5.

BUILDING MATERIALS

A resource to build knowledge about specifying healthier materials offering fundamental rules and guidelines and a sample materials analysis chart. These documents can be used to create assignments for students to compare building materials with the added criteria of catering to a vulnerable population.

The Library of (Healthier) Material Libraries

INFORMATIVE

These libraries provide guidance that can help make your product searching more informed and efficient.

MATERIALS GUIDES & REPORTS

ADD DESCRIPTION

- Better Building Materials G -uide, *USGBC*
- Insulation Recommendations, *Building Green*
- Resilient Flooring & Chemical Hazards, *Healthy Building Network*

COMMON PRODUCT LIBRARIES

On average, what material types are usually most hazardous, and what chemicals and substances are commonly in those products?

- HomeFree Product Spotlight
- Quartz Databas
- Green Procurement Compilation
- BuildingGreen Product Guidance

RECOMMENDATION LIBRARIES

ADD DESCRIPTION

- Healthy Babies Bright Futures
- Smart Mommy Healthy Baby Product Guide
- Consumer Guide, *Green Science Policy Institute*
- Healthy Home Guide, *Environmental Working Group*

STANDARDS-BASED

Standards-based libraries can help you find what's inside products, if those substances are hazardous, and if it meets the criteria of certain certifications or building standards.

DISCLOSURES

ADD DESCRIPTION

- Health Product Declaration (HPD) Public Repository
- Declare Database
- International EPD Database
- ClearChem Directory

EVALUATIONS

ADD DESCRIPTION

- Portico$, *Healthy Building Network*
- Mindful Materials*
- BlueGreen Alliance Foundation
- Transparency Catalogue, *Sustainable Minds*
- Pharos $
- Origin

CERTIFICATIONS

ADD DESCRIPTION

- Cradle to Cradle Project Registry
- Level, *BIFMA*
- NAF/NAUF/ULEF/CARB Compliant
- Indoor Advantage, *SCS*
- Greenguard, *UL Environments*

COMPLIANCE

ADD DESCRIPTION

- Living Building Challenge Compliant
- LEED Compliant, *USGBC*

INDUSTRY & INNOVATION

These libraries can help you select materials for a project through extensive databases of healthy and/or cutting-edge building materials

PRECEDENT LIBRARIES

ADD DESCRIPTION

- Healthy Affordable Building Products, *Healthy Materials Lab*
- LBC Project List
- Bullitt Center Project List

MATERIAL INNOVATION

ADD DESCRIPTION

- Ma-tt-er
- Materia
- Matrec Eco Material Database $
- Materio $
- Transmaterial

DESIGN LIBRARIES

ADD DESCRIPTION

- Material ConneXion $
- Designer Pages $

Healthy Materials Lab, 2018

THE NEW SCHOOL
PARSONS
HEALTHY
MATERIALS LAB

The 12 Product Rules

These 12 product rules provide a simple approach to selecting better, healthier, and more environmentally responsible building products and materials. They are offered in the spirit of author Michael Pollan's Food Rules, which applies memorable rules of thumb to complex dietary decisions.

* Choose products that are fully disclosed...

1. If you are buying more than a ton of it, know its carbon footprint.

Don't drive yourself crazy over every detail. Focus on the biggest drivers of greenhouse gas emissions, like the structural system.

2. If you don't know what's inside it, don't put it inside.

There are only so many ingredient lists you can read. Focus on interiors, where occupant exposure might be an issue.

3. Buy the company—not just the product.

A token "eco" line isn't enough anymore. Look at manufacturers' overarching sustainability practices.

...and mostly optimized...

4. Close the loop.

Consider the whole product cycle—not just where it comes from but also where it is likely to go after demolition.

5. Minimize exposure to the worst substances.

Avoid getting overwhelmed. Focus on VOCs, with their high exposure potential, and the most-toxic chemicals (like those that are biopersistent or carcinogenic).

6. If it runs or flows, efficiency comes first.

For some products (plumbing, HVAC, lighting, and appliances), operational efficiency matters most.

7. Don't freak out.

Almost anything can be toxic. Red flags are sometimes red herrings.

8. Compare with care.

We'd love to be able to compare apples to apples. But there are too many oranges in the mix, so look for significant differences between products.

9. Let someone else do the work.

Use well-developed research tools. Know that a robust multi-attribute certification might be the best way to judge a product's sustainability.

...but not too much.

10. Use less; just use it better.

What's the surest way to reduce the impact of a product? Don't buy it.

11. Durability and resilience live on.

Sometimes it's worth a bigger initial impact if the product will stand up to the test of time ... and weather.

