HEALTHY MATERIAL DISCLOSURES AND LABELING

AIA kCOTE 2019.03.14 E. U. S. P.

Also used instead of

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TRE GLYCERINE, U. S. P.

MATERIAL CONSIDERATIONS: FRAMING THE ISSUES

A rough and incomplete breakdown of material considerations:

- Source where does it come from
 - Impacts of extraction, beneficiation, and production
 - Across multiple categories of impact
 - Potentially massive and complex product history
 - Impact of system that produces product
 - Equity and social costs
- On-site
 - Impacts during installation (direct and indirect)
 - Impacts during operation (direct and indirect)
 - Impacts during demolition or de-installation (direct and indirect)
- End of Life
 - Seperability of materials
 - Tenuous assumptions about future use

Tradeoffs between impacts, difficult to quantify between impacts and across categories of impact

MATERIAL CONSIDERATIONS: FRAMING THE ISSUES

Health / Safety among other impacts.

- How detailed impacts should be developed?
- Can or should distinct impacts be combined into an single metric?

Slow and complex regulatory environment, quickly moving product and chemical development

Goals of material selection improvement? Potentially:

- Improve one or more impact categories (known impacts)
- Improve one or more impact categories (not or poorly known impacts)
- Improve transparency
- Incentivize improved material availability
- Characterize impacts
- Quantify impacts

Some limitations:

- Availability of information
- Complicated flow of material manufacturing system
- Trade secrets

Complicated by consideration of a product's lifespan (this is a specific breakdown from LCA practice)

							B	Building	asse	ssme	nt infor	m	ation				. : .	
	Building life cycle information															Supplementary information beyond the		
	A1-3 A4-5 B1-7 C1-4														building life cycle			
PRODUCT stage CONSTRUCTION			USE stage					END OF LIFE stage					D					
Raw material supply B	Transport SV	Manufacturing		Transport A	Construction- installation process SY		B1 9 B6 B7	B2 Waintenance Opera	B3 Kebair ational	B4 Gefurbishment water	B5 Keplacement esu		De-construction demolition	Transport	Waste processing	C4 Disposal		Benefits and loads beyond the system boundary Reuse- Recovery- Recycling-

From EN 15978 - diagram from Construction sector views on low carbon building Materials, Jannik Giesekam, John R. Barrett & Peter Taylor

DISCLOSURE AND CERTIFICATION APPROACHES

EPDs

ENVIRONMENTAL PRODUCT DECLARATION

Environmental Product Declarations

ISO 14025 – lays out "Type III Environmental Declarations"

Subject to Product Category Rules (PCRs) for specific types of products, some redundancy of PCRs

EPDs can be either

- product specific, single company

or

- generic

Generally comparable only between products under a single PCR

No current ability to load in product-specific LCA into WBLCA tools

Interface is the world's largest manufacturer of commercial carpet tile.

For over 40 years Interface has consistently led the industry through design and innovation and is a world leader in environmental sustainability. We are well along the path to achieving Mission Zero®, our promise to eliminate emaisingle: PCR have on the environment by 2020. We are committed into WBLCA tools At Interface, we believe Life Cycle

Assessment is critical for evaluating the environmental impacts of our products Indicators are supposed to represent a comprehensive measure of impacts on the environment. Generally, a tool provides us with a certain set of indicators.

Global warming potential (kg of CO2e) Acidification potential (kg SO2e) Human Health (particulates) (kg PM2.5e) Eutrophication potential (kg N-e) Ozone Depletion potential (kg CFC-11-e) Smog potential (kg O3e) Total primary energy (Joules)

"e" stands for "equivalent"

HEALTH PRODUCT DECLARATIONS (HPDs)

What does it do:

description from: hpd-collaborative.org

- The HPD Open Standard is a voluntary technical specification for reporting data about product contents and associated health information.
- It provides detailed technical specifications for reporting data about the attributes of a product, as delivered to the job site.
- It defines how to report screening of the product contents, using authoritative lists of hazards and other information that is valuable for further analysis and assessment of health-related questions.
- It allows for reporting of any additional information that the product manufacturer wishes to provide about a product.
- It provides a single reporting format that is accepted as documentation to meet the requirements of various certification systems.
- Provides for a common standard for reporting across products and product categories.
- It enables manufacturers to disclose information to the level they choose or based on the information they have from meeting minimum requirements to full disclosure and transparency.
- It is managed and supported by the HPD Collaborative (HPDC), a nonprofit member organization representing a large and growing cross-section of building industry participants.

