Project Team User Guide: Using Health Product Declaration® (HPD) Open Standard, version 2.1.1

December 2018

Health Product Declaration Collaborative
www.hpd-collaborative.org

Health Product Declaration Collaborative
401 Edgewater Place, Suite 600
Wakefield, MA 01880
info@hpd-collaborative.org
+1.781.876.8871
Toll free: +1.877.394.3408

Copyright © 2018 Health Product Declaration Collaborative. All rights reserved.
All trademarks referenced are the acknowledged property of their respective owners.

Contents

Acknowledgements 5
Foreword 6
About this *Project Team User Guide* 9
1. Introduction 10
How does the HPD Open Standard work – what does it do? 11
What does the HPD Open Standard not do? 12
What makes an HPD a "good HPD?" 12
The Health Product Declaration Collaborative – a resource for project teams 13
2. Getting Started with HPDs 14
Talking within your firm – why support reporting, disclosure, and transparency using HPDs? 14
Talking with clients – why should they support disclosure, and how can client requirements be supported using HPDs? 15
3. Using HPDs 16
What if an HPD is not available? 17
Overview of the Process 18
If you are working on a LEED v4 Project, the following process will help you achieve the Material Ingredients Credit using HPDs 18
If your client has disclosure/transparency requirements other than LEED v4 that can be met by HPDs, the following process will help you be successful in meeting these goals 20
How to Obtain and Use HPDs – Key Steps in the Process 21
Finding HPDs 21
HPDC Public Repository 21
In-house firm libraries/repositories 22
Libraries/repositories maintained by other organizations 22
Requesting HPDs directly from manufacturers 22
Understanding HPDs – Key Concepts 23
How the HPD is structured 23
Content inventory 24
Descriptors of the completeness and type of reporting 27
Hazard Screening and Assessment 27
Evaluating HPDs 29
Selecting Products 30
Working with Consultants and Third Parties 31
Working with Manufacturers 31
Learning from Practice: Introduction to Case Studies 31
In Summary – Key Tips for Project Team Success 32
When Possible – Encourage Disclosure and Transparency 33
Taking the Next Step 33
4. Understanding the HPD Open Standard and HPDs – Section-by-Section Details 34
Section 1: Summary 35
Section 2: Content Inventory 42
Section 3: Certifications and Compliance 48
Section 4: Accessories 49
Section 5: General Notes 50
Section 6: References 51
5. Examples of HPDs 53

Acknowledgements

The Health Product Declaration Collaborative (HPDC) expresses appreciation to the HPDC members and staff who contributed to this *Guide.*

Susan Kaplan, HLW International, and Joel Ann Todd, HPDC staff, led the effort.

The following members and staff also contributed to the Guide:

HPDC Members:

- Mike Manzi, Bora Architects
- Catherine Bobenhausen, Colden Corporation
- Tom Lent, Healthy Building Network
- Gail Vittori, Center for Maximum Potential Building Systems
- Robin Guenther, Perkins+Will
- Summer Minchew, Ecoimpact Consulting

HPDC Staff

- Wendy Vittori
- John Geyer
- Millali Marcano
- Tristan Roberts

Foreword

By Robin Guenther, FAIA LEED Fellow, Principal, Perkins+Will

"...materials matter, and the choices architects and interior designers make have consequences for the health of building occupants, communities, and ecological systems."

Today, building materials are no longer quarried, harvested, or gathered from nature; they are formulated, engineered, and extruded in factories - a global, industrial building materials system. At the same time, growing awareness of material science and indoor air quality— and their impacts on occupant and community health— are placing owners, designers, and specifiers in this industrial building materials marketplace at increasing risk, with little guidance or navigational tools to assist in understanding and evaluating material choices.

As an architect, I live this reality every day. I watch contractors applying coatings without protective respirators, and wonder about whether there is fly ash or added antimicrobial chemicals in the ceiling tiles we specify. I read the labels for VOC levels in big box home product retailers, and look at the cans on project sites. For more than two decades, I have written, talked, and generally tried to raise awareness among designers, manufacturers, and health care clients that *materials matter*, and that the choices architects and interior designers make have consequences for the health of building occupants, communities, and ecological systems.

Initially, my peers thought I was deranged – why would I want to put my growing design reputation "at risk" over such an unknown issue? But I now believe that those of us who began our journeys in the 90's were in fact witnessing a rapid expansion of "better living though chemistry" – an explosion of presumed product performance enhancements achieved through adding unpronounceable substances to even the simplest of building products. We sensed that something was changing, even if we didn't quite know what it was. Twenty years later, our materials are almost unrecognizable.

Recently, I read a history of food labeling in the U.S., and believe it can teach us about the need for transparency in building materials. The need for food labeling emerged once food production became dominated by mass production and distribution, when the balance of power shifted against the consumer. It was impossible for a consumer to know the ingredients in the canned, bottled, and prepackaged food items that dominate the food industry. To borrow economics terms, this "asymmetry" of information between the producer and consumer provided food producers with an incentive to minimize the quality of their products—it produced "a market for lemons."

The problems inherent in this asymmetry became quickly apparent: in a market with two food products, one safe and nutritious and one not, the manufacturer knows which is the better product, but without labeling the buyer does not. Because the buyer cannot distinguish, the better product can only be sold at the same price as the inferior product. The producer will only supply the inferior product, and the better product will be forced off the market. The food industry tried many marketing schemes prior to labeling – trademarks, "seals of approval," and brand distinctions, but none of these effectively addressed this asymmetry. Ultimately, government and food safety advocates demanded ingredient labeling as THE only effective mechanism for consumer knowledge and choice. In terms of intellectual property and secrecy arguments against labeling, once science made it possible to detect ingredients in food products (a sort of "reverse engineering"), the food industry realized that "trade secrets" were no longer possible.

Buildings: the black box of material health understanding

When buildings were constructed from substances available in our surroundings, designers understood what materials were and where they came from. A cathedral's stone was often quarried within walking distance of where it was set, and house paint was a mixture of cow's milk, crushed limestone, and pigments from local clay pits. People saw the entire life cycle of a material from its extraction to disposal; at demolition, materials were often salvaged "as is" or structures simply biodegraded. Many of us have visited such ruins – evidence of past built environments dissolving back to nature. Composite materials had relatively simple formulations. It wasn't an idyllic world—toxic substances like lead and asbestos were used – but it was a more transparent world. We knew what our materials were made from, even if

we didn't fully understand the environmental and human health consequences of their manufacture, use, and disposal. Today, we deconstruct and salvage upwards of 90 percent of those materials for contemporary uses.

In the contemporary construction marketplace, building material sourcing is much more complex and opaque—designers and manufacturers are confronted with complex chemistry, global supply chains, and evolving understanding of the environmental, health, and social justice issues surrounding manufacture, use, and end of life disposal. Product composition and health profile information is scarce, impossible to locate and difficult to understand. Product composition disclosure is at the discretion of the manufacturer, and what a manufacturer knows about the components that make up their product is often incomplete and at the discretion of their suppliers. The layers of opacity can be very deep, and with multiple component product assemblies composed of hundreds of substances, coatings, and fastening systems, they require massive compilations of information generated by multiple suppliers.

This has created a situation where no one really knows what contemporary buildings are made of – much less the ecological and human health consequences of this paradigm. Research on the ecological and health effects of building material substances is nascent, but public health community has begun to focus attention on this issue. Many of these substances not only pollute the environment, but also have adverse affects on indoor air quality. The U.S. Environment Protection Agency (EPA) found that *"many indoor environments have higher pollutant levels of two to five times higher, and occasionally more than 100 times higher than outdoors levels due to occupant activities, building materials, and ambient conditions."* This is especially disturbing since, according to the EPA, North Americans spend 90% of their lives indoors. A Center for Disease Control (CDC) report 2011 titled "Disparities and Inequalities" found that *"among the approximately 110 million housing units in the United States, approximately 23.4 million are considered unhealthy"* due to toxins and other environmental pollutants. Recent research on added flame retardant chemicals and anti-microbials suggests that the presumed product performance may not in fact be real.

Rethinking our materials paradigm

In *Ecological Intelligence*, psychologist Daniel Goleman challenges us to demand "radical transparency" in all products – he calls on consumers (in this case project teams) to demand to know the hidden social, environmental and health impacts of products. He defines Swarm Rules to guide our transformation: first, know your impacts; next, favor improvement; finally, share what you learn. He believes that we can train ourselves to think differently—"to develop an innate flight instinct when confronted by a shampoo that contains methylparaben or a garden chair made with endangered tropical wood." Can we do this with building materials? I believe we can: the question is HOW?

Can we radically transform our global materials economy at the scale of the local and sustainable food revolution? Can we take the lessons learned from food labeling to the building products world? Environmental scholar David Orr writes: "The sustainability revolution is nothing less than a rethinking and remaking of our role in the natural world. It is a recalibration of human intentions to coincide with the way the biophysical world works." Can we imagine a materials economy that recalibrates around simple principles of sustainability and health?

The Health Product Declaration® Open Standard

This transformation begins with disclosure of building material ingredients, and the Health Product Declaration Open Standard represents a critical step forward for our industry in achieving this end. It gives us the opportunity to leapfrog past the increasing complexity and confusion of trademarks, eco-labeling, health claims, and certification systems to address the asymmetry that exists in the marketplace between building product producers and consumers. It is critical to have a comprehensive, uniform, open standard that serves as the basis of analysis, evaluation, and comparison of products – to create a level playing field where project teams can select healthier materials and manufacturers can openly compete on the basis of healthier product chemistry.

It is a daunting task to reimagine the materials economy—the building blocks of our built environments. Very few owners, designers, and specifiers began their careers as chemists, and the information can be at times overwhelming and confusing. It's easy to view this as "too much information" – a chorus, unfortunately, I already hear too often. But we have to believe that every time we access and use this information, every time we ask a manufacturer for an HPD,

and every time we question a chemical ingredient and ask for a healthier alternative, we are making a difference, even if we aren't sure how.

Already, the use of Health Product Declaration information is being recognized and rewarded in green building tools – LEED v4 Materials and Resource credits and the WELL Building Standard. The Health Product Declaration Open Standard information can be used in GreenScreen, Cradle to Cradle, Pharos, Portico, and Quartz. A dedicated group of owners, designers and manufacturers are committed to supporting the expansion of voluntary ingredient disclosure—a group that is growing exponentially.

This Guide will help project teams succeed in understanding HPDs and using the information to inform product selection today—it assists us all in becoming actors in a great chain of transformation. Together, we are bringing a new materials economy into being, one that values transparency, health, and life. The HPD Open Standard creates the platform for building owners, manufacturers, specifiers, and installers to partner to transform the materials economy based on human and ecological health—to deliver buildings that can be safely recycled by our grandchildren. The time is NOW for a new relationship between the built environment and the natural world, and transforming our building products is an important step in reaching that goal.

Robin Guenther FAIA LEED Fellow
Principal, Perkins+Will
Senior Advisor, Health Care Without Harm
New York, August, 2016

About this *Project Team User Guide*

This Project Team User Guide was written by and for project team members, and reflects the practice of material health from this user perspective. It is designed to meet the needs of architects, interior designers, contractors, specifiers, and other project team members who are using completed HPDs:

- to identify ingredients of products they use and to understand health information associated with those products,
- to work collaboratively with manufacturers toward healthier products, and
- to meet requirements of clients and certification systems.

The *Guide* recognizes that working with health-related information is new territory for most project teams and that most teams don't have toxicologists, industrial hygienists, and other experts to help them navigate this new territory. While the *Guide* is not intended to replace this expertise, it will enable a project team to better understand the HPD Open Standard, what an HPD contains, and how that information can be used.

The *Guide* may also be of interest to others: manufacturers who create HPDs for their products, researchers and analysts who are using data reported in HPDs to better understand material health practices, and those who simply want to learn more about this field. We welcome comments and suggestions from all perspectives that can help us learn and improve the implementation of the HPD Open Standard in building projects.

The *Guide* is organized into the following chapters:

1. *Introduction* – what is the HPD Open Standard? What is an HPD?
2. *Getting Started with HPDs* – where and how do I begin? What are the benefits of using HPDs – to my firm and our clients?
3. *Using HPDs* – where do I find HPDs? What key concepts and terms in HPDs do I need to understand? What should I look for in an HPD?
4. *Understanding the HPD Open Standard and HPDs: Section-by-Section Details* – definitions and explanations of terms and concepts in the HPD Open Standard
5. *Case Studies* – how projects have used HPDs in practice
6. *Examples of HPDs*

Each chapter begins with a brief overview to introduce the entire Project Team to concepts of transparency, disclosure, and the HPD Open Standard followed by more detail that specifiers and others on the team with specific responsibilities can use for product selection, purchase, and installation. Detailed definitions of terms are included in Chapter 4.

New in HPD 2.1.1:

Harmonized method for hazard screening

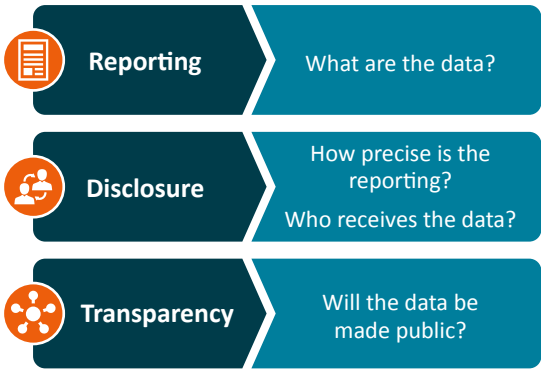
Introduction of Special Conditions

Other updates and clarifications to existing material in the Standard

This version of the *Guide* is based on version 2.1.1 of the HPD Open Standard. This revision of the Standard is a minor revision building on the v2.1 release, which focused on harmonization with the LEED v4 Material Ingredients credit. This version incorporates new procedures to make results of hazard screening more consistent across different tools. It also introduces Special Conditions, which are classes of materials, such as biological materials, or mixed recycled content, where standard content inventory and hazard screening methods aren't feasible. As the HPD Open Standard is updated and revised periodically, the *Guide* will also be updated to reflect the changes. For update information on this *Guide*, visit the HPDC website (http://www.hpd-collaborative.org).

1. Introduction

The **HPD Open Standard** is a voluntary technical specification for reporting information on product contents and associated health information. Developed by a coalition of architects, designers, specifiers, owners, manufacturers, contractors, materials researchers, and non-governmental organizations (NGOs), the HPD Open Standard is a key element in the movement toward achieving greater transparency and disclosure in reporting the human and environmental health aspects of building products and materials.



Ultimately, the goal of transparency and disclosure is product innovation, improvement, and optimization – enabling open collaboration of voluntary market participants to enhance the healthfulness of materials used in the built environment. The rewards of participation can accrue to all. For building owners and designers, an HPD provides the data needed for product selection incorporating health considerations. For manufacturers, this same information can inform product design. As disclosure takes place, and products are developed that have superior health characteristics, HPDs enable these efforts to be publicly known – and rewarded – by those who make decisions about product specification and procurement.

"This Guide will help project teams succeed in understanding HPDs and using the information to inform product selection today – it assists us all in becoming actors in a great chain of transformation."

Robin Guenther FAIA LEED Fellow
Principal, Perkins+Will
Senior Advisor, Health Care Without Harm

Creating an HPD, which is the responsibility of the product manufacturer, is the first step in this process. The HPD provides accurate, consistent and reliable reporting of the basic information that opens the door to the collaborative process. Project teams play a key role in a collaborative process of innovation – bringing together customers and manufacturers. In requesting and then using an HPD, project teams can set a "virtuous cycle" in motion. With access to health-related information disclosed in HPDs, project teams can give preference to products for which such information is available.

