Healthier Materials

HMFH ARCHITECTS

Presenters

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Pilot Program History

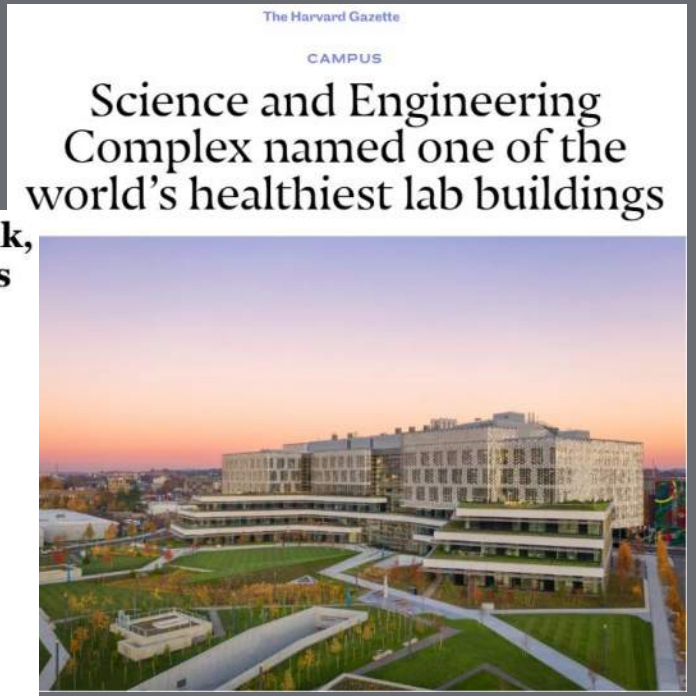
Harvard University used the construction of the new SEC building as a living lab and had a goal to minimize the use of products with toxic disease-causing substances such as PFAS, chemical flame retardants and PVC in floor to ceiling building materials and everything in between.

Inspired by Harvard's Healthy Building initiative, MSBA and HMFH started a pilot program to understand what types of chemicals go into our public schools.

'The more you dig into it, you think, Oh, God.' A growing mission seeks to reduce toxic chemicals in schools

By Kay Lazar Globe Staff, Updated May 2, 2022, 7:15 a.m.

Jack McCarthy, executive director of the Massachusetts School Building Authority, aims to slash the number of toxic chemicals used in construction and renovation projects in the state's schools. JONATHAN WIGGS/GLOBE STAFF



The Harvard Gazette

CAMPUS

Science and Engineering Complex named one of the world's healthiest lab buildings

Called a "silent epidemic," toxic chemical releases are linked to both human and environmental health. Cancer, asthma, obesity, ADHD, and reproductive issues are on the rise. Chemical releases also taint food and water supplies, and contribute to climate change and ozone depletion, disrupting the wellbeing of entire populations. HBN's research, data tools, and education provide solutions for improving global health.

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Chemicals of Concern

There are over 80,000 chemicals used in materials today and many have not been tested for long term human use.
The MSBA Pilot Project's goal is to avoid these chemicals in touch surfaces such as flooring, furniture, window treatments, paints, ceiling tiles etc.

This is a goal on all HMFH projects to ensure that we are delivering the healthiest environment possible for the educators and students that use our buildings daily as well as to protect the people in the supply chain that mine, manufacturer or transport them to our job sites.

The Red List & ILFI

GOAL: Specify Red List free non-toxic materials for all touch surfaces. The ILFI (International Living Futures Institute) Red List represents **the worst ingredients** and chemicals used in the building industry:

https://living-future.org/red-list/

Development of the Red List

In addition to seeing chemicals on the red list phased out of production and use, ILFI hopes to influence the materials industry to be more conscientious about producing nonharmful-to-humans materials. While many products exist that may have an adverse effect on human health, the Red List focuses on some of the worst offenders. It is subject to change based on emerging scientific knowledge, but currently includes:

- Asbestos
- Cadmium
- Chlorinated polyethylene and chlorosulfonated polyethlene
- Chlorofluorocarbons (CFCs)
- Chloroprene (neoprene)
- Formaldehyde (added)
- Halogenated flame retardants
- Hydrochlorofluorocarbons (HCFCs)
- Lead (added)
- Mercury
- Petrochemical fertilizers and pesticides
- Phthalates
- Polyvinyl chloride (PVC)
- Wood treatments containing creosote, arsenic or pentachlorophenol

Why is this so important?

