



Industry in Depth

Exploring Beneath the Surface: The Technical Side of Laminate

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hances are, you encounter laminate hundreds of times in your daily life – perhaps without even realizing it. Laminate is found on kitchen countertops, in public bathroom partitions, in office cubicles and even on the table at your favorite restaurant. It may be one of the most functional and ubiquitous materials found in residential and commercial design. But despite its widespread use, few people understand exactly what laminate is, the different types or its many applications.

and expand and contract with humidity. They are recommended for any application in which durability and impact resistance are concerns, may be used for both vertical and horizontal surfaces, and have a low initial cost and a lifespan of five to 15 years. HPL is also available in hundreds of designs and multiple finishes.

Low-pressure laminates (LPLs) are also known as melamine boards or direct-pressure laminates. They are comprised of a single-wear layer over a single decorative sheet and are only recommended for vertical surfaces or low-impact/low-traffic areas. LPLs have a very low initial cost, but only a one- to five-year lifespan. They are available in a limited number of designs and finishes.

WHAT IS LAMINATE?

So just what is it? The official definition of laminate is “a man-made decorative material that is applied to the surface of a substrate.” It is often referred to as HPL, or high-pressure laminate, but its technical name is thermo-setting high-pressure decorative plastic laminate. Laminate has many features that account for its widespread use: It’s available in hundreds of designs, it’s

low-maintenance, it’s heat- and impact-resistant, and it offers high value for the investment.

Laminate is manufactured one of two ways: under high pressure or low pressure.

HPLs are the most commonly used laminates. They are comprised of multiple layers of resin-treated paper fused together during manufacturing. HPLs can be adhered to a variety of substrates, have a dimensional behavior similar to wood,

DESIGNING WITH LAMINATE

When selecting laminate for a project, there is more to consider than just

color and design. Designers must also make a decision on the type of laminate, texture, edge treatments, and substrate or postforming needs. Most often, these decisions are based on performance needs, budget and intended use of the product.

Many people do not realize there are several types of HPL available. HPL is often divided into various product types: general purpose, vertical surface, postforming, flame retardant, high wear, cabinet liner and backers. Most laminate falls under the general-purpose category. General-purpose laminate can be used for both horizontal and vertical surfaces, in places where the surface must be functional, decorative and durable, such as a residential kitchen countertop or a work surface. Vertical-surface laminates provide a decorative and functional surface for walls or surfaces that

have minimal impact and wear, while postform-grade laminates are compatible with a heating and bending process that forms the laminate over a radius to eliminate seams.

More than 90 different types of specialty and performance laminates exist. Each was developed to address specific performance needs, such as an extra-thick laminate that does not require a substrate, an extra-thin laminate used inside cabinets or double-sided laminate that has a decorative face on both sides. Other specialty laminates were designed for specific environments, such as hospitals or buses.

As the name implies, chemical-resistant laminate resists common chemicals. It may be used in hospitals, labs and other areas where a variety of chemicals or cleaning agents are used. Impact-resistant laminates contain a core made of

aluminum or steel, and may be used in mass transit vehicles, light industrial facilities and maritime interiors. Wear-resistant laminates are produced for commercial, contract and institutional applications that demand a decorative surface that can withstand more than normal wear. They have up to six times the abrasion and scuff resistance of conventional laminate. Another specialty laminate is fire-resistant laminate, which is produced for interior applications that require decorative surfaces with resistance to flames and smoke in case of fire.

Once the type of laminate is selected, it is time to consider color, design and texture. Most laminate companies have a standard offering of 200 to 250 design choices, and textured finishes add even more options. Some manufacturers have limited-access libraries of

Laminates can offer designers an embossed finish with the look and feel of wood.



Most laminate companies have a standard offering of 200 to 250 design choices, such as this contemporary metallic design from Wilsonart Contract.



non-standard designs, including select discontinued patterns or custom patterns added for a large customer. These designs generally carry a longer lead time and premium up-charge. To add a custom design or color for a client, outside the standard HPL offering, most manufacturers require a minimum annual usage of 250,000 square feet and a three- to five-month lead time for the entire development process.

In addition to hundreds of colors and designs, laminate is available in several textures. Most of these textures are created with stainless steel plates, but some specialty finishes require the use of textured foil. Finishes not only change the look of the laminate, they can affect how a laminate wears resistance, so the use and location of the laminate's texture should be considered when making a selection.

It is important to remember that when choosing a color or texture, certain textures appear more scratch-resistant than others. For example, gloss textures show scratches more easily than matte textures. The more texture a surface has, the more it will resist scratching – texture can actually “interrupt” a scratch. Also, consider that certain colors and patterns minimize the appearance of normal wear. Scratches are less visible on light colors than on dark colors, and general wear and stains are less visible on patterns than on solid colors.

Always specify laminate under lighting conditions that match that of the final installation. While great care is taken in quality control of papers used in laminate production, some colors may have a metamerism.

Texture options include:

- **Matte** – A textured finish with a moderate reflective quality.