12. Perfection is the enemy.

You can't do it all. Prioritize specific product and material goals with the owner and project team, and know when to compromise.

The 12 Product Rules were developed by Jennifer Atlee; Anne Hicks Harney, FAIA; Paula Melton; and Kirsten Ritchie, P.E. Design by Julia Jandrisits

For more on selecting sustainable and healthy products, visit www.BuildingGreen.com/productrules

BuildingGreen

Building Green, 2016

THE NEW SCHOOL PARSONS HEALTHY MATERIALS LAB

Specify

Healthier Materials & Sustainable Buildings | C4: Executing a Healthier Project

MATERIAL CATEGORIES

POTENTIAL HAZARDS: VISIBLE AND INVISIBLE

Many hazards are in products that we don't see, such as adhesives, joints, sealants, and backings. Since we are visually oriented, addressing these hazards can feel less satisfying than addressing more visible materials. The diagram below introduces a few chemical challenges and health strategies for some of the most visible materials, as well as for a couple of the invisible products that are used along with them.

VISIBLE MATERIALS

FACADE

WOOD

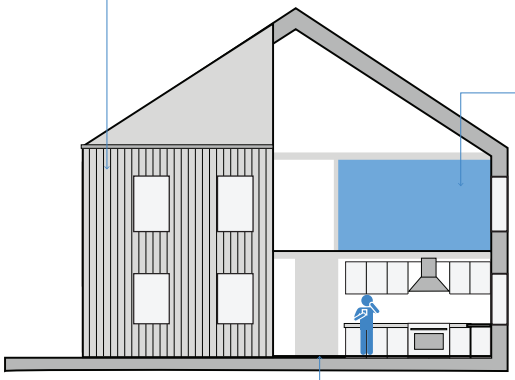
Pressure treatment using copper to prevent rot, insects, and fire

*Look for "modified" wood (wood that is preserved by modifying the cellular structure using heat or additives such as linseed oil) as an alternative to pressure treated products.

METAL

Cladding made from heavy metals like zinc or copper; Chromium conversion baths used in powder coating aluminum cladding

*Try to avoid heavy metal cladding; When specifying aluminum, look for cladding finishes made without chromium-based conversion baths.



PAINTS

Organic binders used in acrylic and latex paint that require problematic preservatives; v

*Prefer mineral-based paints, like silicate- or lime-based paint. They tend to be made with non-organic materials, and do not require preservatives because of their highly alkaline content.

FLOORING

VINYL

Phthalates used as a plasticizer; Carcinogenic feedstocks; Dioxin gas released at high temperatures

RUBBER

Styrene and butadiene; Isocyanates in the binder; Toxics in crumb rubber, including lead and hydrocarbon processing oils

WOOD

Formaldehyde-based binders in laminate flooring products

*When choosing a resilient flooring material, consider each material's hazards over its life cycle. For instance, rubber flooring is problematic during production, but not as much during the user phase. Use this information to ensure that your choice meets your health goals; When choosing wood flooring, look for solid wood products or laminate products with no added formaldehyde (NAF).

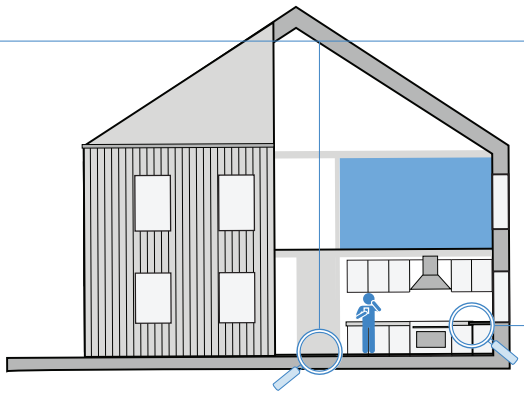
INVISIBLE MATERIALS

ADHESIVES

FLOORING

Isocyanates in polyurethane- and epoxy-based adhesives

*Eliminate adhesives through mechanical fastening. If adhesive is required, prefer methanol-free modified silane polymer glue



SEALANTS/FINISHES

FLOORING

Isocyanates in polyurethane; Bisphenols in epoxy resins

COUNTERTOPS

Perfluorinated alkyl compounds used to seal natural stone countertops

*Prefer materials that don't require sealants, such as granite countertops; For wood floors, look for solvent-free oil or lacquer finishes.

Citations

Lewis, Martha. "Material Categories: Where to Keep an Eye Peeled." Presentation for Healthy Materials Lab online course, New York, NY. 2018.