By the time a student graduates from high school, they will have spent **more than 15,000 hours in a school,** which is the second longest indoor exposure time after their home. For more than 50 million K-12 students this is a time of critical physiological, social and emotional growth and development.

https://schools.forhealth.org/#relevant-research-sidebar

AIA Material Pledge

- support **human health** by preferring products that support and foster life throughout their life cycles and seek to eliminate the use of hazardous substances
- support **social health & equity** by preferring products from manufacturers that secure human rights in their own operations and in their supply chains, positively impacting their workers and the communities where they operate

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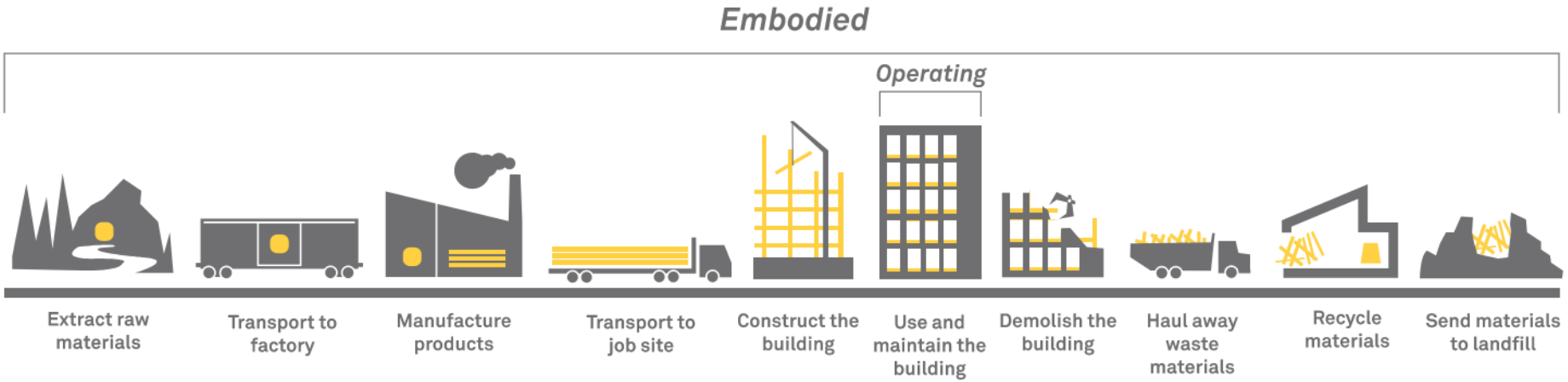
AIA Material Pledge

- support **climate health** by preferring products that reduce carbon emissions and ultimately sequester more carbon than emitted
- support a **circular economy** by reusing and improving buildings and by designing for resiliency, adaptability, disassembly, and reuse, aspiring to a zero-waste goal for global construction activities.

