

UV Powder Goes to the Garage

By Steve Couzens

A new market has emerged literally overnight, and the speed at which it has grown has certainly been helped by UV-powder technology on medium density fiberboard (MDF). Let us investigate how today's garage cabinetry came upon us so quickly and why it is here to stay.

New housing starts, both single-family and condo/duplex style, have risen at record levels the last three years (Figure 1). The Southern and Western regions of the United States experiencing this major growth do not typically build basements, rather opting for larger garage areas of storage. New homes with three car garages are now commonplace in many mid- to upper-class neighborhoods across the Midwest. Neighborhoods have become small communities among themselves, with more bicycles and cars in the

driveway than ever before. Another factor is that garages have become "the man's kitchen" rather than just a place to park the car. A man's tools used to be reflected in a small tin box with a handle and a car was just a mode of transportation. Not so anymore. The man of today spends more time in his garage/work space area tinkering, building and fixing, and has so many more things to store.

Garage Storage Cabinets with UV Powder to the Rescue

Garage storage cabinets and "finished" floors and walls are now sought after for a more upscale and usable space. Flexible design parameters of MDF and the CNC machining center offer an excellent opportunity to meet the wide variety required for sizes and layouts of garage storage systems. MDF takes advantage of the fact that it is an "engineered wood" instead of natural lumber so it is a very consistent material that can be easily machined, shaped and painted. Engineered wood is a composite panel, consisting of a blend of various hardwood fibers that are combined with a synthetic resin bonding system and joined together under heat and pressure. The various thicknesses of MDF used for garage organizer systems is dictated by the use of the component, but typically 3/4" is used for cabinet doors and drawer fronts, and 1/2" or 5/8" for end and side panels.

This is where the UV-powder finishing process plays a very important role. A lower temperature heating zone is required for preheating the MDF parts as they begin their 24-minute

FIGURE 1

Process temperature/dwell time analysis thermoset vs. UV cure

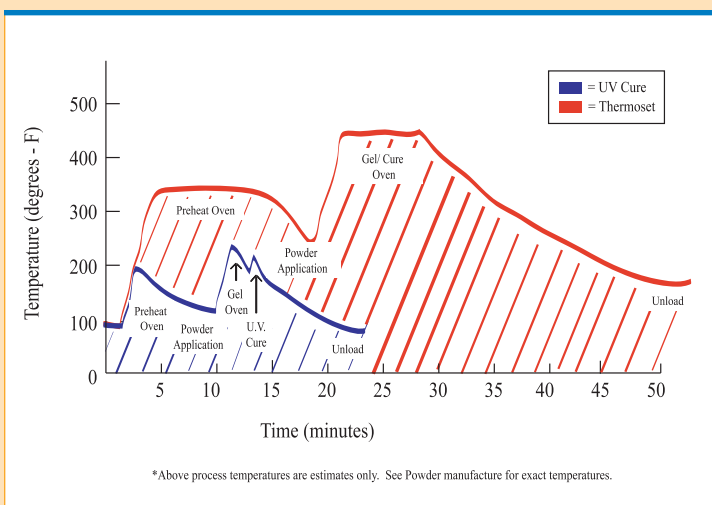
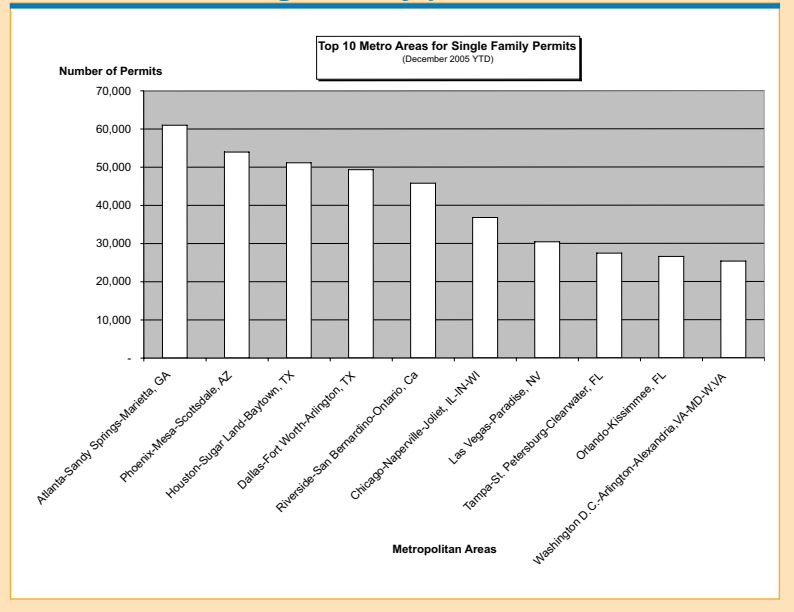


FIGURE 2

Metro areas for single family permits



ride through the total UV-powder coating process. Since we are not using heat to crosslink and cure the applied powder, there is no reason to “load up” the MDF with heat as would be required with a heat-cured thermoset powder (Figure 2). Higher temperatures tend to dry and crack the MDF. What we are using to cure the UV powder is light that activates the photoinitiators that are mixed into the powder formulation, inducing a crosslinking reaction of the monomers and oligomers (Figure 3). This crosslinking process takes place in the UV-lamp chamber of the finishing line, which is directly after the melt and flow oven (Figure 4). This is also referred to as the gel oven, but it is never called the cure oven, as that term is only used in a thermoset powder system.

