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Application Challenges and Insights

- Floor Refinishing Odors

ANSWER:

All coatings emit vapors as they dry. Primarily, these vapors are evaporated solvents and their odors vary from mild to strong. One common misconception is that strong smelling solvents must be bad while solvents that do not have strong odors must be safe. Regardless of how much the vapors smell, the most comfortable and healthiest environment for the homeowner is achieved by aggressively expelling the vapors from the house. The homeowner will appreciate your concern for their comfort and well-being.

While leaving the house closed-up and turning on the furnace or air conditioning will actively churn the air and quickly dilute the vapors throughout the house, it will not eliminate the vapors. Although it is quite possible that the vapors may be dispersed so evenly by this method that their smell will diminish to the limits of detection, the vapors will still be present. The best way to assure indoor air quality is by employing the following recommendations.

- There is only one way to eliminate vapors effectively, expel them from the house. This is achieved by exchanging the indoor air with clean outdoor air. Once a floor has dried to the touch, most of the solvents have been emitted.
- At this point, opening windows and doors is a good start. Using them in conjunction with the furnace (see cautions later in this article), ventilation or air conditioning systems helps immensely. Adding portable fans to the mix and turning on bathroom and kitchen exhaust fans will really stir the air and help.
- If outdoor air is actively being introduced to the house and there are no air spaces in the house where air is stagnant, such as closets, fumes will be eliminated after an enough air exchange. How many is impossible to determine because of a multitude of factors that vary for every house and environment.

One common misconception is that strong smelling solvents must be bad while solvents that do not have strong odors must be safe.

A house contains a fixed number of cubic feet of volume. If an equal volume (one air exchange) is brought in from outdoors, it will mix with the indoor air. For every volume of air entering the house, an equal amount must leave the house. The clean air mixes freely with the odor-filled air. There is no easy way to predict how much they will mix because so much depends on the way the air moves through the complex space comprising a typical house. How “tight” the house is and what “assist” is provided by mechanical air moving systems in the house (furnace, etc.) will greatly influence air exchange rates.

Additionally, external factors such as wind blowing around the house and differences in temperature or even small differences in air pressure between the inside and the outside of the house can have a large impact on air exchange rates as well. All these factors can be exploited to move air effectively and eliminate vapors. Each air exchange, each cycle, expels more of the vapors until at some point there are essentially no vapors or odors left to expel.

Another contributing factor influencing required air exchanges to clear the air is the amount of floor space being coated relative to the total square footage of the house. A two hundred square foot coating job in a two thousand square foot house will require considerably fewer air exchanges to clear the air than would a floor-coating job covering every square foot of the house.

There is no doubt these goals are easier to achieve during warm seasons of the year.

Obviously, cracking windows open, taking advantage of summer breezes, even setting up fans is generally no problem at those times. The dilemmas seem to appear primarily during the winter months when the need to ventilate and bring in outside air is directly at odds with the goal of maintaining acceptable levels of heat and not waste energy. The temptation is strong to leave the house closed tight, run the furnace enough to maintain a moderate temperature, and wish the fumes away. Although this approach might work OK in older, less energy efficient homes, because the “leakage” is high enough to achieve some acceptable air exchange rates, it will not work with new energy-efficient construction.

Simply cracking open a window and opening an internal door can raise the rate of air exchange to approximately two per hour if another “exit” air path (cracked-open window) is provided as well. The temptation is strong to leave the house closed tight, run the furnace enough to maintain a moderate temperature, and wish the fumes away.

Contractors may consider reviewing their practices regarding ventilation requirements today as opposed to how they have dealt with these matters in the past. Houses today are built much tighter than in years past. A contractor who in the past never had to bother with ventilation after completing the final coat should be aware that the natural “leakiness” of older construction practices and standards pretty much assured good natural air exchange rates. That is not true today. Modern homes can easily attain a natural air exchange flow that is only a quarter of what older houses had. This means business as usual does not apply to the contractor’s responsibilities regarding ventilation. He must do more today than he did in the past to assure the homeowner occupies a space that is comfortable and safe to occupy. NIOSH has done extensive studies to determine Indoor Air Quality standards and recommendations for air exchange rates that result in comfortable and healthy living environments. For example, they recommend that during the heating season, a house should have air exchange rates of at least three per hour. However, it is quite possible with today’s energy efficient construction methods to achieve conditions as low as one-half of an air exchange per hour. On the other hand, the same room in an older, less energy-efficient house can easily have an air exchange rate of about two per hour even with the windows and doors closed. Obviously, though the older house has an energy disadvantage of “leaking in” cold air from outdoors, it has a health advantage of providing acceptable air exchange rates. This also allows the vapors to dissipate at a much higher rate. Likewise, bacteria, mold and other undesirable things have a tougher time staking a claim in this “breathing” environment. (See references 1,2,3 & 4).

Simply cracking open a window and opening an internal door for the “tight” construction example above can raise the rate of air exchange to approximately two per hour if another “exit” air path (cracked-open window) is provided as well. Adding a box fan in the window can bump the rate of air exchange to over 5 per hour. Although it is impossible to know how many air exchanges are required for a specific house to eliminate all the vapors, it is obvious that high rates of air exchange over a period of a couple of days has the potential to

exchange outdoor air with indoor air hundreds of times. Unfortunately, sometimes a choice must be made during this brief ventilating period between saving energy or restoring indoor air quality. (See reference 1).

Sometimes the contractor can minimize the potential for lingering fumes, particularly in the winter, by making sure he is optimizing the coating process. It is vital that he follow the manufacturer's recommendations carefully. Allow stains to dry completely before coating. If a stain is not completely dry, it will slow down the cure time of subsequent coats, or worse – wrinkling or mottling could occur. All coatings should be applied at their recommended coverage rates and no heavier. Heavy coats take longer to dry, cure and expel all their solvents. Consequently, they will emit odors longer. Avoid coating at low temperatures. Coating at lower than recommended temperatures will extend the drying and curing times. (Safety tip: Depending on the type of coating used, it may necessary to heat up the house, then shut off the heat and any sources of ignition prior to coating).

