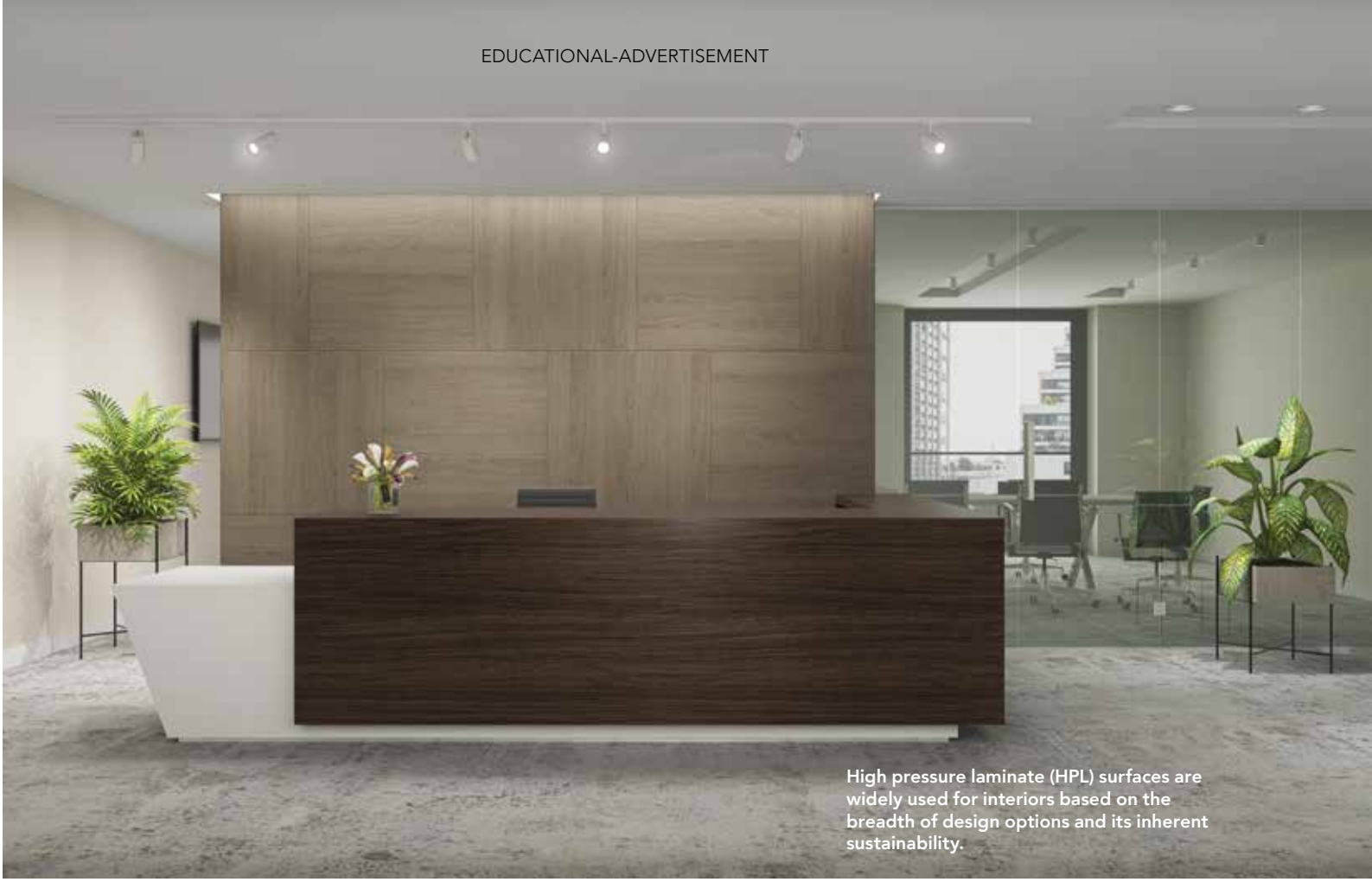

All images courtesy of Wilsonart

High pressure laminate (HPL) surfaces are widely used for interiors based on the breadth of design options and its inherent sustainability.

High Pressure Laminate: A Sustainable Choice

Durability, certified wood content, and high post-consumer recycled content make HPL an ideal product for commercial and residential designs

Sponsored by Wilsonart | *By Peter J. Arsenault, FAIA, NCARB, LEED AP*

The green building movement has been fueled by a variety of factors. From the standpoint of the effect on the environment, the focus has been to use materials and products that minimize impacts or use harvesting and processing methods that are responsible and sustainable. According to the Food and Agriculture Organization of the United Nations, deforestation and forest degradation continue at alarming rates with multiple environmental impacts. Therefore, specifying wood-based materials that are sustainably grown and harvested as well as contain high percentages of post-consumer recycled content can directly address these forest problems. From a human health standpoint, the demand for healthy and sustainable indoor environments continues to be on the rise. According to THINKLAB, employee health and wellness has become a critical factor for business leadership to consider, particularly since the COVID-19 pandemic exposed many shortcomings in these areas. While many different building products can address this two-fold concern of environmental impacts and human health, this course looks closely at one widely used interior building product.

