M.L. CAMPBELL®
WOOD FINISHING SYSTEMS

GUIDE TO FINISHING

MDF

MEDIUM DENSITY FIBERBOARD

M.L. CAMPBELL®
WOOD FINISHING SYSTEMS
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Application Specifications

Solvent System
Lower Grade MDF Board

1. Sand all flat surfaces with 320-400 grit no-fil sandpaper, and sand all routed areas with 400-600 grit no-fil sandpaper.
2. Seal all routed areas with one coat of MAGNALAC® Clear Pre-catalyzed Lacquer reduced 50%.
3. Sand entire surface with 320 grit no-fil sandpaper.
4. Prime entire surface with one coat of CLAWLOCK® Primer/Undercoater reduced 10%. Apply at 4-5 mils wet.
5. Sand entire surface with 320 grit no-fil sandpaper.
6. Prime entire surface with one coat of CLAWLOCK® Primer/Undercoater reduced 10%. Apply 4-5 mils wet.
7. Sand entire surface with 400 grit no-fil sandpaper.
8. Topcoat with one coat of M.L. Campbell Pre- or Post-catalyzed Pigmented Coatings in desired color and sheen. Apply at 4-5 mils wet.

Solvent System
Good Quality MDF Board (Small Pore)

1. Sand all flat surfaces with 320-400 grit no-fil sandpaper, and sand all routed areas with 400-600 grit no-fil sandpaper.
2. Prime entire surface with one coat of CLAWLOCK® Primer/Undercoater reduced 10%. Apply at 4-5 mils wet.
3. Sand entire surface with 320 grit no-fil sandpaper.
4. Prime entire surface with one coat of CLAWLOCK® Primer/Undercoater reduced 10%. Apply at 4-5 mils wet.
5. Sand entire surface with 400 grit no-fil sandpaper.
6. Topcoat with one coat of M.L. Campbell Pre- or Post-catalyzed Pigmented Coatings in desired color and sheen. Apply at 4-5 mils wet.

   CLAWLOCK® Primer/Undercoater must be catalyzed with 10% Care Catalyst before reduction. Over-catalyzing can cause damage to the wood and under-catalyzing can slow down the cross-linking process.

MDF (Medium Density Fiberboard)

MDF provides many advantages over most other wood-based composition sheet material. Smoothness, surface stability and resistance to cracking by the elimination of joints are just some of these advantages. MDF can be constructed of small particles of hardwoods, softwoods, a combination of the two and in some cases, even paper. An adhesive is added to this mixture and the small particles are compressed under high pressure. MDF will be identified in different densities of pounds per cubic foot of pressure used in the manufacture of the board. Higher pounds of pressure and smaller particle size contribute to the smoothness and stability of the surface and the cutting/grooving possibilities to achieve a uniform finish. In most cases, the high density (48 lbs./cubic foot) MDF is easiest to work with when finishing and requires fewer coats to produce a good finish. High quality MDF is easily finished on perpendicular and folded edges without the need for elaborate filling application of lippings or other bonded edging materials.

Surface Preparation

MDF panel-routed areas and edges should be cleanly cut with sharp, quality tools and free from saw or cutter marks before the finishing process starts. When milling and finishing MDF, it is important to remember that MDF is constructed of small particles of wood adhered together under pressure. Worn tools, or the wrong type of tool, will continually pull these small particles of wood from the board. This leaves behind a very coarse-textured surface with many voids, requiring extra finishing steps. High temperature and abrasion during cutting contribute significantly to cutting tool wear when machining MDF. The best way to develop a smooth profile is to use ceramic router bits, diamond-coated tool materials or some of the newer carbides now available. The quality of the initial milling process will greatly affect the amount of labor necessary to achieve a good quality finish. After milling, all cut surfaces will be porous and more absorbent than the uncut areas. Routing will also create fiber raising. To minimize this raising, sand the milled surface with 320-400 grit sandpaper, before the first coat is applied. Using a coarser grit sandpaper pulls out small particles of wood, leaving a void that has to be filled during subsequent finishing steps. At the same time, all unmilled flat surfaces should be sanded with 320-400 grit no-fil sandpaper.

Some MDF is supplied UV-filled. This presents a very dense, smooth surface in unrouted areas for finishing. When preparing UV-filled board for finishing, the surface should be very well sanded to assure proper adhesion of the finished system to the UV-filled MDF. The flat surfaces should be sanded with 180 grit sandpaper and finished as soon as possible after sanding. Coatings applied to unsanded UV-filled MDF will not exhibit proper adhesion.

Common Problems

Finish Absorption

The finish may show excessive absorption over the entire face area, often in irregular patches. This is most commonly caused by the use of finishes with low solid content and low viscosity.

Soft Finish/Poor Cure

While this can be caused by a variety of factors, one of the most prevalent is a high wax content in the MDF board. The wax is drawn up into the finish coat, causing the finish to improperly cure.

MDF Uniformity

To produce quality MDF board, one type of wood or a mixture of woods with the same properties must be used. Hardwoods tend to absorb a finish differently than softwoods. Mixing these types of woods or a manufacturer's board on a given job can lead to finishing problems.

Free Ammonia

Ammonia is used in some board manufacture to limit the release of formaldehyde. If excessive free ammonia is present, it can result in yellowing of white coats and, in some cases, improper curing of acid-catalyzed finishes. Excessive free ammonia can also cause certain veneers, such as oak, to become discolored.

Poor Quality MDF Board

Low quality MDF board can have voids, a soft porous interior or general quality variations that can result in excessive finishing problems.

Improper Conditioning of the Board

MDF board should be at room temperature, and moisture content should be 8±2% for machining or finishing. Unusually low moisture content in the MDF board at the time of manufacture increases the risk of edge cracking of thick paint films.

Coating Weight

Too much coating weight can lead to film cracking, especially in edge areas. Too little coating weight will provide an insufficient film barrier to moisture penetration into the MDF substrate. It is important to follow the coating manufacturer's recommendation on finish application.

Finishing MDF

MDF board has been a standard of the European wood finishing industry for many years. M.L. Campbell is able to offer a unique, high performance cross-link coating system for finishing MDF board. CLAWLOCK® Primer/Undercoater is an ultra high solids primer/surfacer based on the latest European and North American formulation technology. This two component (amino-alkyd) primer/surfacer is formulated with the necessary solids to fill voids in MDF board. It provides an excellent adhering, chemical-resistant, moisture-resistant base for the application of finished coats.

In addition to our solvent systems, M.L. Campbell is able to offer our customers a technologically advanced water-based system for finishing MDF. Although the water-based systems do not have the high solids that are obtainable in the solvent-type MDF finishing system, the water-based systems will exhibit excellent results when applied to properly prepared MDF board.

Application Specifications

Water-Borne System

1. Sand all flat surfaces with 320-400 grit no-fil sandpaper, and sand all routed areas with 400-600 grit no-fil sandpaper. When applying Water-Borne Coatings to MDF, it helps to lightly mist edges with water, then sand.
2. Prime entire surface with one coat of POLYSTAR™ Water-Borne Primer/Surfacer. Apply at 4-5 mils wet.
3. Sand entire surface with 320 grit no-fil sandpaper.
4. Prime entire surface with one coat of POLYSTAR™ Water-Borne Primer/Surfacer. Apply at 4-5 mils wet.
5. Sand entire surface with 400 grit no-fil sandpaper.
6. Topcoat with one coat of POLYSTAR™ Pigmented Water-Borne Lacquer in desired color and sheen. Apply at 4-5 mils wet.