



A Guide to Plastic Laminates

and other decorative cabinet surfaces

by Ed Pell

"It's a mica cabinet with melamine interior and foil edging."

People who sell or spec kitchen and bath cabinetry hear terms like this all the time. But what do they mean? What are the differences between types of decorative surfaces? And what are their advantages and disadvantages?

There have been major technological advances in surfacing in the past few years, and more come along every day. With these advances in mind, *Kitchen & Bath Business* prepared this guide to some of the decorative surfaces used in cabinetry and countertops today.

High-Pressure Laminate

What it is: High-pressure decorative laminate (HPDL) is composed of three types of paper fused under heat and pressure into a single surface. The top coat is a protective overlay of melamine. The decorative surface is paper saturated with melamine/formaldehyde resin. It has either a surface color or a gravure print.

Under these two levels is a core of three to nine sheets of phenolic-resin-saturated kraft paper. The entire assembly is pressed at 800 to 1,200 pounds-per-square-inch pressure for about an hour. This is known as the "cure."

HPDL is known to kitchen-industry old-timers as mica. It is sometimes incorrectly called Formica, which is not a generic term, but the trade name of one of the major suppliers. The product is known by other trade names, including Wilsonart, Pionite, Nevamar, Dura-Beauty, and Dupopal. It is also called plastic laminate.

Properties: HPDL is divided into two grades—forming and non-forming. Non-forming laminate is rigid, while forming laminate can be formed (bent).

Generally, the cabinet industry uses vertical-grade laminate, which is .030" thick. A horizontal grade which is .050"

thick is used for countertops and other high-wear surfaces. Both thicknesses come in forming and non-forming grades. Usually, with forming-grade laminates, the thinner it is, the easier it is to form, and the tighter the radius to which it can be bent.

HPDL comes in sheets, and is applied to a substrate, generally particleboard, primarily with contact cement and mechanical pressure. Codes occasionally call for, plywood substrates for countertops.

The product generally is used on cabinet doors and exteriors. At one time, it was more widely used than composite panels on cabinet doors, but in the last few years composite panels have grown in popularity.

In Europe, for every cabinet using HPDL, four are made with melamine composite panels.

Advantages: HPDL is available in a wide range of colors, patterns, textures, and finishes. It can be obtained with special fire-resistant, abrasion-resistant, or chemical-resistant surfaces. It has excellent stain, abrasion, scuff, and wear resistance.

Disadvantages: HPDL is a fairly expensive product compared to other types of decorative surfacing. It is heavier, is not repairable, and is more difficult to fabricate.

Variations: *Color-through laminate* is similar to standard HPDL, except that melamine color sheets are used throughout instead of a phenolic core (or body). The laminate contains color throughout, and no black line is visible.

Color-through laminate is used primarily for special edge treatments in which the surface is engraved or routed to reveal other colors below. It is not used much in cabinetry, but is used for custom countertops with designer edgings. It is higher priced than ordinary HPDL, and fabrication is more difficult than with ordinary laminates. It is

offered by Formica Corp. under the name "ColorCore," by Wilsonart as "Solicor," and by Pioneer as "Melcor."

Continuous laminate is used primarily in Europe, although some U.S. manufacturers have the capacity to produce it. It is generally thinner than U.S. laminate, and is provided in rolls and cut as needed. In Europe, laminate suppliers usually offer cabinet components as well, and these are manufactured with continuous laminate. Formica Corp. offers a continuous laminate in .016" thickness. It is available in certain stock colors for light horizontal and vertical applications, and can be applied with a vinyl or paper laminator or a hot press.

Continuous laminate is not as impact-resistant as regular HPDL because it is thinner. It can be used on cabinet sides, doors, and shelves, but should not be used on countertops.

Metallic laminates are primarily of two types: a thin (usually .020" or .030") sheet of metal glued to a substrate, or a thin layer of metal on a phenolic core similar to that of ordinary HPDL.

The most popular metals are copper, aluminum, or stainless steel. Copper usually is lacquered to prevent oxidation, and aluminum is anodized. The metal surface can be colored or textured.

Metallic laminates of either type do not have the same wear- or stain-resistant properties as HPDL and require more attention and care. They are used on vertical surfaces only, usually as accents.

Composite Panel

What it is: A composite panel is a layer of kraft paper impregnated with either melamine resin or polyester resin, which is thermoset or thermofused (fused with heat and pressure) to a substrate of particleboard, fiberboard, or some other material. It is sold as

laminated board, unlike HPDL, which is sold in sheets. If is sometimes known as low-pressure laminate, short-cycle laminate, melamine, or MCP. (MCP is a trademark of the Masonite Corp.)

Composite panels generally have just one print sheet on the surface, although some suppliers offer an overlay sheet. Both the front and back of the panels are laminated to avoid warping. Generally, polyester is more prevalent west of the Rockies, melamine east of the Rockies.

Composite panels come in a limited range of colors and patterns, compared to papers (see Impregnated Paper) and HPDL.

