

FINISHING HARDWOOD FLOORING



FINISHING/REFINISHING MANUAL

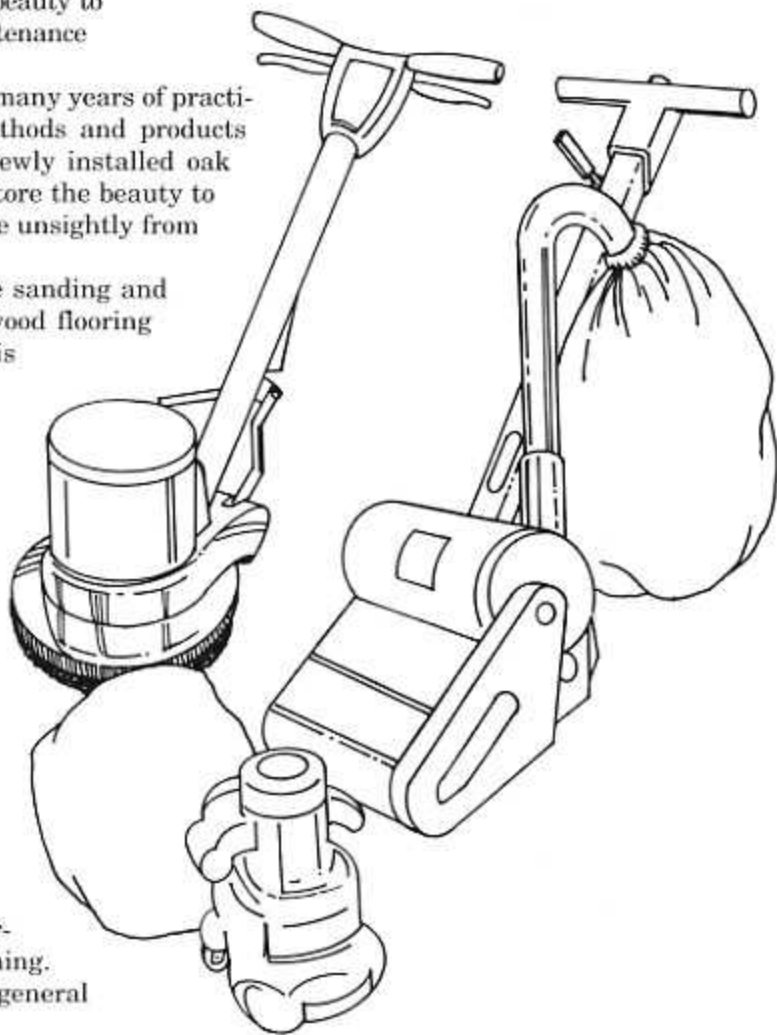
Wood flooring that carries the NOFMA/WFI trademark/certification is a precision-made product of enduring beauty. The proper finish enhances both grain and color and protects the wood. Poor quality or poorly applied finish allows the wood's natural beauty to deteriorate and creates an unneeded maintenance problem.

In this manual we have incorporated many years of practical experience. Described are some methods and products that give a beautiful, lasting finish to newly installed oak and other hardwood flooring. How to restore the beauty to existing hardwood floors that have become unsightly from wear or neglect is also covered.

NOTE: This manual covers only the sanding and finishing methods. Installation of hardwood flooring over different types of construction is described in *Installing Hardwood Flooring*, the manual available on that subject from the Wood Flooring Institute.

Should you encounter a situation not covered here or have additional questions, contact NOFMA: The Wood Flooring Manufacturers Association, Technical Department for assistance. Phone (901) 526-5016 from 8:30 a.m. to 4:30 p.m. Central Time, Monday through Friday, or FAX (901)526-7022 any time.

Acceptable floor finishing materials are produced by many manufacturers, who have also developed application procedures appropriate for their products. Read the manufacturer's instructions thoroughly **BEFORE** proceeding with finishing. The instructions given here are of a general nature...



Where they vary from the label instructions of the product or equipment being used ALWAYS FOLLOW THE MANUFACTURER'S DIRECTIONS WITH REGARD TO SAFETY EQUIPMENT AND INSTRUCTIONS.

**OTHER WFI PUBLICATIONS
OF INTEREST**

Installing Hardwood Flooring - Information on installing hardwood flooring in many types of construction.

Wood Floor Care Guide - How to keep hardwood floors beautiful with minimum care; tips on stain removal and other subjects.

Copies of these manuals are available on request to the Wood Flooring Institute, P. O. Box 3009, Memphis, TN 38173-0009.

Most major producers of wood flooring in the United States are members of NOFMA: The Wood Flooring Manufacturers Association, an organization that upholds industry standards. The NOFMA/WFI trademark/certification on flooring is your assurance of quality and that it was produced by a member of NOFMA/WFI.

***NOFMA: The Wood Flooring Manufacturers Association
supports sustainable forestry and the responsible stewardship
of all natural resources.***



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The specifications and instructions contained herein supersede all previous and undated publications from NOFMA/WFI.

WHEN TO BEGIN THE FINISHING PROCESS

Since a near-occupied environment was established prior to installation, it is recommended that unfinished flooring be allowed to acclimate 1 to 3 weeks before proceeding with sanding and finishing operations. This acclimation allows the flooring to react and move as the environment dictates so that slight cracks, slightly raised edges, etc., can be sanded, filled, and finished to give the best appearance. Longer periods of exposure to job site abuse and moisture can result in future problems.

After finishing is completed, temperature and humidity should continue to be maintained at near occupancy levels.

NEW FLOORS - Applying the finish to the hardwood floor should be one of the last jobs of any construction project. This prevents the traffic of workmen from marring the finish. Wall coverings should be in place and painting completed except for a final coat on the base molding.

OLD FLOORS - Remove all furniture, rugs, and draperies from the room. If you're planning on wall repair, painting or applying wall covering, do that work before you refinish the floor so paint or paste will not drip on the new floor.

