Harmonization in Green Building

Tools for Assessing Chemical Hazards in Building Products

BY CATHERINE BOBENHAUSEN

CATHERINE BOBENHAUSEN is an Authorized GreenScreen Practitioner at Vidaris, Inc. She also serves on the Technical Committee of the Health Product Declaration Collaborative. She can be reached at (212) 689-5389 or **cbobenhausen@vidaris.com**.

The movement toward transparency in chemical assessment that began in 1992 with the launch of GHS has taken another step forward.

Driven by global and national harmonization efforts and collaboration among multiple stakeholders, a shared vocabulary for identifying chemical hazards is emerging. GHS—the Globally Harmonized System of Classification and Labeling of Chemicals, the landmark international mandate resulting from the 1992 Earth Summit—was impelled by these visionary guiding principles:

- protection will not be reduced
- protection will be based on intrinsic properties (hazards) of chemicals
- all types of chemicals will be covered
- all systems will have to change
- involvement of all stakeholders should be ensured
- comprehensibility must be addressed

With the June 2015 rollout of new Safety Data Sheets using GHS, greater harmonization with global scientific research and classification of hazards began in force.

Similarly, in the building products sphere, the Material Health Harmonization Task Group (HTG) has made significant progress in harmonizing tools that manufacturers can use in the transition to inherently safer building products. Version 4 of the USGBC's Leadership in Energy and Environmental Design (LEEDv4) certification program includes a material transparency credit to reward project teams for selecting products for which "the chemical ingredients … are inventoried, using an accepted methodology" and for products "verified to minimize the use and generation of harmful substances."

In its "Harmonization Opportunities Report," the HTG concluded that a shared platform for product content inventory and chemical hazard analysis "can be developed to create a comprehensive single portal of entry for manufacturers and a single repository for hazard classification data." It also outlined efforts to develop a "universally applicable taxonomy for the purpose of product content inventory" using recognized terms from GHS; the European Union's Registration, Evaluation, Authorization, and Restriction of Chemicals (REACH) regulation and Restriction of Hazardous Substances (RoHS) directive; EPA's Design for the Environment (DfE) program; and others.

The expected outcomes of the HTG harmonization work include elimination of redundancy, lower costs for manufacturers, and the basis for a unified community of practice for chemical hazard assessment and material health profilers/assessors. The benefits include discovery of synergies between the leading systems, enhanced interoperability between programs, and enhanced market value based on clarification of the singular role of each program.

TOOLS FOR ASSESSING CHEMICALS

Several tools are available to inventory, screen, assess, and optimize chemical ingredients and hazards. Some set progressive levels of certification for products, while others classify the hazards of chemical ingredients in the product. Each of the following programs plays critical roles during one or more of these steps, each is referenced in LEEDv4, and representatives from each participated in the HTG with support from the U.S. Green Building Council and Google:

- Cradle to Cradle Certified Product Standard (by Cradle to Cradle Products Innovation Institute, C2CPII, **www.c2ccertified.org**)
- GreenScreen for Safer Chemicals (by Clean Production Action, CPA, **www.greenscreenchemicals.org**)
- Pharos Chemical and Material Library and Building Product Library (by Healthy Building Network, HBN, **www.pharosproject.net**)
- Health Product Declaration (by Health Product Declaration Collaborative, HPDC, **www.hpd-collaborative.org**)
- Declare (by International Living Future Institute, ILFI, **http://living-future.org/topic/declare**)
- BIFMA level (by Business and Institutional Furniture Manufacturers Association, BIFMA, **http://levelcertified.org**)

Cradle to Cradle (C2C) and GreenScreen (GS) incorporate full hazard assessments to assign hazard rankings to chemicals, building on the GHS and extending it to cover a more complete set of health endpoints. The GreenScreen List Translator provides a quick screening methodology for finding known chemicals of highest concern using a set of rated authoritative scientific lists. The C2C and GS

full assessments rank chemicals, mixtures, and polymeric materials and their transformation products based on human health hazard endpoints, physical hazards, environmental health, and environmental fate (including persistence and bioaccumulation). Both C2C and GS are used in the LEEDv4 material ingredient optimization credit.