High pressure laminate (HPL) covers horizontal and vertical surfaces in many different types of commercial, institutional, and residential buildings. As part of a

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Learning Objectives

After reading this article, you should be able to:

1. Identify and recognize the characteristics of high-pressure laminate (HPL) that contribute to favorable design and performance attributes in building interiors.
2. Investigate the independent, third-party standards that HPL products must meet to demonstrate sustainability in terms of environmental and health impacts.
3. Assess the ways that HPL can contribute to green and sustainable building designs that seek certification from LEED v4, v4.1, BD+C, ID+C, and WELL v2 standards.
4. Specify sustainable HPL in a variety of building types, and formulate appropriate selections related to specific applications.

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variety of other products, such as cabinetry, countertops, wall coverings, and furnishings, it can contribute directly to sustainable building design solutions. HPL products can be specified that meet accepted standards for minimizing or reducing environmental and health impacts. All of these can be documented to assist in green building certification programs, such as LEED, WELL, and others.

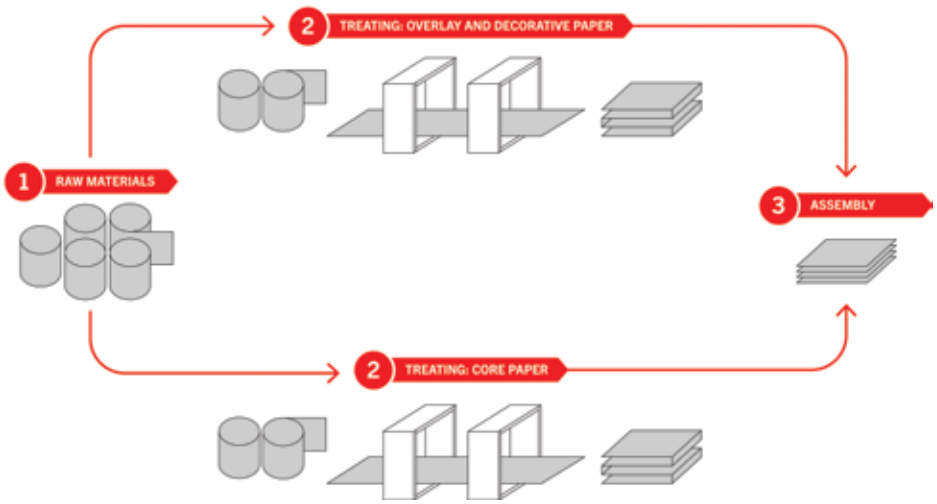
HPL CHARACTERISTICS

HPL has a number of distinct design and performance characteristics that make it appealing not only for design, construction, and long-term use but also sustainability.

HPL Manufacturing Process

The basic makeup and essence of HPL is found in its manufacturing process. This process is the basis for a life-cycle assessment (LCA) of the product and is summarized in the following cradle-to-gate steps:

1. **Raw materials:** The laminate production process begins in the receiving area of the manufacturing plant. Decorative paper, kraft paper, overlay, and other raw materials are sourced from outside vendors according to the manufacturer's specifications and requirements. Of particular note, this is where the manufacturer can control the amount of recycled content that is part of the papers that make up the HPL.
2. **Decorative overlay and core papers:** Decorative paper provides the pattern, woodgrain, or solid color for a sheet of laminate. Overlay paper gives laminate its surface strength and scratch resistance. Overlay paper is saturated with melamine resin, cured, and cut to size. Both decorative paper and treated overlay paper may be stored in rolls or cut to sheet size and stored until needed. Sheets of decorative paper and overlay are pulled and assembled in sets based on production run needs. At the same time, just as decorative papers are readied for press, the kraft paper, which makes up the core of laminate, undergoes a similar process. Kraft paper arrives in bulk and is placed in a paper storage area. From this staging area, the kraft paper is taken to the phenolic treater, where it is saturated with phenolic resin, cured, and rolled or cut to size. Treated kraft paper is taken to a core stock area where it is assembled based on the sheet laminate makeup type. Each type of laminate (general purpose, postforming, vertical grade, etc.) requires a slightly different layup.
3. **Assembly:** The appropriate material from the stock area is taken to the pressing department to be collated with the decorative papers from the assembly area.
4. **Pressing:** The two processes come together as the decorative paper and core paper are assembled at the press and cooked for about an hour under high heat and pressure (hence the name high pressure laminate). The decorative and kraft papers are then sandwiched between two stainless steel textured plates, which impart the tactile finish (gloss, matte, textured, etc.) on the completed laminate sheet.
5. **Sanding:** Once the press cycle is complete, the laminate is taken to a sander. The edges of each sheet are trimmed, and the back is sanded to provide better adhesion in fabrication. At this stage, the pattern identification number is printed on the back of each sheet.
6. **Cut to size:** A range of standard-size HPL panels are available. While 4 feet x 8 feet is the most common, some products are also available in widths of 3 feet and 5 feet, while lengths may also be available in 10 feet and 12 feet (check with manufacturers for specific sizes of specific product types). In addition, some special-order sheets are cut to size for the customer. This takes place in a cut-to-size area after the laminate leaves the sander.