SANDING EQUIPMENT NEEDED

A drum or belt *wood floor* sanding machine, an edger or spinner, appropriate sanding paper or belts and edger discs, in COARSE, MEDIUM and FINE grits. (See *TIPS* #2)

NOTE: The drum or belt sanding machine that has a separate lever for raising and lowering the sanding drum is preferred. The lever provides additional control during the sanding process. Always wear ear protection.

A floor polisher 15" to 17" diameter, 200 rpm or less, with a sanding disc attachment and sanding discs or sanding screens in fine grit, also white or brown buffing pads.

Hand tools and miscellaneous equipment: broom, vacuum, hammer, 6d to 8d case nails, nail set, nail puller, long handled paint scraper, hand sanding block and sandpaper, 2"- 3" putty knife and prepared wood filler, oscillating electric sander - if available. For repairing boards: circular saw, 1/2"-1" chisel, pry bar, hand saw, block plane, wood glue, drill, utility knife, replacement flooring.

PREPARING THE FLOOR FOR SANDING

Sweep the floor clean immediately before sanding. Inspect the floor carefully - tighten any loose boards by face nailing with flooring cleats or 6d to 8d flooring nails, preferably into joists, look for any protruding



Fig. 1. Before sanding an old floor remove the base shoe. Use a wood wedge behind the pry bar to protect the baseboard from damage by the bar.

NOTE: If the base shoe and base have been painted many times, leave them in place.

nail heads or nails not driven down below the wood's surface, pull them out or counter-sink them with a nail set and replace any damaged or defective flooring boards (sanding exposed nails can produce sparks creating a fire hazard in the sander dust bag).

SANDING A NEW STRIP OR PLANK FLOOR

Load the drum sander with a coarse grit to medium grit sandpaper (See *TIPS* #3 & #4). Place the machine along the right hand wall (unless making an angle pass as described in *TIPS* #5 through #7), with about two-thirds of the length of the floor in front of you. Start the motor with the drum raised off the floor, walk slowly forward at an even pace and ease the drum to the floor. As you near the wall at the end of the pass, gradually raise the drum off the floor. Practice before turning on the machine.

Cover the *same* path you made on the forward cut by pulling the machine backward and easing the drum to the floor as you begin the backward pass.

When you reach your original starting point ease the drum from the floor. Move the machine to the left side approximately three to four inches. Then repeat the forward and backward passes and move to the left after completing each set of passes. You will only sand a 3" to 4" wide strip of un-sanded area with each set of passes. When the two-thirds area of the room is sanded, turn the machine in the opposite direction and sand the remaining third in the same manner. Be sure the sanding passes made in the one-third area overlap the first passes by two to three feet. This blends the two areas together.

After completing the first sanding operation, or "cut", with the drum sander, use the edger to sand along the baseboards, up to corners, in closets, and other areas the drum sander did not reach. With new flooring, which is relatively smooth, use the next grit

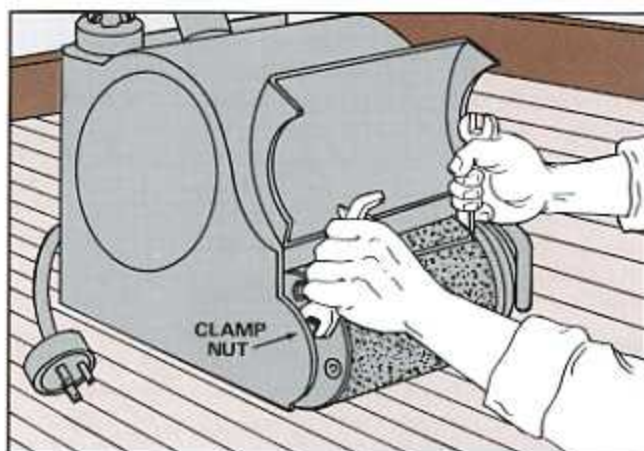


Fig. 2. To load the drum sander, thread sandpaper into the loading slot, turn the drum a full revolution and slip the other end of the sheet into the slot. Tighten by turning the nuts at both ends of the drum. Don't *overtighten* and over-compress the drum rubber, which stresses sanding paper, widens slot, and increases chatter. Some sanders may take sanding sleeves or belts. Others may have a clamp to hold paper on the drum. **ALWAYS UNPLUG** sander when changing paper.

sandpaper that will be used on the drum sander. With old flooring it may be necessary to use the same grit paper as the first drum cut to remove old finish or level abused areas. (See *TIPS #9*)

If a medium grit cleans and sands the floor completely, use it for the first cuts. If extra passes are required to clean and level the strips go to a more coarse grit paper. The first cut with drum sander and edger should produce a level, completely sanded floor (with corners and obstructions to be scraped later). All following sanding procedures merely remove the sanding scratches produced by the first cut. (See *TIPS #10*)

When using the edger move in an easy quarter-

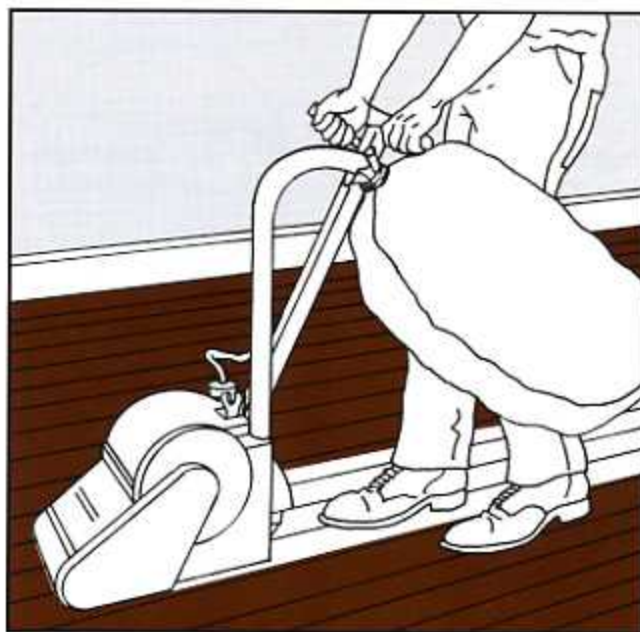


Fig 3. *Never* let the sanding drum touch the floor *unless* you are moving the machine forward or backward. If that happens you will cut a hollow in the floor that is difficult to remove. (See *TIPS #8*)

