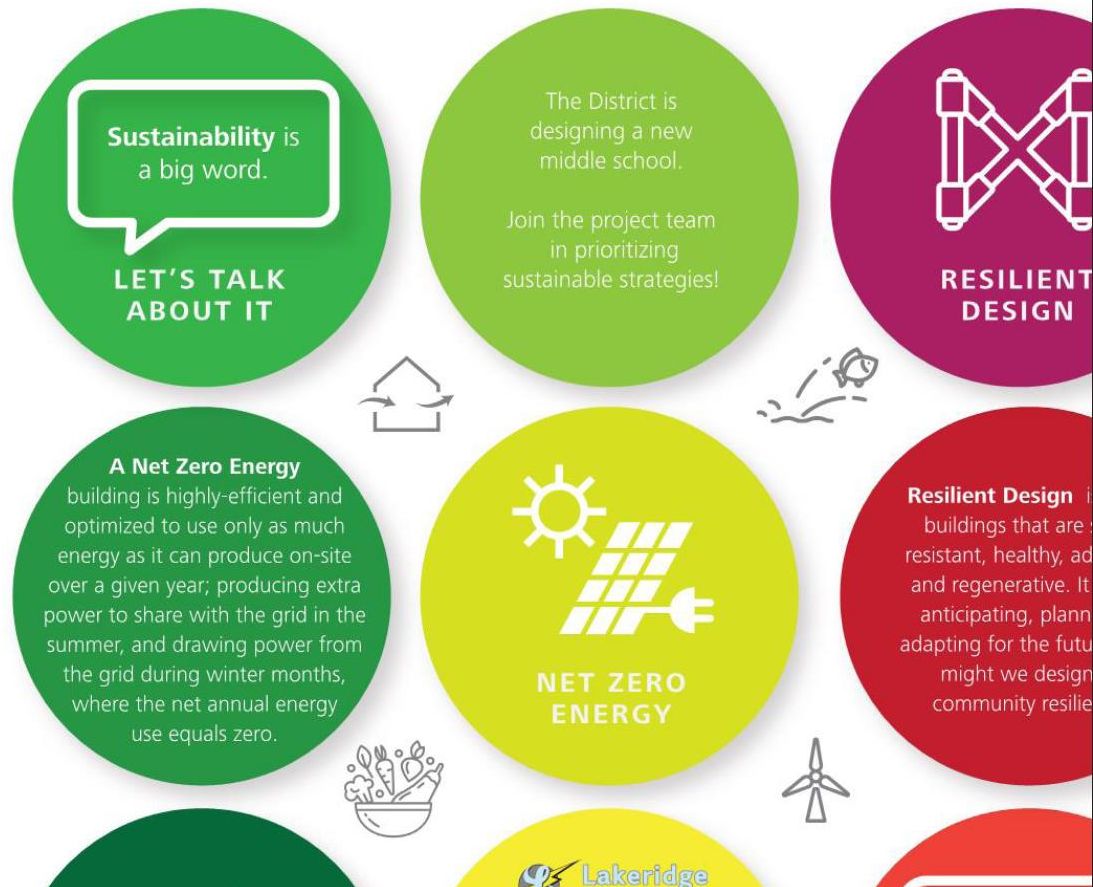
We are conducting a **massive clinical toxicological trial**, and our children and our children's children are the experimental subjects.

-Herbert Needleman & Philip Landrigan



mahlum

 **Lake Oswego**
School District



Activity 1

What does sustainability mean

for you personally?



RESILIENT DESIGN

COST: \$-\$\$\$

OPERATIONS: SEWER

If the city sewer system is damaged, the school could treat/ manage its own wastewater onsite. This could come in a number of forms: a series of constructed wetlands, packaged system requiring electricity, holding tank with macerating



WATER

COST: \$\$

STORMWATER POND

Stormwater Detention Ponds are designed to temporarily store water and release the water slowly over time.



WATER

COST: \$

STORMWATER SWALES

Stormwater Swales are vegetated stormwater facilities that provide treatment stormwater runoff. Typically stormwater swales are linear, and gently sloped.



NATURE

COST: \$\$

NATURE PLAY

An outdoor landscape of natural materials and habitats where children can explore, play, and learn. These are informal opportunities for the exercise of the mind and

NET ZERO ENERGY

COST: \$\$\$

GEO-EXCHANGE SYSTEM

A geo-exchange system uses the ground as a source of heat during the colder months and as a heat sink during the warmer months. The geo-exchange loop boosts mechanical



WATER

COST: \$\$

STORMWATER LANDSCAPE PLANTERS

Stormwater Planters are vegetated stormwater facilities that provide treatment and detention for stormwater runoff. Typically stormwater planters are flat-



RESILIENT DESIGN

(STRUCTURE)
COST: \$-\$\$

RISK CATEGORY III-IV (AREAS OF ASSEMBLY)

Gathering spaces (gym, commons, etc) in the school will be upgraded to a higher earthquake design standard to increase the magnitude of earthquake they are likely to



MATERIALS

COST: \$-\$\$

SUSTAINABILITY HARVESTED LUMBER

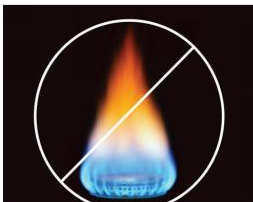
Responsibly managed forests can provide livelihoods and raw materials for generations to come, while also helping us to control and adapt to climate change, protecting and enhancing biodiversity, soil fertility, and clean, fresh water. Lumber with Forest Stewardship Council (FSC) certification comes from managed forests.

NET ZERO ENERGY

COST: \$\$

FOSSIL FUEL FREE BUILDING

To be fully net zero energy and net zero carbon, the school should not use fossil fuels. This means that the school does not have boilers for heating, gas water



MATERIALS

COST: \$-\$\$

LOCAL MATERIAL PRODUCTION

Specifying materials that are assembled locally from resources extracted within a local region around the building site

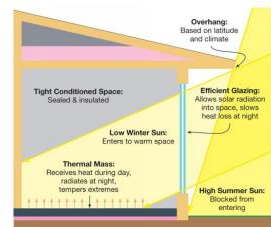


RESILIENT DESIGN

COST: \$\$

OPERATIONS: HEATING + COOLING

Passive systems utilize the natural environment combined with the building itself - insulation, orientation, massing, strategic placement of windows, etc. - to provide conditioning such as ventilation, heating, and cooling. If the grid goes down, the building will be able to maintain relatively comfortable conditions (55F-85F).