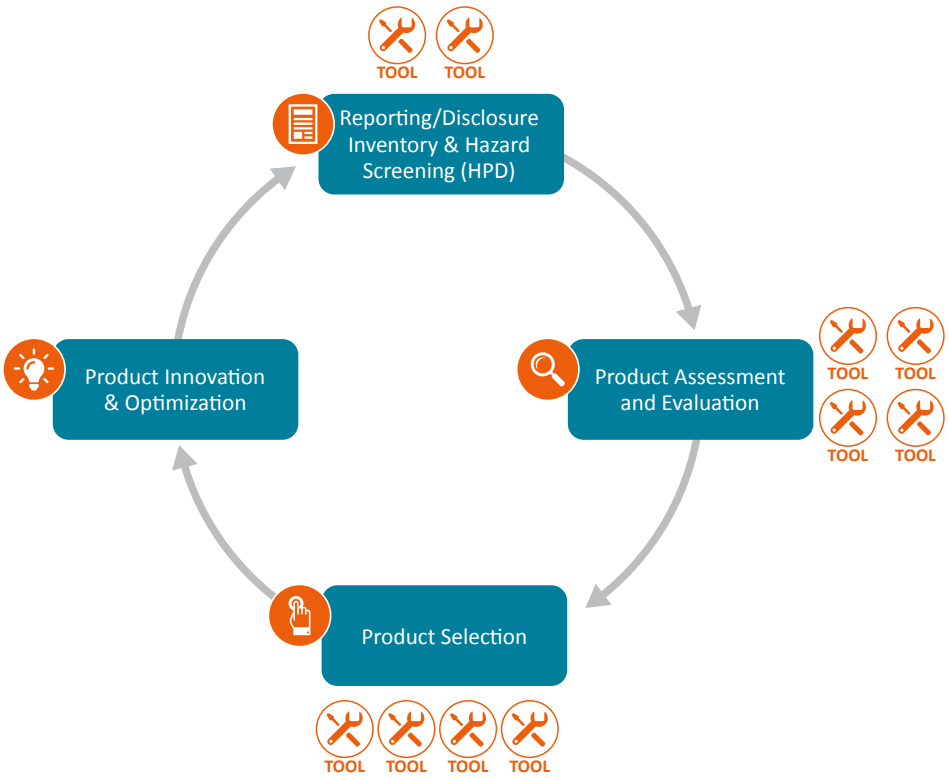


Figure 1. Virtuous Cycle of Collaborative Innovation to Improve Building Products and Disclosure

The **HPD Open Standard** consists of a reporting **Format** and **Instructions**. When a manufacturer enters product data into the Format, it becomes the completed "**HPD**" – the document used by project teams.

How does the HPD Open Standard work – what does it do?

- The HPD Open Standard is a voluntary technical specification for reporting data about product contents and associated health information.
- It provides detailed technical specifications – **Format and Instructions** – 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, not explicitly specified in the Format, that the product manufacturer wishes to provide about a product. This can include additional health-related information, such as exposure and/or risk assessments.
- It provides a single reporting format that is accepted as documentation to meet the requirements of various certification systems, standards, and assessment tools, including LEED™, WELL®, and Cradle to Cradle™.
- By providing a common standard for reporting across products and product categories, it enables cross-product analysis and assessment. This provides for higher-level information to assist project teams in product evaluation and selection using health-related information.
- 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 assists manufacturers and their customers in using a common language and database to discuss improving and optimizing products from a health perspective.
- 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. The HPDC's standard development process ensures that the HPD Open Standard is an evolving standard that will incorporate reporting for new health-related data as it becomes available.

What does the HPD Open Standard not do?

- *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.

What makes an HPD a "good HPD?"

- The quality of an HPD is judged by the completeness and accuracy of the information provided. The HPD Open Standard provides technical specifications for the **Format** and **Instructions** on how to complete an HPD. A "good HPD" complies with the technical specifications defined by the HPD Open Standard.
- An HPD is often used as a reporting tool to document compliance with credits or criteria in one or more certifications, such as the LEED v4 Materials Ingredients credit, for example. To provide a "good HPD" for such purposes, the creator of the HPD needs to ensure that the information reported meets the criteria for such certifications. This *User Guide* provides information about the relevant credit requirements of several such certifications, such as in LEED v4. The definitive guidance for compliance is always the issuing organization's own documents.
- The HPD Open Standard provides a manufacturer with a defined, standardized methodology to report at higher levels of disclosure – and more stringent thresholds – than may be required for a given certification. Manufacturers may also choose to include additional information in Notes sections. They may also show support for transparency by publishing their HPDs via the HPD Public Repository.

The HPD is used as a data source for many other programs in the material health ecosystem, reporting content inventory and associated health information that has been entered by the manufacturer in compliance with the HPD Open Standard.

Core programs in the building industry's material health ecosystem have harmonized their reporting of content inventory and associated health information with the HPD Open Standard. This data is made available in other programs either through the printed HPD report (in PDF format), or, increasingly through an automated data exchange, using the HPD Builder API (Application Program Interface) connection.

Figure 2 illustrates the core programs within the material health ecosystem where data reported in an HPD is currently being shared. As material health practice grows within the building industry, new programs are emerging. HPDC actively supports and promotes harmonization with all material health and transparency programs.

- HPDs receive screening information from Pharos and GreenScreen® and provide content inventory information to these tools.
- HPDs can also provide inventory and hazard information to support Declare. HPDs can feed into Cradle to Cradle and Google's Portico, where project teams can select and specify products with HPD information. HPDs can also be used as documentation for credits in the LEED rating system and the WELL Building Standard.
- HPDs can also be used as documentation for the LEED rating system, the WELL Building Standard, and the Living Building Challenge.

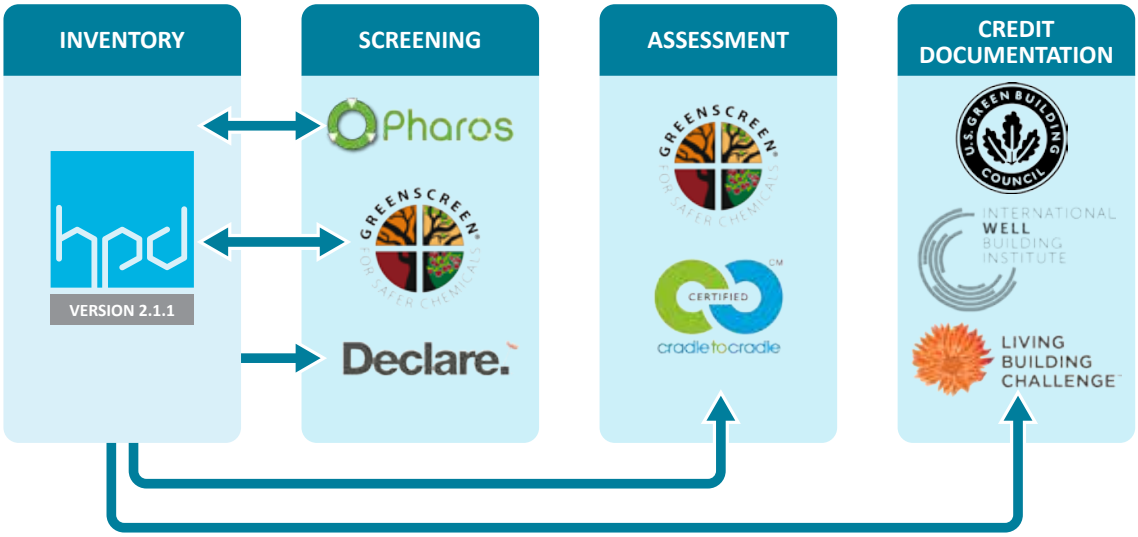


Figure 2: Relationship of HPD to Examples of Other Systems and Tools

The Health Product Declaration Collaborative – a resource for project teams

The HPD Collaborative (HPDC) is a resource that supports industry adoption of the HPD Open Standard. Through its Technical Committee and Advisory Panels, HPDC works proactively with users, manufacturers, and the broader materials ecosystem to remove barriers, lower the cost of reporting and using this information and ensure transparency in decision-making. Additional resources to support your project team's efforts are available on the HPDC website (www.hpd-collaborative.org).

2. Getting Started with HPDs

Project teams get involved with HPDs for various reasons; among them, the following are typical scenarios:

- Your firm is committed to materials transparency and disclosure on health aspects of products.
- Your project is pursuing LEED, WELL, Living Building Challenge, or another certification that includes credits that use HPDs as a form of documentation and/or includes materials-related credits for which health-based chemical ingredient data is required.
- You have policies related to requesting this information from manufacturers and implementing selection preference for products from manufacturers that are participating in transparency and disclosure programs.
- Your client or customer requires you to identify and specify products from manufacturers that are participating in transparency and disclosure programs.
- Your firm, client, or customer has particular material ingredient policies or requests and you require disclosure information to ensure that those requests are met in your product specification.

Alternatively, you, your firm, and your client might not yet have clear plans for material transparency and disclosure, but, you are ready to take a first step toward better material health on your projects.

Whether you have seasoned processes for using HPDs in place, or you are totally new to this topic, this *Guide* will provide valuable information and suggestions for creating/improving your processes. The *Guide* provides:

- Tips on talking within your firm, and with your clients
- Definitions and other information to help you understand HPDs
- Suggestions and case studies on using HPDs
- Suggestions for communicating with manufacturers

Talking within your firm – why support reporting, disclosure, and transparency using HPDs?

If your project is one of the first attempts within your firm to work with the HPD Open Standard and HPDs, it will be important to ensure that everyone involved has a shared understanding of the basics around reporting, disclosure, and transparency. The concepts of transparency and disclosure are becoming increasingly common in our lives. We have learned to expect nutrition labels on food, sourcing information on seafood, and ingredient labels on personal care products. Although it may not be as obvious that building products can have an impact on health, in fact, they do. Given how much time we spend in and around our buildings, an increasing number of us want to ensure the same attention to making healthier choices for our buildings.

If you are initiating a discussion around these topics within your firm, here are some important concepts that you may want to share to support a focus on disclosure and transparency in building products:

- Green building certification systems incentivize disclosure and building product transparency; HPDs can contribute to achieving the LEED v4 Material Product Disclosure and Optimization-Material Ingredients credit and the WELL Enhanced Material Safety credit.
- Disclosure and transparency are endorsed by leaders in the design community.
- HPDs allow clients to consider this additional information in making informed choices about building products used in their project.
- Manufacturers are the main providers of material transparency information; HPDs offer a standardized framework for engaging in productive dialogue with manufacturers. Increasingly, manufacturers are taking the initiative to make HPDs available for their products.
- Firms that express interest in product disclosure contribute to greater awareness throughout the industry and incentivize product innovation.

Once you have determined your project's path in these areas, using HPDs to support these goals provides a simple path to collecting the product information you will need. As the most widely adopted industry standard for reporting and achieving credit/certification related to material health, HPDs are the common language within the building industry for reporting health-based product information. More and more manufacturers are creating HPDs for their products, recognizing that an HPD provides the most accurate, reliable and consistent method for product content and associated health information reporting.

Talking with clients – why should they support disclosure, and how can client requirements be supported using HPDs?

Increasingly, clients are initiating discussions with firms to support the inclusion of health-related considerations for their projects. Some of the largest real estate owners, for example, Google, have established their own criteria to evaluate and reward these practices on their projects. Often these systems will be built around HPDs, or, require the use of certifications that draw upon data found in HPDs. In this situation, the project team can immediately focus on how to use HPDs in the project, as explained in Chapter 3.

In situations where you are initiating a conversation with your client who has not yet expressed interests around transparency, disclosure, or health-related concerns, here are several starting points that may be helpful:

1. The trend toward Corporate Sustainability Programs is now well established. Leading companies in all industries have created sustainability programs. Increasing disclosure regarding the building products used in a company's buildings and wellness practices can be key elements in a corporate sustainability program (see http://www.hpd-collaborative.org/ey-value-of-sustainability-reporting/.
2. For clients building their own facilities, increased awareness of the building's health attributes can also become a foundational element of a corporate wellness program.
3. Efforts to create healthier environments can help building owners and employers increase competitiveness in the marketplace.
4. For clients engaged in green building programs, HPDs provide the most widely accepted documentation of material health related credits, and are accepted in leading building rating systems, such as LEED v4, WELL, and Declare/ Living Building Challenge.
5. The use of HPDs is growing rapidly, and is the accepted industry standard for reporting product contents and associated health information. The HPD Open Standard has an ongoing harmonization process to make it an effective tool for both creating and using health-related information about building products with all leading standards and certifications. It is backed by the standards development process of the HPD Collaborative, a nonprofit member organization dedicated to the maintenance and evolution of the HPD Open Standard. HPDC membership is open to anyone actively working with building products, ensuring that building owners have a voice at the table in determining the progress of disclosure and transparency industry practices.

3. Using HPDs

In using HPDs, project teams should keep in mind that HPDs are technical source documents, whose primary purpose is to provide accurate, reliable, and consistent information on the detailed chemical contents and health-related information about a product. Nonetheless, project teams without advanced expertise in material health can effectively use HPDs to achieve important project goals:

- **Use HPDs to achieve requirements of certification systems.** HPDs can be used directly by project teams to achieve credits for certifications, such as with LEED v4 and the WELL Building Standard. Each certification has its own requirements for the data elements, level of disclosure, and number of reports required. This *Guide* provides useful information to help a project team use an HPD – without further technical assistance – to contribute to achieving credits in the most common certifications; see Evaluating HPDs, later in this *Guide*.
- **Use data and information in HPDs to inform product selection.** The information in HPDs can be used by project teams in product evaluation and selection. For example, HPD information can be used in conjunction with other resources, such as priority chemicals lists, to compare the health-related attributes of products. Such advanced analysis will generally require the assistance of a material health expert or use of an automated product evaluation tool. As more health-related information on more products becomes available, there is growing activity from third parties to conduct higher-level analyses and issue reports on the health-related attributes of building materials. Project teams seeking additional information can refer to internal firm libraries, or other online libraries. Additional sources you might investigate for health-related information on building products are buildinggreen.com, healthybuilding.net, and mindfulmaterials.com.
- **Use HPDs to collaborate with manufacturers on product innovation**. Finally, some firms and clients are interested in discussing the health-related attributes of products directly with product manufacturers. HPDs provide a common language and database of information on the health attributes of products to support these discussions. HPDs play a key role in the cycle of product improvement and innovation described in the Introduction chapter of this *Guide* and illustrated in Figure 1.

Figure 3 illustrates how project teams can use HPDs to support these goals and processes. By using an HPD to meet credit requirements of project certification systems, such as LEED, and by using the information in the HPD to encourage product improvements, the project team sends an important signal to the manufacturer: through our product specification and selection process, we will reward those products for which disclosure is provided, and further reward products where improvements in the health attributes of the product are made. When manufacturers see this "closed loop" – that rewards their efforts to create HPDs and improve their products' health characteristics – they are encouraged to do the same for more of their products.

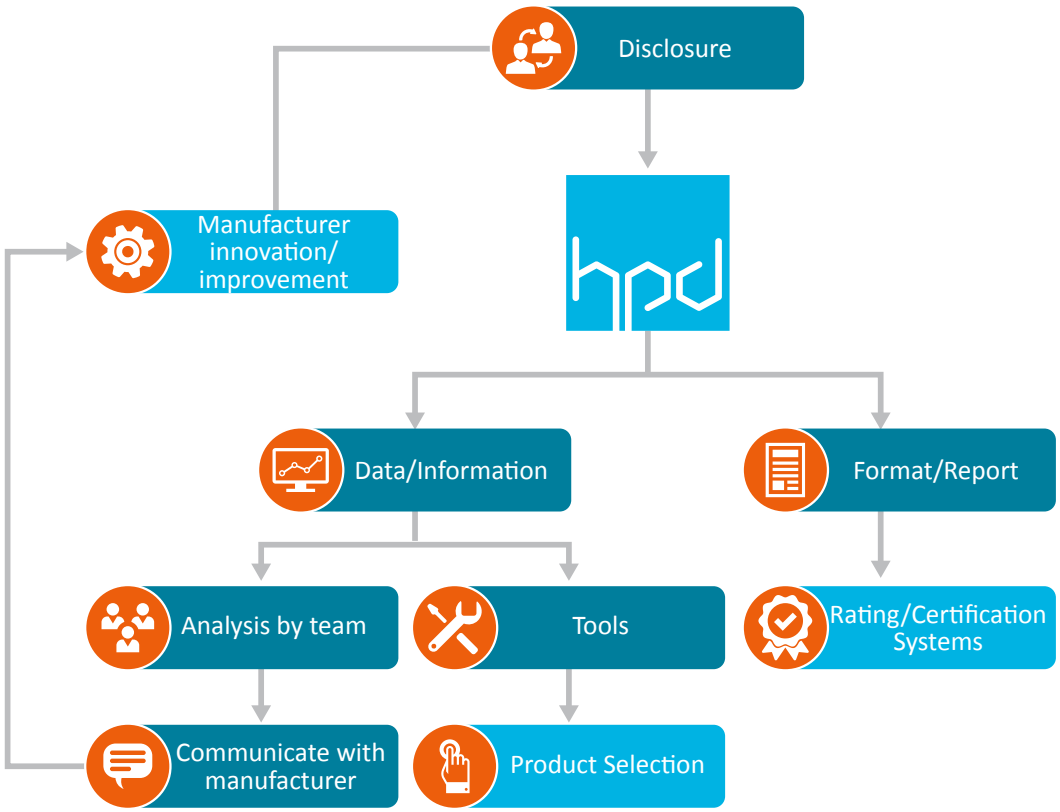


Figure 3: Uses of HPDs

What if an HPD is not available?