circle pattern at end walls overlapping into the drum sanded area 4"-6", and following the direction of the grain, to some extent. (See Figure 5.) Do not try to make the edger cut more aggressively by putting extra pressure to the front. This merely makes ridges and grooves which are hard to remove. Along walls parallel to flooring direction, move back and forth with the direction of the flooring, also overlapping into the drum sanded area. The edger typically cleans a 1" to 2" strip on each pass.

After drum sanding the floor with a coarse grit sandpaper, repeat drum sanding with a medium grit sandpaper. For the edger, use fine grit sandpaper. If coarse was used on the first cut use medium grit and

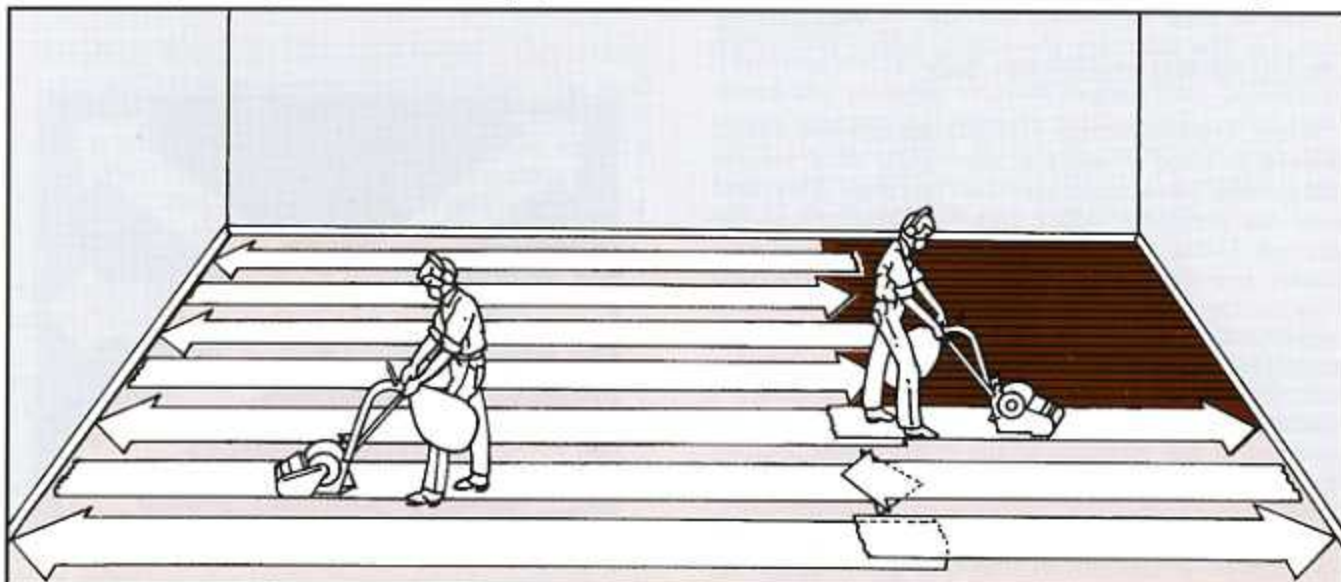


Fig 4. Sand in the longest direction of the room, starting at the right-hand wall. Move forward and backward, then move the machine to your left a few inches and make another pass. After sanding two-thirds of the room, turn the machine 180° and sand the remaining one-third.

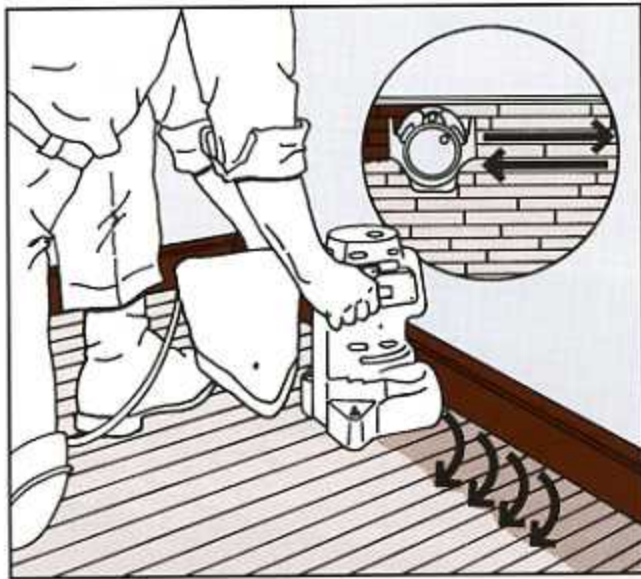


Fig. 5. Use the power edger to sand up the baseboard and in other areas the drum sander won't reach. Follow the direction of the grain along side walls. End sanding strokes along the grain at the end walls. Overlap into drum sanded area.

follow with fine grit on the edger. Complete the sanding operation using the fine grit sandpaper on the drum sander.

Generally, filling of nail holes, blemishes, cracks, etc., should be done before the fine sanding cut. Use a commercially prepared wood flooring filler. Some fillers may need coloring or may not take a bleaching operation; check with the supplier or manufacturer.

Also, it may be necessary to trowel fill the entire floor, particularly an old floor, due to the extent of cracks between strips. Multiple character marks found in #1 and #2 COMMON Grades which are fillable grades may also require trowel filling. Trowel filling should be done before the medium or final sanding cuts. Let the filler dry *thoroughly* before proceeding with the sanding. (Overnight is best.)