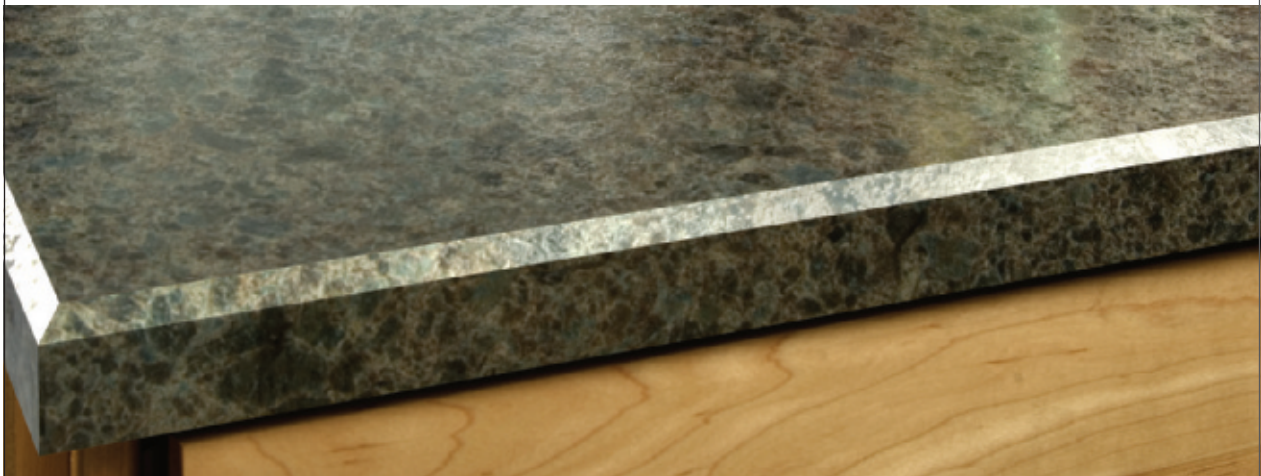
Matte is the standard finish on most laminates.

- **Crystal** – A finely beaded design that minimizes fingerprints and has high scratch resistance.
- **High Gloss** – A texture with a mirror sheen finish that is susceptible to scratching and not recommended for horizontal surfaces.
- **Textured Gloss** – A finish similar to waxed wood furniture.
- **Beaded** – A pebbled texture with the look and feel of coarse-grained sand.
- **Woodgrain** – An embossed finish with the look and feel of wood.

INSTALLATION BASICS

Laminate is only one of several raw materials used to build a finished product. Laminate must be bonded to a substrate, so adhesives, suitable substrates and backers are required for installation as well. Contact adhesives may be used for bonding

High-definition laminate has a finish that alters the laminate's look, texture and wear-resistance capabilities.



laminates to a variety of cores. They are particularly useful for applications to metal or impervious surfaces. Contact adhesives should be uniformly applied to both surfaces that require bonding. These adhesives have high immediate bond strength, and once contact has been made, the components cannot be moved.

There are two primary types of adhesives: solvent-based and water-based. There are many different choices for a substrate, but the best choice is a substrate with high internal bond strength. Unsuitable substrates include plaster, plasterboard, gypsum board and concrete. A backer is then used to balance the laminate construction, prevent warping and protect the substrate from moisture. Backers are generally the same material as the top surface, or one matching in dimensional stability.

The process of heating the HPL to bend around a substrate form is called postforming. Most plastics, once cured in manufacturing, cannot be reheated and reformed, but postforming laminate includes modified resins that allow the sheets to be reformed under heat and pressure. Once heated and formed, the laminate will hold its new shape permanently.

Postforming is used to create countertops, moldings, trim pieces and cabinet doors. It is helpful in places where a “solid” or seamless look is preferred, such as deck edges and cabinet doors, or where “kid-friendly” curves are welcome, since they eliminate sharp edges. Postforming is also used to achieve special edge treatments, laminate inlays or inlays with other materials, such as tile, wood or metal.

USES FOR LAMINATE

Laminate is found in both traditional and surprising applications. Some of the most common and recognizable uses of laminate include residential countertops and cabinetry, office work areas, public restrooms and department store wall panels. Laminate is also abundant in corporate offices, retail stores and malls, hospitality environments, healthcare settings and educational institutions.

Some of the more surprising areas where laminate is found include casino slot bases, airplanes, mass transit seats, theme park rides, furniture, interior doors and marker boards. Laminate also is usually found in high-traffic areas, including cashier/checkout stations, kick plates, pony walls, retail fixtures and bar tops.



A variety of styles and mixture of materials can be used to edge both residential and commercial laminate surfaces.

It should not be used in areas with extremely high moisture, humidity, extreme heat or cold, in aseptic rooms or outdoors.

LAMINATE UNCOVERED

Once you know what to look for, you will notice that laminate is everywhere. If you look around your office, you may see laminate in cubicles, on the reception desk, in restrooms, on the conference table, on the elevator control panel or even within some of your office furniture. The material is very durable, extremely functional and highly fashionable. Now that you know the technical side, we hope you realize it is an extremely versatile and usable material as well.

Laminate – it’s not just for kitchen countertops anymore.

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Adapted as an exercise by Suzanne Heath, Senior Director, Education and Professional Development

exercise:

- 1) Give three examples of where you might choose to install laminate.
- 2) Define "laminate."
- 3) Name the two different kinds of laminate and explain what sets them apart from each other.
- 4) Provide three examples of where laminate should not be used.
- 5) In your own words, explain the laminate installation process.

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