

Working with highwood[®]/Everwood Material

highwood[®]
NATURE'S CLOSEST RIVAL

everwood

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GENERAL INFORMATION

highwood® synthetic wood material is our proprietary high-grade poly alternative to real wood. This unique material is at the core of many of our products, including all of our furniture brands and Everwood dimensional lumber. It can be handled and machined in a similar fashion to natural wood. Most methods used for storing, fabricating, and cleaning real wood can be used with *highwood*® products, making it an extremely versatile material. This section provides useful guidelines that will help you get the most out of our synthetic lumber and the products that we make from it.

Storage

As with real wood, *highwood*® material should be properly supported and protected from the elements when stored. Avoid prolonged exposure to direct sunlight or excessive temperatures (>100°F or 38°C). Usually, storing the products as packaged will provide the necessary support. The best practice is to store *highwood*® profiles indoors on a clean, flat surface and covered to protect from dirt and dust. *highwood*® material expands and contracts with temperature, therefore the product should be at room temperature before fabricating to ensure proper measurements.

MACHINING

It is important that all saw blades, cutters, and drill bits used to cut the material be kept sharp. Dull tools increase the heat generated while machining, which may soften or melt the material and result in a poorly machined surface. Any build-up of 'plastic sawdust' may melt around the tool and also cause a poor surface.

Cutting

highwood® materials can easily be cut with circular blades (table saw, radial arm saw, miter saw) and band saws. Use caution with reciprocating saws (e.g., jig saws) as heat generation can melt the material; we suggest using low RPM and high Orbital setting when using reciprocating saws. Circular saw blades should be carbide-tipped with no more than one tooth per inch (maximum: 20T for 7-1/4 inch blades, 30T for 10 inch blades). Blades designed for 'fast ripping' tend to work well (example: Diablo 24 tooth 10 red). ATB-alternating tooth bevel-style blades with a 6° to 12° rake are a good selection. Pushing the material through the saw, or plunging the saw into the material as fast as is safely possible will give the best cuts.

A blade lubricant such as silicone spray can be used to help reduce friction and hence keep heat build-up to a minimum. Saw blades must be in good condition: flat and sharp. Blade wobble or diameter run-out will create friction and soften the product. Select a blade with the thinnest possible kerf that provides adequate stiffness. Using blade collars to reduce blade wobble is advisable. As with real wood, the material should always be cut from the 'show side' to the back face to avoid chipping of the finished surface.



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Drilling

highwood® material can be drilled using all types of drills (e.g., brad point, split point, step drills). For larger diameter holes, Forstner bits work very well. Care must be taken to frequently remove the waste as the hole is drilled to avoid heat build-up and melting of the ‘plastic sawdust’. Coated drills (titanium nitride) reduce friction, and are highly recommended. Drill speeds should be 400 to 900 RPM to minimize heat generation. High feed rate provides the best results. Push/plunge the bit through the material as fast as is safely possible is recommended.

Planing & Jointing

highwood® material can be planed or jointed just like real wood. Planing the product surface exposes the foam’s cell structure which, while not detrimental to performance, can be sealed if you prefer. A high-quality sanding sealer works well. Removal of the exterior ‘skin’ of the product should be done evenly on both sides of the profile when possible to minimize any induced stresses, bows or twists which may occur when the product expands or contracts.



Routing

A router can be used to create dados, rabbets, round-overs, and other design elements. Carbide tipped tools should be used, and spiral up-cut style bits are best. Straight flute bits create friction and cause melting of the material. High bit speed and feed rates are recommended. For cutting depths greater than 3/4" (20mm), an air knife should be used to continually remove the waste material from the bit. Routing on CNC equipment is ideal and produces furniture grade cuts.

JOINING & FASTENING

The type of joining method used will depend on the final application and strength requirement of the joint. More than one method of joining may be used in a joint (e.g. glue AND screw). Most standard woodworking joints (e.g., mortise and tenon, lap joint) are effective for joining *highwood*® material.

Screwing

A variety of screw types are suitable for *highwood*® materials. The greatest holding strength is achieved with parallel thread, coarse pitch screws. Exterior wood screws with a type 17 point work particularly well. Pre-drilling is advised in thick boards or when using long screws. Highwood is quite hard, and screws can shear if holes are not predrilled.

For exterior use, select a proper corrosion-resistant fastener. Stainless steel is superior for corrosion, but are quite soft so predrilling is particularly recommended for SS screws. Ceramic-coated screws are strong and provide good corrosion resistance. GripRite brand deck screws work extremely well, and typically do not require predrilling.

Joining with pocket screws is an ideal method of making butt joints. Using a jig, such as supplied by Kreg Tools (www.kregtool.com), to create the pocket holes and subsequently gluing and screwing creates a strong butt joint.



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Nailing/Stapling

Nailing is not effective for fastening thick profiles of *highwood*® material; screwing or stapling is preferred. For thinner profiles, nails should not be closer than 3/8" from the edge of any profile. Pneumatic nailers can be used for finish nails and brads, and work very well on thinner boards (maximum 1x nominal boards material with a 0.68" actual thickness).

