COMPOSITE PANEL ASSOCIATION

SecondWAVE

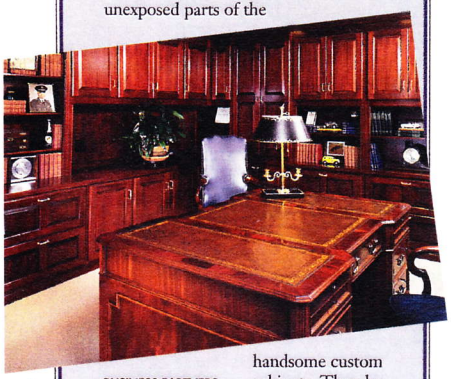
SECOND EDITION THE NEW GENERATION OF COMPOSITE PANEL PRODUCTS

PARTICLEBOARD "THE CHOICE OF EXPERIENCE" FOR GEORGIA CABINETMAKER

Particleboard arrives by the truck-load at Woodstock Woodworks Inc., a custom cabinetmaking shop headed by Vernie Worley in Woodstock, Ga. Worley and his crew have traveled as far away as the Bahamas to work on a client's vacation home, but most of the company's residential clients are in the Atlanta area.

"We do a house a day, and I don't have a dissatisfied customer," says Worley, founder and president of the 37-year-old business, which thrives on customer referrals rather than advertising. "We use industrial grade particleboard on almost everything."

For a recent remodeling project in Atlanta's prestigious Buckhead area, Worley chose particleboard for custom cabinets throughout the upscale house. In the new addition's posh home office, for example, Worley recommended particleboard to the client for all the unexposed parts of the handsome custom cabinets. Then he finished the fronts of the cabinets, as well as doors and chair rails, with solid mahogany, as specified by the contractor. The result is a dazzling display of all that a home office can be.



© David Schilling

BUSINESS PARTNERS: Solid mahogany on the door fronts and particleboard on all the unexposed parts of these custom cabinets make this prestigious home office affordable.

For the kitchen and bathroom cabinets, Worley chose a combination of wood products. "The cabinet frames are of wood because we do dowel joints, and we like to use wood facers for that application," Worley says. "We used particleboard on the cabinet bottoms, back rails and unexposed ends, and MDF on the door fronts."

Worley's company also created the home's elaborate custom closet system using a combination of particleboard and MDF. "One extremely large closet has

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FLEXIBLE, MACHINABLE

MDF Helps Craft Museum Makeover

Engineered wood hangs out in some high-brow company. Patrons of the Seattle Asian Art Museum may not realize they're viewing medium density fiberboard (MDF) along with the artifacts, but the architects responsible for the museum's renovation chose the material most deliberately.

Olson Sundberg Architects in Seattle directed the recent museum makeover. Their task was to make art and setting work together seamlessly with the landmark building's contemporary purpose. The 1933 Art Moderne structure, designed by architect Carl Gould, was originally the home of the Seattle Art Museum, which in time outgrew the space. By the early 1990's, the building needed a face-lift for its new life as the Seattle Asian Art Museum, home to a 7,000-piece Asian collection.

© Michael Shopenn

MDF joins premiere products — travertine, slate and marble — to create a timeless ambiance for the recently renovated Seattle Asian Art Museum.

"Our concern for this design was the same concern we have for all our work: how well can you craft the architecture," says Rick Sundberg, principal at Olson Sundberg and leader of the renovation team. "Some projects are all about perfection and MDF allowed us to get the effect that we wanted.

Crisp design, easy to paint

"MDF gave us a lot of flexibility. For example, its tight surface made for outstanding paintability and its superior machinability gave us the crispness we were after in our design," Sundberg explains. "And compared to solid wood, MDF was a more economical choice for the renovation. The installations look expensive but were very modest in cost.

"In fact, MDF did exactly what we wanted it to do. We couldn't have been happier," continues Sundberg.