The use of portable fans and turning on kitchen and bathroom exhaust fans is very effective as well, if they are not used before the final coat is dry to the touch. All coatings should be applied at their recommended coverage rates and no heavier. Heavy coats take longer to dry, cure and expel all their solvents. In winter the contractor would do well to educate the homeowner about the need for good ventilation during the first few days after the final coat is applied. He or She should alert the customer that there would be some heat energy loss in order to achieve the necessary ventilation.

This can be a real dilemma for some people. Find out before you start the job if there is going to be an issue. It seems that there is a wide range of tolerance among consumers regarding the “comfort levels” they expect. Many homeowners consider residual vapors as a minor inconvenience and see no need to make a fuss about it. At the other extreme are small groups of people with various degrees of chemical sensitivities that are much more sensitive to residual vapors.

Frequently, in those cases, most people cannot even detect an odor that the “sensitive” person finds unacceptable. For these reasons, it is a good idea to find out how they feel about wasting some heat energy for a couple of days in order to achieve excellent ventilation. Also ask them if they are chemically sensitive or if they are OK with temporarily living with some residual vapors for a few days. If they are very chemically sensitive or they object to wasting any heat energy, they may be better off waiting until a warmer season to have this work done. Even people with chemical sensitivities should be able to enjoy hardwood floors so long as the coatings are applied properly, the curing conditions are suitable, aggressive ventilation is achieved and a sufficient time (determined by temperature and number of air exchanges) has elapsed before the homeowner returns and reoccupies the home.

Each contractor will develop methods that work best for him and his customers. For winter jobs, the key points are to maintain temperatures during the job according to the product application instructions. Ventilate, if possible, between coats once the coating is dry to the touch. Once the final coat has dried to the touch, crack open some windows just a little. Then, depending on the type of product used, when the fumes have subsided sufficiently to not present a fire hazard, set the furnace thermostat to about 70 degrees. Check back in a while to see what temperature the furnace is maintaining. As the coating dries, the windows

can be opened a little more. The idea is to have an enough inflow of outside air to challenge the ability of the furnace to keep up without allowing the temperature to fall too much. Remember that the cold air will fall to the floor level so be careful to limit introducing really cold air. The goal is to introduce fresh air without harming the coating. It is important to emphasize at this point the need to be very cautious regarding fire hazard when using the furnace after using solvent-borne coatings. Initial ventilation should not utilize the furnace. Initial air exchanges must be achieved by opening windows and doors to evacuate fumes.

Once the fumes have subsided, exhaust fans and/ or portable fans may also be employed. The furnace's blower, acting as a fan (no heat) can often be utilized at this early phase of ventilating as long as the switch position on the thermostat has positions for "Fan Only", the thermostat temperature selector has an "Off" range, and the pilot light has been extinguished.

Ideally, introducing outside air should tax the furnace enough to keep it running nearly continuously, but not so much that the house temperature cannot be maintained above 60 degrees. Adjust this by increasing or decreasing the window openings, if the coating has cured sufficiently to handle the cold air at floor level. The reason for this is furnaces have powerful and efficient blowers coupled with efficient distribution ducting. Make good use of these assets. The blowers typically can move up to six hundred cubic feet per minute, fifteen to twenty percent of which is fresh outdoor air (assuming the furnace was installed properly). The ductwork distributes this air all over the house to flush out vapors. Each cubic foot of air moved carries away a portion of the vapors. It's like an invasion of clean air and, in the end, the clean air always wins. The use of portable fans and turning on kitchen and bathroom exhaust fans is very effective as well, if they are not used before the final coat is dry to the touch. Avoid using box fans in windows in cold weather.

Especially today, more than ever, it is important for the skilled craftsman to provide top-notch services that single their company out as the one that cares. Successful companies these days share in a common ideology that the customer is number one. What seems to get lost however, is the understanding that the products used in our industry have certain needs. Because we are dealing with chemicals and processes, specific practices must be maintained to achieve total satisfaction. These steps go far further than merely successfully applying a floor finish. The care before, during, and after makes all the difference in the world and will result in a much happier customer and healthier bottom line. As a former floor contractor, I concur with the message in our feature article, *Breathing Easy*, that it is imperative contractors try to ventilate appropriately or at least advise the homeowner regarding proper steps to clear the home's air of vapors. By doing so you will be perceived as a quality craftsman and expert in your field.

Fans aimed into closets and into any place there is not much natural airflow is certainly recommended. In a room, it is best to use articulating fans and set them so that at one limit they aim at a corner, then sweep to the adjacent corner. If only a few fans are available, the best utilization is to place them in doorways blowing into a hallway. The "draw" of the fan will pull fumes evenly from all parts of the room. This will result in complete mixing of room air with no stagnant areas in warmer seasons, it is equally important to achieve good rates of air exchange. Fans in rooms and box fans, particularly mounted in windows, can be very effective. The best way to take advantage of summer breezes to maximize air exchange

may be to note the wind direction, then open the windows wide on the upwind and downwind sides of the house. Leave the side windows closed (using fans in these rooms). This way you not only take full advantage of the wind blowing into one side of the house, but the passage of the wind around the house will cause the air to speed up resulting in a slight drop in pressure on the downwind side of the house. This causes an area of low pressure (partial vacuum) immediately downwind of the house. So, in addition to the wind being blown through the house, air is also being sucked through the house. The combined effect can result in a very respectable air exchange rate even when the wind is light. Back when houses were built without a large emphasis on energy efficiency, little was known about indoor air quality. It generally wasn't a problem. The birth of the science of indoor air quality was the result of some hard lessons learned from the consequences of building structures very "tight" to gain energy efficiency but not providing adequate ventilation. In 1981, a state building was completed called the Bateman building. At the time it was heralded as a model of energy efficiency. However, within a year of its opening it was unoccupied. Eighty percent of the occupants of one floor, for example, suffered from symptoms that were attributed to the building environment. It was ultimately concluded that poor ventilation was at fault.

Since that time, in 446 episodes of "tight building syndrome" investigated by NIOSH, 52% were attributed to inadequate ventilation. Other minor contributors were air contamination from inside the building, air contamination from outside the building, microbiological contamination, and unknown causes. It can be argued that the contribution of inadequate ventilation is, in fact, understated in these conclusions because if better ventilation had existed the other factors would have contributed even less.