The sections that follow outline processes for finding and obtaining HPDs. Disclosure is an emerging field; many products do not yet have HPDs, or any other form of disclosure that accurately and reliably provides health-related information. Therefore, *one of the most important steps project teams can take is to request HPDs. This effort on your part will help expand the number of available HPDs across all types of building materials and will help build the community of practice in disclosure and transparency.*

If an HPD for a product is not available in the HPD Public Repository or other public source, it may be possible for a manufacturer to respond to your request within the timescale of your project. Creating HPDs can be a time-consuming job for the manufacturers, so the earlier your request is made the more likely it will be that you will have an HPD for a product within the timeframe needed to inform a decision or meet a submittal requirement. A number of firms have taken the step to act proactively by requesting HPDs from manufacturers for their commonly used products – outside the scope of a specific project. This step helps ensure that an HPD will be available when needed. For more information on discussion with manufacturers, see the section called Finding HPDs later in this chapter.

NOTE: You may be offered other documentation in lieu of an HPD, for example, a manufacturer inventory or Safety Data Sheet (SDS). HPDs are prepared using the HPD Open Standard – the consensus industry standard for reporting accurate, reliable and consistent data on product contents and health-related attributes. Other reporting formats may not include all data elements specified in the HPD Open Standard. An HPD will provide the most comprehensive reporting available when considering health-related information.

Overview of the Process

The HPD Open Standard is still in the early stages of development and maturation. We are constantly learning and improving practice in the use of the Standard. The guidance for users provided in this *Guide* is based on experience with real projects: what has worked and what hasn't. Please take these as suggestions for your consideration and adapt them to the specific situations with your project. We encourage and welcome your feedback on new ideas that reflect your experience with disclosure and transparency in your practice, so that we can continue to improve the information in subsequent versions of this *Guide* (send feedback to support@hpd-collaborative.org with "Guide Feedback" in Subject line).

Regardless of the specific goals that HPDs will fulfill in your project, in general, project teams will benefit if their HPD activities include the following steps:

1. Make sure that the members of the team and firm are aware of why transparency is important and why health concerns have arisen within the building industry regarding chemical ingredients of building materials. This background is helpful for many team members and adds context to the benefits of disclosure and transparency.
2. Ensure that the pertinent members of the team and firm are familiar with the concepts of the HPD Open Standard and HPDs. (This chapter contains an overview of key concepts, and Chapter 4 of this *Guide* contains detailed definitions of terms and data elements in the HPD Open Standard.)
3. Designate a person or persons as "Transparency) Champions" within the firm.
4. Consider having your firm become a member of the HPD Collaborative, to connect with others who are most engaged in the development and use of the HPD Open Standard.
5. Ask for HPDs as early in your project timeline as possible. Since disclosure and transparency tools are still relatively new in the building industry, many products do not yet have published HPDs. Alerting the manufacturer to your interest will help move an HPD more rapidly to publication. It may be possible for manufacturers to respond to a new request within your project timeframe, even if an HPD for a desired product is not yet being created.
6. Specify as many products with HPDs as possible that meet performance and other evaluative criteria. This practice will help familiarize the contractors and the project team with HPDs and increase the number of HPDs available for databases (see information on Repository later in this chapter).
7. Recognize that at this early phase in industry adoption of disclosure and transparency practices, some people on the extended project team may be working with HPDs and the associated information for the first time. Plan ahead by determining who may need support to gain basic familiarity with disclosure practices.

In addition to these steps, the following section outlines a suggested approach for using HPDs in two common project scenarios:

1. Pursuing LEED v4 certification
2. Meeting the client's transparency and disclosure goals, other than LEED v4 certification

If you are working on a LEED v4 Project, the following process will help you achieve the Material Ingredients Credit using HPDs

1. Familiarize the team with the LEED Material Ingredients Credit relating to HPDs.
    - Review the LEED v4 credit carefully and understand exactly what compliance means. See http://www.hpd-collaborative.org/leed-v4-credit-achievement/ for guidance.
    - Ensure that the entire team fully understands the requirements and the consequent design and time implications for HPD acquisition and review.
2. If possible, include the Contractor/Construction Manager/Bidders in discussions about HPDs prior to bidding. Ensure that the Contractor/Construction Manager/Bidders are aware that meeting LEED v4 credit requirements with HPDs will be a feature of the project. Strongly encourage them to get training if they have no previous experience with HPDs; training is available on the HPDC website and through the U.S. Green Building Council's

Education@USGBC platform. They can also learn about the specific requirements of LEED v4 on the HPDC website (www.hpd-collaborative.org/LEED-v4-credit-achievement/).

3. Use the HPDC Public Repository to find HPDs – if they are in the Repository, they meet the requirement for being "published" and are the most recent published versions of the HPD. There are other resources available as well for finding HPDs and evaluating them. The LEED credit has specific criteria for HPD compliance therefore not all HPDs will automatically comply.
4. Start with *at least five to 10 more products* with HPDs than you need for **quantity** compliance.
   - Review the HPD of each of these products to ensure that it meets the LEED v4 HPD **quality** compliance requirements. Use the LEED Pre-check Indicator to do a preliminary scan
   - If HPDs are unavailable for selected products at the time the project enters the Design phase, request an HPD from the product manufacturer. Manufacturers may be able to complete a LEED-v4-compliant HPD by the Submittals phase. However, you may not want to count on this product as one of your minimum quantity requirements, as it may take longer to prepare the HPD than the time available for your project. Check back with the manufacturer frequently on progress. Make it clear that you intend to use their LEED v4 compliant HPD if they put the effort into creating it on your timeline.
   - Keep track of the products for which you have obtained compliant HPDs. It is normal to see your original five-to-10-product buffer shrink, as products that do not meet the required reporting levels in LEED v4 drop from the list.

LEED v4 Material Ingredients Credit quantity requirements:

- At least 20 different permanently installed products from at least five different manufacturers for Option 1
- Products that account for at least 25% by cost of the total of permanently installed products for Option 2

LEED Pre-check Indicator

The LEED Pre-check is an optional mechanical cross-check that manufacturers can use to determine whether all required fields have been completed and whether basic requirements have been met, e.g., threshold level and characterized/ screened/ identified).

The LEED Pre-check Indicator does not assess data quality or content of the data fields. It does not "verify" that information is accurate.

Per LEED requirements, users of HPDs should still review those that pass the Pre-check to make sure they meet all quality requirements.

5. **During product selection and specification** – after you have collected enough HPDs to meet the quantity and quality requirements of the LEED credit, proactively monitor product specification and selection activities to ensure that the selected products remain part of the project throughout all design and bidding phases.
   - In the Division 01 section of your product specifications that discusses substitutions, clearly state that if an HPD is required for a specific product, a substitution will be rejected if it does not have an HPD that meets the quality requirements.
   - Insert appropriate language in the Division 01 of your product specifications documenting the fact that you are pursuing the LEED v4 Material Ingredients credit. Include a very brief explanation of the credit and its requirements, including the link to credit requirements on the HPDC website. Don't assume Contractors know the specifics of HPD requirements and don't expect them to go searching on their own. Suggest that Contractors use the LEED Pre-check Indicator as a preliminary test of compliance.
   - In each individual product specification section of the predetermined product that requires an HPD, make the HPD a "performance requirement" and specifically ask for HPDs to be included in the Submittals requirements.
6. **During the Bidding phase**, reinforce the requirement for HPDs. Be alert for substitutions and questions related to HPDs if possible.
7. **At the LEED kick-off meeting**, clarify what is expected regarding HPDs, and make clear that there is a preference for the use of products that have compliant HPDs.
8. **During the Construction phase:**
   - Be alert for substitutions; strictly enforce rejection of incorrect substitutions or substitutions without HPDs that meet quality requirements.

- Keep track of exactly how many products with compliant HPDs have actually been procured and properly documented on LEED forms. If your firm is not acting as LEED consultant, this is only for your internal assurance. Documentable tracking is the responsibility of the Contractor and LEED consultant.

Taking the above steps will significantly increase your project's likelihood of succeeding in achieving the LEED v4 Material Ingredients credit.

Note that there are other credits in LEED that also use HPDs to document data requirements – for example, LEED for Healthcare contains a prerequisite and several credits that include HPDs as documentation.

If your client has disclosure/transparency requirements other than LEED v4 that can be met by HPDs, the following process will help you be successful in meeting these goals

1. Determine the nature of the client's requirements:
   a. If the client has a clear set of criteria and requirements that include the use of HPDs, including quantity and quality requirements, proceed to Step 2.
   b. If the client has defined criteria and requirements, but is not including HPDs as a reporting tool, suggest including the use of HPDs if appropriate to meet their needs (see Chapter 2: Getting Started with HPDs).
   c. If the client does not have a functional and clear pathway to transparency, then offer to help define one.
      i. If agreed upon, craft a set of criteria, including HPDs and other tools, that are aligned with the client's understanding and commitment. Include both HPD quantity and quality requirements.
      ii. Then proceed as described under "a" above.
2. Once the client's requirements are clear, ensure that the entire team fully understands the requirements and the consequent design and time implications.
   a. If possible, include the Contractor/Construction Manager/Bidders in discussions about HPDs prior to bidding.
3. The following steps can be followed to integrate HPDs into the client project.
   a. Use the HPDC Public Repository to find HPDs – if they are in the Repository, they meet the requirement for being "published" and are the most recent published versions of the HPD. There are other resources available as well for finding HPDs and evaluating them. The LEED credit has specific criteria for HPD compliance therefore not all HPDs will automatically comply.
   b. Ideally, you will identify more products with HPDs than you need for the client's **quantity** compliance. It is important to obtain these additional HPDs, above the minimum number, to ensure that you will have the minimum, following review, to comply with the client's **quantity** requirement. Review each product's HPD to ensure that it meets client's **quality** compliance.
   c. If a product does not already have an HPD at the time the project enters the Design phase, understand that the manufacturer may not be able to complete a compliant HPD by the Submittals phase.
   d. Keep track of the products for which you have obtained compliant HPDs to meet the quantity and quality requirements. It is normal to see your original five-to-10-product buffer shrink, as products that do not meet the client's required reporting levels drop from the list. Unless you are 100% certain you have all the products you will need, it is a good practice to maintain at least several more than the minimum requirement, even if you need to add some additional candidates in midstream.
4. Insert appropriate language in the Division 01 of your specifications documenting the exact transparency requirements and how they can be achieved.
   a. Ensure that the client has a reporting format in place to track and document submissions of transparency requirements.
   b. If one does not exist, suggest that your firm create one for use on the project.
   c. In Division 01 designate who has the responsibility of tracking and documenting achievement of transparency requirements. This may take negotiations between team, owner, and contractor.

5. In the Division 01 section that discusses substitutions, clearly state that if an HPD is required for a specific product, then a substitution that does not have a fully compliant HPD will be rejected.
6. In each individual specification section of the pre-determined product that requires an HPD, make the HPD a "performance requirement" and specifically ask for Submittals of actual HPDs.
7. During the Bidding phase, be alert for substitutions and questions related to HPDs.
8. At the project kick-off meeting, clarify what is expected regarding HPDs, and encourage the use of products that have compliant HPDs.
9. During the Construction phase:
    a. Be alert for substitutions; strictly enforce rejection of incorrect substitutions.
    b. Ensure that there is a responsible party keeping track of exactly how many products with compliant HPDs have actually been procured and that they are being properly documented on required forms.

How to Obtain and Use HPDs – Key Steps in the Process

This section provides information on specific steps recommended for each of the actions that a project team may need to implement in using HPDs:

- Finding HPDs
- Understanding key concepts in HPDs
- Evaluating HPDs
- Selecting products
- Working with third parties
- Talking with manufacturers
- Learning from practice: Introduction to Case Studies
- Taking the next step
- Tips for success

Finding HPDs

The first task in using HPDs is locating and accessing them. This can be accomplished by contacting manufacturers directly or through available repositories and libraries of HPDs.

The HPD Public Repository

The authoritative location for "publishing" an HPD is in the HPDC Public Repository.

HPDC Public Repository

- The HPD Public Repository is the authoritative source for HPDs that have been made public. This online resource is the mechanism for manufacturers to publish their HPDs. Its use is free for both creators and users of HPDs. HPDs included in the HPDC Repository are not reviewed or verified by HPDC. The HPDC Repository is searchable by CSI division, CSI section, manufacturer name, and product name. It is open to all, free of charge. (See http://www.hpd-collaborative.org/hpd-public-repository/)

In-house firm libraries/repositories

Some firms maintain in-house libraries or repositories of materials and keep HPDs on file. This has the advantage of providing immediate access to an HPD. It also allows project teams to become familiar with manufacturers and products that disclose and/or comply with particular project requirements. Keeping these libraries up to date can become an onerous task.

When printed or "file" copies of HPDs are used, make sure they are current. This can be done by checking with the HPD Public Repository and/or manufacturer. HPDs are required by the HPD Open Standard to be updated if there is a significant change in the product composition, so they are subject to change at any time. They also have an expiry date, which is printed on the HPD. HPDC recommends as a best practice to start with the most current version of a published HPD, obtained from the HPD Public Repository. This resource is easy to use and available at no cost.

Libraries/repositories maintained by other organizations

The development of product libraries and databases with HPDs and other sustainability- and transparency-related information is a rapidly evolving area. Currently the main external repository for finding products with HPDs is Mindful Materials.

Mindful Materials, created by HKS Architects, began as a labeling system for their in-house library as a practical means to incorporate transparency information into designers' everyday work process, providing easy-to-access product ingredient information where designers search for it most often: on resource library shelves. It has expanded to a repository for HPDs and other disclosure information used by numerous firms and supported by industry partnerships. More information is available at http://www.mindfulmaterials.com/.

As noted above with in-house library materials, there is the possibility that such reference sources may not have the most up-to-date version of an HPD. This may always be obtained from the HPD Public Repository at no charge.

Requesting HPDs directly from manufacturers

If an HPD for a desired product is not available in any of these locations, you should contact the manufacturer directly. While your product representative may not be aware of HPDs, it is increasingly likely that someone in the corporate office is. Asking whom to speak to about the company's sustainability programs will probably help you find the best corporate resource for HPDs.

An important driver for manufacturers to prepare HPDs is receiving a request from owners and/or design teams. This provides an unambiguous signal to them that you (the customer) are interested in using product content and health information as part of your decision process. Every request you make increases demand for HPDs. Whom should you send this letter to? Ask your product representative who in the organization is best positioned to act on it. It may be a sustainability leader or team, or a product chemist, compliance officer, or regional sales leader. In some instances, it's the CEO.

"Although we were committed to HPDs, initially we were not optimistic about being able to publish meaningful data. Our products are rarely used without finishes, which commonly contain health hazards… one of our major paint suppliers, Valspar, brought on a toxicologist with experience in creating and verifying HPDs… Our unusually engaged and educated supply chain allowed us to assemble meaningful information."