The Museum's largest and most problematic space was its Garden Court, a large, sky-lit room that links the building's dazzling Art Moderne entrance hall with its more intimate art galleries. In the Garden Court, the architects' challenge was to give scale to the room's awkward proportions and to anchor art objects on display against possible earthquakes.

In creating the Garden Court's new look, Sundberg and colleague Walter Schacht elected to work with MDF. The architects designed a series of Deco-esque pylons or columns with horizontal grooves that match similar grooves in the room's original travertine wall. The vertical pylons stand against the wall and accommodate art decks or horizontal platforms that display the museum's artifacts. At the far end of the Garden Court, the design team transformed an old fountain into a handsome display platform. All of the room's new installations are made of MDF.

"The pylons are very commanding," Sundberg notes. "We used them to deliberately manipulate space and change the perceived proportions of the room. They are styled to link the room's Art Moderne context with the profusely carved facades of the Indian temples that originally housed the statuary on display.

"MDF allowed us to get excellent results — it's a material that just paints really well," Sundberg says. "In the case of the pylons, we used a gray-green metallic paint that works visually with the museum's original slate floors and travertine walls.

Impressed by MDF's density

"The reaction to the new design has been very positive. When people find out that it's made of MDF, they're astonished. People touch the material, knock on it and are impressed by MDF's density; it has weight to it."

Sundberg's liking for MDF extends outside the museum walls. "Throughout our office we have modular units made of silver-painted MDF, so I'm surrounded by it nearly every day," the architect says. "In fact, we use it in so many designs that I take it for granted.

Environmental benefits

"We also like MDF from an environmental viewpoint since it's made from wood chips and other wood residuals," Sundberg continues. "We — and other architects — are using more and more sustainable products in an effort to make a positive impact on the environment.

"We've found that it takes time to work on clients' perceptions of acceptable products. Still, the more architects take advantage of environmentally-sound materials, the more other people will see how it can be done."

Olson Sundberg Architects chose MDF — finished in a metallic paint — for the visually commanding Deco-esque pylons they designed for the renovated Garden Court of the Seattle Asian Art Museum.

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Particleboard takes center stage on an entertainment island/room divider in the Deck House living room featured in the February issue of *Home Magazine*. Laminate flooring completes the sophisticated mood.

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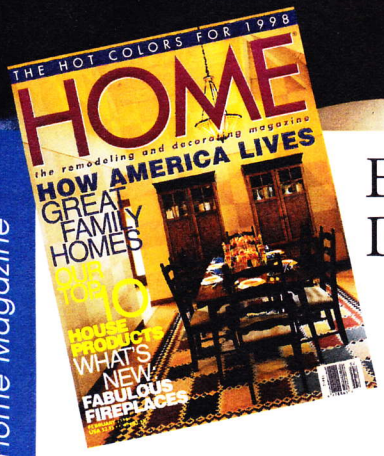


Engineered Wood Is Integral Part of Deck House's Organic Architecture

Not quite a magazine centerfold, particleboard nevertheless takes center stage in a living room showcased in the February 1998 issue of *Home Magazine*. In fact, engineered wood is used throughout the featured Chapel Hill, N.C., Deck House, mixing handsomely with the home's natural wood components.

Deck House, Inc., one of North America's leading designers and manufacturers of quality, custom-built homes, has constructed 8,000 houses for families since its founding 30 years ago. Based on the concept of organic architecture, each Deck House is designed to complement its surroundings and feature the use of fine woods.

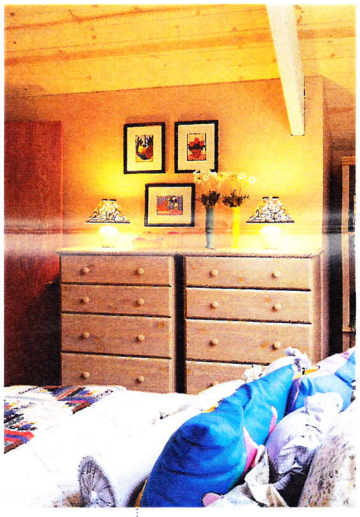
The Deck House recently highlighted in *Home Magazine* offers the publication's 4 million readers ideas and solutions for their own homes. Tours of the house also provide the public with hands-on exposure to new products.