Undoubtedly, clean air is important to comfort and health. It is also relatively easy to achieve. It requires little effort to crack open some windows. It requires only a small additional effort to set up some fans. A few minutes of coaching a homeowner on how to make good use of their furnace and other systems to expel the fumes at an optimum rate is time well spent and will assure the homeowner you want them to be comfortable and healthy. Aggressive ventilation is key.

Assuming the product has been applied correctly, optimizing air exchange rates should eliminate fumes and odors within a few days. Following these guidelines, a rule of thumb is if no odors remain the fumes are gone, and the aggressive ventilating regimen can be stopped. Indoor air quality is defined as the quality of air within a living space that promotes comfort and health. Striving for that goal should give all of us a lot of comfort

- [How to Sand & Finish Maple Wood Flooring](#)

ANSWER:

Recently a wood floor finisher asked for some advice regarding a job he was about to begin. His customer wanted a wide maple floor finished in a 2,000-square-foot house. The floor was to be sanded, stained a dark brown color and finished with four coats of a leading waterborne finish in a satin sheen. The customer and his designer made it clear that the stain

color and the satin sheen level was expected to be even and uniform over the entire floor area. A sample was made, and the designer wanted the stain more uniform. This finisher has been in business for many years and in recent years has found customers are becoming more critical. He has become very fussy in his sanding procedure and is doing the best finishing job he can, but his high-end customers are never quite satisfied. He has bought new equipment to avoid old machine problems and has tried to keep up with newer tools and techniques. He is confident in the skills he's learned over many years, but the newer products don't seem to work the same as his old favorites. His biggest concern on this job is not his abilities, but his customer's occupation — he happens to be an attorney.

He is hardly alone in his concerns. Contractors everywhere are asking, "How has wood flooring work become so critical over the years." and, "Why do we have more problems with maple floors than we have with oak."

Maple flooring has had a major resurgence since white floors lost popularity in the early 1990s. Because of its clean, light appearance that is easy to decorate around, maple has become the flooring of choice when a light design is required. Along with maple strip flooring, more maple plank is being installed, and in areas where maple was not prevalent in the past. Areas with high relative humidity, such as Florida, are seeing maple plank gain popularity. This can create concerns for installers because of the relative instability of wide maple flooring. Fortunately, with climate control more widespread than ever before, these issues have been minimized to some extent.

Of greater concern to many wood floor finishers are the difficulties that can and do arise when sanding and finishing maple. These can include sandpaper lines, abrasive selection, screen or swirl marks, wavy grain appearance, stains not taking uniformly, debris in the finish between coat abrasion and uneven sheens in low sheen finishes. Understanding how some of these issues create problems can save you time and money.

A Little History

In the 1950s and '60s, most final sanding's on wood floors were done with 60- and 80-grit sandpapers. Most residential floors were oak. Sandpaper discs (hard plating) were finding use on parquet and mosaic floors. Screens were not yet invented. Drum machines — the only ones available then — ran considerably slower than the belt sanders of today. The most used finishes were shellac, varnish and seal-and-wax. Lacquer, moisture-cured polyurethane, oil-modified poly and Swedish finishes were gaining popularity. With many of those early products being so forgiving, most of the problems encountered by floor finishers were procedural.

Today floors are being sanded with belt sanders to 120 and 150 grit and screened with 180 grit on rotary and orbital machines. VOC compliant oil stains, which have less solvent than older products and can take longer to dry, are used nationally. Waterborne finishes are applied in multiple coats, sometimes four or five. Between coats, sealers and finishes are treated with abrasive pads with very fine sanding strips.

Any one of these changes can cause problems, and when we combine them all, we have different and more complex finishing problems than in the past. Most, however, are still procedural. Some species, such as oak, are more likely to help the flooring contractor by hiding some of these mistakes. Maple, however, is not so forgiving.

Not so many years ago, many in our industry referred to a maple herringbone floor coated with waterborne finish as "The Floor from Hell." This was because every sanding and application imperfection tends to show up on dense, light-colored woods such as maple, and applying finish across the grain was, and still is, a challenge. With the improvements in

waterborne finish technology, flow and leveling are becoming less of a problem, but the finisher must still be vigilant.

Abrasives

One secret to sanding maple to a smooth, level finish is to start with an abrasive grade that will take down over wood at the side-match and level butting end joints. Inexperienced floor sanders attempt rough sanding with a grade of paper too fine to effectively flatten the floor and remove the over wood. This comes from either trying to avoid an extra sanding or a fear of being too aggressive. That extra sanding maybe the key to a good job.

As when sanding any floor, never skip more than one grade of paper. When trying to save a sanding step, the lines from the previous sandpaper grade always shows up in the final finish coat. Sanding finer than 100 grit and/or fine screening closes the already tight grain of maple so much that the finish coats tend to show a washboard effect. This effect does not show up until the third or fourth coat is applied, and it is difficult to hide.

This is the same as the grainy, hungry look that appears on oak, but since the maple grain is tighter, it shows as a washboard or wavy look. The deeper the seal coat penetrates and the longer it can dry before abrading, the flatter and more level the floor will look.

Sanding

When fine sanding maple floors, always reduce drum pressure to its lowest setting and slow the drum speed if your machine allows for it. Avoid sanding maple too smooth. Depending on the finish being applied, anything finer than 100 grit may be too smooth — always consult the finish manufacturer's directions.

Chatter marks with drum machines have been around for almost 40 years, and while waves in belt machines are newer, they can be just as frustrating. These can be an issue with any type of flooring, but especially with maple. Woods with open, porous grain, such as oak, can hide a small amount of these imperfections, but they stand out on maple and other dense woods.

Check that wheels are clean and free of debris, inspect drive and fan belts for splits or cracks, and check pulleys for chips. Keeping equipment in good working condition and paying attention to how paper is loaded can go a long way to eliminating wave and chatter. On belt machines, keep the upper roller assembly clean.

Many contractors do not like to screen maple. Screen scratches or swirl marks seem to have a way of showing in the final finish. The tendency is to sand and/or screen finer to hide these sanding imperfections, and this can lead to finish problems. Prior to the introduction of sanding screens, all floors were drum-sanded, edged and the edges hand-scraped and/or hand-sanded. This procedure is still recommended for many floors, and especially for floors being stained.