HEALTH PRODUCT DECLARATIONS (HPDs)

hpdc

What does the HPD Open Standard not do?

description from: hpd-collaborative.org

- It is not a certification. It is a standard for how to report information about product contents and associated health information.
- It does not assess or certify products, materials, or substances; in this way it is a different type of standard from "standards" for certifications such as Cradle to Cradle, Declare, etc.
- It is not an assessment of product performance.
- It is not a life cycle assessment.
- It does not identify whether a product is "better" or "worse" than another.



description from: c2ccertified.org

- Product rated through five quality categories:
 - material health
 - material reutilization
 - renewable energy and carbon management
 - water stewardship
 - social fairness.
- Achievement level in each category: Basic, Bronze, Silver, Gold, or Platinum
 - Lowest category dictates product overall mark
- Assessment Summary Reports are reviewed by the Institute but prepared by trained third-parties
- Every two years, manufacturers must demonstrate good faith efforts to improve their products in order to have their products recertified.

Product Scorecard



from: c2ccertified.org

CERTIFIED Cradletocradle BRONZE	CRADLE TO CRADLE CERTIFIED ^{CM} PRODUCT SCORECARD									
QUALITY CATEGORY	BASIC	BRONZE	SILVER	GOLD	PLATINUM					
			Ø							
RENEWABLE ENERGY & CARBON MANAGEMENT		0								
			Ø							
SOCIAL FAIRNESS				Ø						
OVERALL CERTIFICATION LEVEL										

Cradle to Cradle Material Health Certification



from: c2ccertified.org



DECLARE LABEL



description from: living-future.org

A Declare Label Answers Three Questions:

- Where does a product come from?
- What is it made of?
- Where does it go at the end of its life?

Intended to be a transparency platform and product database.

References the "Red List"

The Red List contains the worst in class materials prevalent in the building industry.

The commonly-used chemicals on the Red List are:

polluting the environment

bio-accumulating up the food chain until they reach toxic concentrations

harming construction and factory workers

Declare.



INTERNATIONAL LIVING FUTURE INSTITUTE™

description from: living-future.org

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 Componant, 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.)



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

description from: bifma.org

BIFMA is the trade association for business and institutional furniture manufacturers.

Several versions of Furniture specific standards:

ANSI/BIFMA e3-2019 (prior version in 2014 and 2010) for Furniture Sustainability provides measurable market-based definitions and establishes performance criteria for increasingly sustainable furniture.

ANSI/BIFMA M7.1 Standard Test Method for Determining VOC Emissions - provides industry approved emissions requirements for low-emitting seating and office furniture products.

ANSI/BIFMA X7.1 Standard for Formaldehyde and TVOC Emissions - provides chamber test methodology for the emissions of seating, office furniture systems, and components

description from: chemsafetypro.com

Registration, Evaluation, Authorization and Restriction of Chemicals

- 2006 EU legislation, in effect June 1, 2007 and created the European Chemical Agency
- Reporting up and down the supply chain, increasingly small amounts of imported materials triggering reporting required
- Mandatory registration of products
- Includes a substances of very high concern (SVHC) list
 - Mandatory notification of smaller amounts of these materials
 - Includes:
 - substances meeting the criteria for classification as carcinogenic, mutagenic or reprotoxic
 - persistent, bio-accumulative and toxic substances
 - very persistent and very bio-accumulative substances
 - substances for which there is evidence for similar concern, such as endocrine disrupters

GREENSCREEN ASSESSMENT AND LIST TRANSLATOR SCORING CHEMICALS AND PRODUCTS

from: greenscreenchemicals.org



UL PRODUCT LENS

- Response to other disclosure indicators
- Hazard data "in context" using exposure indicators along four phases within the life cycle of the product.
- Collaboration between UL Environment, MBDC and Cradle to Cradle Product Innovation Institute
- Program's chemical assessment is based on the Materials Health Assessment Methodology from the Cradle to Cradle Certified Products program.
- Designed to meet the chemical disclosure requirements outlined by the design community and LEED
- 18 products listed currently on the UL spot database