Beyond the Building Occupancy



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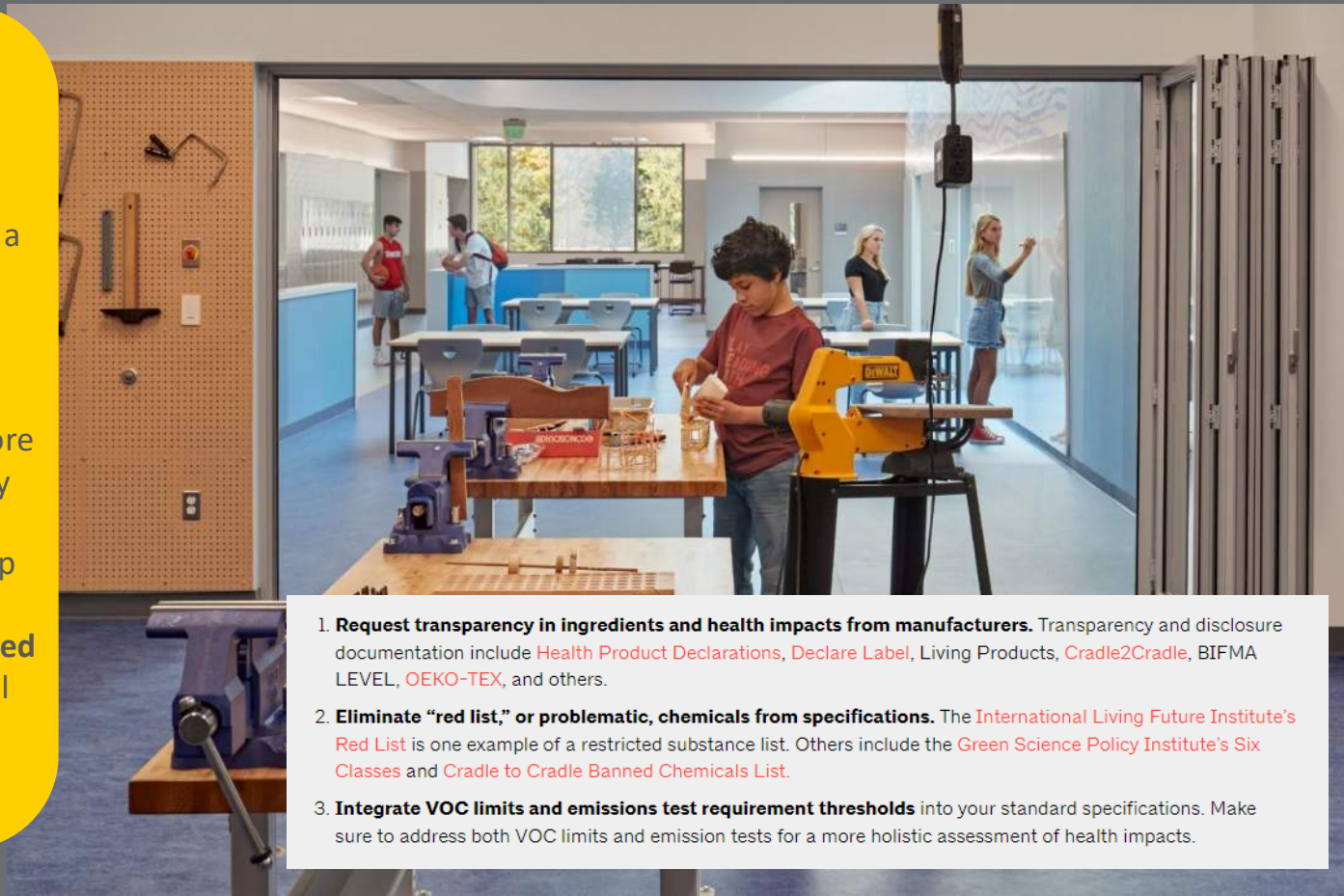
It’s Complex…

How to get started:

Focus on **healthier** materials.

Push manufacturers for **greater transparency** as a first step so at a minimum we understand what materials are going into our schools.

Harvard was able to convince more than **1,200 companies** to publicly disclose the ingredients in their products and create labels to help others make healthy decisions. Many manufacturers **reformulated** their products to remove harmful chemicals.