Cleaning

Debris in the finish coats accounts for many complaints when finishing maple. Again, the density of the wood and the light color tend to show even the slightest amount of dirt or dust. Thoroughly vacuum not only the floor but all baseboards, windowsills and any adjoining areas. Then vacuum the floor a second time. This step pays dividends. Create a clean area adjacent to your work area and clean your shoes, pants and knee pads before the application of any finish coats. Many finishers keep a pair of smooth-soled shoes for finishing only, while others will wear "booties." It's also advisable not to let anyone enter your work area once it is prepared for finish coats.

When carpeting adjoins your work area, cover the carpet with a drop cloth to avoid stirring up carpet fibers and tracking them in. Fibers in a final coat can bring you back for a recoat. Tack the floor with water, a solvent product or tack cloth appropriate for the sealer and finish you are applying.

Staining

Staining maple is generally not recommended by finish manufacturers since the dense grain does not allow the penetration of most pigments. Dyes work better but limit the colors available. Maple is a difficult wood on which to achieve uniform stain, and the appearance can look as if the stain was not applied evenly. If you screen before staining, be aware that the screen marks will show in any dark stain color. Educate customers about the difficulties involved in the staining of maple so they are warned of possible appearance issues.

Show the customer a variety of wood tone stains reduced with neutral stain. By using wood-tone stains mixed with neutral or clear stain, screen marks will be less noticeable, and the stain will appear to be more uniform. Should the customer expect a darker, more uniform color, there are two other procedures that can be used. The first is to sand the floor with 100 grit on the drum machine and the edger, and then hand sand the edges with the grain with 80grit sandpaper. The second is to screen and then "pop the grain" with water and allow to dry overnight before staining.

The result of these options is that the neutral-stain floor will have the least stain color showing, the "popped grain" floor will have the deepest color with some blotchy areas of grain, while the drum-sanded floor will have the most uniform color and most even appearance. There is more hand work involved in this last floor, but the results are well worth the time and effort.

Application Tools

The correct finish application tools to use when finishing a maple floor are the ones that you are the most comfortable with. Since maple floors can be touchy to finish, it is never a good idea to try anew or different application tool. Whether you use a brush, roller, lambswool or T-bar, the key to a good finish job is an even, uniform coating. It is important to feather any tool if applying a low-sheen finish. The T-bar type waterborne applicator has become popular with almost every type of finish and is a fast way to get a uniform coating.

Between Coats

Take care when abrading between multiple sealer and finish coats. Maple's density and light color can make screen marks, sandpaper lines or swirls obvious. No matter whether sandpaper strips or screens are used, it is the sharpness of these materials that causes marks, even in fine grades such as 150 or 180 grits. The safest approach when abrading between coats is to always use worn or old sandpaper or screens. Many floor finishers have found an advantage to using maroon abrasive pads between coats instead of screens (use the abrasive recommended by the finish manufacturer). Remember, between coats the intent is to smooth the coating, not remove it. Minimal abrasion is preferable to aggressive abrasion.

Be aware that scratches tend to be more prominent if thick or heavy finish coats are applied. This is especially true when using non-compliant oil-modified polyurethane or VOC-compliant oil-modified urethane. Hand-sanding between coats with used sandpaper, screens or abrasive pads in the direction of the grain helps to avoid screen marks. Many contractors feel that it is "old fashioned" to get on their knees and hand-sand a floor.

Be advised that if it eliminates problems, then it is well worth the time it takes.

Low-Sheen Finishes

Maple is noted for being problematic with uneven finish sheens. The theory is that uneven coats of any low-sheen finish, especially satin or matte, can show up as shiny streaks or spots on a finished floor. Also obvious on these same floors are stop marks from lambswool applicators and trail ridges from T-bars. Many finishers then think that the material was bad or that the flattening agent was not mixed in sufficiently.

The fact is that the flatter and smoother a dense floor becomes, the more critical the application of the finish coats becomes. Problems usually show up on the third or fourth coats. Shiny areas can appear wherever there are heavy finish spots such as drops, puddles, turn or stop marks. As the flattening agent settles to the bottom of the applied coating, any area where there is a heavier film appears glossier due to the additional film build in that spot. These are even more obvious under can lighting or where there are large windows. The reason this phenomenon appears more in satin or matte coatings is because of the greater amount of flattening agent added to achieve the lower sheen. This can happen with any type of finish.

The best way to avoid this problem is to make the customer aware of the possibility. Stick with semi-gloss or gloss topcoats and use care when coating. Keep in mind that thinner coats always work better on maple. If shiny streaks or spots appear, it is difficult to hide them by recoating. Also, as the number of coats increases or as the coats become heavier, the higher the sheen level. Satin can look like semigloss; semi-gloss can look like gloss.

- **Wood Floor Finish Has Milky Cast & Uneven Sheen**

ANSWER:

The Problem

I got a call about a floor with finish that showed a definite milky cast—sometimes described as a hazy look—in the overall appearance of the floor. In addition, there were differences in luster throughout the floor.

The Procedure

The 2¼-inch red oak floor was installed and sanded. A catalyzed water-based finish in a satin sheen was applied. The first two coats were applied and dried normally. They were clear and even in appearance.

When the final coat was applied, the floor was normal looking. A day later, the contractor received a complaint that the floor was hazy looking. When he went back and looked at the floor, there was a definite white, hazy cast to the floor, and he noticed the floor had an uneven luster.

The Cause

In discussing the finishing process with the contractor, it was discovered that on the day the final coat was applied, it was raining outside, so the contractor couldn't open any of the windows. The humidity was high, and the air was cool, although the house had heat and the floors were not cold. By not opening windows or adding ventilation, the moisture from the

water-based finish was trapped in the house. The finish could not dry properly, as the drying process of the co-solvent and water in the finish were slowed down dramatically.

Additionally, the extra trapped water hydrolyzed the catalyst in the coating, preventing it from curing the finish.