When drum sanding and edging are completed proceed to hand scrape and then hand sand corners and around doors and other cased openings. Also hand sand the perimeter edges. Use the same grit as the last cut. Using a sanding block or electric oscillating sander can facilitate the hand sanding process. If staining the floor a dark color, the electric oscillator may leave egg shaped marks which will show in the stain. Hand sand these out or do not use the oscillator.

When using a hand scraper apply even pressure, scraping in the direction of the grain. Avoid gouging the wood with the scraper. A brick with a piece of old blanket glued around it makes a good sanding block. Sand about 6" into drum sanded area. Always sand and scrape in the direction of the grain along the length of boards.

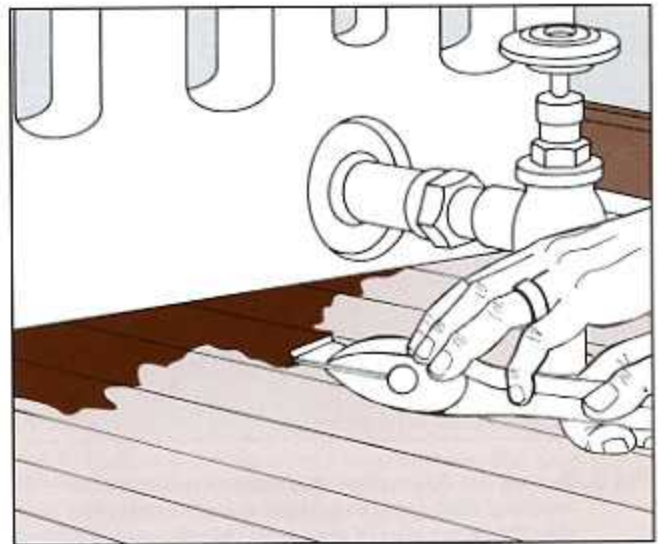


Fig. 6. A hand scraper is used where the edger does not reach, and to remove old finish in tight spots. Always scrape in the direction of the flooring grain. Then hand sand or oscillate scraped area. Stripper (See TIPS #9) may be used where scraping is difficult, such as under radiators or between stair balusters.

Using a sanding disc (one grit finer) or screen disc (same grit as fine cut) on the buffer over the entire floor can also improve blending of edged and drum sanded areas. (See TIPS #11) Move buffing machine back and forth with the direction of flooring boards.

If the floor is to be stained a light to medium color, the fine sanding cut with 80 grit sandpaper leaves the wood fibers open and enables more stain to penetrate, producing a deeper shade and more uniform appearance. An option is to screen with an 80 grit after the fine sanding cut, particularly if the fine cut was 100 grit. Use of the buffer and screen increase the risk that circular scratches will show if a dark stain is applied.

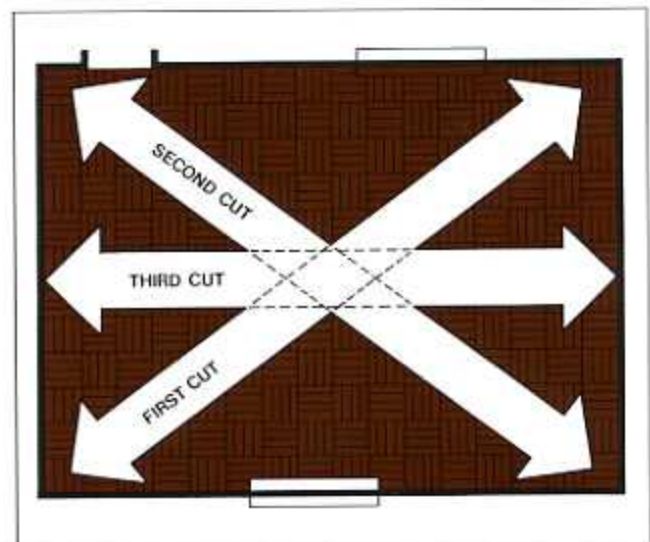


Fig. 7. Parquet, block, herringbone and similar floors.

Three sanding cuts followed by screening or discing is the recommended procedure and will provide a uniform surface for most all standard finishes. Two cuts followed by the screening or discing operation may be sufficient but may produce a more coarse surface and is considered a minimal sanding procedure.

SANDING PARQUET, BLOCK AND SIMILAR PATTERNED FLOORING - Use the drum sander and edger for two sanding cuts. With the first cut do not sand directly across or with the pattern but always on an angle. Start the first sanding cut diagonal to the grain using a medium grit sandpaper. Then use fine grit sandpaper for the second cut on the opposite diagonal. Use the buffer and screen or disc to make a final fine cut with the room's longest dimension. (See Figure 7.) (A coarse first cut is usually not necessary.)

REFINISHING AN EXISTING FLOOR - Most solid wood flooring is 3/4" thick and can be sanded and refinished a number of times. Thinner wood floors, solid or engineered - 1/2" or 3/8" thicknesses - should be refinished with caution because repeated sandings can wear down the groove edge, causing breakage or wear through to reveal nails. With laminated flooring, professional sanding is recommended.

To determine the floor thickness remove a floor heating register or the shoe mold and baseboard so that an edge of the flooring can be measured.

When refinishing floors, remove as little of the surface as is absolutely necessary. This is particularly true with veneered and thinner floors. On square edge strip flooring that is face-nailed, all nails must be driven slightly below the surface of the wood to permit sanding.

The following instructions apply to standard 3/4" strip, plank and block floors and, with the cautions just mentioned, to the thinner materials.