Sustainable HPL begins with raw materials being processed into decorative, overlay, and core papers that are assembled ready to create specific products.

The fabrication process involves pressing, sanding, cutting, finishing, and shipping to final users.

Continues at ce.architecturalrecord.com

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Wilsonart, a world-leading engineered surfaces company, is driven by a mission to create surfaces people love, with service they can count on, delivered by people who care. The company manufactures and distributes High Pressure Laminate, coordinated TFL and Edgeband, Quartz, Solid Surface, Epoxy, and other decorative engineered surfaces. **www.wilsonart.com**

7. **Finished goods:** Once the laminate clears the sander and cut-to-size areas, it is sent to the finished goods staging area, where it is stored temporarily prior to being shipped to market.
8. **Shipping:** Laminate sheets are pulled from finished goods inventory, packed on skids, and loaded aboard trucks for shipment to regional market destinations.

In all, the process is efficient but allows for a wide variety of options in terms of design and performance needs for a building project.

HPL Design Properties

Any designer who has worked with HPL in the past can attest to the wide range of design options available. This allows for great design freedom to create horizontal and vertical surfaces that suit a wide range of styles, settings, or appearances.

Manufacturers take pride in offering an artistic range of HPL panels with colors, patterns, styles, and replicated appearances (stone, wood, etc.) that is in keeping with the latest interior design trends and preferences. HPL panel color is determined primarily by the selection of the decorative layer on the panels. Hence, manufacturers can readily offer a full range of choices in a broad color spectrum by using a different decorative layer. There are also a variety of textures that can be created during the manufacturing process as noted, including gloss, matte, and even raised 3-D textures. This allows panels to be used on walls, ceilings, doors, counters, cabinetry, and other applications with the best color, appearance, and texture to suit each individual use.

The multiple panel sizes available for certain types of HPL allows for the efficient integration of the HPL panels into architectural and interior designs with greater control over seams, geometric patterns, and final appearance. Further, since the material can be easily cut in a fabrication shop or on-site with common carpentry tools, custom sizes and shapes are easy to achieve. In these cases, the most efficient and economical size can be selected to cut multiple custom shapes to minimize waste.

HPL Performance Properties

The laminated makeup of HPL and the type of resins used all contribute to the overall strength and rigidity of the panels. The density and integrity of the material is high even though there are different panel thicknesses available to suit different panel strength needs. For example, HPL panels suitable for a horizontal use such as a counter may be thicker than those used for a vertical surface such as a wall. The final thickness is determined in the factory by the manufacturing process with a focus on the core layers. Different types of HPL will have different thicknesses of cores based on their final usage (general purpose, post-forming, vertical grade, etc.).

The wear layer in HPL combined with the impact-resistant core layers create a very durable and long-lasting finished surface. This provides for an exceptional long-term service life, which makes replacement less likely and long-term sustainability more the norm. In particular, it performs very well in terms of the following:

- **Impact resistance:** The built-in durability from the high-pressure lamination of the core and other layers during manufacturing helps prevent damage to the material that may be caused by impact.
- **Scratch resistance:** The wear layer is the first line of defense against scratching or surface damage. The durability of this topmost layer is the key to resisting this otherwise potential issue.
- **Water and moisture resistance:** The nonporous surface of all HPL resists moisture and allows bulk water to roll off or be cleaned up readily. Further, it does this without requiring sealing.
- **Wear resistance:** HPL has commonly performed better over time when compared to some traditional veneers, vinyl, or wood. This means less maintenance and reduced likelihood of replacement compared to those products. At least one manufacturer has an enhanced HPL surface that achieves a wear resistance of up to three times greater than competing HPLs.

The make-up of HPL directly supports its resistance to impacts, scratches, water, moisture, and wear.

From an indoor environmental quality perspective, the ability of HPL to be cleaned and disinfected easily is clearly important. HPL is a nonporous surface that can withstand frequent and harsh cleaning and disinfection protocols (particularly in the era of COVID and other public health concerns), making its inherently durable surface easy to clean with no need for sealing. For projects that have special requirements, different HPL products are available that can provide added protection for high wear surfaces, chemical resistance, or fire resistance.