MATERIALS

COST: \$

THERMAL MASS

Thermal mass is a material within the building that absorbs thermal energy during the day and releases it when it's cooler to reduce load on the heating system. At it's simplest, this would be an exposed concrete floor that is



NATURE

COST: \$\$

GARDEN TO CAFETERIA

A small amount of soil can provide a lot of food. It can also teach students about biology, agriculture, and even the culinary arts.



MATERIALS

COST: 0-\$

MATERIAL EFFICIENCY

Expose and celebrate the building structure and systems. This would mean removing ceiling or other finish materials and designing structural and mechanical systems to be more aesthetically pleasing.



WATER

COST: \$

GREEN ROOF

A Green Roof or Eco-roof is a building roof that is covered with living plant materials.



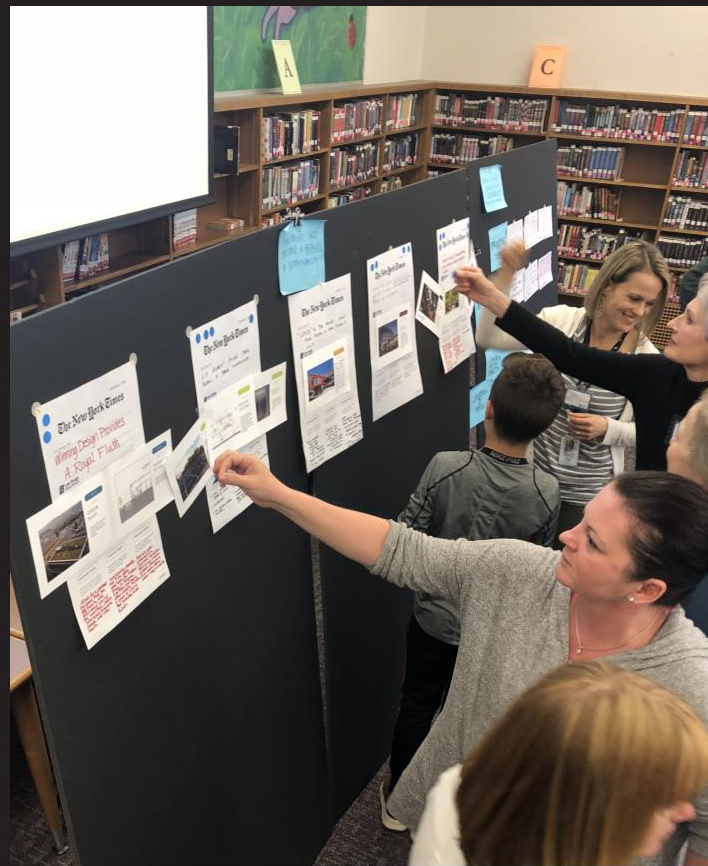
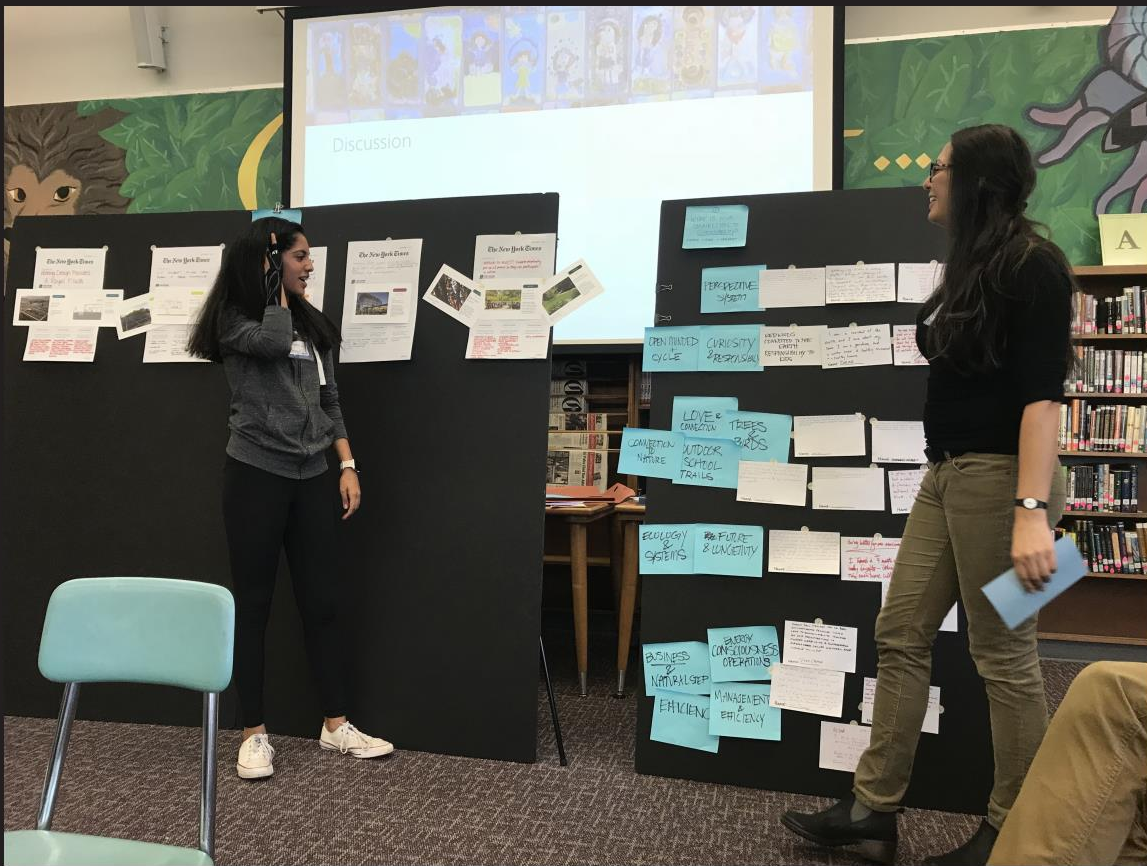
RESILIENT DESIGN

(STRUCTURE)
COST: \$-\$\$\$

US RESILIENCY COUNCIL RATING

Target specific resiliency goals using the US Resiliency Council rating systems. Use the USRC rating system (similar to LEED) to target a silver, gold or platinum rating.