1. **Request transparency in ingredients and health impacts from manufacturers.** Transparency and disclosure documentation include Health Product Declarations, Declare Label, Living Products, Cradle2Cradle, BIFMA LEVEL, OEKO-TEX, and others.
2. **Eliminate “red list,” or problematic, chemicals from specifications.** The International Living Future Institute’s Red List is one example of a restricted substance list. Others include the Green Science Policy Institute’s Six Classes and Cradle to Cradle Banned Chemicals List.
3. **Integrate VOC limits and emissions test requirement thresholds** into your standard specifications. Make sure to address both VOC limits and emission tests for a more holistic assessment of health impacts.

Designing Public Schools

Material Challenges:

Are there three equals?

Are they proven & durable materials?

Do they fit in our budget?

Are they produced locally?

Bristol-Plymouth Regional Technical High School

BP stats:

410,000 GSF
1,430 students
23 Vocational Programs
Ch. 149 Construction

On Budget!
Starting Construction
Opening 2026

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Designing Public Schools

Strategies:

Use a ranking system

Create a database of products

Target easy wins

Rating Systems and Labels

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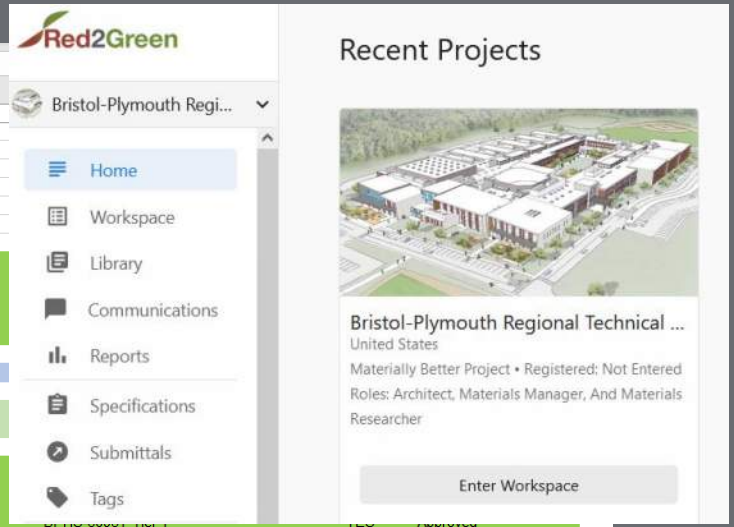
Database-Are we making progress?

- We have researched, verified and logged over 800 products in our database to date
- Our goal is to track every product that is submitted in construction and push manufacturers for an EPD, which discloses the ingredients in their products or a letter explaining why they do not have one