Overall, HPL is a strong and durable product that performs well in many different situations, meaning it is inherently sustainable over the long term.

GREEN PRODUCT STANDARDS FOR HPL

The information about the makeup and characteristics of HPL products generally comes from the manufacturer. So how do design professionals get objective information to verify the sustainable nature of these products? The answer is to use an independent third-party organization that tests and evaluates a wide range of products specifically for green building and sustainability traits. Recognizing that this is the widely accepted practice, HPL manufacturers who are serious about demonstrating their sustainability engage with such third-party organizations to have their products tested and rated. The results of these tests are then published and available upon request from either the organization or manufacturer. The common tests and certifications related to sustainable material makeup or healthy indoor environments for HPL products include the following.

International Organization for Standardization (ISO)

International Organization for Standardization (ISO) standards specify requirements for environmental, occupational health and safety, and quality management systems. Organizations use these standards to enhance their environmental performance, provide safe and healthy workplaces, enhance customer satisfaction, and other quality measures. Specifying products from a manufacturer that is ISO Certified indicates that the company has committed to monitoring and reporting a high level of operations. Common ISO certificates include ISO 9001 for Quality Management System, ISO 14001 for Environmental Management System, and ISO 45001 for Occupational Health and Safety Management System.

Environmental Product Declaration (EPD)

An environmental product declaration (EPD) is an independently verified and registered document that communicates transparent and comparable information about a product's life-cycle environmental impact. It is a voluntary declaration of the life-cycle environmental impact. Currently, an industry-wide EPD is available for HPL products and shows favorable results for sustainability in all categories. There are scenarios for end-of-life repurposing or for disposal in a landfill for comparative purposes.

Forest Stewardship Council (FSC)

The Forest Stewardship Council (FSC) is an independent, non-government, not-for-profit organization established to promote responsible forest management practices. FSC Chain-of-Custody (CoC) certification traces the path of products from forests through the supply chain, verifying that FSC-certified material is identified or kept separated from noncertified material. Since HPL is made up primarily of forestry-based paper products (typically up to 70 percent in the core, decorative, and overlay papers), manufacturers can choose to use FSC-certified raw materials by working with their suppliers on proper sourcing. Those that do, and can provide the CoC documentation to back it up, are generally seen to be leaders in providing responsible, sustainable products.

SCS Global Services: Recycled Content Certification

The SCS Recycled Content Certification evaluates products made from pre-consumer or post-consumer material diverted from the waste stream. Certification measures the percentage of recycled content for the purpose of making an accurate claim in the marketplace. HPL manufacturers can control the amount of recycled content by working with their raw material suppliers on the recycled content percentage in the core and decorative paper layers. Those with high levels of postconsumer recycled content (16–67 percent depending on the specific laminate product) are seen as industry leaders in sustainability.

Health Product Declaration (HPD)

The Health Product Declaration (HPD) Open Standard is a standard specification for the accurate, reliable, and consistent reporting of product contents and associated health information for products used in the built environment. The HPD Open Standard specification is harmonized with numerous rating certification standards in the building industry. HPD version 2.2 is the current version that has been used to demonstrate minimal if any health impacts from using standard laminate products in building interiors.

UL GREENGUARD

Products that achieve UL GREENGUARD Certification are scientifically proven to meet some of the world's most rigorous third-party chemical emissions standards, helping to reduce indoor air pollution and the risk of chemical exposure, while aiding in the creation of healthier indoor environments. The GREENGUARD Gold Certification standard includes health-based criteria for additional chemicals and also requires lower total volatile organic compound (VOC) emissions levels to help ensure that products are acceptable for use in environments like schools and healthcare facilities. Manufactured HPL products have been tested using these rigorous standards, and some are available with GREENGUARD Gold certification.

An industry-wide environmental product declaration (EPD) is available for designers to discern the specific environmental data about the products.

An independently prepared health product declaration (HPD) is available to identify health and wellness aspects of HPL.

SCS Indoor Advantage Gold Certification

SCS Indoor Advantage Gold certification indicates low VOC emissions with the most transparent indoor air quality (IAQ) standard for furniture and building materials. It is recognized by the EPA and GSA and qualifies for many green building rating systems, including LEED v4, BREEAM, WELL Building, and Living Building Challenge. Some HPL products have been tested and certified based on this program.

All of these standards and independent testing protocols provide designers and building owners with information and assurance that the products being used or specified meet the criteria for sustainability. This information is then used as the basis for creating green building designs.

GREEN BUILDING CONTRIBUTIONS OF HPL

Beyond product testing and certification, architects and designers are focused on creating entire buildings that are green and sustainable. Hence, the products and materials in those buildings become part of that effort as coordinated by the designer following the requirements of the green building standard being used. The leading standards are LEED v. 4.1 as proffered by the U.S. Green Building Council (USGBC) and the WELL Building System. Some of the most common ways that HPL can contribute to these certifications are as follows.