Stapling is an effective method for fastening thinner boards and is preferred over nailing. Medium and wide crown staples used with pneumatic staplers are best. Corrugated staples should not be used with *highwood*® materials. Pneumatic tools should be fitted with an air regulator and operated at no greater than 75 PSI.



Gluing

A wide range of adhesives are suitable for gluing *highwood*® material, including solvent-based and solvent-free products. Water-based adhesives (standard woodworking glues) will NOT bond *highwood*® material. Care must be taken when using solvent-based adhesives, as the solvent will alter the appearance of the material if it gets on the finished surface. Adhesives produced by Testors (#3501GA, #3503GA, #3521GA), GOOP, and IPS Weld On (#16) are recommended. Other solvent-based adhesives can be used, but may not develop comparable bond strength. Solvent-free adhesives, such as Gorilla Glue, 3M's Scotch Weld (#TE- 031), 3M's Jet-Melt (#3764), and Titebond (#5492) work well with *highwood*® materials. These products yield strong bonds and excess glue can be removed by sanding. Other solvent-free adhesives made by 3M, namely Super 77 and Super 90 are available in a spray can and provide an excellent structural bond with *highwood*® materials.

Each of these adhesive products set in 1 to 7 minutes, and therefore require pressure to be applied during this time. In all cases, the parts to be bonded must be clean and free of dirt and dust to achieve a good bond. Clamps or assembly jigs are the best method for forming good joints. After the adhesive sets, a cure time of 1 to 2 hours is required to build sufficient bond strength before working with the material. Whatever type or grade of adhesive is selected, the usage and safety instructions supplied by the adhesive manufacturer must be followed.

Product #	Type	Form	Advantages	Disadvantages
Testors #3501 GA	Solvent Based	5 gallon pail Squeeze Tube	Quick Dry, Very Strong Bond	VOCs, Odor, Drips and Runs will Mark Surface
Testors #3503 GA	Solvent Based	5 gallon pail Squeeze Tube	Extra Fast Dry, Very Strong Bond	VOCs, Odor, Drips and Runs will Mark Surface
Testors #3521 GA	Solvent Based	5 gallon pail Squeeze Tube	Non Toxic, Low VOC's, Very Strong Bond	Drips and Runs will Mark Surface
IPS Weld On #16	Solvent Based	5 gallon pail Squeeze Tube	Readily Available, Strong Bond	VOCs, Odor, Drips and Runs will Mark Surface
3M Scotch Weld #TE-031	Solvent Free	Cartridge	No VOC's, High Early Strength, Strong Bond	Requires Special Applicator, High Cost
3M Jet Melt #3764	Solvent Free	Cartridge	No VOC's, High Early Strength, Strong Bond	Requires Special Applicator, High Cost
Tite Bond #5492	Solvent Free	Caulk tube	Strong Initial Tack, Readily Available, Low Cost, Easy Application	Moderate Bond Strength
3M Super 77	Solvent Free	Spray Can	Readily Available, Easy Application, Versatile, Fast Setting, Good Bond	High Cost
3M Hi-Strength 90	Solvent Free	Spray Can	Clean Application, Strong Bond, One Minute Dry Time	High Cost

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Bending

To produce curved products, *highwood*® profiles can be bent using a jig or form. To bend, heat the profile to 195 to 215°F (100°C) in a convection oven, hot box, or hot liquid bath. Heat only long enough to make the profile pliable (time varies with profile thickness: typical 7 to 15 minutes). Overheating will cause the foam to expand and the profile will become misshapen. By contrast, if the profile is not hot enough, it may wrinkle when bending. Trials are required to define the amount of time and specific temperature for your equipment and each profile. Remove from the oven and shape in the jig; allow to cool. The ends of the profile will 'mushroom' so be certain to allow approximately 2" (50mm) to be trimmed on each end.

FINISHING

Unlike real wood, *highwood*® materials is supplied with a finished surface. Therefore, care should always be taken to protect the surface during manufacturing and shipping of finished goods. However, if the surface is scratched or marred, it can be repaired.



Sanding

Machine or hand sanding can be used to remove scratches or tool marks (after machining). Disc or orbital sanders should not be used, as they generate heat and can soften the material. Belt sanders, pad (palm) sanders, drum sanders all work well, as does hand sanding. *highwood*® material can be wet or dry sanded. To remove fine scratches, use #0000 steel wool in the direction of the grain and then apply a soft wax such as bee's wax or carnauba wax before buffing with a soft cloth.