"'How America Really Lives' is the theme of our February issue," explains Gale Steves, editor of *Home Magazine*. "With the Deck House, we designed a home that answers our two most frequent reader questions: is there such a thing as a low-maintenance house, and how can I stretch my furniture budget?

Value, durability and low-maintenance

"We chose products that fit the busy lifestyle of a typical two-income family with kids, meaning the emphasis is on usability and easy maintenance," Steves notes. "Engineered wood products fill a need for value, durability and low-maintenance."

Particleboard and medium density fiberboard (MDF) appear in virtually every room of the *Home Magazine*-decorated Deck House. In the home's largest living space, a handsome entertainment island/room divider effectively creates two separate areas: a living room and a family room. The custom-built unit, finished with high-pressure black, white and wood laminate faces on particleboard substrates, houses a television cabinet on one side and a fireplace on the other.



Dressers manufactured from engineered wood are virtually indistinguishable from the traditional furnishings that the family brought to the Deck House, Steves says.

Laminate flooring is big hit

In the Deck House dining room, which rates magazine cover status, laminate flooring establishes a sophisticated mood with a bold pattern of diagonal stripes.

Laminate flooring is an engineered wood product, constructed by fusing several layers of material under tremendous heat and pressure. Typically, the product's surface layer — consisting of a high pressure or low pressure laminate with a clear, durable melamine finish over a printed design — is bonded to particleboard or high-density fiberboard. Leading laminate flooring manufacturers are duplicating rich wood and inlaid wood looks, as well as stone-look patterns replicating terrazzo, slate, granite and marble.

"Laminate flooring is one of the big hits of the house," Steves notes. "People are surprised at how it unifies the home's public rooms and how we were able to use it with other decorating elements."

High-style furnishings from Sauder Woodworking are also part of *Home Magazine's* Deck House design and include flat-pack desks, cabinets, dressers and chests crafted from particleboard and MDF. "In every room, the flat-pack styles we chose are virtually indistinguishable from the traditional wood furnishings the family already owned," says Steves. "Flat-pack furniture offers a good value, allowing the home owners to extend the family budget. Particularly in the home office, the furnishings crafted from engineered wood create a complete work environment, designed for modern electronics, at a very reasonable price.

"Engineered wood allows you to take an ecological stand because it's made of wood residuals that otherwise would have been thrown away," *Home Magazine* editor Steves comments. "And the result is a strong, versatile product.

"Our readers are people remodeling or building a home, and my job as editor is to show them all the new ideas in the market," Steves continues. "Engineered wood is not really understood by the general public, but it's an important part of the choices we have and people should know it's available.

"One reason we design a project like the Deck House is so readers can see how new products work in the whole ambience of a house," Steves explains. "When they see engineered wood in the context of a real home, it makes a great deal of sense to them. We show by example."

In the Deck House kitchen, the good looks and easy maintenance of engineered wood fit *Home Magazine's* February theme, "How America Really Lives."