Sanding. It may be necessary to use a very coarse "open coat" paper to remove the old finish. The heat and abrasion of the sanding operation make the old finish gummy and may quickly clog normal sanding paper. First try regular paper (particularly on a diagonal). If 90% of the finish is removed and the floor is generally flattened, coarser grits are not necessary. (See TIPS #3) When you get down to new wood use the same procedures and grits as previously described under "Sanding a New Strip or Plank Floor". If the old floor has been painted several times it may be necessary to use paint remover to uncover the wood surface. (See TIPS #12)

The number of sanding passes required for "Refinishing" will be largely determined by the condition of the old floor and the thickness of the finish being removed. If the surface is in *very good* shape, with only light scratches and few dents, and has no build-up of old finish and wax, one pass with the disc

sander and fine paper may be sufficient. Be sure all the old finish is removed.

If the floor has been abused, scarred or dished, use as many cuts as are necessary to get a smooth, unblemished surface. If badly scarred and abused boards have not been repaired, it may be advisable to leave some blemishes in the floor or too much sanding may be required. (See TIPS #2 #5 #8)

With a floor that is in fair condition, make the first cut at a 45°± angle to the flooring direction with medium grit paper to level the floor and remove 90% of the finish. Then follow the instructions given for sanding a new floor on the succeeding cuts. Use the same grit paper as was used on the 45° cut for the first cut parallel to the flooring strips.

PREPARATIONS FOR FINISHING

IMPORTANT: Allow ample time with the sanding procedure to apply the first coat of stain or other finish the same day that sanding is completed. This prevents a raised grain condition which creates a rough surface.

When machine and hand sanding are completed sweep and vacuum the floor. Wipe up and/or vacuum all dust on windows, sills, doors, door frames, and baseboards.

Inspect the floor carefully. Spot-fill missed cracks and nail holes with a commercial flooring filler, applied sparingly with a putty knife. When dry, hand sand with fine sandpaper, same grit as final sanding.

IMPORTANT: Check with finish manufacturer or supplier to make sure fillers are compatible with finish materials.

For future re-finishing, it is essential to know the brand names and color of the stain and other finishing products used, or if the floors were prefinished at the flooring manufacturing plant.

FINISHING

Immediately after sanding is completed the finishing process should begin. This process involves applying a protective coating and a color, if desired, to the flooring. Finishing produces a uniformly enhanced surface and seals the wood to make it less absorbent to moisture and foreign materials.

GENERAL TYPES OF FINISH MATERIALS

IMPORTANT: Read entire label before applying finish and use only compatible products. Compatibility questions between different materials should be referred to the finish manufacturers.

Always follow ALL of the manufacturer's safety precautions, especially for skin contact, ventilation, breathing apparatus, fire hazards and disposal.

Penetrating Seal. This sealer soaks into the wood pores and hardens to seal the floor. It wears only as the wood wears, will not chip or scratch and is generally maintained by thin applications of wax. After years of wear the floor can usually be restored without sanding by cleaning it and applying another coat of sealer or a special reconditioning product. Worn areas can usually be refinished without showing lap marks when new finish is applied over the old. A penetrating sealer may also contain stain which colors the wood while sealing it.

Stain or stain sealer combination. Staining is the first step in the finishing process if other than a natural finish is desired. The oil stain with a penetrating sealer in combination is generally easiest to apply and accomplishes two things, coloring and sealing, in one application. Stain only (without sealers) requires more care with the application in order to avoid uneven coloration and lap marks. A stain only generally requires 8 hours or less to dry (*Read directions*). The combination products (stain and sealer) require at least overnight or up to 48+ hours to dry in stagnant, damp, or humid conditions.

Fast-drying sealers and stains. These products should be used only by a person who is accustomed to handling and applying them. The mechanic should be able to complete the job within the allotted drying time to avoid lap marks or a splotchy appearance.

With a sealer/wax system, most manufacturers recommend two coats of a penetrating sealer, then wax. A reconditioning product is generally available for use when traffic or other conditions cause discoloration or wear of the finish. These reconditioning products restore the floor to its original appearance without the need for sanding.

With a surface finished system, one coat of sealer generally followed by two coats of the surface application produce satisfactory results. FOLLOW THE MANUFACTURER'S DIRECTIONS.

Application: Stain or penetrating sealer can be applied by hand wiping with rags, by brushing, or with a lambs wool applicator. Start application in one corner along one edge of the room and move with the direction of the flooring. Use a paint brush to apply to flooring at wall lines. "Cut in" about 2" or 3" from walls to avoid smearing moldings. Apply liberally with rags along the length of the starting wall in a strip you can reach across.

When using an applicator apply a heavy streak of material along the grain; leave about one foot of space from the wall-side application. Go to where this stripe was started. Do not re-dip; use the excess material to fill in the empty space, wiping across the grain. Maintain a uniformly stained area to a particular line or run of boards across the room.

Distribute material evenly, do not leave puddles or



Fig. 8. A long-handled lamb's wool applicator is excellent for applying penetrating seal finishes or pigmented wiping stains. Spread generously in the direction of the grain; wipe up excess.

a heavy excess on the surface. Wiping up the excess can follow almost immediately after the applicator moves away from the corner area. The length of time the stain is allowed to remain on the floor, to some extent, will determine the degree of color tone. Use clean rags and wipe up the excess material left on the surface of the flooring. Repeat the application and wiping process, working parallel to the stained area across the room. Be sure to overlap by one strip into previously stained area and wipe the overlap well or else an area that appears darker (a lap mark) can result.

NOTE: Do not allow stain/penetrating sealer to dry before wiping. DO NOT allow water drops, sweat, or bare hands and knees, etc. to come in contact with the unstained and stained areas or discoloration and imprints will result.

After completing the first coat allow to dry overnight or longer, as necessary. Use a #1 steel wool pad or white or brown fiber buffing pad on a floor buffer and buff the floor. Clean, vacuum, and dust residue. (*See TIPS #13 & #14*) If only stain was used, apply sealer as the next step.