NATURE

WATER

NET ZERO ENERGY

RESILIENT DESIGN

MATERIALS

SEPTEMBER 1, 2020

The New York Times

Lake Oswego, Ore.

UNPLUG TO PLAY!!! Students voluntarily give up cell phones so they can participate in nature.

Lake Oswego School District



Community Impact Curricular Impact Operations Impact

How might this strategy benefit the local Lake Oswego events calendar, partnerships, or public perception?

- interactive activities available to students
- accommodate individuality
- welcomed by
- families, friends
- involved in community
- access, cherished
- connections
- like school there
- involve others outside school
- connect families

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- cooperative learning
- wellness, fitness
- theatre experiences
- curiosity
- critical thinking info
- feedback
- conversation
- carries over to personal
- fiber

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- safety considerations

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SEPTEMBER 1, 2020

The New York Times

Lake Oswego, Ore.

Winning Design Provides A Royal Flush

Lake Oswego School District



Community Impact Curricular Impact Operations Impact

How might this strategy benefit the local Lake Oswego events calendar, partnerships, or public perception?

- Allows for a community space that has beauty and efficiency desired for meetings, classes, after-school programs, camps, and other events.

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- Consistently changing real time data available for student study in Science, Electives, and many other classes. Preserves a space of silence that promotes mindfulness.

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- Reduces water consumption. Improves insulation efficiency, creates outdoor classroom. water, require maintenance.

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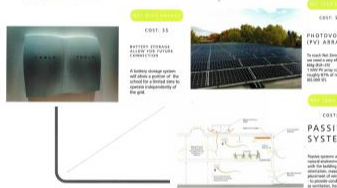
SEPTEMBER 1, 2020

The New York Times

Lake Oswego, Ore.

L.O. STUDENT POWER THEIR SCHOOL + THEIR COMMUNITY

Lake Oswego School District



Community Impact Curricular Impact Operations Impact

How might this strategy benefit the local Lake Oswego events calendar, partnerships, or public perception?

- OPEN SOURCE SHARE OF WORK
- AWARENESS
- LOW MAINTENANCE FOR AHEAD

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- BOLD AS SCIENCE IN DISPLAY
- MAIN
- SPREADS AWARENESS + MORE MEANINGFUL (TEACHING)

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- LOW MAINTENANCE FOR AHEAD

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SEPTEMBER 1, 2020

The New York Times

Lake Oswego, Ore.

City opens Living School will last 100 years; able to function through big earthquakes

Lake Oswego School District



Community Impact Curricular Impact Operations Impact

How might this strategy benefit the local Lake Oswego events calendar, partnerships, or public perception?

- community embrace school as it's living from 500 will use it as emergency center.

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- Just expect usable for curriculum.
- Great for STEM classes

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- local residents love new sustainable spaces to inspire learners of all ages
- benefit from our \$ in local products.

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SEPTEMBER 1, 2020

The New York Times

Lake Oswego, Ore.

"LOSD" In The Woods : School Finds Future In Mass Timber & C.L.T.

Lake Oswego School District



Community Impact Curricular Impact Operations Impact

How might this strategy benefit the local Lake Oswego events calendar, partnerships, or public perception?

- local residents love new sustainable spaces to inspire learners of all ages
- benefit from our \$ in local products.

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- Students feel welcome and excited by the cutting edge materials while maintaining natural connection to our ecosystem.
- some maintenance stuff have been realized to maintain green roof garden, link to learning + collection, open and fun fresh off - free range

How might this strategy change the school's program offerings, maintenance plans, or staffing?

- some maintenance stuff have been realized to maintain green roof garden, link to learning + collection, open and fun fresh off - free range

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ACTION

... architecture doesn't get the benefit of an **extensive period of trial and error**, a custom designed building needs to function from day one.

-AIA Committee on the Environment (COTE) Top Ten Toolkit

Waiting for a unicorn?







- CORE INSTRUCTION
- STAFF/STUDENT SUPPORT
- SPECIAL EDUCATION
- GROSS MOTOR ACTIVITY
- FOOD SERVICE
- LIBRARY
- CIRCULATION
- BUILDING SUPPORT

BPDO CHEAT SHEET

The three Building Product Disclosure and Optimization (BPDO) credits in LEED v4 are pushing the industry into new territory. USGBC has done a great job defining and spurring manufacturers to support some options, but others are not yet (as of mid-2017) achievable, for a range of reasons. So go after the easy ones, and don't waste time on others until they're within reach.

	ENVIRONMENTAL PRODUCT DECLARATIONS (EPDs)	RAW MATERIAL EXTRACTION	MATERIAL INGREDIENTS
OPTION 1 DISCLOSURE (1 POINT)	EASY (AND GETTING EASIER ALL THE TIME) <ul style="list-style-type: none"> 20 product-specific EPDs from at least 5 suppliers Industry-average EPDs count at 1/2 value GOOD TARGET FOR EXEMPLARY PERFORMANCE (40 EPDs)	NOT ACHIEVABLE AT THIS TIME <ul style="list-style-type: none"> Corporate sustainability reports have to include specifics on raw material extraction. Almost none of them do (yet). IN THE FUTURE: Will become viable after we see results from USGBC work with suppliers to define and develop examples of compliant CSRs. Even after that happens, however, it may a while before a critical mass of companies publish them.	EASY (AND GETTING EASIER ALL THE TIME) <ul style="list-style-type: none"> 20 disclosure statements from at least 5 suppliers Lots of disclosure statement options GOOD TARGET FOR EXEMPLARY PERFORMANCE (40 disclosure statements)
OPTION 2 (& 3) OPTIMIZATION (1 POINT)	NOT ACHIEVABLE AT THIS TIME <ul style="list-style-type: none"> 50% (by cost) of products have to show better-than-baseline performance in several environmental impact categories. No more than 30% can be from structure & enclosure, which is challenging even with new flexibility on that requirement from USGBC. IN THE FUTURE: Will become viable for more projects if/when USGBC approves more certifications as indicative of across-the-board improvements.	DOABLE (ESPECIALLY WITH THE SWITCH FROM FSC-ONLY TO LEGAL WOOD) <ul style="list-style-type: none"> 25% (by cost) of products have to meet one of the options: take-back program, bio-based, salvaged, recycled content, or "legal wood." No more than 30% can be from structure & enclosure IN THE FUTURE: Watch out for potential changes to the legal wood pilot credit that could make it more restrictive.	NOT ACHIEVABLE FOR MOST PROJECTS <ul style="list-style-type: none"> 25% (by cost) of products have to show: <ul style="list-style-type: none"> Hazard avoidance OR Supply chain optimization No more than 30% can be from structure & enclosure, which is challenging even with new flexibility on that requirement from USGBC IN THE FUTURE: Once suppliers get on board with documenting supply chain optimization it should become within reach.