Lisa Britton, Industrial Louvers, Inc.

In contacting manufacturers, it is important to be clear about your requirements based on the project team's defined goals and uses for the HPD – will it be used for LEED or WELL certification? Google Portico? What thresholds are required? What data elements? Information on specific requirements of various systems can be found on the HPDC website at http://www.hpd-collaborative.org/leed-v4-credit-achievement/ and are discussed later in the Guide under Evaluating HPDs.

Keep in mind that some certifications, such as LEED v4 Materials Ingredient Disclosure credit, *require public disclosure of an HPD.* If the manufacturer will only provide the HPD to you under a non-disclosure agreement (NDA), then it is not considered to be publicly disclosed. Encourage the manufacturer to place HPDs in the HPD Public Repository; the authoritative reference for public disclosure is the HPD Public Repository.

The manufacturer might have an HPD for the product already in development. In this case, you might only need to ensure that your project's requirements can be met and that the HPDs will be available when needed for the project. Note the caution in the first section: if HPDs are not available for specified products when the project is entering the Design phase, understand that the manufacturer may not be able to complete a compliant HPD by the Submittals phase. Be sure to check in on the manufacturer's progress periodically.

Alternatively, manufacturers might lack knowledge or experience with HPDs and the HPD Open Standard. In this case, suggest that they familiarize themselves with the HPD Open Standard Format and Instructions, as well as additional information available via the HPDC website, so they can consider moving forward with creating and publishing HPDs.

Issues with disclosure: creating an HPD can pose challenges for manufacturers, particularly when undertaking this effort for the first time. It is not uncommon for the manufacturer to lack the detailed knowledge of what substances are in the materials purchased from suppliers, which are required to complete an HPD. Those suppliers might be constrained from providing the information because of proprietary formulas, or because they don't know all of the ingredients. Searching for this information through the supply chain can be time consuming for manufacturers, particularly for complex products that are composed of many parts or materials.

Sometimes product manufacturers are constrained in disclosing product contents by supplier contracts that either do not provide this information to them, or do not allow for them to disclose this information to others. The HPD Open Standard provides a method to create and use HPDs in this circumstance. *If concerns about non-disclosure agreements (NDA) or proprietary formulas are raised, contents can be declared proprietary and the substance name/CAS RN can remain undisclosed as long as role, amount, and hazards are disclosed. This type of disclosure will also be accepted by some certifications, such as LEED v4 Materials Ingredients credit.*

In order to deal with NDA and proprietary situations, many manufacturers enlist the assistance of third-party preparers in creating their HPDs. These third-party preparers will execute the required non-disclosure agreements with suppliers, perform the needed evaluations on the substances in question, and provide the results to the product manufacturers, so that they can complete their HPDs without themselves accessing the NDA information.

Assistance for manufacturers: the HPDC provides an automated tool to assist manufacturers and third-party preparers in the creation of HPDs. More information about this tool, the "HPD Builder," is available on the HPDC website. Manufacturers who lack sufficient expertise in material health to create HPDs may wish to consider the services of a third-party preparer. The HPDC website provides contact information on member firms that provide these services (http://www.hpd-collaborative.org/members/).

Understanding HPDs – Key Concepts

How the HPD is structured

The HPD Open Standard defines six sections for the HPD:

- **Section 1: Summary** – highlights the contents of the product and their hazards, as well as key reporting elements such as thresholds
- **Section 2: Content in Descending Order of Quantity** – this inventory is the heart of the HPD; it lists contents in the product, their associated hazards, and other relevant information
- **Section 3: Certifications and Compliance** – for example, certifications for VOC content and emissions
- **Section 4: Accessories** – for example, what's needed to install or maintain the product
- **Section 5: General Notes** – for example, explanations from the manufacturer
- **Section 6: References** – for example, links to hazard lists used in the HPD

The HPD Open Standard (http://www.hpd-collaborative.org/hpd-2-1-1-standard/) includes both a **Format** and detailed **Instructions** for each data element included in the Format. It also includes a glossary. While primarily oriented toward those creating an HPD (product manufacturers), the Instructions can also be very helpful as a reference for project teams, providing a detailed technical specification for what each data element of an HPD includes.

There are three key concepts underlying the HPD Open Standard that project team members will find useful in working with HPDs:

- **Content inventory**, including definitions of contents (materials and substances), thresholds, and content inventory methods
- **Descriptors of the completeness and type of reporting** – characterized, screened, and identified
- **Hazard screening – GreenScreen® for Safer Chemicals scores**

These concepts are introduced in the following section. More detail on these concepts, as well as further explanation of each section of the HPD, is included in Chapter 4 of this *Guide*.

Content inventory

Introduction to content inventory

The content inventory lists contents in the product as well as the thresholds established for their reporting, hazard screening information, and other relevant information. Within the HPD this information is summarized in Section 1, which is always the first page of an HPD. Details of the content inventory are reported in Section 2, which begins on page 2 of the HPD, and continues for the number of pages required to report the complete information.

HPD v2.1 revised the methods that can be used to create a Content Inventory, based on requirements for achieving the LEED v4 Material Ingredients credit with HPD v2. (The LEED credit language is based on HPD 1.0 and is not consistent with HPD v2.) The methods for creating a content inventory are based on how *contents* are categorized (for the entire product or for each of the materials that comprise the product) and how reporting *thresholds* are applied (a single threshold for the entire product or individual thresholds for each material). The creator of the HPD, the product manufacturer (or, on behalf of the manufacturer, a third- party preparer) determines which of these content inventory reporting methods is used in a given HPD.

Content Inventory Methods

In addition to the Nested Materials Inventory with material-level thresholds and Basic Inventory with product-level threshold, HPD 2.1.1 allows a Nested Materials Inventory with product-level threshold.

- **Nested Materials Inventory Method**: contents are reported first at the *materials* level. *Substances* are then itemized within each material. If a substance appears in multiple materials, it will be listed multiple times in the inventory, appearing under each material where it is a constituent.
  - Nested Materials Inventory with material-level thresholds. In this method, thresholds are established for each material and these thresholds govern which substances must be listed under each material.
  - Nested Materials Inventory with product-level threshold. In this method, a single threshold is established for the product and is used to determine which substances are listed under the various materials.
- **Basic Inventory Method**: contents are reported only at the substance level, regardless of the material structure of the product. A product-level threshold must be used.

A Nested Materials Inventory provides useful information about the structure of the product, and groups the substances within their respective materials. This additional information facilitates improvement and innovation of the product. All three of these methods can be used to meet LEED requirements. The details of these reporting methods are further explained later in this chapter.

Contents: materials and substances

A product's *contents* can include the *materials* and itemized *substances* that comprise each material:

- **Material.** A "material" is a uniform solid, liquid, or gas. Materials are composed of one or more "substances."
- **Substance.** A "substance" is matter that can be characterized by the entities that comprise it (molecules, atoms, etc.) and by its physical properties, such as density, refractive index, electric conductivity, melting point, etc.
- **Content.** The word "content" is used in the HPD Open Standard to refer to both materials and substances more generally, and to refer to materials and substances together.

Most products are composed of one or more materials, and materials are composed of one or more substances. As illustrated below in Figure 4, products can be composed of just a few materials or can be very complex, involving numerous materials and extensive supply chains:

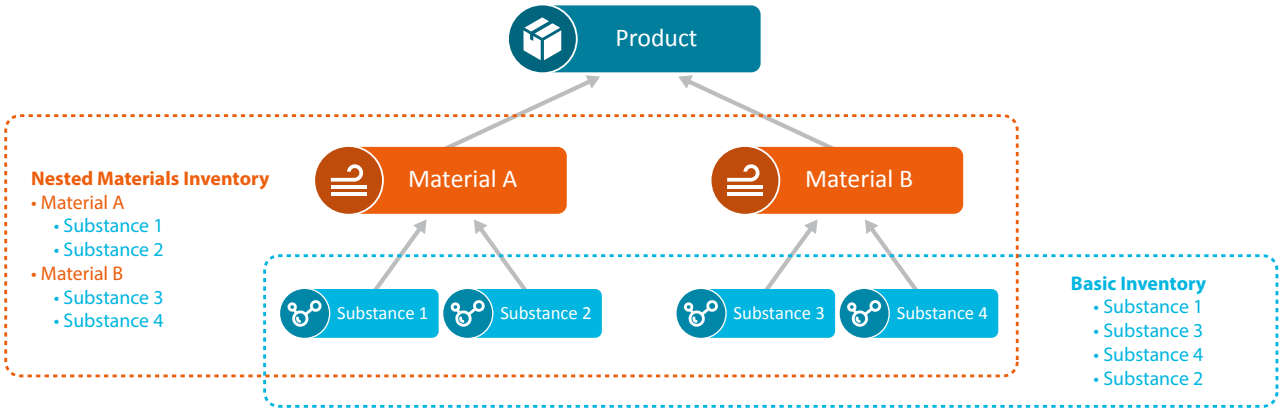
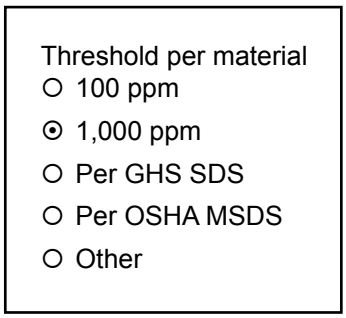


Figure 4. Nested Materials Inventory Structure

Threshold



"Threshold" is key to understanding the precision of reporting used in the HPD (and its ability to comply with LEED, Cradle to Cradle, and other programs). The threshold is the amount or concentration of a substance that must be present for that substance to be reported, at the specified threshold level.

A lower threshold means that smaller amounts of substances will be reportable and therefore disclosure will be more complete. There are several ways thresholds can be reported:

- Parts per million (ppm) in which a threshold of 100 ppm is more stringent and requires reporting of substances present at lower concentrations than a threshold of 1,000 ppm, and hence is likely to lead to disclosure of more substances. Note that concentrations can also be expressed as percentages, with 100 ppm = 0.01%, 1,000 ppm = 0.1%, and 10,000 ppm = 1.0%.
- Safety Data Sheet (SDS), based on the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals. The SDS requires content reporting at 1,000 ppm (0.1%) only for reproductive toxicants, carcinogens, and category 1 mutagens, and at 10,000 ppm (1%) for all other hazard categories. The SDS is required to report certain hazardous contents that will be handled by workers in factories and does not require reporting of all substances.
- OSHA MSDS, the U.S. Occupational Safety and Health Administration's Material Safety Data Sheet, an older format that has been replaced by the SDS. It requires reporting carcinogens at 1,000 ppm and all other contents at 10,000 ppm. Note that this threshold is being phased out in the U.S. and will no longer be an option in the next version of the HPD.

Thresholds can apply to the whole product or to each material in the product. If thresholds are reported for each material, the summary can include several different thresholds; for example, 1,000 ppm for some materials and 100 ppm for others.

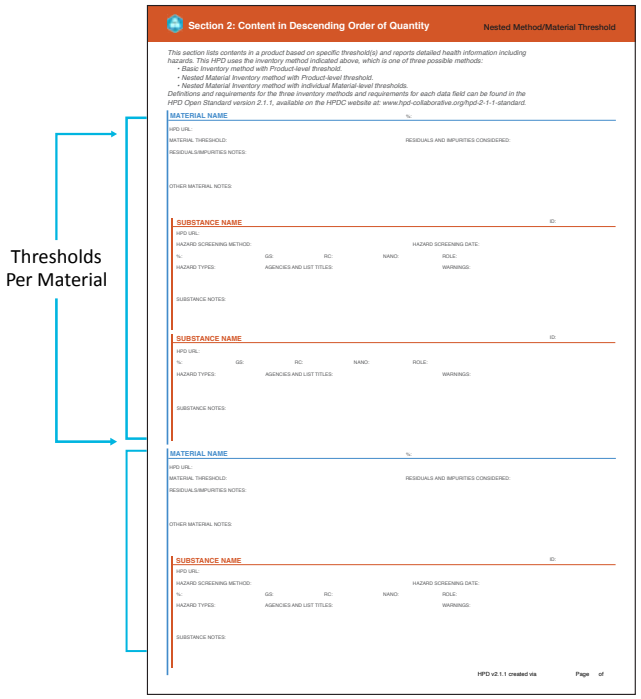
Content inventory methods

The methods that can be used to report the contents in a product, "Nested Materials Inventory" and "Basic Inventory," are further explained in this section.

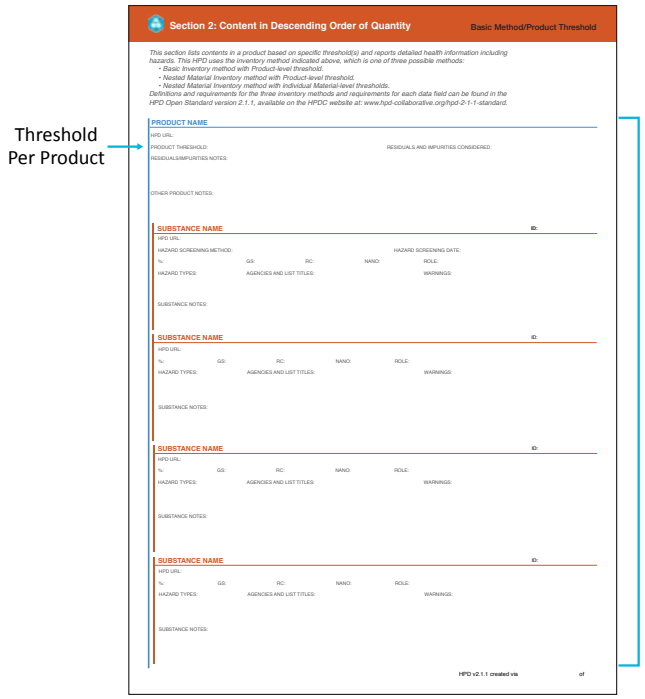
- **"Nested Materials" Inventory method.** This method lists **all** materials in the product. All substances within each material that are above the threshold level specified are itemized under that material – hence, the inventory has a "nested" structure. As described above, there are two variations of this Inventory, based on the way the threshold is specified – at the material level or at the product level.
  - If **material**-level thresholds are used, they will be indicated in the Threshold data field for each material.
  - If a **product**-level threshold is used for a Nested Materials Inventory, reporting is based on the following:
    - A material-level threshold may be used for selected individual materials to provide additional information where it is available and the manufacturer chooses to disclose it (i.e., the actual threshold used to identify substances for that material). All substances above that threshold in the material are listed, not just the subset of substances that are above the product-level threshold established for the entire product.
    - For any material where the product-level threshold is used, only those substances that are present at or above the product-level threshold are reported, "Other" is indicated as the threshold for the material.
    - It is possible that a material can be listed with no substances nested under it. This could occur if all substances in the material are below the product-level threshold indicated. "Other" is indicated as the threshold for any such material.
- **"Basic" Inventory method**. This method does not identify materials and creates a single list of all substances within the product based on a product-level threshold.

See illustration that follows:

Nested Materials Inventory



Basic Inventory



Examples of HPDs created with these different methods are provided on the HPDC website (http://www.hpd-collaborative.org/sample-hpds/).

The Nested Materials Inventory method offers a number of advantages:

- Managing content data by material rather than by product allows suppliers to provide data to final manufacturers about discrete materials in the supply chain for use in a final product HPD. Suppliers can update that information as

their supplied materials change. Manufacturers can produce HPDs on different products simply by assembling the appropriate material inventories from suppliers, without having to rebuild HPDs from scratch for each variation or update.

- Suppliers can provide inventory threshold information without having to know the different specific concentrations of their material in the final products.
- This material-based format allows the HPD to support other programs, such as Cradle to Cradle, which evaluate thresholds of concern on a material basis rather than a product basis.
- It enables manufacturers and project teams to identify the specific material(s) containing the listed hazards; this is a first step toward reducing or eliminating the hazard and developing an improved product.
- It informs discussions between manufacturers and project teams about the role of the material and the potential for finding less hazardous alternatives.
- It more closely matches manufacturers' ordering systems and databases.
- It encourages reporting of substances at finer detail.