LEED Materials and Resources (MR) Credits – Building Product Disclosure and Optimization

There are several opportunities in this category.

- **Environmental Product Declarations:** Under option 1 of this credit, the designer must select a designated number of products that meets the disclosure criteria, which can include an Industry-Wide Type III EPD. This is defined as "Products with third-party certification (Type III), including external verification, in which the manufacturer is explicitly recognized as a participant by the program operator. Products with industry-wide EPDs, which conform to ISO 14025 and EN 15804 or ISO 21930 and have at least a cradle-to-gate scope, are valued as one whole product for the purposes of credit achievement calculation."

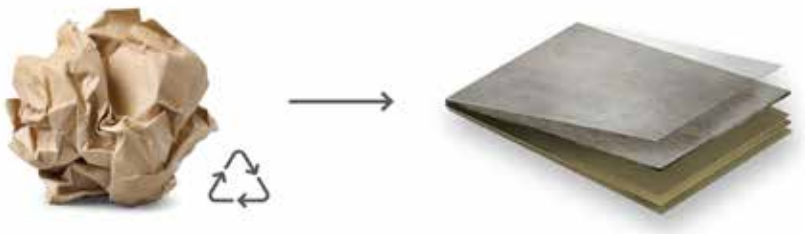
  The industry-wide EPD for HPL meets this definition. However, it should be noted that HPL is a decorative surface that is bonded to a substrate to provide structural support before being fabricated or converted into a finished article by skilled fabricators. The final product will typically include the substrate, an adhesive, and other component such as edge banding, drawer slides, door handles, or door cores, composite wood face sheets, etc. HPL all by itself does not qualify for this credit in the format produced by HPL manufacturers. For manufactures of finished articles, an industry-average EPD is available for use in preparing an EPD of the finished articles.
- **Responsible Sourcing of Raw Materials – Wood:** Achieving this credit for Wood Products requires that they must be certified by the Forest Stewardship Council or USGBC-approved equivalent. Products meeting wood products criteria are valued at 100 percent of their cost for the purposes of credit achievement calculation. Note that not all HPL manufacturers can provide this, but at least one has led the way in this industry and offers FSC CoC Certification on request.
- **Responsible Sourcing of Raw Materials – Recycled content:** Products meeting recycled content criteria are valued at 100 percent of their cost for the purposes of credit achievement calculation. However, LEED makes a clear distinction between pre-consumer and postconsumer content, which is defined as follows:
  - **Post-consumer** recycled content is made from waste that has been used by a consumer, disposed of, and diverted from landfills. Examples include paper, milk cartons, newspaper cardboard, and wood products.
  - **Pre-consumer** recycled content (also sometimes called post-industrial) is material that is salvaged from a manufacturing process only.

  While both types of recycled content are positive, postconsumer is seen as more desirable because it returns material back into the life cycle of products (i.e., cradle to cradle) rather than post-industrial, which simply makes for a more efficient manufacturing process.

  Based on all of this, LEED defines recycled content as the sum of the full amount of postconsumer recycled content plus only one-half the pre-consumer recycled content, based on weight. The recycled fraction of the assembly is then multiplied by the cost of assembly to determine the recycled content value. Hence, the more postconsumer recycled content that is used, the better. In the case of HPL, it is the kraft paper that makes up the layers and has a specific amount of recycled content, which varies based upon product type (17 percent to 34 percent is available). In this case, it is best to seek laminate and backers that have been certified by SCS Global Services for recycled content. It is also worth pointing out that manufacturing innovations have allowed for a continued increase in the amount of postconsumer recycled content in HPL products, without sacrificing appearance or performance.
- **Material Ingredient Reporting – Health Product Declaration:** To qualify for this credit, the installed product needs to have a published and complete HPD with full disclosure of known hazards in compliance with the HPD Open Standard to demonstrate the chemical inventory of the product to at least 0.1 percent (1,000 ppm). Similar to EPDs, HPL can be used in support of manufactured products that pursue an HPD.

LEED Indoor Environmental Quality (EQ) Credits – Low-Emitting Materials

There are also several opportunities in this category.



High levels of postconsumer recycled content are preferred by LEED and other green building standards since it directly diverts waste away from landfills or incineration.

- **Adhesives and Sealants:** At least 75 percent of all adhesives and sealants, by volume or surface area, must meet the LEED VOC emissions evaluation and 100 percent percent must meet the VOC content evaluation. The adhesives and sealants product category includes all interior adhesives and sealants applied on-site. HPL manufacturers can provide information and documentation on acceptable adhesives and sealants that work for the product application and comply with the EQ criteria.
- **Composite Wood:** At least 75 percent of all composite wood, by cost or surface area, needs to meet the formaldehyde emissions evaluation or salvaged and reused materials criteria. The composite wood product category includes all particleboard, medium density fiberboard, hardwood veneer plywood, and structural composite wood not included in the flooring, ceiling, wall panels, or furniture material categories.