LOCAL MATERIALS COUNT DOUBLE!
(EXTRACTED, MANUFACTURED, & PURCHASED WITHIN 100 MILES)
This could make a difference for wood, aggregate, salvage items in the Raw Material Extraction credit.

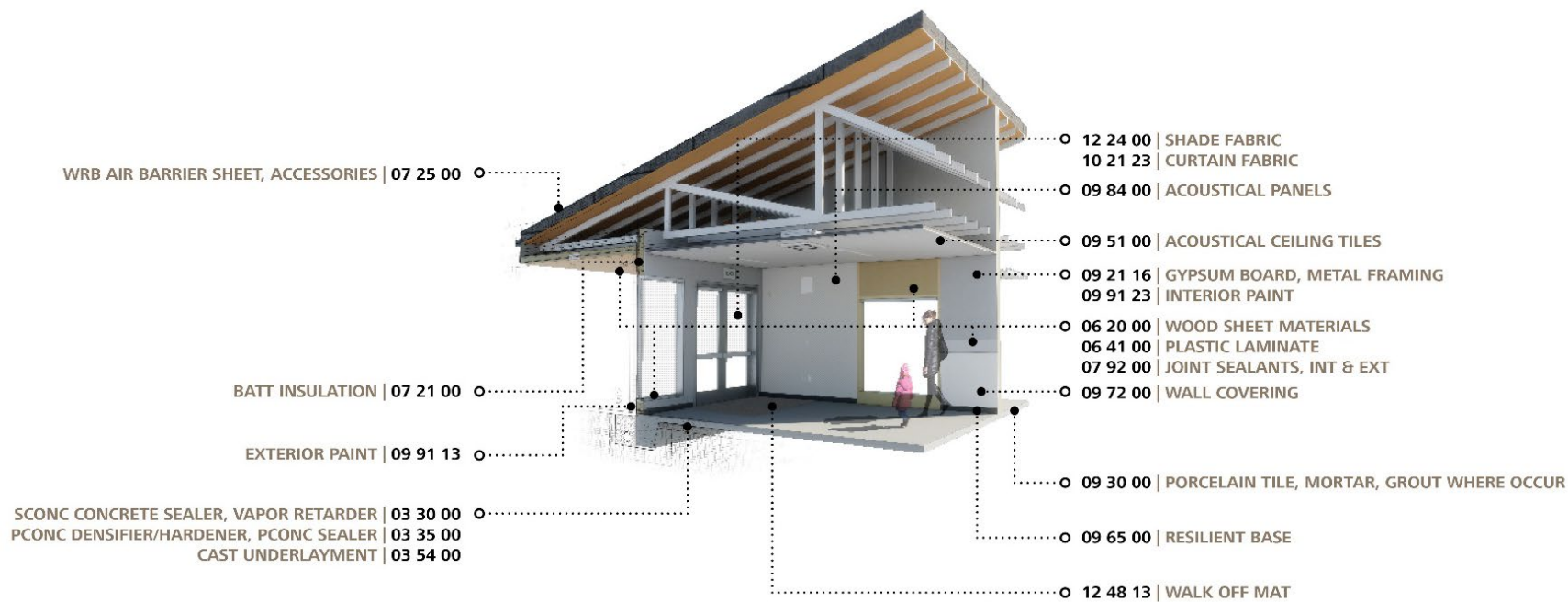
Materials Transparency

What is our metric for success?