The C2C certified products registry identifies more than 250 products that are eligible for the LEEDv4 material ingredient disclosure credit. About half of those are eligible for the LEEDv4 material ingredient optimization credit. C2C accreditation, like the other HTG programs, starts by assessing the inherent hazards of each chemical. The C2C protocol, however, goes an additional step of considering the potential for exposure for high hazard chemicals. C2C protects the identity of chemicals.

Pharos' Chemical and Material Library (CML), an online catalog of more than 35,000 chemicals, polymers, metals, and other substances, identifies key health and environmental information using 42 authoritative scientific lists for human and environmental health hazards, 20 restricted substance lists. It provides rapid lookup for health warnings, GS and C2C hazard rankings, and GreenScreen List Translator scores for each listed substance and benchmarks for every substance with a public GreenScreen full assessment. Pharos' Building Product Library (BPL) provides in-depth health and environmental information on more than 1,500 building products, based

on manufacturer transparency and independent research.

The Health Product Declaration version 2.0, released in September 2015 for public use, is a standardized format for voluntary reporting of chemical information in products, and is the creation of a customer-led, non-profit membership organization (Health Product Declaration Collaborative). It is designed to meet the needs of customers (designers, specifiers, builders, developers, owners, and users) for reporting by building product manufacturers on material content and associated health information. The HPD is used to document compliance with systems that certify products and building projects. The process of creating an HPD can reveal ingredients that a manufacturer was not aware of, which can lead to use of less hazardous substitutes. The HPD classifies chemicals based on their presence on HPD Priority Hazard Lists, their GreenScreen List Translator scores, or full GreenScreen assessments.

The ILFI Declare Red List includes most of C2C's list of banned chemicals: perfluorinated compounds (PFCs), halogenated flame retardants, phthalates, short-chain chlorinated paraffins, and polyvinyl chloride. Of the more than 200 products in the Declare products database, more than 100 are identified by their manufacturer as "Red List Free." Beyond the label designation, the manufacturer also lists the ingredients in the product's components, which can further inform the design decision.

The BIFMA level is BIFMA's sustainability certification program for

business furniture. The level mark indicates that the product, the manufacturing facility, and the company responsible for the product brand have been evaluated against sustainability criteria including materials selection and usage; energy and atmosphere; human and ecosystem health; and social responsibility impacts. Chemicals include those from EPA's Tool for the Reduction and Assessment of Chemical and other Environmental Impacts (TRACI) 2011 dataset. Filters in Pharos' Building Product Library can be used to find BIFMA level furniture under different versions and progressively stringent rankings.

NEXT GENERATION TOOLS

The Quartz Project has recently emerged as a result of a collaboration between Flux, a technology company founded to deliver collaboration tools for increasing efficiencies in building architecture and engineering; Healthy Building Network, a nonprofit devoted to reducing toxic building materials; Google, which describes itself as a global technology company committed to creating healthy and sustainable workplaces; and Thinkstep, a global sustainability software, data, and services firm. The Quartz Common Products Database is an open database of composition, health hazard, and environmental impact data for building products. It brings together information on the effects of building materials on both human health and environmental sustainability. Methods applied in Quartz include Pharos Project/ GreenScreen hazard screening,

TRACI 2.1, and ISO 14044.

Google created its own Healthy Materials Program to identify the healthiest products and materials for its buildings. Through its tool, Portico, Google encourages design teams to include products whose manufacturers have published HPDs, commissioned GreenScreen assessments, or attained C2C certification. Google's scoring system awards more points for higher levels of transparency and material health.

THE SIX CLASSES CHALLENGE

In another example of a collaborative effort to enhance communication on the topic of chemical hazards, the Green Science Policy Institute has led the Six Classes Challenge (**www.sixclasses.org**), with the five-year goal of a 50 percent reduction in use of entire classes of harmful chemicals in consumer products. A series of short but informative webinars offer overviews on use and toxicity of highly fluorinated chemicals, antimicrobials, flame retardants, bisphenols and phthalates, organic solvents, and certain metals.

TOWARD SAFER PRODUCTS

The movement toward transparency in chemical assessment that began in 1992 with the launch of GHS has taken another step forward with the HTG. In both cases, the overarching goal of harmonization is the manufacturing of inherently safer products. For more information on the HTG, read the Harmonization reports at **http://bit.ly/htgharmo nizationopp** and **http://bit.ly/htghar monizationupdates**. ⑤