  The LEED v4.1 requirement for composite wood panels is that they meet California Air Resources Board Ultra Low Emitting (CARB ULEF) or No Added Urea Formaldehyde (NAUF) resin requirements. HPL is not a composite wood panel, even though it does contain paper that is derived from wood. This is a common misunderstanding concerning HPL. Since HPL has low emissions of VOCs and is not a composite wood panel, it is exempt from both the California Air Resources Board (CARB) and the EPA Composite Wood Rule. Most HPL product types may qualify as an individual component in a system or part of a finished product or furniture, depending upon the LEED credit approach used. As a laminate, HPL is exempt from reporting NAUF content. NAUF certification needs to be requested from the manufacturer of the finished article who will include the substrate (wood panel), adhesive, HPL decorative surface, backer, edge banding, and other components into a certification for the finished product.
- **VOC Emissions Evaluation (Option 1) and Furniture Emissions Evaluation:** This credit is based upon UL GREENGUARD low chemical emissions testing. HPLs with UL GREENGUARD Gold Certification meet or exceed the requirements for low chemical emissions on all laminate types.

LEED Indoor Environmental Quality (EQ) Credit – Interior Lighting

If the HPL is being used on furniture that is in the scope of the work (built in or freestanding), then Option 2, Lighting Quality – Subpart F may be an opportunity to contribute to a project. In this case, select furniture finishes to meet or exceed the stated thresholds for area-weighted average surface reflectance, namely 45 percent for work surfaces and 50 percent for movable partitions. When using HPL, note that light reflectance values (LRVs) are pattern dependent. Consultation with a manufacturer's technical representative is advised to assure that the selected patterns meet the desired LRV.

WELL Building Standard – Materials

The WELL Building Standard is increasingly being recognized as a means to assess and certify a healthy indoor environment. It relies on 10 core concepts plus an innovation concept as a basis for certification at different levels. One of the core concepts is materials with subcategories X06 VOC Restrictions, X07 Materials Transparency, and X08 Materials Optimization. The makeup and product certifications for HPL used for LEED in these categories can also be used in WELL to show compliance and help a building achieve certification.

SPECIFYING SUSTAINABLE HPL

Based on everything discussed so far, it should be clear that it is quite possible to specify and use HPLs as part of a green and sustainable building. However, keep in mind that not all laminates are created equally. It is important to understand the specifics that have been discussed here and specify the most sustainable products. This means incorporating the proper language for durability, postconsumer recycled content, and other performance requirements as well as the design criteria. Some of the relevant items to address in a standard three-part specification format are highlighted as follows.

Part 1: General

The scope of the specified work can include all preparation, substrate review, product choices, and final installation. In terms of specifying performance, the appropriate testing standards should be referenced not only for the HPL products but also for any adhesives or substrates used. For sustainability, the third-party testing requirements should be stated, including all those discussed earlier.

Composite wood and HPL can be specified with very low levels of formaldehyde and other volatile organic compounds to be compliant with sustainability standards.

Submittals for HPL should include the usual manufacturer's data and information for all products used, plus samples with color and texture data to confirm that the correct appearance is being achieved.

Quality assurance is clearly an important part of any field-installed system, and the same is true here. Installers should have qualifications acceptable to the manufacturer. Evidence of such qualifications can be requested as a submittal, but it is important that the people actually in the field are the ones with the qualifications and experience needed.

On-site protection of products should be carried out according to the manufacturer's instructions and recommendations, particularly if any standard limited warranty is called for.

Part 2: Products

If multiple HPL products are used, they should be identified by type in the specifications, and the location of each type needs to be clearly called out in either the drawings or specifications. The details of the specified products can include:

- The specific type, size, and texture of the HPL panels should be identified for each product used. The maximum yield from the panel manufacturer's standard sizes result in cost-effectiveness and green design.
- The specific performance criteria for each product, including thickness, dimensional stability, surface characteristics, and any other needed criteria, can be specified.
- The specific sustainability characteristics

Each of the specific HPL products used on a project need to be specified for their particular characteristics of thickness, size, color, texture, and other features.

HPL products are manufactured according to high-quality standards and need to be installed by fabricators and crafters with equally high standards.

should be called out. In particular, the percentage of postconsumer recycled content, the VOC restrictions, and other green criteria should be stated.
- The specific color, pattern, and texture of each product needs to be called out. Manufacturer's literature should be consulted for this as with any finished product.
- Other requirements, including the details of cleaning and stain removal for the product, can be called out.

Part 3: Execution

As with any installed product, the installation requires multiple steps that need to be clearly articulated in the specification in order to achieve the best results.