In cases like this, not only is the film hazy, it also is usually soft enough to put a fingernail into the surface. Trapping the water and co-solvent would also keep the film wet longer, allowing it to soak in differently in different places on the floor. This would account for the uneven luster when the finish dried.

How to Fix the Floor?

If this is truly only in the final coat, a good screening to open the surface and allow the trapped solvent and water to come out for 24 hours before applying finish will help clear the film. Then, a good wet coat of finish should be applied, allowing the proper drying conditions and ventilation.

Remember that with satin finishes, the heavier the coat, the shinier the finish, and the thinner the coat, the duller the finish. So, apply the finish very evenly and with a uniform wet film thickness, and make sure there is good ventilation for drying.

If the haze is in more than one coat, the contractor must start over by sanding off the finish. Screening deep enough to take out more than one coat is possible but is not an efficient use of time. Also, screening that deep is hard to do without leaving severe scratches that would have to be removed by starting over anyway. So, it's best to bite the bullet, dig out the drum, and start sanding.

In the Future

On those cold wet days when the windows cannot be opened for proper ventilation, there are two ways of preventing this condition from happening (sometimes both may be necessary):

- 1) Set some 20-inch box fans around the house on timers set to turn on slow speed a half hour after you leave. This circulates air throughout the house and helps pick up moisture everywhere in the building.
- 2) Relative humidity is just that—relative to the temperature. Turning the heat up to 90°F would allow the air to pick up more water, since the warmer the air, the more water it will hold.

- **Ventilation**

ANSWER:

After the application of any Graco floor refinishing product, it is recommended the area be adequately ventilated to remove any solvents or odors that remain.

Ventilation is the exchange of the home's ambient air, containing evaporated solvents, with fresh air from the outdoors. Ventilation is required to dissipate the remaining solvent odors because they can be unpleasant for the occupants. Exposure to heavy concentrations of solvent fumes can cause headaches, nausea or respiratory problems.

You should begin ventilating approximately four hours after the finish has been applied.

This time can vary depending upon temperature, humidity and film thickness of the finish on the floor. In general, the floor should be dry to the touch so airborne dust particles will

not settle and stick in the new finish. The determination of how soon to ventilate should always be left to the floor finishing mechanic, or contractor responsible for the floor. The best method of ventilation is to open doors and windows that are on opposite sides of the newly finished area. Using box or attic fans to help move the air outside is a very useful tool. Because the solvent fumes can migrate throughout the home or building into areas that were not finished, it is prudent to ventilate the entire structure. Remember that some of the solvents that are used are heavier than air and will flow downward unless adequately ventilated. The nature of a solvent is to evaporate and diffuse into the ambient air. If fresh air is available, the solvent will always escape.

Ventilation is the exchange of the home's ambient air containing evaporated solvents with fresh air from the outdoors.

The only time that solvents and the accompanying odors remain is when there is inadequate ventilation. A good rule of thumb is that if you can still smell solvents, then you need to ventilate the rooms better.

It is a common misconception that turning up the heat or air-conditioning will remove the solvents from the house. This is not true. If the air inside the house is not exchanged with fresh air from outside, the solvents and their accompanying odors will continue to circulate through the home and its air ducts and furnace filters.

In most cases, following adequate ventilation, the structure can be occupied 48 hours after the last coat of finish has been applied. The finish will continue to cure over the next 2- 4 weeks, depending on temperature, humidity and ventilation. During this time, it is sometimes possible for the occupant to notice a slight odor. If an odor is noticed, then providing adequate ventilation will remove the trace odor.

Individuals who are especially sensitive to solvents should allow more time to elapse before returning to the home. During this time, it is important to continue to ventilate the entire area as mentioned above.

- **Wood Floor Maintenance**

ANSWER:

Cleaning

Wipe up food and other spills immediately using a dampened (not soaking wet) rag or paper towel. Regular cleaning should be done with mild wood floor cleaner which is specially formulated to clean your new finished floor.

No Waxing

Finished floors should never be waxed. Do not use oils or waxes, or cleaners that have these properties. If wax or other treatments are applied, recoating may not be possible.

Recoat

As your floor begins to show wear and does not clean easily with, recoating is recommended. Contact your hardwood flooring professional when recoating becomes necessary.

Know Your Floor

Know what products were used to finish and clean your wood floor. Keep track of the dates (month/year) that the floor was installed, finished, refinished and/or repaired. Remember the company name of your floor installer and finisher. When moving, leave the above information in the home for the next homeowner.

Preventive Maintenance

Preventive Maintenance may be the most important factor in determining the longevity of your wood floor finish.

- Place walk off mats in entry ways and near sink areas to minimize the amount of dirt and water that comes in contact with your floor.
- Check your chair legs and other pieces of furniture and attach felt floor protectors to all furniture that will come in contact with your wood floor.
- Keep high heel shoes in good repair. Heels that have lost their protective cap can cause little indentations in any floor surface, even concrete!
- Keep pet claws trimmed.
- Do not over-water plants. soil, fertilizers, and plant foods may have chemicals in them that could damage your finish.
- Soft rubber (shoe soles, toy wheels, etc.) will leave marks on the floor. Most of these marks can be rubbed out but should be avoided if possible.

Post Application Tips

A minimum of 48 hours is recommended before returning to the residence. Providing good ventilation will minimize the odor and help the floor finish cure faster. You can generally walk on the floor after 24 hours. However, you should use your floors with care for the first two weeks after application. The gentler you are on the floor during this time, the more satisfaction you will get from your floors for years to come.

Furniture

Allow two to three days before placing furniture onto the floor. Do not drag or slide the furniture into place. Install felt floor protectors on furniture legs before replacing furniture. Allow two to three weeks before putting carpets or rugs on the floor. If covered prematurely, finishes may discolor.

Cleaning

Do not use water or any cleaning substances on the floor for the first 2 – 3 weeks.