DIVISION 9 – FINISHES			
	09 21 16	GYPSUM BOARD ASSEMBLIES	FRAMING, STUD, RUNNER, DEFLECTION TRACK, FIRESTOP TRACK, FLAT STRAP BACKING, CHASE, HAT CHANNELS, SUSPENDED CEILING FRAMING, GRID SUSPENSION, GYP, IMPACT-RATED, MOLD-RESISTANT, WATER-RESISTANT, CEILING BOARD, SHAFTWALL, METAL EDGE BEAD, J-BEAD, L-BEAD, U-BEAD, CONTROL JOINT, TRIM, CEMENTITIOUS BACKING BOARD, JOINT COMPOUND, JOINT TAPE, ADHESIVE, ACOUSTIC SEALANT, CH-STUD, CH-STUD RUNNER, ALUMINUM REVEAL BASE MOLDING
			HIGH IMPACT GYP BELOW WALL PROTECTION FRY REGLET BASE
			METAL FRAMING = EPD GYPSUM BOARD = EPD + HPD
	09 30 00	TILING	TILE, TILING, EPOXY, GROUT, MORTAR BED, THICKSET, THINSET, ADHESIVE, SEALER, SEALANT, TRIM, QUARRY TILE
			QUARRY TILE QT-1: DAL TILE, PAVER TILE, COLOR STORM GRAY WITH SMOOTH FACE, 6"X6" QTB-1: DAL TILE, PAVER TILE COVE BASE, COLOR STORM GRAY WITH SMOOTH FACE, 6"X6" COVE – COVE CORNER – INSIDE COVE CORNER CERAMIC TILE CT-1: WHITE (MAHLUM INTERNAL DEFINITION) MFR/COLOR: PENTAL SURFACES, BITECH WALL TILE, SOFT 8"X10", COLOR WHITE (VERTICAL, STACKED BOND INSTALL) (NO BASE AT TILE WALL, RUBBER AT ADJACENT WALL) CT-2 (WALL AND FLOOR): OLIVE MFR/COLOR: DALE TILE, KEYSTONES COLLECTION, 2"X2" WALL – FLOOR – COVED BASE, COLOR CYPRESS (COORDINATE COVE BASE AT ALTERNATE) CT-3 (WALL AND FLOOR): YELLOW MFR/COLOR: DALE TILE, KEYSTONES COLLECTION, 2"X2" WALL – FLOOR – COVED BASE, COLOR MOON BEAM (COORDINATE COVE BASE AT ALTERNATE) CT-4 (WALL AND FLOOR): TEAL MFR/COLOR: DALE TILE, KEYSTONES COLLECTION, 2"X2" WALL – FLOOR – COVED BASE, COLOR CORNSILK (COORDINATE COVE BASE AT ALTERNATE)
			PORCELAIN TILE, MORTAR, GROUT = EPD + HPD
	09 51 00	ACOUSTICAL CEILINGS	ACOUSTICAL CEILING PANEL, SUSPENSION SYSTEM
			MATERIAL: MINERAL FIBER NRC/ CAC RATING FINISH ACT-1: 24X48 ARMSTRONG OPTIMA PLANT BASED #3153PB (NRC .95) OR USG HALCYON CLIMAPLUS (NRC .95) FIBERGLASS, SQUARE EDGE PROFILE (98241) ARMSTRONG PRELUDE 15/16" EXPOSED TEE GRID SYSTEM ACT-2 (KITCHEN): 24X48 ARMSTRONG OPTIMA HEALTH ZONE PLANT BASED XXX CERTAINTED ECOPHON HYGIENE ADVANCE A (NRC .8) (BEST) WITH ARMSTRONG PRELUDE 15/16" EXPOSED TEE GRID SYSTEM GRID TYPE: SEE ABOVE ACCESSORIES: DRYWALL TO ACOUSTICAL CEILING TRANSITION MOLDINGS TRIMS AND TRANSITIONS PROVIDE STEPPED AXIOM TRANSITIONS WHERE ACT CEILING TRANSITIONS TO GYPBOARD CEILING AND THERE IS A VARIATION IN HEIGHT, REFER TO RCP FOR HEIGHTS. EXAMPLE: TYPICAL TRANSITION OF 2" WOULD UTILIZE MODEL AXTR2STR PROVIDE FLUSH, SHADOW AXIOM TRANSITIONS WHERE ACT CEILING TRANSITIONS TO GYPBOARD CEILING AND THERE IS NO CHANGE IN HEIGHT. MODEL AXTR7907STR HOLD DOWN CLIPS
			ACT TILES, GRID = EPD + HPD

Tracking Decisions

Transparency & Disclosure



Building Product Disclosure Data

Environmental Product Declaration (EPD) & Material Ingredient Disclosures

PART 1 GENERAL

1.1 SECTION INCLUDES

- A. Suspended metal grid ceiling system.
- B. Acoustical units (**ACT-1, ACT-2**).

1.5 SUBMITTALS

- A. See Section 01 30 00 - Administrative Requirements, for submittal procedures.
- B. Shop Drawings: Indicate grid layout and related dimensioning and mechanical and electrical items installed in the ceiling.
- C. Product Data: Provide data on suspension system components and acoustical units.
- D. Building Product Disclosure Data:** For each product listed, submit all current, applicable (but not less than one) declaration and disclosure types.
 - 1. Product:
 - a. Acoustical Tile
 - b. Suspension System
 - 2. Environmental Product Declaration (EPD) Type:
 - a. Product specific Life Cycle Analysis (LCA) conforming to ISO 14044 with at least a cradle to gate scope.
 - b. Industry-wide (generic) EPD with third-party certification (Type III), manufacturer is a recognized participant
 - c. Product specific Type III EPD
 - d. Other USGBC approved programs
 - 3. Material Ingredient Disclosure Type:
 - a. Health Product Declaration (HPD): www.hpd-collaborative.org
 - b. ILFI Declare Label: www.living-future.org/declare
 - c. Cradle to Cradle (C2C) Certified: www.c2ccertified.org
 - d. Cradle to Cradle (C2C) Material Health Certificate: www.c2ccertified.org
 - e. Underwriters Laboratory (UL) Product Lens certificate: <http://industries.ul.com/environment/transparency/ul-product-lens-program>
 - f. Other USGBC approved programs



Building Product Disclosure Data

Project specifications

SELC - Construction

1900 N 170th Ave
Shoreline, WA 98133

BNB Project # 117029.200

Date: March 21, 2018

Submitted To: Brian Gerich

Mahlum Architects
71 Columbia, Suite 400
Seattle, WA 98104
Phone: 206 441-4151
Fax: 206 441-0478

Submitted By: Eliot Hills

BNBuilders, Inc.
2601 4th Avenue, Suite 350
Seattle, WA 98121
Phone: 206.382.3443
Fax: 206.382.3440

Description: Gypsum Board Assemblies

Discipline: Architectural

Subcontractor: Northwest Partitions

Item	Qty	Status	Comments
1.4 B Product Data	1	Submitted	
1.4 C Building Product Disclosure Data	1	Submitted	
1.4 D Test Reports	1	Submitted	

Package Notes:

Reviewer's General Comments:

mahlum SUBMITTAL REVIEW

This review is only for general conformance with the design concept and the information given in the Construction Documents. Corrections or comments made on the shop drawings during this review do not relieve the contractor from compliance with the requirements of the plans and specifications. Review of a specific item shall not include review of an assembly of which the item is a component. The Contractor is responsible for dimensions to be confirmed and coordinated at the jobsite; information that pertains solely to the fabrication processes or to the means, methods, techniques, sequences and procedures of construction; coordination of the Work with that of all other trades performing all Work in a safe and satisfactory manner.