- **Examination and preparation:** The importance of this step should always be stressed. In addition to the architect, the installer should review and examine the substrate for conditions that may affect the installation or the overall performance of the finished surface. Any issues will need to be corrected if they are found to be out of compliance with stated requirements.
- **Installation:** The HPL should be secured in place according to manufacturer's instructions and installation manuals. These should be consulted to assure that the products are installed to meet the code and conditions for a successful project.
- **Protection:** Once installed, the HPL should be able to withstand normal activity but should be protected from any remaining construction work that could adversely affect it.
- **Cleaning:** Upon completion, the surface should be cleaned of any construction or miscellaneous dirt, debris, etc. as the manufacturer may suggest.

When specified and installed correctly, the HPL will provide the desired look, long-term performance characteristics, and sustainability levels that are intended.

CONCLUSION

High pressure laminate (HPL) has been shown to be an appealing solution for use in sustainable, well-designed buildings. The varied and extensive range of design characteristics provide architects with broad design freedom and many opportunities for creativity. The tested and demonstrated performance characteristics help assure that the material will function as intended over the life of the building.

WELLNESS CENTER CASE STUDY

Project: Foundry Ridge Meadows
Location: Maple Ridge, British Columbia, Canada
Designer: WORK Design Studio

The Facility: Foundry Ridge Meadows offers young people aged 12–24 access to health and social services. Foundry strives to make it easy for young people and their families to find the care, connection, and support they are seeking.

The Challenge: Sometimes, functionality and a sense of comfort can feel at odds. At Foundry Ridge Meadows, this was not an option. Function and safety were priority to ensure the health and wellness of youth and their families. However, to help fulfill the organization's purpose, it had to feel inviting. "As a youth wellness center, we wanted to ensure the materials would hold up over time, so durability played a large role in our material selection process," says Vanessa Jansen, principal of WORK Design Studio. "Therefore, materials were selected with the help of various youth stakeholders to create a noninstitutional approach to health-care and mental health services. Infection control and durability were key and helped drive the overall product selection."

The Surfaces: Knowing the importance of creating a safe environment in this space, the community members, youth, and stakeholders were involved in the project, from functional programming to furniture selection and material selection. A mix of HPL surfaces—including high-wear HPL—was the perfect solution, considering durability and disinfection procedures.

The Result: A beautiful, warm, welcoming space where the community feels a sense of ownership and safety has been developed. The woodgrain helps create residential warmth, while the punch of color brings a youthful and fun touch.

HEALTH-CARE CASE STUDY

Project: Mission Trail Baptist Hospital
Location: San Antonio, Texas
Architect: Earl Swensson Associates (ESa)
Owner: Vanguard Health Systems

The Client: It is somewhat tongue-in-cheek when Landon Lawson, project director for Vanguard Health Systems, quips that "Vanguard is the vanguard of outcome-based quality health care," but the company is certainly part of what is driving the big philosophical changes in health-care design. "Our sole focus is health care," Lawson says, "and it is really evolving from sick care to caring for health. We implement evidence-based practices to move from a fee-for-service model to a fee-for-value model." With 28 facilities in five distinct markets (Arizona, Illinois, Massachusetts, Michigan, and Texas), Vanguard cultivates locally branded health systems that meet the needs of the people in the region.

The Project: The Mission Trail Baptist Hospital (MTBH) is a 214,000-square-foot, 110-bed replacement facility that was recently completed in San Antonio, Texas, as a part of the Baptist Health System, a group within Vanguard. Architects and designers from Earl Swensson Associates (ESa) collaborated with the project owner and care providers to develop a patient-centered, family-friendly hospital. In addition to applying best practices for evidence-based health care, there were three design criteria that informed the specification of materials throughout the project: LEED Gold certification, regional harmony, and creating a facility that is both light and quiet.

The Sustainability Approach: Part of MTBH's vision is to be "good stewards of our resources." "For us, it was important to incorporate LEED principles into the hospital by focusing on the things that really made sense, versus just how we can get points for X, Y, and Z," Lawson says. This included features that were innovative for the general public, such as electric car charging stations, a smart phone app called SnapWalk that allows visitors to scan a QR code and get directions within the facility, and lighting strategies that give functional options to bright overhead fixtures. It also guided the specification of interior finishes. "We selected several designs of high-pressure laminate (HPL) for different applications in the project," says Angela Rinehart, interior designer for ESa. The construction of HPL differs from traditional laminates. In addition to a decorative layer and substrate, HPL includes several layers of saturated kraft paper that give the material superior impact resistance. This significantly increases the durability and life of the product. "Overall, we try to be very aware of the origin of the products that we use. Not only are the products manufactured in Temple, Texas, but they are sourced within 500 miles of San Antonio. Plus, it has recycled content, so it qualifies for several LEED credits."