Descriptors of the completeness and type of reporting

Characterized, Screened, Identified

This section summarizes the completeness and type of reporting in the HPD.

- "Characterized" indicates whether the percent weight (quantity) and role or function are provided for all substances above the threshold indicated.
- "Screened" indicates whether all substances above the threshold were screened for hazards using lists in the HPD Open Standard, and results are reported.
- "Identified" indicates whether all substances above the threshold are reported by name and identifier (Chemical Abstract Service Registration Number – CAS RN).

Characterized O Yes Ex/SC O Yes O No
% weight and role provided except SC substances characterized according to SC guidance

Screened O Yes Ex/SC O Yes O No
Screened using Priority Hazard Lists with results disclosed except SC substances screened according to SC guidance.

Identified O Yes Ex/SC O Yes O No
Disclosed by Name (Specific or Generic) and Identifier except SC substances identified according to SC guidance

SC=Special Condition (See Notes)

You may encounter situations where a manufacturer has not "Identified" one or more substances but still has "Characterized" and "Screened" them. This reporting approach provides a way to withhold disclosure of proprietary information but still report information about potential hazards associated with the product contents. Such reporting would provide for compliance with certification requirements, such as for the LEED v4 Material Ingredients credit.

Hazard Screening and Assessment

Pharos Chemical and Materials Library and GreenScreen® for Safer Chemicals scores

New in HPD v2.1.1 – Harmonized Hazard Screening

HPD v2.1.1 uses a new "Harmonized Method" for hazard screening, ensuring that HPDs produced by different tools provide consistent results.

An integral element of reporting about products with the HPD Open Standard is to include a hazard screening of the substances in the product and a listing of hazards that have been associated with these substances. This association information has been determined by many different, independent authoritative bodies, based on criteria that they have established using the results of epidemiological, toxicological, and scientific research studies. The HPD Open Standard specifies which of the lists created by these authoritative bodies are to be considered in the hazard screening information reported in an HPD (see Appendices B–F of the HPD Open Standard for further information on the authoritative bodies and hazard lists. Appendix E, HPD Priority List Warnings is now on the HPDC website, not in the Standard document, due to length; see https://www.hpd-collaborative.org/hpd-2-1-1-standard/).

A screening result that indicates an association of a substance with a hazard does not provide information about the exposure to or risk of that hazard in the product. Determination of exposure and risk requires additional assessment of the product. Obtaining hazard screening information is a necessary first step in creating exposure and risk assessments, so it is important information to be reported in an HPD. It is also required information for meeting the LEED v4 Material Ingredients credit requirements.

For the HPD Open Standard, Hazard Screening is performed using the HPD Open Standard Priority Lists. These lists are primarily based on the GreenScreen® for Safer Chemicals, a program of the nonprofit organization Clean Production Action, but also include lists from the U.S. Environmental Protection Agency, the European Union, and other governmental organizations. Typically, the hazard screening results that are reported in an HPD will be produced using the HPD Builder tool. Within the Builder tool, the hazard screening is automated through the use of the Pharos database, which is created and maintained by the Healthy Building Network. It is also possible for this screening to be performed if an HPD has not been created using the HPD Builder tool, but it is very difficult to conduct an accurate hazard screening without the use of the HPD Builder or another automated tool. If the HPD does not indicate that it was created using the HPD Builder tool (this reference will appear in the upper right hand corner of the HPD Summary page) then you should inquire to verify that a proper hazard screening was conducted. If an HPD has been third-party-verified, the third party will have verified this information.

The GreenScreen approach, as implemented using the Pharos database, facilitates comparative chemical hazard screening and assessment at the substance level. There are two types of GreenScreen results that can be reported in an HPD:

- *List Translator(LT) scores*: these are produced through an automated tool that *screens* against hazard lists specified in the HPD Open Standard. No assessment is performed. For more information on the GreenScreen List Translator™: http://www.greenscreenchemicals.org/method/greenscreen-list-translator
- *Benchmark (BM) scores:* these are produced through a Certified Full GreenScreen Method assessment that includes a toxicological review of all available information from scientific studies, hazard lists, and modeling or analogs. For more information on the Full GreenScreen Method: http://www.greenscreenchemicals.org/method/full-greenscreen-method

Benchmark scores represent a more comprehensive assessment than List Translator scores.

In addition to the complete list of identified hazards, the HPD hazard screening summary includes two summary indicators based on GreenScreen results for substances that are included on GreenScreen lists (substances from other lists are indicated as UNK (unknown):

- **Number of GreenScreen BM-3/BM-4 Contents.** This section reports on the total number of substances with *lower* hazards – Benchmark 3 (use but there's still opportunity for improvement) or Benchmark 4 (prefer – safer chemical).

Number of GreenScreen BM-4/BM-3 contents 0
Contents highest concern GreenScreen Benchmark or List translator Score LT-1

- **Contents' highest concern GreenScreen Benchmark or List Translator Score**. This section reports on the most hazardous GreenScreen List Translator or Benchmark score found in any of the substances in the product.

Additional information on these concepts and other data in the HPD is presented in Chapter 4 of this *Guide*.

Evaluating HPDs

Once you have access to HPDs, the next task is evaluating the quality of the HPDs and whether these HPDs meet the requirements of your project. The HPD Checklist, included in the HPD Open Standard, provides guidance on a "compliant" HPD, one that meets the requirements of the HPD Open Standard. If you need HPDs for green building certification systems, the HPDC website (www.hpd-collaborative.org) includes detailed information on how to use HPDs to meet the requirements of the following rating systems, which have been summarized below:

- LEED v4 – Building Design and Construction rating system
  - Material Ingredients Credit – Option 1 – key requirements (detailed requirements available at http://www.usgbc.org/node/2616399?return=/credits and http://www.usgbc.org/node/2616399?view=interpretations&return=/credits)
    - Use Basic Inventory or Nested Materials Inventory method
    - All reportable substances must be characterized and screened; name can be withheld but amount, role, and hazards must be provided
    - Three combinations of inventory method and thresholds for reportable substances are acceptable –
      - Basic Inventory with threshold at least 1,000 ppm in the product
      - Nested Materials Inventory with threshold at least 1,000 ppm in each *material*
      - Nested Materials Inventory with threshold at least 1,000 ppm for the entire *product*
      - More detailed guidance is provided by HPDC at http://www.hpd-collaborative.org/leed-v4-credit-achievement/.
        The LEED Pre-check Indicator provides a preliminary scan of the HPD – a preliminary indicator of consistency with specific requirements of LEED v4 Material Ingredients credit. It is a mechanical cross-checking of inventory method; threshold; residuals and impurities; characterized, screened, and identified indicators with the specific requirements of the LEED v4 credit; and check of presence of entries for all fields required by HPD Open Standard. This pre-check does not assess data quality.
  - Material Ingredients Credit – Option 2 – key requirements (detailed requirements available at http://www.usgbc.org/node/2616399?return=/credits):
    - Reporting threshold must be 100 ppm; no other threshold qualifies
    - No LT-1 or BM-1 substances in the product
- WELL Building Standard [requirements available at https://www.wellcertified.com/standard]

Harmonization with LEED v4

Since v2.1, the HPD 2.1 has been harmonized with LEED v4, including a "LEED v4 Pre-check Indicator."

See guidance for using HPDs to meet LEED v4 Material Ingredients credit, Options 1 and 2, at http://www.hpd-collaborative.org/leed-v4-credit-achievement/

In addition to these requirements, you should check the following items:

- Expiry date – how old is the HPD and is it still valid? HPDs expire three years after the screening date.
- % Weight –
  - For HPDs that are prepared using the Nested Materials Inventory method: for materials, the percentages should total to 100% (or very close), since all materials must be listed in this method.
  - For HPDs that are prepared using the Basic Inventory method: for substances, the percentages need not total to 100% because some substances will fall below the reportable threshold.

Further evaluation of the quality of information reported in an HPD may be beyond the expertise of the typical project team, unless the team includes a member with material health training. HPDC will be creating training and credentialing programs for project team members who are interested in furthering their expertise in this area (for updates on HPDC training and credentialing programs, see https://www.hpd-collaborative.org/resources-2.

An alternative to consider for further evaluation of HPD quality is to request third-party-verified HPDs from the manufacturer. HPDC has a program for third-party verification, and a protocol to be used in verification. Third-party verification ensures that the HPD is accurate and complete. Some third-party verifiers also ensure that the HPD meets the requirements of LEED or other tools. Third-party verifiers can be found at https://www.hpd-collaborative.org/approved-third-party-verifiers/.

Designers may also explore additional assessments that have been performed by the manufacturer, such as those offered by the Cradle to Cradle Product Innovation Institute, ToxServices, or other professional organizations that specialize in material health assessments and/or product optimization. The Notes section of an HPD will often include this information.

Selecting Products

Some tools in the marketplace can assist project teams in product selection; however, a comprehensive decision support tool is not yet available. Another issue that project teams currently face is that there typically aren't enough products with HPDs to allow content and hazard information to be used consistently.

Given this current reality, what role can HPDs play in the process of evaluating and comparing building products on human and environmental health attributes? How can teams use the data in HPDs? A review of actual projects that used HPDs suggests the following:

- **HPDs can be used in setting materials selection goals.** Project goals can place high priority on occupant health and/or on reporting, disclosure, and transparency in general. Projects can state a preference or requirement for using products that have HPDs, and for the level of disclosure that the manufacturer is supporting.
- **HPDs can be used to screen for substances that are identified as priority chemicals.** When screening for the presence of priority chemicals, keep in mind that HPDs only require reporting to thresholds established by the manufacturer. Additional effort with the manufacturer may be required to uncover the presence of priority chemicals that are present below those thresholds. Check on the threshold established with the priority list you are using; evaluation using priority chemical lists often requires that any occurrence of substances in a product, regardless of amount, be accounted for.
- **HPDs can help in evaluating proposed alternative products that result from avoiding priority chemicals of concern**. When products are substituted to avoid priority chemicals, the alternative product may have health or environmental impacts equal to or worse than those in the original product – this is sometimes referred to as a "regrettable substitution." Since the HPD presents a more complete picture of the hazard profile of products, using the information in the HPD may help to prevent these regrettable substitutions.
- **HPDs provide insight on a wide range of hazard associations** – not just the "worst of the worst" chemicals. For instance, the HPD can help designers screen out endocrine disruptors, if that's a goal for the client or the project. The HPD includes the GreenScreen score for each chemical (as available), ranging from BM 1 (or LT-1)—"avoid this ingredient"—through BM 2 (or LT-2)—"use but look for substitutes"—and BM 3—"use but there is still opportunity for improvement"—to BM 4—"prefer, safer chemical." And, the GreenScreen Assessment summary in Healthy Building Network's Pharos Project Chemicals and Materials Library shows the ranking (very High, High, Medium, Low, very Low) for different health hazards (such as endocrine disruption), which can inform product selection and help meet project goals.
- **HPDs for actual products can be compared with generic products.** Some industry associations provide generic hazard information for their products. In addition, an open data collaboration among Flux, Healthy Building Network, Google, and thinkstep, known as Quartz, provides a generic, non-manufacturer-specific composition of a wide range of common building products, such as drywall or interior paint, as well as hazard screening and lifecycle environmental information. This provides a baseline for a project, and allows project teams to track the improved chemical hazard profile of actual selections through importing HPD data (see http://www.quartzproject.org/).

The reporting of information in an HPD – the content inventory, hazard screening, and other health-related information – is not an end in itself. It is the first step in a program of product assessment and optimization, considering health

information as a fundamental product characteristic. The long-term goal of increased reporting, disclosure, and transparency of product contents and associated health information is to stimulate innovation and optimization of products so that building owners and their project teams can select and install healthier products, with equal or better performance, in their projects. To serve this broader goal, the HPDC remains focused on providing the open, standard format for reporting of product information in an accurate, consistent, and reliable manner.

Working with Consultants and Third Parties

A growing number of consultants and third parties offer assistance in working with material health information. This assistance typically takes the form of consultation, decision-support tools, and verification services. There is also a growing number of organizations that are dedicated to collaborative efforts with users and manufacturers to work on product optimization.

Many of these organizations are active members of the HPD Collaborative and can be found via the HPDC website https://www.hpd-collaborative.org/approved-third-party-verifiers/.

Working with Manufacturers

Information in the HPD provides an opening for dialogue with manufacturers – if an HPD contains hazard information, you can talk to the manufacturer (ask your sales rep for the most appropriate point of contact within the organization for this type of discussion) about the possibility of finding alternatives to reduce or eliminate the hazard. You can express your goal of finding healthier products and note the marketing advantage they will have with your firm and others.

Beyond reporting information in the HPD Open Standard format, manufacturers can determine to whom this information is disclosed, and whether to disclose this information to the public – i.e., "transparent." You should consider the level of disclosure and transparency that you want to ask of manufacturers.

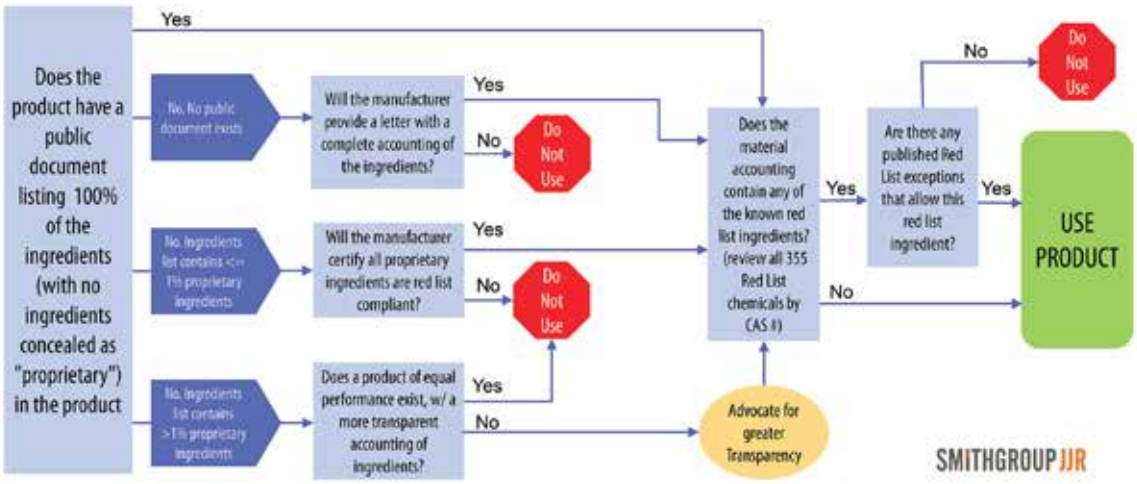
- Is disclosure through a third party sufficient for your project purposes? In this case, you may only be informed of whether the product meets certain requirements that your project has established, based on the information in the HPD.
- Different certification programs have varying requirements for disclosure. Some require full transparency on all contents. Others require only the disclosure of hazard information. If you are selecting products to qualify for specific certifications, you need to check their disclosure requirements and communicate them clearly to the manufacturers.
- Increasingly, project teams are adopting a transparency goal, in which a product is rewarded for being publicly disclosed. If this is a goal of your project, be sure to communicate this in advance to the manufacturers whose products you are considering. Many products may have HPDs, but not be publicly disclosed, i.e., "transparent."

Architects, designers, and specifiers should talk to manufacturers about other preferences, priorities, and needs in product lines, from color to durability to cost. Adding discussions of hazards can be done. And, it can work!

Learning from Practice: Introduction to Case Studies

Since we are all learning when and how HPDs can be used in projects, case studies of teams that have incorporated HPDs and/or other disclosure and transparency tools in their projects suggest strategies and lessons learned during the process. Brief introductions to these case studies follow, and more complete write-ups of these and other case studies can be found at website http://www.hpd-collaborative.org/case-studies/.

- **Brock Environmental Center**, Chesapeake Bay Foundation, SmithGroupJJR. This project established goals for materials that included disclosure of chemicals (preferably through HPDs); avoidance of materials that contained Living Building Challenge Red List chemicals; use of locally sourced, salvaged, and reclaimed materials; and use of FSC wood. All project stakeholders were involved early and a process was established to support these goals; the process is illustrated below.