B3 | Concrete Finishes

	A	B	C	D	E				
1	Spec #	Specificat	Product Type	Product Name	Manufacturer				
208	057300	Decorative Gl	Glass Railings		Julius Blum & Co. Inc.				
209	057300	Decorative Gl	Glass Railings		Livers Bronze				
210	057300	Decorative Gl	Glazing	Taper-Loc Dry Glaze System	C.R. Laurence				
211	057300	Decorative Gl	Nonshrink, Nonmetallic Grout						
212	057300	Decorative Gl	Stainless Steel						
213	057300	Decorative Gl	Top Rail	GRL 10BS	C.R. Laurence				
214	078100	Applied Firepr	Cementitious Sprayed Fire-Resistive Material	Pyrolite 15	Carboline Company				
215	078100	Applied Firepr	Cementitious Sprayed Fire-Resistive Material	Southwest Type 5GP (Std. Density)	Carboline Company				
216	078100	Applied Firepr	Cementitious Sprayed Fire-Resistive Material	CAFCO 300 Series (Std. Density)	Isolatek International				
217	078100	Applied Firepr	High Density Cementitious Sprayed Fire-Resistive Material	Southwest Type 7HD (High Density)	Carboline Company				
218	078100	Applied Firepr	High Density Cementitious Sprayed Fire-Resistive Material	Monokote Z-146 (High Density)	GCP Applied Technologies				
219	078100	Applied Firepr	High Density Cementitious Sprayed Fire-Resistive Material	CAFCO FENDOLITE M-II (High Density)	Isolatek International				
220	078100	Applied Firepr	Intumescent Fire-Resistive Coatings	Firefilm III	Carboline Company				
221	078100	Applied Firepr	Intumescent Fire-Resistive Coatings	FS-ONE MAX	Hilti				
222	078100	Applied Firepr	Intumescent Fire-Resistive Coatings	CAFCO SprayFilm WB 3	Isolatek International				
223	078100	Applied Firepr	Intumescent Fire-Resistive Coatings	CAFCO SprayFilm WB 4	Isolatek International				
224	078100	Applied Firepr	Intumescent Fire-Resistive Coatings	CAFCO SprayFilm WB 5	Isolatek International				
225	078100	Applied Firepr	Intumescent Fire-Resistive Coatings	FireTex FX5120	Sherwin-Williams				
226	078100	Applied Firepr	Medium Density Cementitious Sprayed Fire-Resistive Material	Southwest Type 5MD (Med. Density)	Carboline Company				
227	078100	Applied Firepr	Medium Density Cementitious Sprayed Fire-Resistive Material	Monokote Z-106/G (Med. Density)	GCP Applied Technologies				
228	078100	Applied Firepr	Medium Density Cementitious Sprayed Fire-Resistive Material	CAFCO 400 (Med. Density)	Isolatek International				
229	078100	Applied Firepr	Spray-Applied Fireproofing	Monokote MK-6/HY (Std. Density)	GCP Applied Technologies				
230	078400	Firestopping	Cast-in Firestop Sleeve	CP 680-M	Hilti	BPHS-64267	Tier X; C2C Bronze V3.1		Proposed Option
231	078400	Firestopping	Penetration Firestopping Device	CFS-BL	Hilti	BPHS-64266	Tier X; C2C Bronze V3.1		Proposed Option
232	078400	Firestopping	Penetration Firestopping Device	CP 653 BA	Hilti	BPHS-64265	Tier X; C2C Bronze V3.1		Proposed Option
233	081400	Flush Wood D	Doors for Transparent Stained Finish			BPHS-59738			
234	081400	Flush Wood D	Fire-Rated Doors			BPHS-59737			
235	081400	Flush Wood D	Flush Wood Doors	Aspiro Series Doors	Masonite International Corporatio	BPHS-59733		YES	
236	081400	Flush Wood D	Flush Wood Doors	Architectural Series Flush Wood Door - SCL	Oregon Door	BPHS-59846	Tier 1		
237	081400	Flush Wood D	Flush Wood Doors		Oshkosh Door Company	BPHS-59734		YES	
238	081400	Flush Wood D	Flush Wood Doors	Architectural Wood Doors - Heritage Collecti	VT Industries	BPHS-59731		YES	
239	081400	Flush Wood D	Interior Veneer-Faced Doors			BPHS-59736			
240	081400	Flush Wood D	Solid-Core Doors			BPHS-59755			
241	092900	Gypsum Boar	Abuse-Resistant Panels	DensArmor Plus Abuse-Resistant Type X	Georgia-Pacific	BPHS-59665		YES	
242	092900	Gypsum Boar	Abuse-Resistant Panels	Gold Bond Hi-Abuse XP Gypsum Board	National Gypsum	BPHS-59666		YES	
243	092900	Gypsum Boar	Abuse-Resistant Panels	Glass-Mat Mold Tough AR Firecode X	United States Gypsum (USG)	BPHS-59667		YES	