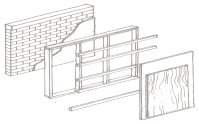
"HomeFree: Product Spotlights," Healthy Building Network, Accessed August 9, 2018, https://homefree.healthybuilding.net/products

Healthy Materials Lab, 2018

THE NEW SCHOOL PARSONS HEALTHY MATERIALS LAB

MATERIALS

ENDORSING PRODUCTS THAT ARE SAFE FOR ALL SPECIES THROUGH TIME



SCALE JUMPING PERMITTED FOR EMBODIED CARBON FOOTPRINT (IMPERATIVE 11)

PETAL INTENT

The intent of the Materials Petal is to help create a materials economy that is non-toxic, ecologically restorative, transparent, and socially equitable. Throughout their life cycle, building materials are responsible for many adverse environmental issues, including personal illness, habitat and species loss, pollution, and resource depletion. The Imperatives in this section aim to remove the worst known offending materials and practices and to drive business toward a truly responsible materials economy. When impacts can be reduced but not eliminated, there is an obligation not only to offset the damaging consequences associated with the construction process, but also to strive for corrections in the industry itself. At the present time, it is impossible to gauge the true environmental impact and toxicity of the built environment due to a lack of product-level information, although the Living Building Challenge continues to shine a light on the need for transformative industrial practices.

IDEAL CONDITIONS + CURRENT LIMITATIONS

The Living Building Challenge envisions a future where all materials in the built environment are regenerative and have no negative impact on human and ecosystem health. The precautionary principle guides all materials decisions when impacts are unclear.

There are significant limitations to achieving the ideal for the materials realm. Product specification and purchase has far-reaching impacts, and although consumers are starting to weigh these in parallel with other more conventional attributes such as aesthetics, function and cost, the biggest shortcoming is due to the market itself. While there are a huge number of "green" products for sale, there is also a shortage of good, publicly available data that backs up manufacturer claims and provides consumers with the ability to make conscious, informed choices. Transparency is vital; as a global community, the only way we can transform into a truly sustainable society is through open communication and honest information sharing, yet many manufacturers are wary of sharing trade secrets that afford them a competitive advantage, and make proprietary claims about specific product contents.

Declare®, the Institute's ingredients label for building products, is a publicly accessible label and online database with an official connection to the Materials Petal. Not only does Declare contribute to the overt methodology for removing a temporary exception, it also provides a forum for sharing the information compiled by a project team as part of their documentation requirements for certification.

declareproducts.com

The Hawaii Preparatory Academy Energy Lab, Kamuela, HI
Living Certification - Living Building Challenge 1.3
Photo: Matthew Millman Photography / Courtesy: Flansburgh Architects

International Living Future Institute, *Living Building Challenge 3.1*, 2016

THE NEW SCHOOL PARSONS HEALTHY MATERIALS LAB

SAMPLE MATERIAL COMPARISON CHART

FLOORS: Labs

			RECOMMENDATION
			
	RUBBER	VINYL	LINOLEUM
Indoor climate	Soft and comfortable surface . No problems with glare. Good acoustic properties. Smells like chemicals, which can be a disturbance.	Less comfortable surface. There may be glare issues, depending on the surface treatment. Poor acoustic properties. No offgassing.	Soft and comfortable surface. There may be glare issues, depending on the surface treatment. The material reduces some noise, but not all. Does emit gases - (no formaldehyde.)
BREEAM credit Hea01, Hea02, Hea03, Hea05a	+++	++	+++
Environment Energy	Good LCA - profile. However only contains max. 10% natural rubber. The rest is synthetic, which must be tested for hazardous substances. Possibility of 10% renewable materials.	Less good LCA profile. Production is based on two primary substances, both of which are carcinogenic.Therefore also problems with disposal.	Very good LCA profile. Contains approximately 35% renewable materials - jute, cork, linseed oil
BREEAM credit Mat01,Mat03	++	++	+++
Operation Maintenance	No need for maintaining the surface treatments. Can be cleaned with water.	Medium lifetime (10-20 years). Life cycle costs estimated medium - high depending on product selection.	PU surface coating is required - applied in factory, needs refreshing. Life cycle costs are relatively high. Flooring is cleaned with water.
BREEAM credit Mat01,Mat05, Man05	+++	++	+++
Disassembly Recycling	Can in be incincerated for energy.	Cannot be reused due to toxins in the plasticizers. PVC is classified as hazardous waste, special restrictions apply to disposal.	Can in be incincerated for energy.
BREEAM credit Mat01, Hea07	++	+	++

Henning Larsen Architects, Accessed 2018