If the SEALER / WAX SYSTEM is the final finish, apply a second coat of sealer and allow to dry. Neutral color should be used if no additional colorant is required. After drying, if rough to the touch, this second coat should also be buffed with #1 steel wool or a fiber pad, and the floors cleaned of residue. Paste wax or liquid buffing wax is then applied and buffed to a satin sheen with the buffing machine. (*See Protecting the Finish Page 9*) To apply a thin coat of paste wax place a walnut size glob of wax in an old cotton athletic sock. Heat from the hand will melt the wax as the pad is rubbed over the floor; let dry before buffing.

SURFACE FINISHES - These finishes remain on the surface of the floor and form a protective coating.

Polyurethane, "Swedish Finish", Moisture Cured Urethane, and Water Based Urethanes to name a few are blends of synthetic resins, plasticizers, and other film-forming ingredients. All are durable, moisture-resistant finishes. These finishes are generally available in high-gloss, semi-gloss, satin and matte, except moisture cured urethane. Any one of them is a good choice for a kitchen where there is exposure to water splashing or spills.

Oil Modified Polyurethane is generally the most common surface finish. It is durable and moisture-resistant, and generally the easiest to apply. This type finish tends to amber slightly as it ages.

Water based finishes (Urethane and/or Acrylic combinations) These are clear, durable, non-yellowing and are non-flammable at time of application. They generally have advantages similar to Oil Modified Urethanes without the odor of mineral spirits, and they dry much faster.

Moisture Cure urethanes are harder and more moisture resistant than the other surface finishes and are generally available only in gloss. They cure by absorbing minute quantities of moisture from the air, which causes them to dry and harden. Relative humidity is critical to the curing process. *Follow manufacturer's directions.* These finishes are extremely difficult to apply properly and are best left to the professional.

"*Swedish Finishes*" (Acid Cure Urethanes) are also durable finishes, generally harder than polyurethanes. They are clear, fast drying and resist yellowing. Type



Fig. 9. When using a brush to apply a surface finish, work in the direction of the boards in a path narrow enough to keep a wet edge. Lap strokes back into area just covered.

of undercoat, working time, number of coats, and other factors are all critical and make application difficult. These finishes should be applied *ONLY* by the highly skilled.

If a *SURFACE FINISH* is to be applied (i.e. Polyurethane, Water Based Urethane, etc.) after the application of stain and sealer, be sure the floors are *completely dry*. Follow by buffing the sealed floor with #1 steel wool, a buffing pad or a fine screen and completely vacuum up residue. (See *TIPS #14*)

NOTE: If water based urethane is to be applied **NEVER** use steel wool. Steel fibers rust on contact with water and will discolor the finish. Use an abrasive nylon screen or fiber buffing pad (white or brown).

Oil Modified Polyurethane APPLICATION. Follow manufacturer's instructions and safety recommendations. Turn off open flames (don't forget pilot lights) and shut off AC/heating units, if recommended. Stir material well but avoid bubbles. Pour into clean paint tray or bucket. Apply to flooring with brush or lambs wool applicator. Start application along one edge of the room with the direction of the flooring. Cut in at the wall with a paint brush. Apply Polyurethane along the length of the starting wall in a strip you can easily reach across.

Brushing. Fill 1/3 of brush with finish, dab off excess drip, apply a liberal amount with smooth even strokes along the grain. Watch out for splattering. Do not over-brush which will introduce bubbles. Work from where finish has not been applied into the area that is still wet, feathering out the lapped areas.

Applicator. Fill applicator with finish, dab off excess drip, and apply across the strip direction in short strokes, working toward previously wet area. Straighten cross strokes with a single gliding stroke along strip direction, feathering into previously applied wet area and lifting the applicator up.

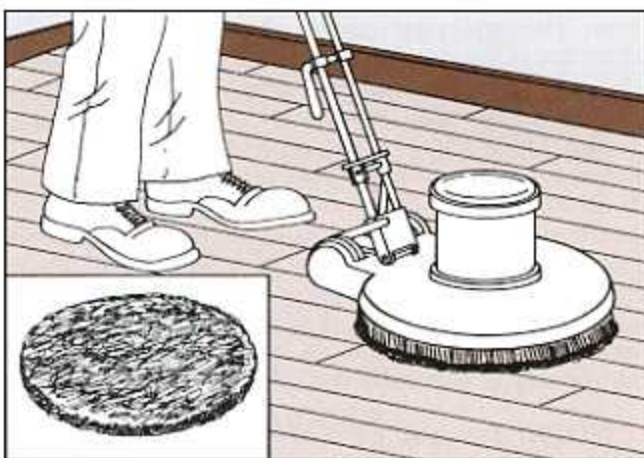


Fig. 10. Professional floor finishers generally use a single circular steel wool pad about 1/2" thick. With a new sharp pad, start in a closet to avoid cutting into finish or stain.

Apply finish in parallel strips across the room. Always maintain a "wet" edge. Don't retouch missed areas (holidays) if finish has begun to skim over. The next coat will fill these areas. Allow to dry overnight.

When dry walk over the floor, especially perimeter exterior walls and feel corners. If the finish sounds or feels tacky it is not dry. **WAIT FOR IT TO DRY.** Buff the *completely* dry finish with #2 steel wool pad or a used 120 grit screen, or hand sand with 120 to 150 grit sandpaper.

NOTE: If finish does not powder when buffing, additional drying time is recommended. Tacky finish residue can knot up and accumulate on the buffing wool, screen, or sandpaper and scratch the finish.

Merely dull all the finish. Don't forget to hand sand or steel wool corners and edges. Too much buffing removes finish material to the extent the sealer/stain is exposed or removed. (See *TIPS #13*)

Vacuum up all dust. Tack floors with a lint-free towel (wrapped around a bristle broom) and *slightly dampened* with water or 100% mineral spirits. Let floor dry *completely*.

Apply second coat. A third coat may be desired for increased protection and durability. Buff between coats to dull the surface.