- **Vandusen Botanical Garden Visitor Center**, Vandusen Botanical Garden, Perkins+Will. This project established goals for materials that included avoidance of Living Building Challenge Red List chemicals; use of locally sourced, reclaimed, and salvaged materials; and use of FSC wood as a primary material. The team found that one of the best strategies was to use simple materials with simple origins and ingredient lists; limiting the number of materials was also useful. Despite extensive research that began early in the process, the team found that many products had small, unforeseen components that contained Red List chemicals.
- **The Durst Organization**, with Vidaris, Inc. and Healthy Building Network. A 2012 company policy contained goals that included product transparency data to inform product selections, along with occupant and ecological health. They realized that integration of product transparency into the process required a new mix of expertise, so the project team was expanded to include an industrial hygienist and materials health experts as well as sustainability and green building consultants. They developed a set of "focus material" types with highest potential health or environmental impacts and conducted an analysis of each. They found that trade-offs are inevitable and it's rare for a product or type to be best on all criteria. More analysis into the factors behind the data and use of additional product screens were needed.
- **Industrial Louvers, Inc.**, a manufacturer's perspective. Creating an HPD is challenging. This manufacturer describes the challenges and how her company overcame them, with cooperation from an engaged supplier. Her company's HPD story will give project teams insight into what manufacturers have to do to create HPDs, why it can be difficult, and some keys to success.

In Summary – Key Tips for Project Team Success

HPDs are relatively new to the green building market, and awareness is growing quickly. Here are a few tips:

- Start early – it might take many months to obtain HPDs from specific manufacturers. Pre-qualify potential manufacturers and products.
- Make sure the whole project team is committed to the disclosure effort. Schedule frequent meetings to keep track of changes in the project that could affect product specification and to make sure no issues have arisen in obtaining specific products.
- Ensure that at least one project team member thoroughly understands the purpose, uses, and limitations of various tools, and can communicate that information to the team when needed.
- When opening a dialogue with manufacturers about disclosed hazards in their product(s) – first thank them for disclosing contents; be positive – support and acknowledge their efforts to improve. Listen to their perspectives – why it might be difficult to eliminate a material or substance and to find an alternative immediately. And inquire

about what they are doing to move forward. The manufacturers will be motivated to continue their efforts towards reporting, disclosure, and transparency when they hear requests and appreciation from multiple customers.

When Possible – Encourage Disclosure and Transparency

HPDs provide information on health aspects of products, which is only one piece of the complex puzzle of product specification and selection. Other information must also be considered, including environmental factors, legal considerations, and the factors that project teams have long considered such as cost, aesthetics, durability, availability, and so forth.

If you are a reader of this *Guide,* you have embarked on the learning process around the use of greater levels of disclosure and transparency concerning the health-related information of the products we select. It is challenging to balance all the factors that you must consider. You will likely face complicated choices, including between products with an HPD that discloses one or more hazards – and products that have not disclosed hazard information. What steps can you take in this situation, to help determine how to use the presence/absence of an HPD in your product evaluation?

- If a project team goal is to reward disclosure and transparency, the manufacturer that provides an HPD is supporting this goal. The company may have a program within its product development process to improve the health characteristics of its products. Engage in a dialogue and learn more about the health information that has been voluntarily provided by the manufacturer. Discuss the manufacturer's product improvement program, and efforts it is making to reduce or eliminate hazards from its products. Use the HPD as a springboard to learn more. Let the company know that its commitment to disclosure and transparency – and whatever efforts beyond that it has taken – is appreciated.
- The product whose manufacturer has not disclosed whether hazardous contents are included or not has not given you the information necessary to assess anything about the health attributes of its product. Use this as an opportunity to ask for this information – an HPD is the easiest and most widely-accepted method available to the manufacturer to fulfill this need. Let the company know that you have a preference for disclosure and transparency. Encourage it to take this first step, and then continue to make improving the health characteristics of its products a priority.

Project teams can have a powerful impact on the development of healthier building products. By supporting disclosure and transparency in your projects, you are joining with hundreds of others to establish health as a priority in the built environment.

Taking the Next Step

For firms that wish to further support the collaborative effort with manufacturers to move toward transparency and healthier materials, the HPD Collaborative offers a number of forums to pursue these goals. HPDC members can become involved in the ongoing development of the HPD Open Standard through participation in the Technical Committee and Technical SubGroups. Membership in the User Advisory Panel enables you to be part of the ongoing dialogue and activities geared to helping develop the practice of material health by project teams.

4. Understanding the HPD Open Standard and HPDs – Section-by-Section Details

This chapter presents more detailed definitions and explanations of terms and data elements in the HPD Open Standard for each section of the HPD.

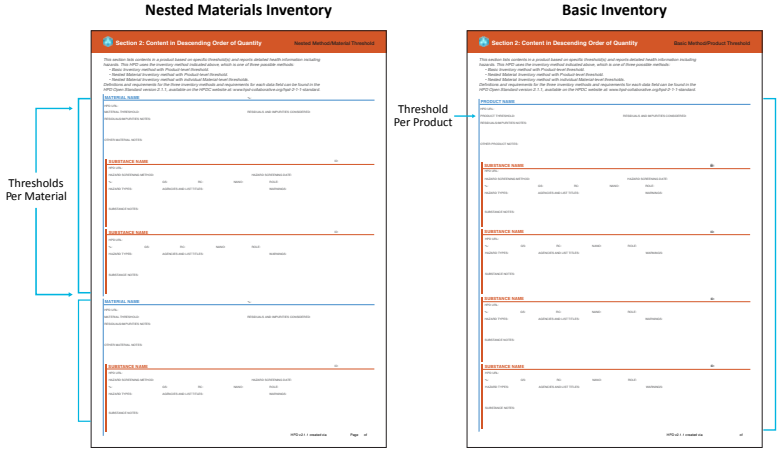
The HPD Open Standard has six sections:

- **Section 1: Summary** – highlights the contents of the product and their hazards, as well as key reporting elements such as thresholds
- **Section 2: Content in Descending Order of Quantity** – This section is the heart of the HPD. It lists contents in the product consistent with established thresholds (amounts), their associated hazards, and other relevant information
- **Section 3: Certifications and Compliance** – for example, certifications for VOC content and emissions
- **Section 4: Accessories** – for example, what's needed to install or maintain the product
- **Section 5: General Notes** – for example, explanations from the manufacturer
- **Section 6: References** – for example, links to hazard lists used in the HPD

The HPD Open Standard (http://www.hpd-collaborative.org/hpd-2-1-1-standard/) includes the Standard Format, section-by-section Standard Instructions, appendices, and a glossary.

There are three methods for creating a content inventory, based on how *contents* are categorized and how reporting *thresholds* are applied. The creator of the HPD, the product manufacturer (or, on behalf of the manufacturer, a third-party preparer) determines which of these content inventory reporting methods is used in a given HPD. The method used in the HPD is reflected in Section 1: Summary, and Section 2: Content in Descending Order of Quantity.; Sections 3, Certifications and Compliance, 4, Accessories, 5:General Notes, and 6: References have the same data fields for all three methods.

- **Nested Materials Inventory Method**: contents are reported first at the *materials* level. *Substances* are then itemized within each material. If a substance appears in multiple materials in the product, it will be listed multiple times in the inventory, appearing under each material where it is a constituent. There are two variations based on thresholds: thresholds can be specified for each material or for the entire product.
- **"Basic" Inventory method.** This method does not identify materials and creates a single list of all substances within the product; the Basic Inventory must have a product-level threshold. See illustration.



Detailed information on data fields follows.

Section 1: Summary

Product Name
by Product Manufacturer (1)
CLASSIFICATION:
PRODUCT DESCRIPTION:

Health Product Declaration v2.1.1 (2)
created via:

Section 1: Summary

Basic Method/Product Threshold (3)

CONTENT INVENTORY

Inventory Reporting Format (4)
- O Nested Materials Method
- O Basic Method

Threshold Disclosed Per
- O Material
- O Product

Threshold Level (5)
- O 100 ppm
- O 1,000 ppm
- O Per GHS SDS
- O Per OSHA MSDS
- O Other

Residuals/Impurities (6)
- O Considered
- O Partially Considered
- O Not Considered

Explanation(s) provided for Residuals/Impurities?
O Yes O No

(7)
All Substances Above the Threshold Indicated Are:

Characterized O Yes Ex/SC O Yes O No
% weight and role provided except SC substances characterized according to SC guidance

Screened O Yes Ex/SC O Yes O No
Screened using Priority Hazard Lists with results disclosed except SC substances screened according to SC guidance.

Identified O Yes Ex/SC O Yes O No
Disclosed by Name (Specific or Generic) and Identifier except SC substances identified according to SC guidance

SC=Special Condition (See Notes)

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.

(11) **SUBSTANCE** | *RESIDUAL OR IMPURITY*
GREENSCREEN SCORE | HAZARD TYPE

Number of Greenscreen BM-4/BM-3 contents: (8)
Contents highest concern GreenScreen Benchmark or List translator Score:
Nanomaterial: (9)

INVENTORY AND SCREENING NOTES: (10)

(12) **VOLATILE ORGANIC COMPOUND (VOC) CONTENT**
Material (g/l): Regulatory (g/l):
Does the product contain exempt VOCs?
Are ultra-low VOC tints available?

(13) **CERTIFICATIONS AND COMPLIANCE** *See Section 3 for additional listings.*
VOC Emissions:

CONSISTENCY WITH OTHER PROGRAMS (14)

Third Party Verified? (15)
O Yes
O No

PREPARER: (16)
VERIFIER:
VERIFICATION #:

SCREENING DATE:
PUBLISHED DATE: (17)
EXPIRY DATE:

HPD v2.1.1 created via Page of

1 **Product Name by Product Manufacturer**
CLASSIFICATION:
PRODUCT DESCRIPTION:

Health Product Declaration v2.1.1 2
created via:

Section 1: Summary

Nested Method/Material Threshold 3

CONTENT INVENTORY

Inventory Reporting Format 4
- O Nested Materials Method
- O Basic Method

Threshold Disclosed Per
- O Material
- O Product

Threshold Level 5
- O 100 ppm
- O 1,000 ppm
- O Per GHS SDS
- O Per OSHA MSDS
- O Other

Residuals/Impurities 6
Residuals/Impurities Considered in __ of __ Materials

Explanation(s) provided for Residuals/Impurities?
O Yes O No

7
All Substances Above the Threshold Indicated Are:

Characterized O Yes Ex/SC O Yes O No
% weight and role provided except SC substances characterized according to SC guidance

Screened O Yes Ex/SC O Yes O No
Screened using Priority Hazard Lists with results disclosed except SC substances screened according to SC guidance.

Identified O Yes Ex/SC O Yes O No
Disclosed by Name (Specific or Generic) and Identifier except SC substances identified according to SC guidance

SC=Special Condition (See Notes)

CONTENT IN DESCENDING ORDER OF QUANTITY

11 *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

Number of Greenscreen BM-4/BM-3 contents: 8
Contents highest concern GreenScreen Benchmark or List translator Score:
Nanomaterial: 9
INVENTORY AND SCREENING NOTES: 10

12 **VOLATILE ORGANIC COMPOUND (VOC) CONTENT**
Material (g/l): Regulatory (g/l):
Does the product contain exempt VOCs?
Are ultra-low VOC tints available?

13 **CERTIFICATIONS AND COMPLIANCE** *See Section 3 for additional listings.*
VOC Emissions:

CONSISTENCY WITH OTHER PROGRAMS 14

Third Party Verified? 15
O Yes
O No

PREPARER:
VERIFIER: 16
VERIFICATION #:

SCREENING DATE:
PUBLISHED DATE: 17
EXPIRY DATE:

HPD v2.1.1 created via Page of

DESCRIPTION OF FIELDS: SECTION 1 – SUMMARY

1. Product Name, Classification, Product Description. Classification is the most applicable six-digit CSI MasterFormat number (Division plus Section). If several classifications apply, the primary designation is indicated in this space and others are listed in the Product Description or General Notes. If there is no classification, N/A is indicated and an explanation is provided in the Product Description.

2. HPD version and tool reference. The current version of the HPD is v2.1.1. HPDs are almost always created using the HPDC's online Builder. The advantage of the Builder is that it automatically fills in all hazard information required by the Standard. The user needs only to provide the substance name and/or Chemical Abstract Service Registration Number (CAS RN), and the Builder automatically scans the requisite Priority Hazard Lists from scientific databases and provides the hazard warnings and GreenScreen scores in the proper format.

3. Inventory Method Header. This indicates which method was used to prepare the HPD – Nested Materials Inventory/ Material Threshold, Nested Materials Inventory/ Product Threshold, or Basic Inventory/ Product Threshold.

4. Specification of Inventory Method. This section clearly indicates

- Inventory Reporting Format.
  - In a Nested Materials Inventory, contents are reported first at the materials level. Substances are then itemized within each material. If a substance appears in multiple materials in the product, it will be listed multiple times in the inventory, appearing under each material where it is a constituent.
  - In a Basic Inventory, materials are not identified and a single list of all substances within the product is created.
- Threshold disclosed per
  - Material – a threshold is specified for each material.
  - Product – a single threshold is specified for the entire product.

5. Threshold. "Threshold" is key to understanding the precision of reporting used in the HPD (and its ability to comply with LEED, WELL, Cradle to Cradle, and other programs). The threshold is the amount or concentration of a substance that must be present for that substance to be reported, at the specified threshold level.

A lower threshold means that smaller amounts of substances will be reportable and therefore disclosure will be more complete. There are several ways thresholds can be reported:

- Parts per million (ppm), in which a threshold of 100 ppm is more stringent and requires reporting of substances present at lower concentrations than a threshold of 1,000 ppm, and hence is likely to lead to disclosure of more substances. They can also be reported by percentages, with 100 ppm = 0.01%, 1,000 ppm = 0.1%, and 10,000 ppm = 1.0%.
- Safety Data Sheet (SDS), based on the Globally Harmonized System (GHS) of Classification and Labeling of Chemicals. The SDS requires content reporting at 1,000 ppm (0.1%) only for reproductive toxicants, carcinogens, and category 1 mutagens, and at 10,000 ppm (1%) for all other hazard categories. The SDS is required to report certain hazardous contents that will be handled by workers in factories and does not require reporting of all substances, so it might not be as comprehensive as an HPD based on other methods.
- OSHA MSDS, the U.S. Occupational Safety and Health Administration's Material Safety Data Sheet, an older format that has been replaced by the SDS. It requires reporting carcinogens at 1,000 ppm and all other contents at 10,000 ppm.

Thresholds can apply to the whole product or to each material in the product. In the HPD Open Standard version 2, the Nested Materials Inventory method allows manufacturers to provide disclosure at different thresholds for different materials in one product – for example, 1,000 ppm for some materials and 100 ppm for others, depending on the level of information made available by suppliers. This summary of thresholds will indicate each of the levels represented by one or more materials in the product, so more than one level can be checked. If a per product threshold is specified, the level indicated applies to all substances in the product.

6. Residuals and Impurities. Residuals and Impurities are trace amounts of substances remaining after the manufacturing process that were not intentionally added for a functional purpose in the final product, defined as follows:

- **Residual**: a substance left over from a prior process, such as a residual monomer in a polymer from incomplete polymerization, that is not intended to remain in the final product
- **Impurity**: a substance that was present in the raw material, such as asbestos that often is associated with vermiculite.

There are several ways that residuals and impurities are identified and quantified: they can be predicted from process chemistry, accepted as industry knowledge, adopted from research, and determined through measurement. In some cases, manufacturers can determine the quantities of residuals and impurities in their product; in other cases, methods for identifying and quantifying these substances are less well developed. HPD Open Standard version 2 recognizes this issue and requires that manufacturers state whether they have taken steps outlined in HPDC Emerging Best Practices, available on the HPDC website, to identify and disclose residuals and impurities:

- "Considered" means that they have made an effort to identify the residuals and impurities; the HPD Open Standard outlines information to be reported
- "Not Considered" means no such effort has been made and the manufacturer must explain why.