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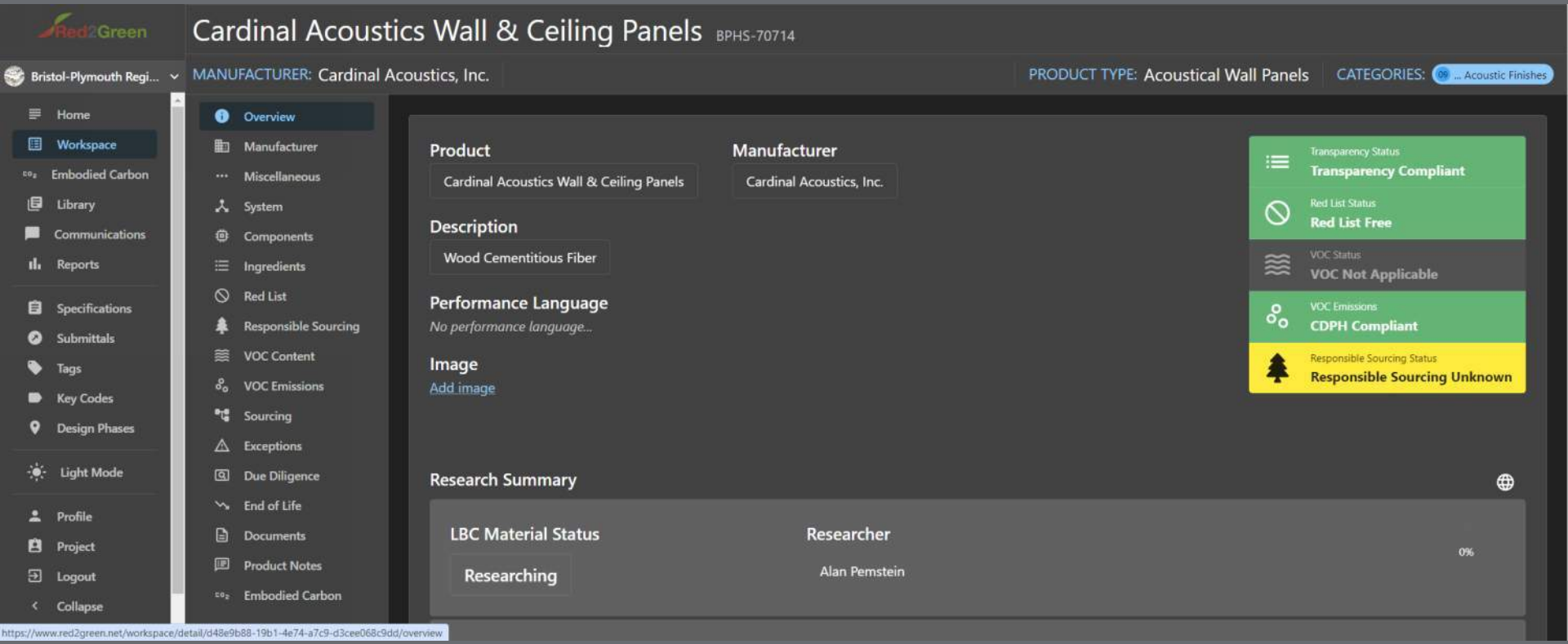
Database-More Robust Tracking



Easy Win- Ceiling Tile

Easy Win- Acoustic Room Components

Easy Win-Spray Fireproofing

Easy Win-Flooring

Easy Win-Tile

Easy Win-Furniture-OSD & MHEC

https://www.usnews.com/news/health-news/articles/2022-11-09/healthier-furniture-without-pfas-toxins-brings-healthier-offices

- Use Cooperative Contracts to procure furniture without requiring three equals
  - State Bid List-Operational Services Division-OSD
  - MHEC

Material Challenges:

- Coatings
  - Paint
  - Lockers
  - Marker Boards
- Gypsum
- PVC Vinyl
  - Gym Wall Pads
  - Gym Divider Curtain
  - Window Shades
- MEP FP Technology

Cost Challenges:

- HDPE Lockers or Metal Lockers- 34% More Expensive
- Glass Marker Boards or Metal Marker Boards- 42% More Expensive
- Porcelain Wall Tile or FRP- 79% More Expensive
- Proprietary Items

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Material Goals Recap