Painting

Highwood material can be painted just like real-wood and holds paint very well. Any high-quality exterior paint can be used — suggested brands include:

- Rust Oleum Oil-Based Enamels
- HGTV Home by Sherwin Williams Weathershield Exterior Paint
- Valspar Duramax Exterior Paint
- Behr Ultra Exterior Paint

The paint can be applied by brush or roller, by aerosol spray or by an air-compressor driven paint sprayer — all will produce excellent results. In each case be sure to apply thin layers and build up the color slowly — since the *highwood*® material is a closed cell structure and does not absorb moisture, the paint will not "soak" into it — instead you are looking to build up clean and thin layers without causing running. No sanding or priming is necessary, just ensure that the material is free of dust and dirt. Exterior acrylic enamels and Alkyd (oil-based) exterior paints will provide the best performance. If using an aerosol spray can be sure that it does not include any aromatic hydrocarbons (E.g. Xylene, Toluene).

For more tips on painting take a look at the video [here](#).



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Staining

highwood® material does not require any staining, painting or preservative treatment to maintain its appearance. However, stains can be used on the material to alter the color of the product — especially on cut areas of the material. Water-based acrylic stains, such as made by Cabot Stains, work very well. Alkyd-based stains or varnishes also work well. Gel-type stains provide more uniform staining and are recommended. Avoid any stain that contains aromatic solvents (e.g., toluene, xylene).

Sealing

Surface sealers, such as urethanes, sanding sealers, or waxes, can be used to seal *highwood*® products. Do not use sealers with aromatic solvents (e.g., toluene, xylene). Be certain to test a small area first before applying the sealer to the entire surface.

Filling

Large holes from drilling or other fabrication processes can be filled by doweling the hole or filled with plastic wood products, such as Minwax High-Performance Wood Filler and ZAR Latex Wood Patch. Dowels can be sanded smooth to blend with the surrounding product. Plastic wood fillers can be stained to blend with the Highwood color.

MAINTENANCE

Little maintenance is required to keep *highwood*® material looking good. The product should be cleaned as needed to remove dirt and debris. No abrasive or harsh chemicals should be used on the product. Aromatic solvents (e.g. toluene, xylene) or cleaners containing aromatic solvents (e.g. Citri-Solv) should never be used on *highwood*® materials.



Cleaning

As the season starts — time to wash away the winter blues. Give your *highwood*® lumber a scrub as follows:

- Fill a bucket with hot water and dish soap
- Use a rag and the soapy water to wipe the surfaces clean of dirt
- For any dirt that remains in the wood-grain (NatureTEX) surface, use a soft bristle brush
- Rinse with fresh, clean water
- For a deeper clean — to really get grime and surface contaminants out of the NatureTEX grooves and cut edges of the lumber, use a power washer with a medium nozzle setting

For a quick clean

- You may use most common household water-based cleaners (Windex, 409, Murphy's Oil Soap, Simple Green, bleach, etc.).
- If your cleaning product is not in this list, simply test it on a hidden area
- DO NOT use cleaners that contain aromatic solvents (e.g., toluene, xylene)

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REPAIR

Minor Scuffs & Scratches

Minor scuffs in *highwood*® profiles can easily be removed by gently buffing with '0000' steel wool. The steel wool blends the scuff or scratch with the surrounding material, and leaves the area with a slightly different patina than the original product. Now that the scratch is removed, the area can be polished with Pledge furniture polish or Carnuba wax to bring up the luster to blend with the virgin profile. Please visit our web page for a short video at highwood-usa.com/pages/care-maintenance.

Deep Scratches

To remove deeper scratches in the product, use a single-edged razor blade to skive the high spots from the surface of the product. Holding the razor blade perpendicular (the tip of the blade directly against the product) to the profile, scrape the surface along the length of the scratch to shave off the raised edges of the scratch. This typically requires 2 to 3 passes with the blade along the length of the scratch. Once the raised edges are removed, use the steel wool and wax technique (noted above) for blending out the area.



Large Dents

For large dents and gouges, use 'sawdust' from the same color *highwood*® profile and lacquer thinner to make a 'plastic wood' patch compound. In a small container, and using the proper personal protective equipment (e.g., gloves, goggles, ventilation) for the solvent, mix some sawdust with a small amount of lacquer thinner to develop a thick paste. Fill the gouge with the paste, smoothing the surface of the patch as best as possible. After the patch dries, use a razor blade to skive off any high spots, and then buff with steel wool and polish the area to blend the color and complete the repair.

INSTALLATION

Installation of *highwood*® materials is quite similar to wood products of similar dimensions (width, thickness). Typically, spans of 16" O.C. are acceptable for decking products of 1" thickness or greater. Trim products (less than 1" thickness) installed in sheltered areas (limited direct sunlight) can also be fastened 16" O.C. Trim products installed in highly exposed areas are best installed on a full backer (sheathing or similar) and fastened 16" O.C. Trim products can also be installed by gluing, with a full coverage of appropriate adhesive.

highwood® profiles expand and contract with temperature, and are not affected by moisture. Thermal expansion is comparable to other synthetic lumber products. Approximately 1/8" should be allowed for a 16-ft board between butt joints. Boards can be fastened tightly side-by-side.