Indoor Air Quality and Composite Woods

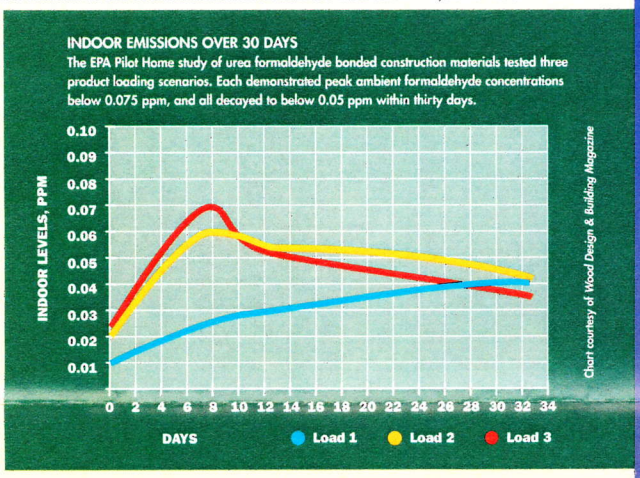
Indoor air quality (IAQ) is of considerable significance to architects and builders and to the occupants of structures they design and build. Without question, IAQ can be a major factor in the health and comfort of building occupants and should be seriously considered in the design process. Architects and builders concerned with IAQ are frequently faced with complex decisions regarding ventilation and source control. One of the major reasons IAQ has become a concern in recent years is that buildings are being constructed to conserve energy, thus reducing the infiltration of fresh air. Fresh air introduced into indoor environments is important in maintaining good air quality.

Yet making sound decisions for controlling the sources of indoor pollutants can be difficult because of the wide variety of pollution sources, including biological activity, building materials, furnishings, and occupant activity. One source of commonly discussed substances affecting IAQ is volatile organic compounds (VOCs).

Most products or materials have VOC emissions. One approach to achieving adequate air quality has been to seek a balance between the sterility of concrete, ceramic and stainless steel, that may emit virtually no VOCs, and the warmer, more hospitable environment of wood, carpets and other materials that may emit minimal levels.

Years of work have enabled researchers to develop computer models that provide reliable estimates of the quantity of indoor pollutant levels, given accurate input of variables. While computer modeling is complicated by ventilation and air mixing rates, temperature and humidity, source strength and loading rates, the presence of emission "sinks," and other factors, we are getting closer to accurately predicting the quantity of substances in indoor air environments. Unfortunately, this is where the science breaks down.

Relating the quantity of VOCs to actual indoor air quality remains the challenge. Technological advances in analytical technique and equipment now make it possible to detect VOCs at the part per billion (ppb) or even part per trillion (ppt) level. But just because a VOC is detected or can be modeled does not mean it is harmful. In fact, some VOCs in indoor environments are considered aesthetically pleasing to many people. For example, pinenes and terpenes (VOCs associated with the "natural wood scent" of certain softwood species) are intentionally added to some household cleaning and deodorizing products. The smell of baking bread is another example of a common household VOC.



Subject to scientific debate

The science of determining what are acceptable indoor levels for various VOCs and what response, if any, occupants may experience from low level exposure to various VOCs is the subject of ongoing debate within the scientific and medical communities. Individuals react differently when exposed to low concentrations of various VOCs. For some VOCs commonly associated with poor IAQ, medical researchers have identified specific concentration levels at which humans may exhibit an adverse reaction. For others, including those typically emitted from wood products, the picture is not so clear.

What role do wood products, and specifically composite wood panels such as particleboard (PB) and medium density fiberboard (MDF), play in the IAQ issue today? A small role, but enough to make them an issue.

There are three basic sources of VOCs from composite wood panels:

Woods: Both softwoods and hardwoods emit VOCs. Over 20 specific VOCs have been identified as attributable to solid wood.

Wood Adhesives: Nearly all adhesives used to produce composite wood products emit some VOCs. Formaldehyde is the best known and is a common VOC emitted from urea and phenol formaldehyde (UF and PF) based adhesives. It is also a naturally occurring compound found in virtually all outdoor air.

Finishes and Laminates: While many wood finishes and laminates can form a nearly impermeable barrier to VOCs from wood and adhesives, they themselves can be significant sources of VOCs.

In North America, most of the PB/MDF produced today is used in furniture or cabinetry where it is laminated or finished in some manner. Even though their products are usually encapsulated, PB/MDF manufacturers have made a concerted effort during the last 15 years to reduce formaldehyde emissions from their products. It is notable that formaldehyde emissions from uncovered PB/MDF have been reduced by over 80 percent since the early 1980s.