description from: ul.com

	Туре	Assessments + Programs					Sco	ре	Compliance			e							
Rating system crtiteria	Date	HPD	C2C full certification	C2C mat'l health cert.	Declare	BIFMA level	Green Screen	REACH	PTD	UL product lens	Ingredient disclosure	Hazard optimization	Percentage by cost	Number of products	All products	Certain applications	Reporting	Included products	Reporting threshold
LEED MRc4: material ingredients	2014																20 products 25% (by cost)	Permenantly installed products	100 to 1,000ppm
LEED v4 pilot credit: hazard/ exposure	2016																5 products 2 manuf.	Permenantly installed products	100 to 1,000ppm
LBC 3.0 Red list	2014																All products	All products	100ppm
WELL 25: toxic material reduction	2015																25% (by cost)	Chemical avoidance in some applications	100ppm
WELL 26: material safety	2015																25% (by cost)	Interior finishes/ furnishings	100ppm
WELL 97: material transparency	2015																50% (by cost)	Interior finishes/ furnishings	100 to 1,000ppm

TABLE 4

Building industry rating system requirements, compared.

VOC Limits

Generally broken out by Content and / or Emissions certified

Most often related to California CDPH Standard Method for the Testing and Evaluation of VOC Emissions from Indoor Sources Using Environmental Chambers

Several versions of guidance:

- As a portion of California Specification 01350
- Version 1.1: 2010
- Version 1.2: 2017 (expansion of product categories and addressing benzene chronic reference exposure level)

VOC Limits

Certification Programs that reference CHDP testing

- Carpet and Rug Institute (CRI)
- Collaborative for High Performance Schools (CHPS)
- Scientific Certification Systems Global Services (SCS)
- UL GreenGuard

Testing Labs that perform CHHP

- Berkeley Analytical Associates (BAA)
- Eurofins Product Testing
- Intertek
- Materials Analytical Services (MAS)
- UL Air Quality Services
- VITO

Product Certifications Requiring CDPH Standard Method v1.1–2010

Certification System	Product Category	Level Required	Product Search
Cradle to Cradle (C2C)	Any	Gold	c2ccertified.org/products/registry
FloorScore	Resilient flooring	-	scsglobalservices.com/certified-green- products-guide
Greenguard	Most building products, furniture and finishes, cleaning products	Gold	www.greenguard.org/en/QuickSearch. aspx
Green Label	Carpet, carpet adhesives, and carpet pads	Plus	carpet-rug.org
Indoor Advantage	Interior building products, including furniture and finishes	Gold	scsglobalservices.com/certified-green- products-guide

Source: BuildingGreen, Inc.

All these certification systems adhere to the current version of the CDPH Standard Method for assessing VOC emissions, but some manufacturers—particularly makers of wet-applied products, which can have hundreds of different formulations—will likely offer first-party declarations of third-party lab results, now acceptable in LEED v4.

VOC Emissions from Pr	roducts: Some	Major Programs	& Labels
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Program	Developer	Product Types	What It Covers	Relationship to CDPH Standard Method v1.1	Programs That Recognize This Label
BIFMA Level	Business and Institutional Furniture Manufacturers Association (BIFMA)	Commercial Office furniture	Multi-attribute standard and certification looking at many sustainability aspects of furnishings Emissions testing credit 7.6.1 screens against allowable levels of 4 sets of compounds: formaldehyde, total VOCs, total aldehydes, 4-Phenylcyclohexene Emissions testing credit 7.6.2 screens against allowable levels of 34 compounds from CDPH Standard Method (slightly higher formaldehyde level permitted) Emissions testing credit 7.6.3 screens against allowable formaldehyde level from CDPH Standard Method	Some credits incorporate CDPH benchmarks Associated testing protocol is referenced in CDPH Standard Method for workstation emissions in open-plan offices (ANSI/BIFMA M7.1)	BuildingGreen Approved (Level 3 only) Collaborative for High-Performance Schools LEED WELL These programs reference the BIFMA M7.1 testing protocol: CDPH Standard Method v1.1 Cradle to Cradle These programs reference both the BIFMA M7.1 testing protocol and the X7.1 emissions allowances: Greenguard Greenguard Gold Indoor Advantage Gold–Furniture
Cradle to Cradle	Cradle to Cradle Products Innovation Institute (C2CPII)	Any product	Multi-attribute standard covering many sustainability aspects of commercial and consumer products Permits a variety of VOC testing methods A variety of hazardous compounds must not be detectable above background levels Limit on total VOCs	References CDPH Standard Method as primary testing and screening method, but allows others Requires addition of product- specific target compounds if not covered by CDPH 7-day test instead of 14	BuildingGreen Approved (Gold or Platinum only) LEED (for material credits, not Low-Emitting Materials)
FloorScore	Resilient Flooring Covering Institute (RFCI) with SCS Global Services	Hard- surface flooring and flooring adhesives	Screens against allowable levels of 35 compounds from CDPH Standard Method Must pass CDPH for both classroom and office scenarios Tests VOC content of adhesives against SCAQMD Rule 1168	Exactly the same for emissions testing Adds content testing for adhesives only	BuildingGreen Approved (must also meet other requirements) Green Globes LEED Living Building Challenge