The Materials: Mike Jones is a project manager for SWA Millwork, the fabricator that built many of the fixtures for the MTBH project. "We mainly produce nurse stations and reception desks," he says. "And we receive a lot of specifications for decorative laminate because it offers so many different colors and designs. Woodgrain is usually the choice in a hospital setting because it feels homey, but if you were to use real wood or veneer plywood, it just would not last as long." The laminates were specified with a Class A fire-rated particleboard substrate. And because the doors and drawers get a lot of use, the casework was built with concealed hinges. The public-area doors in the hospital are done in wood-grained HPL, a comforting design reminiscent of anigre with dark, gold, and reddish hues. The design is carried over into panel systems along the walls, casework, and accents within the patient rooms and nursing stations. Laminate in a warm, straight-grained

amber cherry color is used to soften the stark, white functionality of the back-of-the house doors, desks, and casework. And a lighter Asian sand design accents the nurse's work alcoves and nursing stations. This design also moves out into the corridor to the coffee shop and servery providing a very cohesive look.

The Indoor Environment: Another aspect of the MTBH's vision is to maintain a healing environment. A growing body of research in evidence-based health-care design supports the idea that the physical environment can relieve patient pain and stress, affect well-being, promote healing, and reduce medical errors, infections, and falls. An important component of this is designing health-care spaces that feel less institutional and more familiar. "A big focus for us with the MTBH project was to be as hyper-local as possible with the south Texas culture," Lawson says. "So that plays a big role in the design elements that went into the facility." A physician-led art committee sought out photographs, paintings, and quilts done by local artists. "Angela Rinehart sat on the art committee as well," Lawson says, "so the selections of the finishes worked in concert with the artwork to achieve the general theme we were going for." The warm wood tones of the HPL and the strong neutral foundation of the solid surface set the tonal palette.

MTBH takes its name from the unique history of the area. "We had a local artist do a mosaic tile layout of the San Antonio River in the meditation garden that sits between the medical office building and the hospital," Lawson says. "It depicts each of the missions along the way and shows where MTBH now sits along that trail." Weaving these earthy elements throughout the interior of the facility and the grounds gives patients a sense of place, rather than a feeling of being removed from society because they are sick.

The Lighting Approach: MTBH considers a patient's family to be partners in the care of the patient. To this end, spaces are designed to be simultaneously open and private. Several devices are used to achieve this seemingly contradictory objective. The first is natural light, which streams into the public spaces in the facility through abundant windows and vaulted ceilings. Translucent materials were used to create areas of separation without blocking the light. "We ordered 4 x 8 sheets of resin panels in a bear grass pattern, basically tall grass with different variations of length and height, and cut them to size at our shop," Jones says. The design was also added to some of the nurse stations to counteract the institutional feel of the back-of-house environment. "The panels are aesthetically gorgeous," Rinehart says, "but they really serve a function to help keep the spaces more intimate for patients and family. As hospitals become more like hospitality spaces, the look of organic materials like HPL, stone, and grass really help to counteract the institutional feel, and that is one of our goals."

The Result: All these details add up to serve the first tenet of the MTBH vision statement: "The patient is at the heart and center of MTBH. We exist to serve patients. Each one of us at MTBH is a caregiver and plays a role in our healing mission." That philosophy carries through to the facility itself and the team that carefully developed the healing environment.

RENOVATION CASE STUDY

Project: Our Lady of Consolation Nursing & Rehabilitative Care Center
Location: West Islip, New York

The Facility: Our Lady of Consolation Nursing & Rehabilitative Care Center was originally constructed in 1975. More than 20 years later, the facility has expanded with 80,000 square feet in additions. It has witnessed several major upgrades designed to improve the health-care built environment for its patients, as well as the unique rehabilitation services provided to its in-house residents and local community members.

The Renovation: In early 2017, Our Lady of Consolation Foundation Board sought out to enhance two areas within the facility that served all residents, visitors, and employees. In order to create a more comfortable and welcoming area for the residents and their guests, the facility built a new coffee shop called the Founders Café. Intentionally renovated with materials that would keep the space bright and cheerful, the layout also included a removal of the solid corridor walls replaced with decorative glass paneled partitions to enrich the pleasant, open, and airy atmosphere.

It was also important to the Foundation Board to have a new space entirely dedicated to employees. The chapel, dining cafeteria, and large group lounge room underwent a conscientious renovation, transforming it into a multifunctional space where employees could quietly enjoy their meals, socialize, and rejuvenate during breaks. To achieve the bright, airy, and functional appeal desired for the space, the café and multiuse employee area utilized high-pressure laminate for the casework, tables, and counter walls, while solid surface bedecked the countertops.

The Results: Since the project's completion, the Foundation Board has received positive feedback from the residents, staff, and visitors, and there has been a boost to employee morale.