The voluntary formaldehyde emission limits established by PB/MDF manufacturers for their products have played a major role in bringing these emission levels down. ANSI (American National Standards Institute) Standards A208.1-1993 for Particleboard and A208.2-1994 for Medium Density Fiberboard (MDF) specify formaldehyde emission limits when tested according to ASTM (American Society for Testing and Materials) 1333, the North American "Large Chamber" test. These standards are widely recognized by government agencies, manufacturers and users in both the United States and Canada. Architects and builders should always specify that composite panel products be manufactured in conformance with these standards.

Emissions guidelines

While there are no hard and fast benchmarks for acceptable levels of VOCs such as formaldehyde, there are a few guidelines. In 1984, the U.S. Department of Housing and Urban Development determined that plywood and particleboard used in manufactured homes should not create an indoor level of greater than 0.4 parts per million (ppm) of formaldehyde. More recently, the U.S. Environmental Protection Agency (EPA) has focused on levels of 0.1 ppm and above as "levels of concern."

In a study conducted by the EPA in 1996, indoor formaldehyde concentrations in a newly constructed unoccupied single-family home peaked below .075 ppm after about 10 days and were below 0.05 ppm 30 days after the products were installed in the home. The test house contained what EPA considered to be "high loading" quantities of UF-bonded wood products (PB/MDF used in floor underlayment, kitchen/bathroom cabinets, hardwood plywood wall paneling and interior doors), with formaldehyde emission characteristics typical of products in conformance with ANSI standards.

Until the science of indoor air quality catches up with the rhetoric, architects and builders must rely on their experience and common sense in making design and material choices. Tightly sealed buildings should have fresh air replacement through natural infiltration or mechanical air exchange. Residential buildings need to be allowed to breathe as much as possible during and immediately after construction or painting when emissions from new construction materials are at their highest. Building designers should also use wood products that conform to North American product standards to help achieve adequate indoor air quality.

The Composite Panel Association[sm]

The Composite Panel Association (CPA) brings together 32 North American producers of particleboard, medium density fiberboard and other compatible products, representing 85 percent of U.S./Canadian production capacity. The newly formed CPA represents the merger of the 37-year-old National Particleboard Association and the 20-year-old Canadian Particleboard Association.

Serving as both industry beacon and advocate, the CPA represents the composite panel/engineered wood industry on technical, environmental, quality assurance and product acceptance issues.

Historically, the association has been a vital resource for both producers and users of the products. The CPA is responsible for standards development, sponsors product acceptance activities and works with federal agencies on the model building codes. In addition, it provides product-testing and third-party certification programs and helps manufacturers create in-plant quality-control programs.

Outreach and education are also prime goals of the CPA. The association conducts seminars to assist specifiers, manufacturers and other users of composite panels. It also produces technical bulletins on installation and usage of particleboard and MDF, and develops publications, videos and other materials to inform key audiences about the attributes of industry products. Current publications include *Particleboard From Start To Finish*, *MDF From Start To Finish*, *MDF Standards*, *Particleboard Standards*, and a series of other Technical Bulletins.

The CPA also supports the PB/MDF Institute, which includes in its membership furniture and cabinet manufacturers, equipment suppliers and CPA members. The mission of the Institute is to communicate the attributes of engineered wood products to a broader audience, which includes consumers.

We'd Like to Hear From You

We welcome news tips from our readers and encourage you to contact us with information or leads regarding applications, installations and additional newsworthy uses of composite panel products by architects, builders and manufacturers. We also invite your queries for further information on any of the companies, individuals, products or processes mentioned in our articles. And, we'd like to know of others in your company who would be interested in receiving this newsletter. Please contact us with your ideas and questions.