In a Nested Materials Inventory, the HPD must indicate the number of materials out of the total in which residuals and impurities were considered (in "X of Y" materials). In a Basic Inventory, the HPD must indicate whether they were "Partially Considered" to indicate that some but not all residuals and impurities were considered.

As Best Practices for identifying and quantifying residuals and impurities evolve, reporting will become more feasible and project teams should expect manufacturers to "consider" and provide this information more frequently.

7. Characterized, Screened, Identified. This section summarizes the completeness and type of disclosure in the HPD.

- "Characterized" indicates whether the percent weight (quantity) and role or function are provided for all substances above the threshold indicated.
- "Screened" indicates whether all substances above the threshold were screened for hazards using lists in the HPD Open Standard and whether results are disclosed.
- "Identified" indicates whether all substances above the threshold are disclosed by name and identifier (Chemical Abstract Service Registration Number – CAS RN).

A manufacturer may withhold identification of one or more substances but still "characterize" and "screen" them as a way to protect proprietary information while still providing useful information about potential hazards. This approach complies with LEED v4 Material Ingredients credit, for example.

If Special Condition guidance is referenced in this section, the HPD references HPDC-approved procedures for specific materials or substances to which standard HPD content inventory and hazard screening methods don't readily apply. HPDs using this guidance still meet LEED v4 requirements.

8. GreenScreen for Safer Chemicals scores. GreenScreen® for Safer Chemicals is a program of the nonprofit organization Clean Production Action. It facilitates comparative chemical hazard assessment at the substance level. There are two types of GreenScreen results that can be reported in an HPD:

- *List Translator scores* that are produced through an automated tool that *screens* against specified hazard lists. No assessment is performed. For more information on the GreenScreen List Translator™: http://www.greenscreenchemicals.org/method/greenscreen-list-translator
- *Benchmark scores* that are produced through a Certified Full GreenScreen Method assessment that includes a toxicological review of all available information from scientific studies, hazard lists, and modelling or analogs. For more information on the Full GreenScreen Method: http://www.greenscreenchemicals.org/method/full-greenscreen-method

Benchmark scores represent a more comprehensive assessment than List Translator scores, developing hazard levels for a full set of environmental and human health endpoints.

The HPD summary includes:

- **Number of GreenScreen BM-4/BM-3 Contents.** This section reports on the total number of substances with *lower* hazards – Benchmark-3 (use but there's still opportunity for improvement) or Benchmark-4 (prefer – safer chemical).
- **Contents' highest concern GreenScreen Benchmark or List Translator Score.** This section reports on the most hazardous GreenScreen List Translator or Benchmark score found in any of the substances in the product.

GreenScreen® Score	Title	GreenScreen® Benchmark Equivalency	Description
BM-1	GreenScreen Benchmark-1 "Chemical of High Concern"	N/A	Identified as a Chemical of High Concern based on a comprehensive chemical hazard assessment considering 18 GreenScreen hazard endpoints. Relies on comprehensive, in-depth research using toxicology test results, scientific literature, models, analogs, and expert judgment.
LT-1	"Likely GreenScreen Benchmark-1"	Benchmark-1	An LT-1 score is based on lists that identify it as a Chemical of High Concern. LT-1 is considered equivalent to BM-1. A full GreenScreen assessment to establish the chemical's Benchmark score will trump LT-1.
LT-P1	"Possible GreenScreen Benchmark-1"	Possible Benchmark-1	Frequently LT-P1 means that the chemical appears on a list that does not translate directly to a single Benchmark score, and BM-1 is included in the range of possible Benchmark scores. Further research is needed on the flagged endpoint to determine if the chemical is a BM-1.
LT-UNK	"List Translator - Unknown"	Unspecified Benchmark	An LT-UNK chemical score indicates a chemical is on a GreenScreen Specified List but there is insufficient information to classify the hazard as LT-1 or LT-P1. The LT-UNK score or the absence of a chemical on hazard lists does not mean it is safe. It may mean the chemical has not been reviewed or that the chemical has not been well tested. Therefore the resulting conclusion using the List Translator is that the Benchmark U score is Unspecified pending full GreenScreen review. A full GreenScreen assessment will be needed to determine if a chemical is BM-2, BM-3, or BM-4.

9. Nanomaterials. Nanomaterials are substances that have been engineered to be very small (down to 10,000 times smaller than the diameter of a human hair). Studies of the potential effects of different types of nanomaterials on

the environment and human health are still in early stages, and significant uncertainty remains. Consistent with the precautionary principle, this section is intended to alert HPD users of the presence of nanomaterials in products.

10. Inventory and Screening Notes. Some of the data fields require that the manufacturer include further explanation in the Notes section – for example, an explanation why residuals and impurities were not considered, or the reason why certain substances have not been identified or screened. This section also gives the manufacturer an opportunity to provide additional information on any of the data elements in this section. When Basic Inventory method is used, it is noted in Inventory and Screening Notes.

11. Content in Descending Order of Quantity. This section is designed to give HPD users a quick overview of information provided in the Content Inventory in Section 2. For a Nested Materials Inventory, each material is listed with its constituent substances and their associated hazards and GreenScreen scores all in abbreviated form. For a Basic Inventory, substances and associated information are listed for the product as a whole. See Section 2 of the HPD for complete information and Section 6 of the HPD for a list of abbreviations.

12. Volatile Organic Compound (VOC) Content. VOC content information must be provided for all liquid/wet-applied products; the information is not applicable to other products.

- "Material (g/L))" – this is the quantity of non-exempt VOC content compared to the volume of the entire product as it is supplied, in grams per liter.
- "Regulatory (g/L)" – this is the quantity of non-exempt VOC content compared only to the volume of the non-exempt content in the product in grams per liter. If the product contains water or other non-exempt VOCs in it, this ratio will be larger than the Material VOC. This measure is used by regulatory agencies.
- "Exempt VOCs" – these VOCs do not contribute to smog formation and hence are exempted from outdoor air regulatory reporting. While not contributing to smog formation, some of the exempt VOCs still present health hazards to humans.
- "Ultra-low VOC tints" – for tintable products, are ultra-low VOC tints available? Tinting systems are included in Section 4: Accessories. In addition to "yes" and "no," a response of "NA" means that the product is not tintable.

13. Certifications and Compliance. This section lists certifications that are detailed in Section 3 of the Format. When applicable, VOC emissions and VOC content certifications are included here. Other certifications related to *content* (materials and substances) and *health* (hazards, etc.) may be included.

14. Consistency with Other Programs. This section of the HPD provides optional information on the consistency of the HPD with other programs. Currently the only program included is LEED v4. The LEED v4 Pre-Check Indicator provides a preliminary scan of the HPD – a preliminary indicator of consistency with specific requirements of the LEED v4 Material Ingredients credit. It is a mechanical cross-checking of inventory method; threshold; residuals and impurities; characterized, screened, and identified indicators with the specific requirements of the LEED v4 credit; and check of presence of entries for all fields required by HPD Open Standard. This Pre-Check does not assess data quality.

15. Third Party Verification. Third party verification is a program of desk audits to check aspects of the HPD.

16. Preparer and Verifier. Some manufacturers engage a third party to assist in preparing the HPD. Third parties can provide expertise in gathering and analyzing data and entering data. Third party preparers can also protect confidential data from suppliers, screening substances that are not identified, for example. The preparer is identified in this field. A third party verifier can also be identified in this field.

17. Screening, Published, and Expiration Dates. HPDs need to contain current data. They expire three years after the screening date. In addition, HPDs created with an earlier format (which can be used for one year after the release of the next major version of the Standard) expire three years after the next major version of the Standard was released. HPDs uploaded to the HPDC Public Repository are considered "published." The Repository is the authoritative location for publishing HPDs.

Section 2: Content Inventory

Section 2: Content in Descending Order of Quantity

Basic Method/Product Threshold

This section lists contents in a product based on specific threshold(s) and reports detailed health information including hazards. This HPD uses the inventory method indicated above, which is one of three possible methods:

- *Basic Inventory method with Product-level threshold.*
- *Nested Material Inventory method with Product-level threshold.*
- *Nested Material Inventory method with individual Material-level thresholds.*

Definitions and requirements for the three inventory methods and requirements for each data field can be found in the HPD Open Standard version 2.1.1, available on the HPDC website at: www.hpd-collaborative.org/hpd-2-1-1-standard.

PRODUCT NAME 18

HPD URL: 20

PRODUCT THRESHOLD: 21 RESIDUALS AND IMPURITIES CONSIDERED: 22

RESIDUALS/IMPURITIES NOTES: 23

OTHER PRODUCT NOTES: 24

SUBSTANCE NAME 25 ID: 26

HPD URL: 27

HAZARD SCREENING METHOD: HAZARD SCREENING DATE:

%: GS: 28 RC: 29 NANO: 30 ROLE: 31

HAZARD TYPES: 32 AGENCIES AND LIST TITLES: WARNINGS:

SUBSTANCE NOTES: 33

SUBSTANCE NAME ID:

HPD URL:

%: GS: RC: NANO: ROLE:

HAZARD TYPES: AGENCIES AND LIST TITLES: WARNINGS:

SUBSTANCE NOTES:

SUBSTANCE NAME ID:

HPD URL:

%: GS: RC: NANO: ROLE:

HAZARD TYPES: AGENCIES AND LIST TITLES: WARNINGS:

SUBSTANCE NOTES:

SUBSTANCE NAME ID:

HPD URL:

%: GS: RC: NANO: ROLE:

HAZARD TYPES: AGENCIES AND LIST TITLES: WARNINGS:

SUBSTANCE NOTES:

HPD v2.1.1 created via of

Section 2: Content in Descending Order of Quantity

Nested Method/Material Threshold

This section lists contents in a product based on specific threshold(s) and reports detailed health information including hazards. This HPD uses the inventory method indicated above, which is one of three possible methods:

- *Basic Inventory method with Product-level threshold.*
- *Nested Material Inventory method with Product-level threshold.*
- *Nested Material Inventory method with individual Material-level thresholds.*

Definitions and requirements for the three inventory methods and requirements for each data field can be found in the HPD Open Standard version 2.1.1, available on the HPDC website at: www.hpd-collaborative.org/hpd-2-1-1-standard.

MATERIAL NAME 18 %: 19

HPD URL: 20

MATERIAL THRESHOLD: 21 RESIDUALS AND IMPURITIES CONSIDERED: 22

RESIDUALS/IMPURITIES NOTES: 23

OTHER MATERIAL NOTES: 24

SUBSTANCE NAME 25 ID: 26

HPD URL:

HAZARD SCREENING METHOD: 27 HAZARD SCREENING DATE:

%: GS: 28 RC: 29 NANO: 30 ROLE: 31

HAZARD TYPES: 32 AGENCIES AND LIST TITLES: WARNINGS:

SUBSTANCE NOTES: 33

SUBSTANCE NAME ID:

HPD URL:

%: GS: RC: NANO: ROLE:

HAZARD TYPES: AGENCIES AND LIST TITLES: WARNINGS:

SUBSTANCE NOTES:

MATERIAL NAME %:

HPD URL:

MATERIAL THRESHOLD: RESIDUALS AND IMPURITIES CONSIDERED:

RESIDUALS/IMPURITIES NOTES:

OTHER MATERIAL NOTES:

SUBSTANCE NAME ID:

HPD URL:

HAZARD SCREENING METHOD: HAZARD SCREENING DATE:

%: GS: RC: NANO: ROLE:

HAZARD TYPES: AGENCIES AND LIST TITLES: WARNINGS:

SUBSTANCE NOTES:

HPD v2.1.1 created via Page of

DESCRIPTION OF FIELDS: SECTION 2 – CONTENT IN DESCENDING ORDER OF QUANTITY

As noted under Section 1, there are three reporting methods that can be used in this section.

- **Nested Materials Inventory method, Material-level threshold.** This method lists **all** materials in the product and all the substances within each material that are above the threshold level for each material.
- **Nested Materials Inventory method, Product-level threshold.** This method lists **all** materials in the product and all the substances within each materials that are above the threshold level for the product as a whole. The manufacturer has the option of listing substances in selected materials based on a material-level threshold if this more rigorous information is available and the manufacturer chooses to report it.
- **Basic Inventory method.** This method does not identify materials and creates a single list of all substances within the product. The manufacturer must list all substances above the threshold level for the product.

One of the first things to do in reviewing an HPD is to determine which method is used and, therefore, what rules must apply.

MATERIAL

18. Product or Material Name.

- **Nested Materials Inventory method.** The material name can be a specific brand name or a more generic category name. The name can be "undisclosed" but the reason for nondisclosure must be explained in the Material Notes. Names of materials are sometimes withheld by the manufacturer or the supplier to protect intellectual property/ proprietary information.
- **Basic Inventory method**. The name of the product will appear.

19. Percent (%).

- **Nested Materials Inventory method**. The percent by weight of the material in the final product. A fixed percentage is preferred, but sometimes the percentage may vary and a range can be reported (for example, 5.0%–8.0%). The manufacturer might use a range because materials vary due to market conditions, availability, price, or other factors. Ranges may not exceed 20% without an explanation. An average or typical percentage can be included in the Material Notes. "Undisclosed" means that the percentage is being withheld and the product cannot be listed as "characterized" in Section 1.
- **Basic Inventory method.** This data field is not present in Basic Inventories.

20. HPD URL.

- **Nested Materials Inventory method.** If an HPD for a material exists, it can be cited here. The information on substances in the material must still be entered into the product HPD unless the referenced HPD is a "Special Condition HPD."
- **Basic Inventory method.** This data field is not present in Basic Inventories.

Special Conditions

Some substances or types of substances cannot follow the HPD instructions as written due to special circumstances that can apply to whole classes of materials, such as mixed recycled content. Guidance for these substances is developed by HPDC's technical committees and is posted on the HPDC website under Emerging Best Practices:

http://www.hpd-collaborative.org/emerging-best-practices/.

21. Inventory Threshold. This is the amount or concentration above which intentionally used substances are reported in the HPD for the material or product.

- **Nested Materials Inventory method, Material-level threshold.** Each material can only have one threshold that applies to all of its contents. There can be different thresholds for different materials.
- **Nested Materials Inventory method, Product-level threshold.** Substances may be listed under each material based on the presence of each substance in the final product above the threshold level. For materials in which only substances present above the product threshold are listed, "other" is indicated as the threshold for the material. If

desired, a "Per Material" threshold may be used for selected individual materials to provide additional information where it is available and the manufacturer chooses to disclose it – in this case, what is reported should be the actual threshold used to identify substances for that material, i.e., 100 ppm, 1,000 ppm, per GHS SDS, or per OSHA MSDS. This option can only be used if all substances above that threshold in the material are listed, not just the subset of substances that are above the "Per Product" threshold.

- It is possible that a material can be listed with no substances nested under it. This could occur if all substances in the material are below the Per Product level threshold indicated. "Other" must be indicated as the threshold for any such material. An explanation is required in Substance Notes.
- **Basic Inventory method.** One threshold is given for the entire product.

The threshold is often determined by how much information the manufacturer can obtain from suppliers. See Section 1 summary of substance disclosure level per material in **ppm** for more information on thresholds.

22. Residuals/impurities. This is an indication of whether residuals and impurities were "considered" for the material or product and are included in the inventory. See Section 1 – Residuals and Impurities for further information.

23. Residuals and Impurities Notes. This Notes section provides additional information on consideration of Residuals and Impurities. All other notes are provided in Other Material Notes.

24. Other Material Notes. This section includes information to further explain the entries above.

SUBSTANCE

25. Substance Name. The manufacturer can provide a specific name or a generic name or chemical class. "Undisclosed" means that the manufacturer chooses not to disclose the specific name of the substance, and the reason for nondisclosure must be explained in the Substance Notes; "Undisclosed" substances cannot be considered "identified" in the Summary, unless specifically allowed by Special Conditions. "Unknown" means that the manufacturer does not know the substance name, due to lack of disclosure by the supplier; these "Unknown" substances also cannot be considered "identified" unless allowed by Special Conditions.