- **Bubbles**

ANSWER:

Bubbles and applicator marks in polyurethane are usually the result of overwork with the applicator (not solvent popping). The coating is not compromised, but someone who has considerable experience applying clear coatings should not have a lot of trouble with bubbles

Whether you're using a brush or a pad, polyurethane cannot be applied like paint, where you apply it somewhat randomly and then use your strokes to distribute it evenly and smooth it. Polyurethane is thicker than paint and dries quicker, so bubbles can't migrate up and pop before the surface begins to dry and they get trapped under the film. The bubbles are introduced when you rub back and forth with the pad or brush. The analogy for this is to take a wet sponge and put a drop of detergent on it. If you tap the sponge, you might get a bubble or two. If you rub across it, you'll get more bubbles. If you rub rapidly back and forth across it, you'll get a lather. In the same way, if you "mop" back and forth with a pad or brush in the polyurethane, you'll get bubbles. Keep this in mind when you're applying the polyurethane. Now for the remedy:

First, scuff sand the floor with 220-grit sandpaper, as you would between coats. If you still see a lot of bubbles after a light sanding, you may have to sand a bit more aggressively, just until the surface feels smooth to the touch, but you don't need to remove the first coat.

After sanding, vacuum off the sanding dust, then remove the dust residue by wiping down the surface with a soft, lint-free cloth (old cotton t-shirts work well) dampened with 100% mineral spirits. You are now ready for the next coat.

Whether you're coating a door, a tabletop or a floor, you'll have more success at maintaining a wet edge and avoiding bubbles and applicator marks by always pulling your strokes in the direction of the boards and wood grain, and in the same direction -- right to left or left to right, whichever is more comfortable for you or appropriate to the project:

1 → or ← 1

2 → or ← 2

3 → or ← 3

If you make the first pass left to right and the second pass right to left (basically zig-zagging across the surface), by the time you get to the end of the second pass, more time has elapsed since you laid down the beginning of the first pass and it may have begun to dry and will not level as well and may leave a lap mark.

1- d r y i n g → ← 2

The technique for avoiding bubbles is to lay the coating down as smoothly as possible in the first stroke and leave it alone to level. Use the widest applicator you can to work more quickly and have fewer overlaps. For a floor, a lambswool applicator is recommended for oil-based finish, and a synthetic pad applicator for water-based finish. Many professional floor finishers use a tool called a t-bar. For small areas, use the widest brush possible, natural bristle for oil-based coatings and synthetic bristle for water-based coatings. Load the applicator enough that you may apply a thin coating of finish without having to press down on the applicator to get more out. Overloading the applicator may leave "trails" of product on both sides of the pass where excess squeezes out and the heavier coating will result in heavy lap marks. (You can tap the pad once on the slanted and ribbed part of the tray to release some product if it's too heavily loaded, but don't rub it over the ribs.) Lightly touch the surface with the loaded applicator and then start to move the applicator across the surface in the direction of the wood grain. You may angle the applicator slightly to direct any excess product toward the uncoated surface, like a snowplow, to pick up and distribute on the next pass.

When the brush/applicator stops applying a continuous flow of finish, re-load the applicator and pick up where you left off. This will prevent over-brushing and working quickly means less dry time before the next pass. Again, as explained above, always pulling left to right (or right to left -- whichever is more comfortable for you) will leave less time for a pass to dry before the next pass. Reducing temperature in the working area will slow down the drying

process, allow trapped air to escape, and make it easier to keep a wet edge. Ideal working condition would be between 65 F and 77 F. with less than 50% relative humidity. Another coat applied using this method should give a beautiful, smooth finish with no bubbles. Stirring too vigorously could introduce bubbles into the polyurethane that would show up in the application. While the flattening agent necessitates additional mixing, polyurethane should never be shaken, and it should be stirred from the bottom of the can (where the flattener settles) to the top, taking care not to introduce bubbles.

- **Board Beading**

ANSWER:

The Problem:

Beads of finish forming in the joints.

The Cause:

Most finishes and stains dry from the top down. When the first coat is applied, (and especially when a very heavy coat is applied) whether it is a stain or finish, it seeps down into the cracks between the boards. The material therefore stays comparatively wet because there is no air movement. Usually, at this point three things happen:

- Additional coats are applied
- The floor is covered
- As additional coats are applied, the problem is compounded. Then covering the floor may affect the dry time by locking the solvents down in the cracks. In time the floor expands and contracts. Expansion pushes the boards together and the still wet material down in the gaps is squeezed up, forming the beads.

How to Fix the Problem?

It must be understood that this is NOT a finish problem. How to know? The finish looks great on the face of the boards for all coats; the only issue is the cracks.

The only real solution to the problem is time. Allow the floor to expand and contract and just keep removing the beads that have cured or hardened with a putty knife or scraper. DO NOT attempt to screen the beads off, this will cause circular scratches in the surface of the finish. If there are bubbles that are still soft, remove them with a scraper then wipe the area with a rag dampened with mineral spirits.

How to Avoid in The Future:

Apply the sealer, stain and or finish as per manufacturer's recommended instructions using the correct coverage rate. Remember more material is not better as the general rule of applying any finish is that 2 thin coats are better than 1 heavy coat. Watch for excessive space in the boards. These can be trowel-filled (as per manufacturer's instructions) Also pay attention to the factors that affect dry time. Floors should be installed at normal living conditions. That means, for new wood floor installations, all windows and doors should be in place, all wet trades done and the HVAC system running. It is important to control the job site environment. Avoid high relative humidity, above 90% R.H. and lower temperatures

below 50 degrees F (10 C) that can seriously slow the drying time of sealers, stains and finishes.

Once the floor is finished, allow it to cure appropriately before covering. Check the manufacturers technical sheets for correct dry times.

- [Early Finish Wear Results in an Unhappy Customer](#)

ANSWER:

The Problem

A contractor in the Southeast received a call two weeks after he put the final coat on a resand and refinish job that the homeowner said was now scuffing and scratching badly. The contractor felt he had done everything right.

The Procedure

The contractor was hired to resand an existing Brazilian cherry floor that previously had been coated with oil-based polyurethane finish. It was about 600 square feet of flooring in the kitchen, breakfast area and family room. Due to concerns about dry times and environmental issues, this time the homeowner had decided on a waterborne finish. Because the homeowner had two large dogs and three small children, the contractor sold her on using an extra coat of finish for extra protection.