- ☒ Reviewed ☐ Revise and Resubmit
☐ Rejected ☐ Submit Specified Item
☐ Furnish as Noted ☒ Note Markings

Sunny Zhang
Reviewed
03/29/2018
Date

Putty pads and insulation substitution
request form added to front of package

ViperStud & ViperTrack by CEMCO®

CLASSIFICATION: 09 22 16.00 FINISHES: NON-STRUCTURAL METAL FRAMING

PRODUCT DESCRIPTION: THE VIPERSTUD® DRYWALL FRAMING SYSTEM OFFERS ALL THE BENEFITS OF CONVENTIONAL FLAT STEEL STUDS WITH A DESIGN THAT PERFORMS EVEN BETTER. VIPERSTUDS AND VIPERTRACKS CONSIST OF 100% HOT-DIP GALVANIZED STEEL, AND ARE USED FOR FRAMING OF INTERIOR NONLOAD-BEARING COMPOSITE AND NON-COMPOSITE WALLS. VIPERTRACKS® ARE FABRICATED IN 1-5/8", 2-1/2", 3-5/8", 4" AND 6" WIDTHS WITH 1-1/4" LEGS FROM STANDARD G40 HOT-DIPPED GALVANIZED STEEL. VIPERSTUDS® ARE FABRICATED IN 1-5/8", 2-1/2", 3-5/8", 4" AND 6" WIDTHS FROM STANDARD G40 HOT-DIPPED GALVANIZED STEEL. G60 AND G90 COATINGS ARE AVAILABLE UPON REQUEST. VIPER 25, VIPER18 MIL, VIPER20 (0.195 MIN), VIPER20 (0.209 MIN), VIPER 30MIL, AND VIPER 33MIL MANUFACTURED BY CEMCO RECEIVED AN EVALUATION REPORT (OCRR-0154) FROM ATI EVALUATION SERVICES AND AN EVALUATION REPORT (ESR-2620) FROM ICC EVALUATION SERVICE (ICC-ES), PROVIDING EVIDENCE THAT THE VIPERSTUD DRYWALL FRAMING SYSTEM MEETS CODE REQUIREMENTS: VIPERSTUD NONSTRUCTURAL FRAMING MEMBERS & ACCESSORIES MATERIAL SPECIFICATION (ASTM) A1003/A653/A924; PRODUCT SPECIFICATION (ASTM) C645; COATING SPECIFICATION (ASTM) A1003/A653/A924. ALL CEMCO PRODUCTS ARE MANUFACTURED IN THE USA AT ONE OF OUR FOUR STATE-OF-THE-ART PRODUCTION FACILITIES STRATEGICALLY LOCATED IN FOUR MAJOR METROPOLITAN MARKETS TO ENSURE THAT SERVICE AND QUALITY REQUIREMENTS ARE MET. ALSO INCLUDES THE FOLLOWING CSI MASTERFORMAT: 09 21 16.23 FINISHES: GYPSUM BOARD SHAFT WALL ASSEMBLIES.

**Health
Product
Declaration
v2.0**
created via: HPDC
Online Builder

Section 1: Summary

**CONTENT
INVENTORY**

Threshold per
material
☐ 100 ppm
☒ 1,000 ppm
☐ Per GHS SDS
☐ Per OSHA MSDS
☐ Other

Residuals and
impurities
considered in
1 of 1 materials
☒ see Section 2:
Material Notes
☐ see Section 5:
General Notes

Based on the selected Content Inventory Threshold:

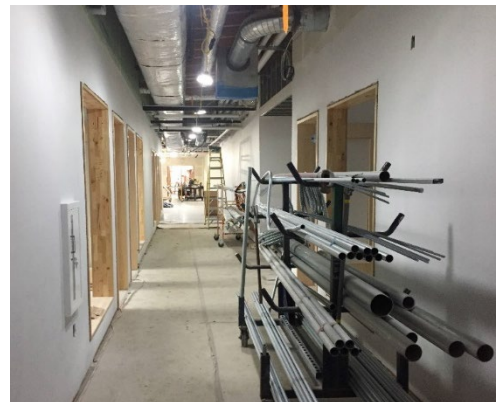
Characterized.....	<input checked="" type="radio"/>	<input type="radio"/>
Are the Percent Weight and Role provided for all substances?	Yes	No
Screened.....	<input checked="" type="radio"/>	<input type="radio"/>
Are all substances screened using Priority Hazard Lists with results disclosed?	Yes	No
Identified.....	<input checked="" type="radio"/>	<input type="radio"/>
Are all substances disclosed by Name (Specific or Generic) and Identifier?	Yes	No



**Environmental Product
Declaration**

ACCORDING TO ISO 14025 AND ISO 21930



Type III environmental product declaration (EPD) developed according to ISO 14025 and 21930 for 5/8" DensGlass® Gypsum Sheathing and 5/8" DensElement™ Sheathing



Building Product Disclosure Data

The response

Batt Insulation EPD

UL Environment ISO 14025											
PCR Building Envelope Insulation											
Functional unit = 1 m2 (R-5.68)											
Cradle to Grave											
60 year LCA											
Scaling factor to other R-values											
											
Type III product specific EPD		Knauf EcoBatt glasswool TR/SM		Owens EcoTouch fiberglass UL							
	Units	Total	R-13 scale (x 3.05)	Total	R-13 scale (x 3.07)	Base	Scale Delta	Scale Env Delta	Units		
Global Warming Potential	kg CO2 eq	6.65E-01	2.03E+00	6.18E-01	1.90E+00	-7.61%	-6.90%	-3,683.30	kg CO2 eq		
Acidification	kg mol H+ eq	1.66E-01	5.06E-01	2.37E-01	7.28E-01	29.96%	30.41%	-6,222.44	kg mol H+ eq		
Eutrophication	kg N eq	2.16E-04	6.59E-04	3.82E-04	1.17E-03	43.46%	43.82%	-14.45	kg N eq		
Smog Creation	kg O3 eq	2.50E-02	7.63E-02	3.81E-02	1.17E-01	34.38%	34.81%	-1,144.92	kg O3 eq		
Ozone Depletion	kg CFC-11 eq	1.37E-10	4.18E-10	1.70E-08	5.22E-08	99.19%	99.20%	0.00	kg CFC-11 eq		
Respiratory Effects	kg PM2.5 eq	-	-	1.46E-02	4.48E-02	-	-	-	kg PM2.5 eq		
Waste to Landfill	kg	3.59E-01	1.09E+00	3.98E-01	1.22E+00	9.80%	10.39%	-3,568.58	kg		
Metered Water	L	1.23E+00	3.75E+00	4.76E+00	1.46E+01	74.16%	74.33%	-305,419.61	L		
Primary Energy	MJ eq	1.16E+01	3.54E+01	9.92E+00	3.05E+01	-16.94%	-16.17%	-138,502.71	MJ eq		
Best in category count		6		2							
Worst in category count		2		6							