26. Identifier. The primary identifier is the Chemical Abstract Service Registration Number (CAS RN), though other identifiers may be used when there is no CAS RN. Use of the CAS RN is important because it cross-references with the hazard lists referenced in the HPD Open Standard and provides definitive identification. As with the Substance Name, the Identifier can be "undisclosed" or "unknown" and the substance cannot be considered "identified" unless allowed by Special Conditions.

27. Percent (%).

- **Nested Materials Inventory method.** The percent by weight of the substance in the material. See percent (%) for Materials above.
- **Basic Inventory method.** The percent by weight of the substance in the product.

28. GreenScreen (GS). See Section 1 – "Number of **lower hazard** substances in Product" and "**Most hazardous** substance score found in Product" for explanation of GreenScreen® scores.

29. Recycled Content (RC). Indicates whether the substance has recycled content.

- "PostC" indicates post-consumer recycled content.
- "PreC" indicates pre-consumer (post-industrial) recycled content.
- "Both" indicates both are included.
- "None" indicates no recycled content.
- "UNK" indicates that use of recycled content is unknown.

30. Nano. Indication of whether the substance is a nanomaterial. See Section 1 – Nanomaterials.

31. Role. Indication of the substance's purpose or function in the material (Nested Materials Inventory method) or product (Basic Inventory method). Examples include: binder, antimicrobial, flame retardant, wear layer, catalyst, preservative, etc. Further explanation of a particular substance can be included in the Substance Notes. This helps in understanding where the substances with hazards are located in the product and why they are included.

32. Hazards Screening. An integral element of reporting about products with the HPD Open Standard is to include a hazard screening of the substances in the product. A hazard screening provides data about whether a particular chemical (a "substance") has been associated with one or more health hazards, and has been determined by several independent authoritative bodies based on criteria that they have established using the results of epidemiological, toxicological, and scientific research studies. The HPD Open Standard specifies which of these lists is to be considered in the hazard screening information reported in an HPD. (See Appendices B-F of the HPD Open Standard for further information.)

It is important to understand that a screening result that indicates an association of a substance with a hazard does not provide information about the exposure to or risk of that hazard in the product. Determination of exposure and risk requires additional assessment of the product.

Obtaining hazard screening information is a necessary first step in creating exposure and risk assessments, so it is important information to be reported in an HPD. It is also required information for meeting the LEED v4 Material Ingredients credit requirements.

For the HPD Open Standard, Hazard Screening is performed using the HPD Open Standard Priority Lists. These are primarily based on the GreenScreen for Safer Chemicals, a program of the nonprofit organization Clean Production Action. Typically, the hazard screening results that are reported in an HPD will result from the HPD creator using the HPD Builder tool. Within the Builder tool, the hazard screening is automated through the use of the Pharos Chemical and Materials Library (CML) reference database. The Pharos database is created and maintained by the Healthy Building Network. It is also possible for this screening to be performed using the Pharos system, if an HPD has not been created using the HPD Builder tool. It is extremely difficult to conduct an accurate hazard screening without the use of one or another of these automated tools. If the HPD does not indicate that it was created using the HPD Builder tool (this reference will appear in the upper right hand corner of the Summary page) then you should inquire to verify that a proper hazard screening was conducted. If an HPD has been third-party-verified, the third party will have verified this information.

The GreenScreen approach, as implemented using the Pharos CML, facilitates comparative chemical hazard screening and assessment at the substance level. There are two types of GreenScreen results that can be reported in an HPD:

- *List Translator(LT) scores*: these are produced through an automated tool that *screens* against hazard lists specified in the HPD Open Standard. No assessment is performed. For more information on the GreenScreen List Translator: http://www.greenscreenchemicals.org/method/greenscreen-list-translator
- *Benchmark (BM) scores:* these are produced through a Certified Full GreenScreen Method assessment that includes a toxicological review of all available information from scientific studies, hazard lists and modelling or analogs. For more information on the Full GreenScreen Method: http://www.greenscreenchemicals.org/method/full-greenscreen-method

Benchmark scores are a more comprehensive assessment than List Translator scores, as they develop hazard levels for a full set of environmental and human health endpoints.

The HPD hazard screening summary includes:

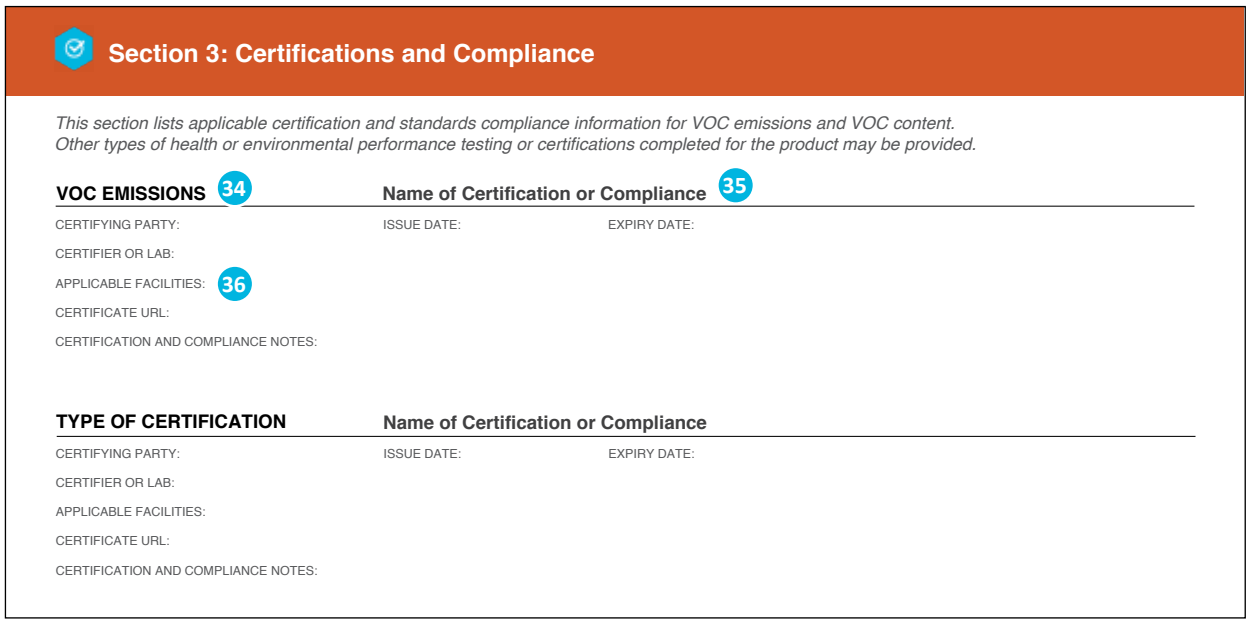
- **Number of GreenScreen BM-3/BM-4 Contents.** This section reports on the total number of substances with *lower* hazards – Benchmark 3 (use but there's still opportunity for improvement) or Benchmark 4 (prefer – safer chemical).
- **Contents' highest concern GreenScreen Benchmark or List Translator Score**. This section reports on the most hazardous GreenScreen List Translator or Benchmark score found in any of the substances in the product.

Hazards are the inherent abilities of substances to cause harm to the environment or human health. In the HPD, each substance is screened against Priority Hazard Lists to see if the substance is listed. If it is listed, the associated hazard type, e.g., cancer, respiratory, physical, etc., is indicated along with the Agency List Abbreviation, e.g., CA EPA, IARC, etc., and Hazard Warning, e.g., carcinogenic to humans, asthmagen, explosive, etc. The lists and agencies can be found in the HPD Open Standard, Appendix D. Lists were selected for inclusion primarily based on criteria developed for GreenScreen. All lists in the GreenScreen List Translator are included if they contain high or very high hazard scores (Benchmark 1 or Possible Benchmark 1, Hazard Range of Very High, High, or Moderate for Carcinogenicity, Mutagenicity/Genotoxicity, Reproductive Toxicity, Developmental Toxicity, Developmental Neurotoxicity, and Endocrine Activity, or Very High or High for all other endpoints). Additional lists have been included to address ozone depletion, global warming, brominated and chlorinated flame retardants, and other chemicals.

HPDC's online Builder cross-references these lists automatically based on name and/or CAS RN.

33. Substance Notes. This section includes information to further explain the entries above.

Section 3: Certifications and Compliance



Section 3: Certifications and Compliance

This section lists applicable certification and standards compliance information for VOC emissions and VOC content.
Other types of health or environmental performance testing or certifications completed for the product may be provided.

VOC EMISSIONS 34 — **Name of Certification or Compliance** 35

CERTIFYING PARTY: ISSUE DATE: EXPIRY DATE:

CERTIFIER OR LAB:

APPLICABLE FACILITIES: 36

CERTIFICATE URL:

CERTIFICATION AND COMPLIANCE NOTES:

TYPE OF CERTIFICATION — **Name of Certification or Compliance**

CERTIFYING PARTY: ISSUE DATE: EXPIRY DATE:

CERTIFIER OR LAB:

APPLICABLE FACILITIES:

CERTIFICATE URL:

CERTIFICATION AND COMPLIANCE NOTES:

DESCRIPTION OF FIELDS: SECTION 3 – CERTIFICATIONS AND COMPLIANCE

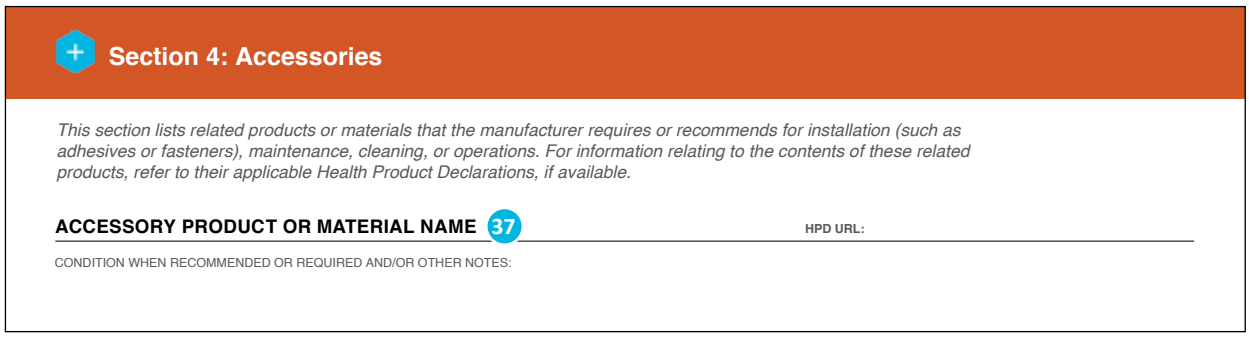
This section lists independent certifications that relate to contents and health-related characteristics. It does not include information on project-level certification systems such as LEED, Living Building Challenge, WELL, or others.

34. VOC Emissions. An entry is required for all products. There are two primary standard methods for this testing: California Department of Public Health Standard Method and the international AgBB standard. Programs that certify VOC emissions with the California standard include Indoor Advantage Gold™, FloorScore®, and GREENGUARD Gold. For some product types, there is no accepted emissions modeling scenario for evaluating the testing results, so "N/A" is indicated. If the manufacturer has chosen not to test or certify the product, "not tested" is indicated. Or, a product might be indicated as "inherently non-emitting source per LEED" if it meets the appropriate LEED qualifications (see http://www.usgbc.org/node/2614095?return=/credits/new-construction/v4/indoor-environmental-quality).

35. VOC Compliance. All products that are wet-applied on site, such as paints, adhesives, or other coatings, must have an entry noting the certification or applicable standard with which the product complies.

36. Applicable Facilities. This section includes the specific manufacturing facilities that are covered by the certifications and standards noted above.

Section 4: Accessories



DESCRIPTION OF FIELDS: SECTION 4 – ACCESSORIES

This section lists additional products that must be used for installation or for warranty compliance (e.g., adhesives, fasteners, field coatings). It may also list products that are recommended but not required for installation, maintenance, cleaning, or operations. These products can contain hazards. If there is an HPD for the accessory, the URL link is provided.

37. Accessory Product or Material Name. If no accessories are required, "no accessories are required for this product" will be entered. This ensures that this information was not omitted inadvertently.

Section 5: General Notes

Several sections in the Standard require notes, which can be specific to a material or substance, or general.

Section 6: References

Section 6: References

38 MANUFACTURER INFORMATION

MANUFACTURER:
ADDRESS:
WEBSITE:
CONTACT NAME:
TITLE:
PHONE:
EMAIL:

39 KEY

OSHA MSDS Occupational Safety and Health Administration Material Safety Data Sheet
GHS SDS Globally Harmonized System of Classi cation and Labeling of Chemicals Safety Data Sheet

Hazard Types

AQU Aquatic toxicity
CAN Cancer
DEV Developmental toxicity
END Endocrine activity
EYE Eye irritation/corrosivity
GEN Gene mutation
GLO Global warming
MAM Mammalian/systemic/organ toxicity
MUL Multiple hazards
NEU Neurotoxicity
OZO Ozone depletion
PBT Persistent Bioaccumulative Toxic
PHY Physical Hazard (reactive)
REP Reproductive toxicity
RES Respiratory sensitization
SKI Skin sensitization/irritation/corrosivity
LAN Land Toxicity
NF Not found on Priority Hazard Lists

GreenScreen (GS)

BM-4 Benchmark 4 (prefer-safer chemical)
BM-3 Benchmark 3 (use but still opportunity for improvement)
BM-2 Benchmark 2 (use but search for safer substitutes)
BM-1 Benchmark 1 (avoid - chemical of high concern)
BM-U Benchmark Unspeci ed (insu cient data to benchmark)
LT-P1 List Translator Possible Benchmark 1
LT-1 List Translator Likely Benchmark 1
LT-UNK List Translator Benchmark Unknown (insufficient information from List Translator lists to benchmark)
NoGS Unknown (no data on List Translator Lists)

Recycled Types

PreC Preconsumer (Post-Industrial)
PostC Postconsumer
Both Both Preconsumer and Postconsumer
Unk Inclusion of recycled content is unknown
None Does not include recycled content

Other Terms

Inventory Methods:
Nested Method / Material Threshold Substances listed within each material per threshold indicated per material
Nested Method / Product Threshold Substances listed within each material per threshold indicated per product
Basic Method / Product Threshold Substances listed individually per threshold indicated per product
Nano Composed of nano scale particles or nanotechnology
Third Party Verified Verification by independent certifier approved by HPDC
Preparer Third party preparer, if not self-prepared by manufacturer
Applicable facilities Manufacturing sites to which testing applies

---

The Health Product Declaration (HPD) Open Standard provides for the disclosure of product contents and potential associated human and environmental health hazards. Hazard associations are based on the HPD Priority Hazard Lists, the GreenScreen List Translator™, and when available, full GreenScreen® assessments. The HPD Open Standard v2.1 is not:

- *a method for the assessment of exposure or risk associated with product handling or use,*
- *a method for assessing potential health impacts of: (i) substances used or created during the manufacturing process or (ii) substances created after the product is delivered for end use.*

Information about life cycle, exposure and/or risk assessments performed on the product may be reported by the manufacturer in appropriate Notes sections, and/or, where applicable, in the Certifications section.

The HPD Open Standard was created and is supported by the Health Product Declaration Collaborative (the HPD Collaborative), a customer-led organization composed of stakeholders throughout the building industry that is committed to the continuous improvement of building products through transparency, openness, and innovation throughout the product supply chain.

The product manufacturer and any applicable independent verifier are solely responsible for the accuracy of statements and claims made in this HPD and for compliance with the HPD standard noted.

Product Name
www.producthpdurl.com

HPD v2.1 created via HPDC Builder
Page X of Y

38. Manufacturer Information. This section provides contact and other basic information on the manufacturer.

39. Key to Acronyms, Abbreviations, and Terms. This section contains a key to acronyms, abbreviations, and terms used in the document.

5. Examples of HPDs

Sample completed HPDs using all three methods can be found on the HPDC website (http://www.hpd-collaborative.org/sample-hpds/).