The Brazilian cherry strip floor was on a plywood subfloor over a crawl space. The contractor took moisture readings before sanding that showed the floor was at 8 percent MC, which was within the range the contractor expected for that area in June. The HVAC was running during the entire job except when the floor was being coated. He sanded the floor and rolled on a seal coat one day, then came back the next day and rolled on three topcoats with about four hours between coats, taking moisture readings between coats to make sure the finish was dry enough. About two weeks after completing the job, the contractor got the phone call that the homeowner was upset about the amount of wear she could already see on her floor.

The Cause

The contractor said he had done everything correctly on the job site, and he seemed to be right. He had applied the finish as instructed and recorded all the relevant moisture readings. In talking with the homeowner, we realized that after 24 hours, the family life on the refinished wood floor, which was a high-traffic area, had resumed as normal, with children, dogs and toys. She said that she was told the floor would be dry after 24 hours, so once it was dry, she could use it like she always did.

This problem brings up the difference between dry times and cure times. For most waterborne finishes, the floor is dry enough to move furniture (but not area rugs) back after 24 hours. After that 24 hours the floor should be “gently used” until it is fully cured, which can be from three days to two weeks later depending on the product. Letting two large dogs and children run across the floor with their toys doesn’t qualify as “gently used,” so the problem on this floor was just that it wasn’t allowed to fully cure before taking the brunt of daily family life.

This contractor had specified in his contract that the floor could not be subject to regular use until it was fully cured, but the homeowner didn’t read all the details, and she said she

didn't remember him telling her that. Out of goodwill the contractor offered to abrade and recoat the floor at no labor cost if she paid the materials cost.

How to Fix the Floor?

The floor must be abraded and recoated.

In the Future

There really can't be too much communication with homeowners about how to take care of their floors both immediately after recoating and for the longer term. Homeowners who find it unrealistic to wait until full cure for regular daily abuse on the floor should go with a factory finished floor or find a contractor who can do a site-cured UV finish, which cures the finish instantly.

- [Finish Flaws: Avoid Common Wood Floor Finish Failures](#)

ANSWER:

I remember a job from my contracting days where we were restoring some floors in a historic home in Denver. The homeowner was a cabinetmaker, and he was meticulous. We resanded the home's original fir floors, and when it came time to coat them, I was using a waterborne finish that had just hit the market (in fact, all waterborne finishes were new back then). The kitchen had floor-to-ceiling windows and a lot of can lights, and it seemed to be impossible for me to get a coat of finish on the floor that looked good. I kept trying different techniques, and I just couldn't get it to be acceptable, at least not up to this client's standards—what nine out of 10 customers would consider to be acceptable wasn't good enough for him. I accepted his challenge of perfection and continued to embrace what seemed to be an unattainable feat. Finally, I had to call my local finish rep to come out to the job, and with his help we were able to lay down a beautiful coat of finish and get paid. I learned a lot of lessons about finish from that one job, from customer expectations to how lighting affects finish and when and where to try out a new finish. But I am not alone: You won't find a wood flooring contractor out there who doesn't have plenty of finish horror stories to tell. In this article I'll try to share some of the most common finish problems I see and talk about things I've learned to prevent them. But before that, let's talk about those customer expectations.

Great Expectations

You need to be confident in understanding what the realistic expectations are for a site-finish wood floor and translate that confidence to your customer. Have you ever had a customer tell you there's a problem and you need to come see it at a certain time of day when the sun hits it from a certain angle with your head cocked to one side just right? Per our industry standards, this perceived "problem" that needs to be viewed under specific conditions may not necessarily be a problem at all. It's unrealistic to think a site-finished floor will end up looking like furniture or cabinets. It's also unrealistic to think the finish on furniture or cabinets will perform the same as wood floor finishes. We don't walk on furniture and we don't (usually) eat on our wood floors. These finishes are manufactured to perform for different purposes and are applied using different methods; therefore, the

results for wood floor coatings are completely different from cabinets or furniture. When assessing wood floor finish issues, the standard is to evaluate the floor under these conditions:

- The floor should be observed from a standing position on the floor being assessed.
- The evaluation must be conducted with ambient lighting, meaning the general illumination present in the room. As contractors we need to consider what the lighting situation is specific to the job, we're on, whether that includes a big window or a row of can lights and adjust our methods accordingly.
- Glare from direct light sources must not be used during evaluation. You can't introduce new lighting sources or wait until a certain time of the day to be able to evaluate the problem.

Before you start the job, paint a picture for the customers of what to expect during the project and, more importantly, when the job is done. This opening conversation with your customer is extremely important and will ultimately affect how your entire job will flow. They need to know ahead of time that wood floor finish is designed to be walked on and that it will not look or perform like their kitchen table. Once your customer understands the complexity of applying finish in an uncontrolled environment and the potential unexpected pitfalls we can endure at the time of application or during dry times, they will better accept minor inconsistencies in the finished product. With that said, let's talk about some problems:



Uneven Sheen

Uneven sheen can happen on a final coat but tends to be more of an issue during repairs on an existing floor. In the picture on the opener page of this article, the contractor attempted taping off individual areas that needed repair. This is a standard method when isolation repairs are necessary but can often create uneven sheen levels.

Sometimes the appearance of different sheens can just be an optical illusion. Lighting and variations in subfloors can make light reflect differently off the surface of the floor. Of course, good luck trying to convince your customers that they're seeing things!

Prevention:

Mix the Finish Well: Whether it's a new floor or a repair, mixing the finish properly is key. Matting agents tend to settle at the bottom of the container, so if the finish isn't mixed well, the finish will usually start out shinier and end up duller.

Expect Sheen Differences: If you're coating a big area, mix all the gallons you need into one larger container; this is called "batching your finish." The sheen can vary slightly from one gallon to another or from batch to batch, so mixing the finish together avoids problems with these minute sheen inconsistencies on your floor. Also, never assume that just because two different finishes are labeled the same, like "matte" or "satin," they will have the same sheen. Sheen levels are inherent to specific finishes and can vary from one manufacturer's product to another. For example, one satin product may have a gloss level that's 15-20 and another product may be 25-30. Sheen levels are proprietary to the products.