Greenguard	UL	Most building products and furniture	Screens against threshold limit value (TLV) of 100+ compounds considered occupational hazardous by the American Conference of Governmental Industrial Hygienists; allowable concentration is 1/100 the TLV Additional limits on formaldehyde, total aldehydes, styrene, total VOCs, particulates	Roughly follows CDPH testing protocol but requires that products pass at 7 days Screens against unique list of target chemicals	LEED (accepted for furniture only)
Greenguard Gold	UL	Most building products and furniture	Screens against allowable levels of 35 compounds from CDPH Standard Method Screens against threshold limit value (TLV) of 100+ compounds considered occupational hazardous by the American Conference of Governmental Industrial Hygienists; allowable concentration is 1/100 the TLV Limit on total VOCs	Incorporates ½ CREL benchmark and roughly follows CDPH testing protocol, with some exceptions Adds its own list of target chemicals and allowable limits Adds total VOC requirement: TVOC emissions must be below 500 µg/m ³	BuildingGreen Approved (for products not covered by FloorScore or Green Label Plus) Green Globes LEED Living Building Challenge
Green Label Plus	Carpet & Rug Institute (CRI)	Carpet, carpet adhesive, carpet cushion	Screens against allowable levels of 35 compounds from CDPH Standard Method Screens against additional compounds: 6 for carpet, 2 for carpet cushion, and 7 for adhesives	Exactly the same testing protocol for emissions testing Must meet all ½ CREL benchmarks Screens for allowable levels of additional product-specific chemicals	Green Globes LEED NSF 140
Indoor Advantage Gold	SCS Global Services	Most building products and furniture except products covered by FloorScore	Screens against allowable levels of 35 compounds from CDPH Standard Method Includes onsite audits of manufacturing facilities and third-party testing labs	Exactly the same: a third-party certification that a product has met CDPH Standard Method for its product category, for private office or classroom scenarios (scenarios are listed on the certificate)	BuildingGreen Approved (for products not covered by FloorScore or Green Label Plus) Green Globes LEED Living Building Challenge

Source: BuildingGreen, Inc.

Approach under B3

	I.1: Low Emitting Materials	M.1B: Product Life Cycle Assessments	M.1: Environmentally Preferable Materials	M.4: Health
Interior Materials (see definition under I.1)	All interior materials in project must comply with I.1			10 materials required (if one of most common it may be double counted)
Any Materials in Project		5 materials required, may be any used in project	55% of all materials are required, some may contribute in multiple categories, so actual % of contributing materials may be lower	

Specifically:

- I.IA: Requires all newly installed interior materials must comply with California Department of Public Health (CDPH) Standard Method vI.I–2010 or vI.2–2017.
- I. I B: Specific requirements for wet-applied interior materials.
- I.2C: Specific requirements for wood products (CARB requirements for ultra-low formaldehyde)
- I.ID: Furniture must meet ANSI/BIFMA M7.1–2014
- M.IB: Product Life-Cycle Assessments Use at least 5 different permanently installed products sourced from at least five different manufacturers (EPD or equivalent)
- M.4A: Demonstrate that the chemical inventories of at least ten permanently installed interior materials from at least five different manufacturers do not contain likely hazardous materials (as shown by GreenScreen LT, GreenScreen BM, C2C, or Declare LBC red-list free)
- M.4B: Limit Mercury Content in Fluorescent Lamps.

A useful guide to setting up "Healthier Materials Plan", including:

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

AIA ARUP

- Understanding background and context
- Creating a Healthier Material Plan
- Implementing a Healthier Material Plan
- Understanding and utilizing product disclosure and optimization and tools
- Overcoming common barriers
- Considering healthier materials in practice
- And sample plans and specifications