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PARTICLEBOARD "THE CHOICE OF EXPERIENCE" *(continued from p.1)*

several cabinets inside it, and we used particleboard on the bottoms and painted MDF on the exposed sections," Worley says. "The closet includes a TV cabinet and even a separate cabinet with many, many individual shelves for each shoebox. It's really a showpiece."

On this project, as on many others, Worley worked with Hren Construction, an Alpharetta, Ga., company that specializes in custom homes. "These are top-of-the-line homes we are building or remodeling, and my clients naturally demand a high level of quality," says builder/contractor Louis Hren, president of 24-year old Hren Construction. "We specify finishes for the custom cabinetry and Worley decides what product to use to get the results we want," Hren continues. "With recent improvements in the quality of particleboard, we have no reservations about using it at all. And as a contractor, I would know if there were problems because I would be the first one called, and we'd have to go back and fix it. But what's rewarding to me is that when clients do call me back, it's to work on their next project."

Worley chooses particleboard for so much of his custom cabinetry, he says, because it is as economical as plywood and it performs better. It's also more stable than solid wood. "Solid lumber sometimes shrinks or expands, which causes problems, and then we have to fix the problem," Worley says. "Particleboard, on the other hand, stays straight and doesn't shrink or expand.

"I also like particleboard because it saws smooth and the edges aren't rough, which saves us a lot of sanding time," he continues. "Some crossgrain plywood edges are rough, and you can't even sand them smooth because the veneer is so thin. And particleboard looks neater. When people open a drawer with a rough bottom, that's the first thing they see, and nobody likes that. We don't have to worry about that with particleboard.

"Particleboard also paints and stains well," Worley adds. "And particleboard nowadays holds screws well."

Worley sometimes educates his clients on the attributes of particleboard. "Some people say, 'particleboard is not that good' and I tell them the problem is not with the board, but because they probably bought something at one time that wasn't designed or constructed properly, and it left a bad taste in their mouth. I don't have any problem taking the bad taste out of their mouth about particleboard."

Every cabinetmaking project at Woodstock Woodworks is a showcase for perfection. "We engineer our cabinets so our clients don't have problems. We use materials in places we should use them," Worley explains.

"We've come to use particleboard as much as we do because we've found it's problem-free," Worley adds. "And when you learn something from experience, you know it for a fact."

POSH AND PRACTICAL: Particleboard creates problem-free built-ins that transform an ordinary space into a luxurious dressing/exercise room in this upscale home.

Specifiers Guide Lists Sources for Wide Range of Composite Panel Products

The Composite Panel Association's (CPA) *1997-1998 Buyers & Specifiers Guide* provides basic information that will enable users to take full advantage of the quality and design flexibility inherent in particleboard and medium density fiberboard (MDF).

Of particular interest is a fold-out chart that clearly shows the diverse range of composite panel products offered by the 65 North American particleboard and MDF plants represented by the CPA. In addition to listing contact information on each plant, the chart contains column subheadings that indicate:

- wood species used,
- the different grades offered,
- flooring and door products (including flooring underlayment, manufactured home decking and door core),
- special items and treatment (30 different options, including fire retardant, moisture resistant, tongue and groove, and various surface treatment options),
- production information (including press size, thickness range and density range).

The guide also describes key areas in which these products can be used, including industrial, kitchen cabinets, countertops, laminated paneling, floor underlayment, manufactured home decking, stair treads, shelving, doors, door jambs, mouldings and millwork. For each of these, the guide describes the most appropriate products, design considerations and applicable industry standards. It also explains how wood geometry, resin levels, board density, additive levels and the manufacturing process can be modified to provide enhancements for specific end uses.

The guide also explains the benefits of both particleboard and MDF and contains a chart delineating the property requirements for grades of particleboard and MDF according to ANSI A208.1 and ANSI A208.2 standards.

For a copy of the *1997—1998 Buyers & Specifiers Guide*, contact the CPA at 301/670-0604 or at www.pbmdf.com.

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