Water Based Urethane APPLICATION. Follow manufacturer's instructions. Turn off AC or Heating units, if recommended. Pay particular attention to coverage figures, open time, and when-to-buff instructions. Use catalyst, if required, stir in and let stand if recommended. Pour finish into *non-metal* tray or bucket. Apply to flooring with brush recommended for water based materials, paint pad, or manufacturer supplied applicator.

Most water based materials are applied by pouring a "small river" along the starting wall near the "cut in" area. The applicator "plows" this material along the direction of flooring the length of the room with excess directed toward unfinished area. As finish material is used, re-pour the "small river" and continue application. Open doors or use fans to exhaust moisture laden air when finish films over and is dust free to facilitate curing. Some manufacturers recommend buffing the rough raised grain after the first coat. Some recommend application of a second coat in 3-5 hours without buffing. *Follow buffing directions and use fiber pads or screens.* A third coat is generally recommended. Application of more than two coats in one day is generally not advised.

NOTE: Do not over-work material. Keep renewing the small river of material and be sure to maintain a wet edge in order to avoid gaps and excessive foaming.

WHITE FLOORS

BLEACHING. Bleaching is generally used to lighten the natural coloration and subdue the darker characteristics of flooring. Bleaching is generally followed with an application of a white or pastel stain. Application of these products should be done by the professional. Before using a bleach be sure the flooring is clean and free from oils, grease, and old finish that might repel the bleach and give an uneven effect. Use only bleaches specified for wood flooring and follow application and drying directions carefully. Some products need neutralizing after application. Extra time is required to complete the bleaching process and allow complete drying.

It's a good idea to make a test area in an inconspicuous place, since the length of time the bleach remains on the floor and the amount used will affect the degree of color removal. Also, bleaching White Oak can result in a greenish coloration.

The bleaching process should be done *only once*.

A white stain may be applied before the surface finish. (See *TIPS #15*) Check that all products are compatible with the stain and/or sealer used and that a non-ambering surface finish is used. The final sanding cut with an 80 grit paper is advised with white stains. This promotes absorption of the larger coloring particles of the stain into the flooring. Be sure the excess stain is wiped from the surface. Follow by buffing when stain is dry. Stain residue on the surface of flooring can interfere with adhesion of the final finish.

NOTE: Seasonal cracks, surface discolorations, and dirt are VERY noticeable and may be objectionable in a white floor.

RECONDITIONING

You should first determine what type of finish is on the floor so appropriate materials can be used.

To determine if a floor was originally finished with a penetrating seal, scratch the surface with a coin or other sharp-edge object in a corner or some other inconspicuous space. If the finish does not flake off, a penetrating seal was probably used and a reconditioning product can be applied to restore its original beauty. **TEST AN AREA.**

If the finish flakes in the corner, a surface finish was probably applied to the flooring. Next check for wax. Wax interferes with intracoat adhesion so re-coating over wax is *not recommended*. Attempt to smudge the surface in the same corner with your finger. If a smudge is evident, wax is probably present and complete re-sanding and finishing is indicated.

With *Surface Finishes* which have not been waxed you can recondition by re-coating if the finish has not been worn away to expose bare wood.

To re-coat surface finishes first remove furniture, etc. Next clean floors with a non-residue cleaner designed for polyurethane on wood floors or non-aromatic 100% mineral spirits. Dull the finish surface with steel wool, a sanding screen or paper as required by the type of finish used for re-coating (See appropriate finish section) Apply a compatible finish using appropriate application techniques as described in finishing.

CAUTION - Adhesion between coats of surface finishes is affected by wax, grease, and some maintenance products, as well as some types of stains, bleaches or sealers. One brand or type of finish may not be compatible with another. Check with manufacturer for compatibility. *Make a test in a closet or some other inconspicuous place* to be sure the finish will adhere and dry properly. This is particularly important when refinishing an old floor since some of the old finish may have penetrated the wood below the level to which it is sanded.

OTHER FINISHES

VARNISH AND SHELLAC - These products were commonly used as floor finishes before today's modern formulations were introduced. However, they are rarely used today, and generally are not considered as durable as the modern finishes. Shellac is not recommended for use as a floor finish since it shows water spots readily. NITRO-CELLULOSE LACQUERS are hard and brittle and scratch easily (very flammable when applied).

STENCILING - Decorative borders or overall floor patterns can be applied to hardwood floors with the use of stencils. However, this job should be done by a professional finisher familiar with these procedures.

PROTECTING THE FINISH

Penetrating Sealer. For the final touch of beauty and to protect the sealer, apply a coat of good wax. Use either a liquid buffing wax or paste wax. Use only brands that are designated for hardwood floors. If a liquid, be sure it has a solvent base (has the odor of mineral spirits) and does not contain water.

The wax will give a lustrous sheen to the floor and form a protective film that prevents dirt from penetrating the finish and will help prevent scratches.

Be sure the finish coat is thoroughly dry before applying wax. Apply a thin coat of wax, let dry and buff with a #1 steel wool pad. For increased luster follow by buffing with a polishing pad or a thick pile wool carpet remnant.

Waxing a commercial installation creates a slipperiness hazard. Gymnasium and roller rink floors should never be waxed. They require special maintenance procedures and products.

Surface Finishes. If you wax a polyurethane finish it can not be re-coated, but must be sanded and re-finished when wear patterns become prominent.

NOTE: Most manufacturers of surface finishes do not recommend waxing. Check manufacturers recommendations.

MAINTENANCE

Wood floors, properly finished, are the easiest of all floor surfaces to keep clean and new looking. Unlike carpeted or resilient floors that show age regardless of care, wood floors can be kept looking like new, year after year, with minimum care.