ELC exterior opaque wall area SF	302,670
Convert to sq meters	28,119

<https://www.epa.gov/energy/greenhouse-gas-equivalencies-calculator>
<https://www.translatorscafe.com/unit-converter/en/energy/3-1/>

Other labels:
N/A
[Declare - Red List Free](#)
N/A
Greenguard

Other labels:
[Living Product](#)
[Declare - LBC Compliant](#)
[C2C Material Health Cert - Gold](#)
Greenguard Gold cert - VOCs
UL recycled content
UL formaldehyde free
EnergyStar

-3,683.30 kg CO2 eq


Equivalency Results

[How are they calculated?](#)

The sum of the greenhouse gas emissions you entered above is of Carbon Dioxide Equivalent. This is equivalent to:


3.7 **Metric Tons**

Greenhouse gas emissions from




0.789

Passenger vehicles driven for one year




9,027

Miles driven by an average passenger vehicle



1.3


Tons of waste recycled instead of landfilled



0.184


Garbage trucks of waste recycled instead of landfilled

CO2 emissions from




414

gallons of gasoline consumed




4,030

Pounds of coal burned



0.049

tanker trucks' worth of gasoline



0.398

homes' energy use for one year

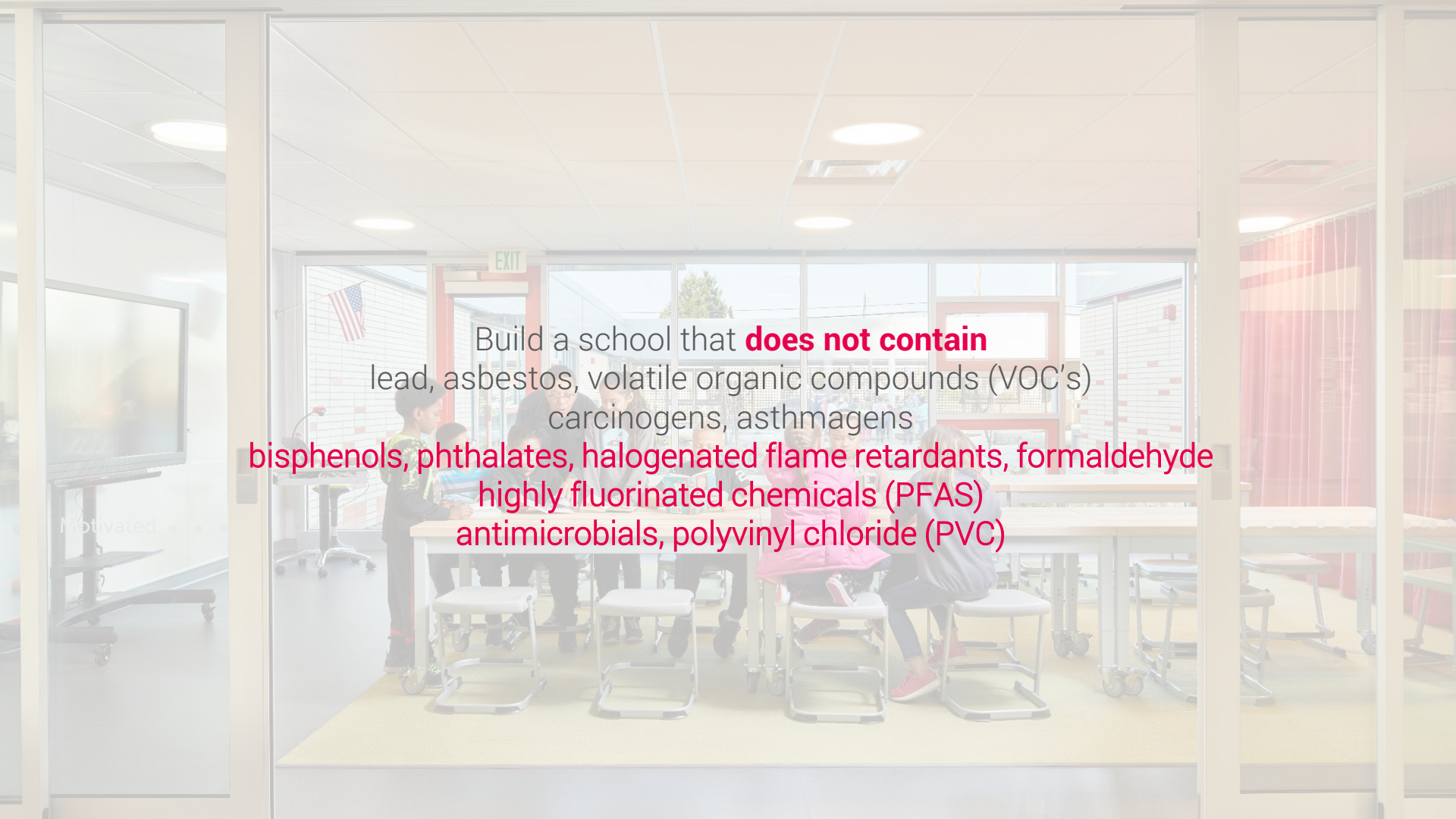
More Questions

Defining Metrics for Success

CHALLENGE

I am only one, **but I am one.**
I cannot do everything, but I can do something.
And I will not let what I cannot do interfere with **what I can do.**

-Edward Everett Hale

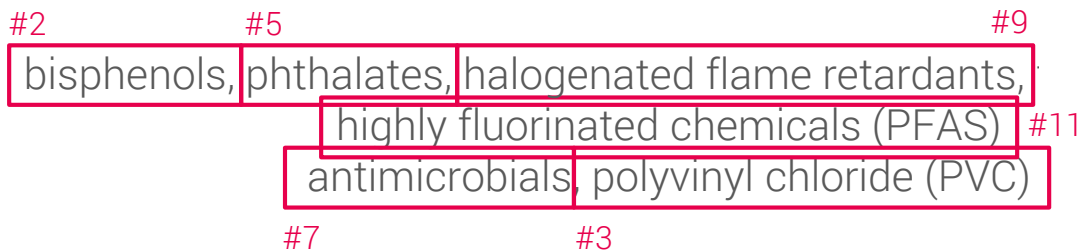
A photograph of a classroom interior. In the center, a group of young children and an adult are gathered around a light-colored wooden table. Some children are sitting on white plastic chairs, while others are standing. They appear to be engaged in a learning activity. The room has large windows in the background, letting in natural light. An American flag is visible on the left side of the room. The ceiling has recessed circular lights. The floor is a light-colored carpet. The text is overlaid in the center of the image, with the words 'does not contain' in bold red. The text lists various chemicals and compounds that should not be present in a school building.