Properties: Composite panel is primarily used in vertical or very light-use horizontal applications, such as shelving. It should not be used for countertops. Generally, because it is thermoset, it is joined to its substrate with a stronger bond than HPDL, papers or other surfaces, which are mechanically fused. It becomes part of the substrate surface, and will not delaminate. It is often available cut to size, and sometimes predrilled for the 32mm system of cabinet manufacture.

Although composite panel has been used primarily on cabinet boxes (exterior and interior), today it is used on doors almost as often as HPDL. Because it is laminated on both sides, the product is used for interiors and exteriors simultaneously.

Advantages: Composite panels weigh less than HPDL glued to a substrate, and offer cost savings.

Disadvantages: In general, composite panels have less impact- and abrasion-resistance than HPDL. The range of colors and patterns is limited (Europeans have a wider choice). Composite panels are not repairable.

Clarification: Polyester composite panels are different from polyester finishes such as those often seen on Italian cabinetry. A polyester composite panel is an impregnated paper thermofused to a substrate. Polyester finishes are high-gloss finishes applied directly to wood.

Impregnated Paper

What it is: Impregnated paper is an alpha-cellulose paper impregnated with urea, acrylic, or melamine resins. Sometimes just called paper, or melamine paper, in Europe it is called foil.

It is measured in weight per square meter—ranging from 18-gram weight to over 70 grams.

Generally, impregnated papers come in wood grains and some solid colors. Some manufacturers consider them a synthetic veneer.

Properties: Paper can be used for profiling. It can be embossed in register to simulate real wood grain. It can be used on all substrates. The lower the weight, however, the more likely the paper is to "telegraph" (show defects in the substrate). Low-weight paper is most often used on cabinet interiors, and higher weight on cabinet doors, sides, stiles, and rails. Very low-weight paper is most often used on wall paneling or audio cabinets than kitchen cabinets.

Advantages: Paper is cheaper than HPDL and composite panels. It is about equivalent in cost to vinyl, but usually looks better. It can be used to match existing wood stains and leaves minimal, if any, join lines. The technology, especially in Europe, has improved considerably over the last five years. Cabinet manufacturers get paper in rolls and apply it with contact cement, hot melt, or PVA glues.

Disadvantages: There is a big differ-

ence in price and quality between the heavy and light weights of paper. Generally, the heavier, the more scratch- and scuff-resistant. Heavy-weight paper has an internal impregnation that gives it some surface integrity. Lighter-weight papers use waxes or silicone coatings to protect the surface, and these wear off under use.

A simple test to judge for quality: In an unobtrusive spot, attach a small piece of Scotch tape for a few hours. When removed, the surface should be unharmed on a high-quality heavy-weight paper.

Vinyl

What it is: Vinyl is a plastic film supplied to cabinet manufacturers either in rolls or laminated to panels. It is offered in thicknesses of from two to eight mils. (One mil equals 1/1000 of an inch.) Reverse-print vinyl is a clear film that has been printed on its back side. When applied, it forms its own wear level above the design. Sandwich laminate vinyl consists of a solid-color, surface-printed layer that is covered with a clear wear layer.

Properties: Vinyl can be miter-folded and wrapped, as is often done on stereo cabinets. It comes in solid colors, wood grains and patterns, and can be used on interiors or exteriors, though it is more common on interiors. It can be applied to most substrates, but substrate defects may telegraph.

Advantages: Vinyl is cheaper than HPDL or composite panels, and roughly equivalent in cost to papers. Vinyl is offered in a wide range of colors and patterns. It has tough wear resistance and fair-to-good stain resistance. It will scuff or burnish, but is repairable in some cases with a heat gun and furniture stick.

Disadvantages: When highly glossed, vinyl has a wet, "plastic" look. Satiny glosses or matte glosses reduce this. It is not as attractive, generally, as papers on wood grains.

Hot-Stamp Foil

What it is: Hot-stamp foil is basically paint or ink reverse-printed on a Mylar carrier foil with an adhesive top coat. Heat and pressure activate the top coat and deposit the ink or paint, and the Mylar is peeled away. It is known also as hot-print foil. It comes in wood grains and solid colors and is used more often on edges and profiles than on flat surfaces.

Properties: Hot-stamp foil is self-seaming or self-trimming since it leaves the Mylar backing only where heat and pressure are applied. It can be used on medium-density fiberboard or wood, but not on particleboard as there are too many gaps and defects. It leaves a coating of 3/4 to one mil. It is used primarily on low- to medium-priced cabinets as edging.

Advantages: Hot-stamp foil offers cost savings over most other methods of surfacing. It can be applied to curves and profiles with contoured rollers. There is virtually no evidence of a seam. Many colors and patterns are available.

Disadvantages: There is little resistance to stains, scuffs, or wear, owing to the extreme thinness of the surface. It cannot fill a gap or defect since it is almost without mass. It is less attractive on flat panels than papers or even vinyl.

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