MDF for Cabinet Construction

Many garage organization systems incorporate tall thin doors with a short opening radius. This is so the door may be opened and closed while the car is still in the garage. MDF is utilized for

this type of door because it will remain flat and straight. It does not exhibit the size change or warp caused by various weather conditions and temperature climates that lumber does. For example, in the Midwest the natural wooden garage entry door gets very tight and tough to open and close as the heat and humidity climbs in July and August, due to the swelling nature of wood fibers. In the winter months, freezing cold and dry conditions tend to shrink the wood fibers, leaving you to feel cold drafts. You should be very careful before putting a whole garage system of natural lumber doors and drawers into such extreme weather-directed environments. Thus, engineered wood, being a composite panel of various hardwood fibers combined with a resin-bonding system under heat and pressure, has been carefully evaluated.

MDF is a natural choice for cabinet doors and drawer fronts that are routed out with various designs. Being engineered wood instead of natural wood, the consistent density of MDF allows for intricate and precise

machining tolerances and finishing techniques. MDF comes in a variety of thicknesses, giving the designer and builder many choices and combinations from which to work. The composite panel has excellent flatness and delivers clean edges upon cutting and routing. The pocket hinge or hidden hinge is very popular with today’s cabinet designers and this can be routed out with extreme accuracy on a consistent basis. Another positive factor is the weight of the MDF. The heavy and dense nature of the MDF gives the overall door a feeling of sturdiness and quality.

Water Proof MDF Wall Panels

A newer grade of MDF is now available that gives new meaning to the term waterproof. This material is 1/2", 5/8" or 3/4" thick and makes excellent wall panels that can be placed directly onto the garage floor. Because of the special properties that prevent swelling, mildew, termites and rotting within these boards, these panels can be placed right to the bottom of the garage floors. Some garage systems offer the 4-foot high “wanes coating” look, with routed groove lines representing the panel appearance. The direct contact with the damp, moist, cold garage floor is one of the areas that this product was designed to excel.

These specially made waterproof panels accept UV powder very well. They machine well on the routers and easily sand in preparation for painting. The finished product looks exceptional, and it will remain that way in the rainy, damp, humid conditions of many southern and coastal states. These tough wall panels give the garage system a totally finished look and offers the homeowner a wall surface that will not easily nick, dent or gouge. This is a major improvement over the typical drywall boards used today, which get

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**WHEN THE SURFACE IS
HEAT SENSITIVE ...**



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BE SERIOUS**

IT'S TIME TO CONSIDER THE CURING POWER OF PULSED UV

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- Peak penetration: this ensures complete curing
- On/off process control: no warm up is required
- Safe: no VOCs are created and it is mercury free
- Flexible and OEM friendly: our small size system can be configured to individual applications
- Elegant: perfectly simple design and operation—no water cooling, no shuttering, no rotation necessary



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soft and mushy in rainy, humid weather. The homeowner has a strong, more solid place to hang wall shelves and various hooks when using an MDF wall panel rather than drywall.

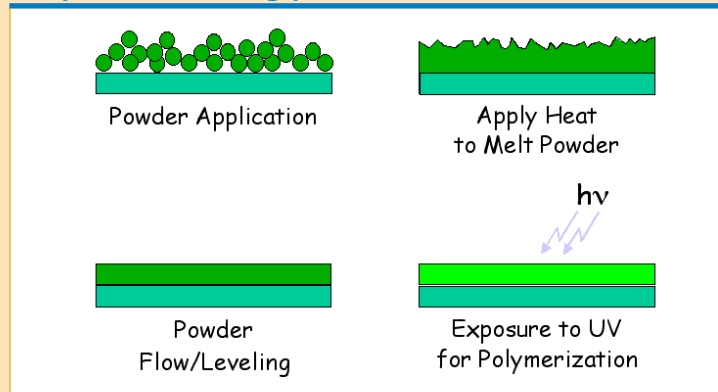
UV Powder Adds to the Quality of the Garage System

With the MDF already having an excellent surface hardness rating from the mill, a UV-powder application simply increases it. The chemistry formulation of UV powder yields an excellent hardness factor on its own, and when you send the MDF component through the lower temperature ovens, there is much less stress on the core of the board. This simply means a more stabilized final product coming off the end of the paint line. Thus, when powder coating an MDF door that is 16" x 80" x 1/2" it is essential to keep this door flat and UV powder makes it possible.

Another area of quality that the homeowner is looking for in his garage organizer system is a uniform looking finish from component to component. The electrostatic spray application process of UV powder

FIGURE 3

UV-powder coating process



onto the lower surface temperature MDF gives a very consistent powder film build of 3-4 mils on the edge of a drawer front as well as in the middle of a three foot square wall panel that is only 1/2" thick. Once again, because we are only curing the UV-powder coating and not extensively heating the MDF, we are able to produce much more consistent looking parts.

The Added Bonus for the UV Powder Coated Garage

The market for garage organizers is new, but the word has already gotten

out. Those words are: "return on investment." The finished garage, with a professionally designed, UV-powder coated garage organizer system is now one of the top five benefits of buying/owning a particular home. Real estate people have noticed the comments and reactions from potential buyers. Even homes that have been on the market a long time and not sold are being affected. Sellers have added brightly colored UV-powder coated MDF cabinets to their garage, put the same property back on the market with an increased price to cover the garage cost and sold quickly.

The well-designed and good-looking garage gives visual evidence of how the owner treats all of his investments, and which something the "man of the house" can certainly be proud.

Today's "marketplace of goods" dictates that quality be very evident, the design appealing to the eye, and the value received be worth the investment. Once again, UV powder on MDF has proven this to be true. ▀

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FIGURE 4

UV powder production line layout