Build a school that **does not contain**
lead, asbestos, volatile organic compounds (VOC's)
carcinogens, asthmagens
bisphenols, phthalates, halogenated flame retardants, formaldehyde
highly fluorinated chemicals (PFAS)
antimicrobials, polyvinyl chloride (PVC)



Kaiser Permanente Environmentally Preferable Purchasing (EPP) Standard

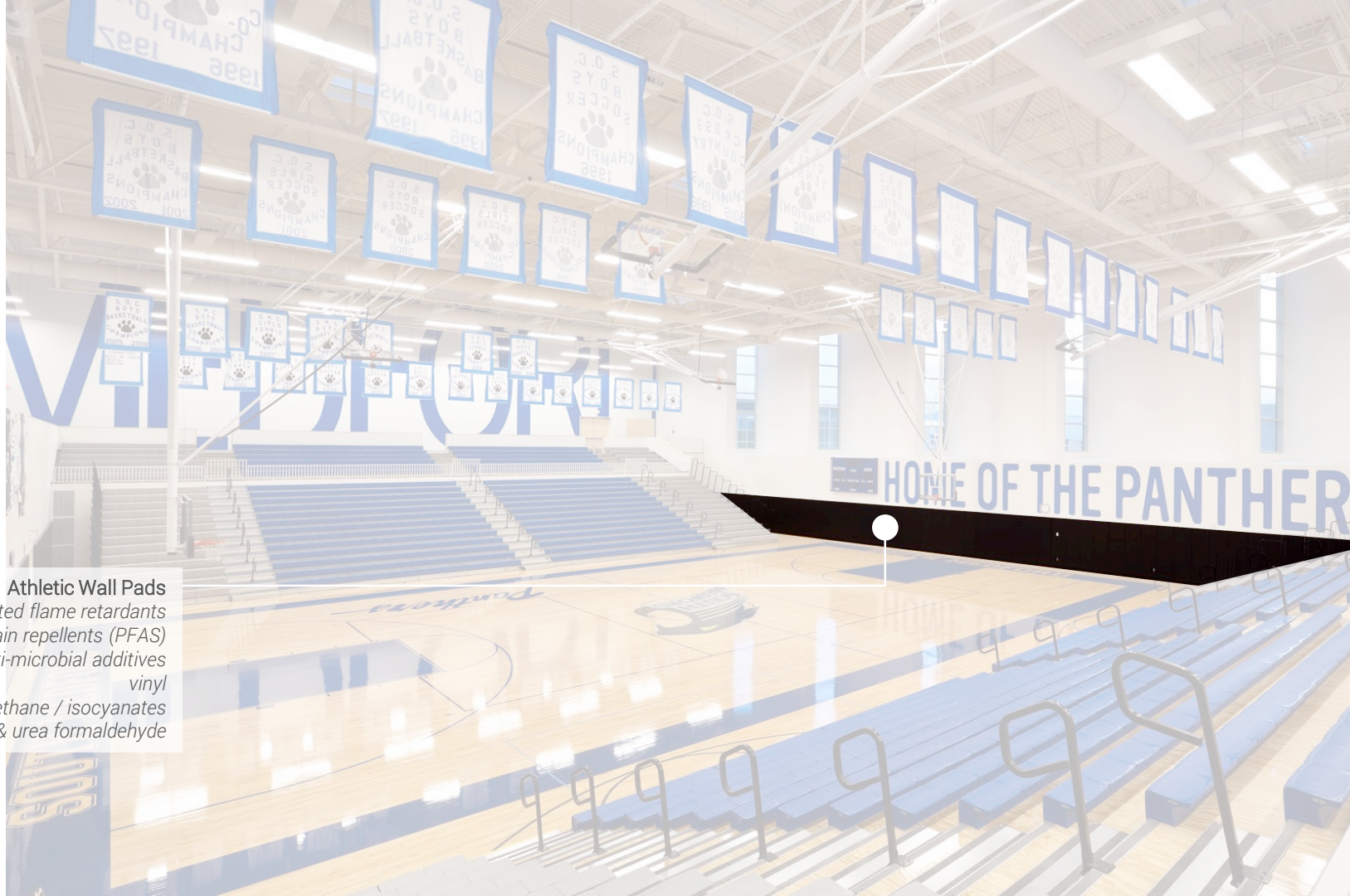
Summary: Products must meet all eleven (11) of the EPP Chemicals of Concern criteria.



Moving the market

Purchasing Standards & Chemical Policies





Athletic Wall Pads

halogenated flame retardants
perfluorochemical stain repellents (PFAS)
anti-microbial additives
vinyl
polyurethane / isocyanates
phenol & urea formaldehyde





FF&E Area Rugs

halogenated flame retardants
perfluorochemical stain repellents (PFAS)
anti-microbial additives
polyvinyl chloride (PVC)
polyurethane / isocyanates
coal fly ash / heavy metals
styrene butadiene latex / rubber

Takeaways

1. We have the **tools** available now, for an honest discussion about material health and embodied impacts.
2. It's **hard!** But it's getting better.
3. Start small. Or start big. **Start.**
4. Find friends.
5. Leverage the hard work of the innovators and early adopters.
6. **Bake in** the material research into your design / construction process.
7. Cultivate your **why story**. Share it freely.

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7. Cultivate your **why story**. Share it freely.
8. Go find your **unicorn**, they do exist!



03 NOVEMBER 2018
A4LE LEARNINGSAPES

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