What is minimum care? A good rule of thumb is to vacuum or dust mop weekly. **Always check with the manufacturer for their recommendations on cleaning and maintenance.** If the floor is waxed, occasional buffing helps remove scuff marks that may appear in the wax coating. A waxed floor need only be re-waxed once or twice a year, or as often as needed in heavily traveled lanes using a paste wax, liquid buffing wax, or wax/cleaner combination. Wax-coated finishes should never be cleaned with water, not even with a damp mop. **Read the label.**

For surface finished floors (polyurethane and the like), before you use any cleaner, check with the manufacturer of the finish used on that floor for their recommendations.

Do not generally wet a floor with water or any cleaner which requires mixing with water. A cloth or mop wetted with water and squeezed dry may be used to wipe up food and other spills, provided the area is buffed dry immediately.

Never intentionally pour water onto a floor. Excessive amounts of water may find a way to seep between the boards or into scratches causing wood fibers to swell and affect the finish.

GYM AND ROLLER RINK FLOORS

The procedures for sanding and finishing a wood sports floor are similar to those described for other wood flooring installations. Type of finish(es) and number of coats are generally established within contract and plan specifications.

Use only products approved for such applications. Follow the specific finishing instructions provided with each product. Deviations from the recommended procedure may affect quality and performance of the finish.

OVERALL APPEARANCE

For more details on the care of your floors, write the Wood Flooring Institute and request a "Wood Floor Care Guide".

After reading this Manual and performing the directed tasks either by you or a professional, your beautiful hardwood floor will be ready to be inspected for acceptance.

Inspection should be done from a standing position with normal lighting. Glare, particularly from large windows, magnifies any irregularity in the floors and should not determine acceptance.

A finish similar to that found on fine furniture should not be expected. Trash in the finish, a wavy look along strips, deep swirls or sander marks, and

splotchy areas can be indications of inadequate finishing or cleaning. The quality of the finish can be acceptable and still include some of these problems, but *they should not appear over the entire floor.*

The perimeter and hard to reach areas (i.e. under radiators, around cabinets and cabinet cut-outs, closets, corners, etc.) are most likely to contain these irregularities.

Again, when inspected from a standing position these irregularities may be present but *should not be prominent.*

GENERAL OUTLINE

For Sanding

NEW or EXISTING FLOORS IN GOOD CONDITION

NEW or EXISTING FLOORS IN ROUGH OR ABUSED CONDITION

Inspect Repair and Clean

Belt/Drum Sander-
Belt/Drum Sander-
Edger-
Edger-

Coarse Cut 36 or 40 grit

Diagonal Coarse Cut 36 or 40
Straight Coarse Cut 36 or 40
Coarse Cut 36 or 40

Medium Cut 50 or 60 grit

Clean and Sweep

Belt/Drum Sander-
Edger-

Medium Cut 50 or 60 grit

Medium Cut 50 or 60

Medium Cut 50 or 60

Clean and Sweep

Spot Fill or Trowel Fill Floors if Necessary

Edger-

Fine Cut 80 or 100 grit

Fine Cut 80 or 100

Belt/Drum Sander-

Fine Cut 80 or 100 grit

Fine Cut 80 or 100

Clean and Sweep

Hand Scrape Corners and Inaccessible Places

Hand sand perimeter and scraped areas or use oscillating sander if stain is to be natural to medium brown.

Use buffing machine and fine screen.

Clean and VACUUM

Seal or Stain and Seal

Steel Wool* or Screen or use Fiber Pad

Clean and VACUUM

SEAL AND WAX FINISHES-

Apply 2nd coat sealer

Wax

Polish

SURFACE FINISHES*

Apply 1st finish coat

Screen or steel wool

Clean, VACUUM, Tack

Apply 2nd finish coat

If necessary screen or steel wool

Clean, VACUUM, Tack

Apply 3rd coat

*Do not use steel wool with water based finishes.

TIPS FOR STRIP/PLANK FLOORING:

1. Use personal protective equipment as recommended by manufacturer.
2. Generally used floor sanding grits:
 - Very Coarse - 20, 24, 30, (open coat)
 - Coarse - 36, 40
 - Medium - 50, 60, 80
 - Fine - 80, 100, 120
 - Very Fine —120, 150
3. The sanding operation should remove a *minimal amount* of wood, less than 1/32"
4. If a medium grit will level the floor or remove old finish on the first cut, it is not necessary to use the more aggressive coarse grit for the first pass.
5. For rougher floors the coarser grits are recommended.
6. If the floor is uneven, cupped or crowned and no moisture problem exists, make the first rough cut at a 45° angle to the direction of the flooring. Make succeeding cuts parallel to the direction of the flooring.
7. Use the same grit paper on both the 45° cut and the first rough cut.
8. If a slight hollow or deep scratch is present in the floor, make multiple angle passes forward and backward across the area. Start the first pass at a 30° angle to the hollow or scratch. Work from both the front and back of the blemish. Repeated sandings made directly across the blemish make it larger. After the blemish is removed, sand the area with the grain to straighten all sanding marks.
9. Always carry a soft lead carpenter's pencil while sanding, and immediately mark exposed nails, slight hollows, excessive scratches, holes to be filled, etc. Pencil marks across the floor before the intermediate sanding cuts also show if the entire floor was sanded.
10. To change from coarse to medium to fine grits, do not skip more than one intermediate grit. (i.e. 40 skip 50 use 60, 60, skip 80 use 100)
11. A sanding disc on the buffer is more aggressive than screening. Use the next finer grit when discing to avoid swirl scratches.
12. CAUTION: Some strippers contain wax and other chemicals which can interfere with the finish. Check with the manufacturer.
13. When buffing sealers/stains, or between finish coats, always start in an inconspicuous place or a closet. A new pad can aggressively cut too deep and remove stain, producing a lightened area, or remove too much finish and not give adequate finish thickness.
14. When using a white or brown buffing pad to buff stain/sealer, check the pad frequently for discoloration which can mean the stain/sealer is not dry and that additional drying is needed.
15. It is not always necessary to bleach before using a white stain. The desired white color may be achieved by the stain only. Staining without bleaching is easier and more trouble-free and does not soften the surface of the wood.