Match Sanding Sequences: The scratch pattern on the flooring surface affects how light reflects off the finished surface. If you have a floor that you final screened with a 220-grit and you hand sand the perimeter of the floor with 120-grit, the gloss level of the final coat will ultimately be different around the perimeter than in the field based on how the ambient lighting is reflecting from the surface.

Keep Consistent Mil Thickness: Say you've got a 1,000-foot floor and two gallons of finish. You're on your last stretch and realize you're running out of finish and may not have enough to finish the job, so you start putting more pressure on your applicator and begin squeegeeing out finish to ensure you get a coat on the whole floor. You will most likely get a callback due to sheen variation. The thickness of the finish affects the appearance of the sheen: The thicker the coat, the higher the gloss level.

Use a New Applicator: Many contractors like to reuse their applicators by washing them out and storing them in containers full of water. Regardless of how clean you think you're getting it, it's almost impossible to get all the finish out of an applicator. Applicators are specially designed to hold onto finish; any remaining finish in the applicator will be transferred to the subsequent coats and can interfere with your final coat. Many of us have always cleaned out our applicators after every job and reused them on the next job without problems. The problem is the one job that goes south and becomes the job we don't get paid on—that can set us back weeks, if not months, in revenue. Keeping a fresh applicator for every job takes one more variable out of the equation for potential failure. If you're adamant about reusing your applicators to save a few pennies, I recommend using a designated applicator for build coats and always using a new applicator for the topcoat (just be sure to de-shed it first). Build the miniscule cost of a new applicator into every job.

Give it Time to Cure: Finish sheens can change slightly (or "mellow") as a product cures out. If you're trying to match an existing finish, make sure you let your finish totally cure before you determine if it's a match or not. I'll never forget the lady who called three hours after I finished her job complaining that there were shiny spots on her floor. When I went to her house two days later, everything was perfect.

Feather Finish In: When doing repairs, take your time to assess the repair area and determine whether you will be able to feather in your repair or need to cut it off at good breaking points (doorways, cabinets, etc.). I like to use the analogy of an airplane taking off and landing when discussing feathering finish. Many times, you can blend areas by simply feathering the finish into the field. This method of repair is acceptable when a) you know the finish you're matching and b) your customer understands the importance of evaluating the repairs after the repair area has fully cured out.

Thin Down the Finish: Depending on your finish, you may be able to thin it down and apply multiple thinned coats. This gives you more control over the build and final appearance. Some waterborne finishes can be thinned down by adding water, and some oil-modified poly can be thinned by adding mineral spirits. You must check with the

manufacturer to determine if that will work for the product you are using. This method is extremely helpful when I have an isolation repair and need to build up the finish at the repair area for a perfect match. I like to apply multiple thinned coats to the area of contention, then carefully blend out subsequent coats beyond the area for the final blending. When I do this, I use a hair dryer or a heat gun to speed-dry each coat and determine how my sheen levels and build compare.

Recoat Everything: When in doubt on repairs, I would simply recoat the entire area or room or find good breaking points. One good approach is to look for areas in the room where the light sources affect the appearance of the floor. Perhaps there's a row of windows or different lighting sources that already create a difference in the perception of the finish; those are great areas where you can determine whether to feather repairs or to find a breaking point.

How to Fix It:

If sheen inconsistencies become a thorn in the job, usually abrading and recoating the entire floor will fix them.



Overworked Finish

In the photo you can see an area where the contractor went over the finish with the applicator once the finish had already skinned over and started to dry. It created bubbles and the finish looks sort of curdled, and you can even see one area where the finish peeled off. Typically, this problem happens with faster-drying finishes like waterborne, but it can happen with any finish in a fast-drying condition. Once the finish has begun to skin over and you run your applicator through it, you are only pulling the finish skin back into the new coating, which creates this “curdled” appearance. Actual bubbles in the finish can be caused by many factors. Here are a few tips to avoid overworked finish:

Prevention:

Lay it Down and Leave it Alone: When I teach someone to coat a floor, I tell them to focus on a manageable work area—about 3 by 3 feet—where you can comfortably keep focus on small areas without overextending yourself. Focus on that one small area and ignore the rest of the floor. If you see a small puddle or a spot you missed 6 feet out, don't touch it. Once the finish is dry you can do minor repairs, and that's easier than repairing a big area of overworked finish. Depending on the finish and the humidity on the job site, you

may have a very short window of opportunity to touch that finish again once it's down. This is also a common issue when you haven't mapped your coating strategy prior to application.

Don't Wring Out Applicators: The most common cause of bubbles I see in the field is when guys continuously "wring out" their applicators during the application process. This is not uncommon and an instinct to keep the applicator free from drips. Keep in mind that when we force the finish from the foam applicators, we introduce air into the applicator in its place. This will always introduce air into the finish we are applying and cause foam or bubbles. Rather than "wringing out" your applicator, get into the habit of tapping excess off.

Don't Use Old Finish: Older or expired finishes can be foamy or bubbly due to the defoamers that can break down over time. Proper mixing of your finish is critical to how the finish performs. Always know who you're buying your finish from and know where to check for the batch codes of each product you're using.

Create a Strategy: Probably the most important step of applying finish is mapping the job prior to getting started. When you're coating a large cut-up floor, detail out a strategy for coating the floor in sections before you start. This way you won't end up in a situation where you have an area half-coated and must come back later. Figure out good cut-off points and use tape lines as necessary.

Control Air Flow: Air movement across the finish causes it to not flow and level as it's designed to do, so the more air flow there is when you're coating, the more likely it is you'll have problems with coating, uneven finish, debris in the finish, streaks, etc. While you're coating the floor, make sure the HVAC system is turned off. As soon as the finish is skinned over, you'll want that air flow circulating again to help evacuate the solvent from the air. The easiest way to do this is to program the thermostat so the HVAC is off while coating and kicks back on when you think the finish is ready for air flow (usually 30 to 45 minutes later). One thing that can be more difficult to manage is the fan under the refrigerator. The only thing to do for that is to turn off the breaker for the fridge while you're coating (just remember to turn it back on!).

Use Finish Retarders: If you are concerned about the finish drying too fast, you can slow the dry time of some finishes by using retarders. Some finish companies offer their own retarders that extend dry times. For some finishes you can slow drying simply by adding water. Check with the finish manufacturer to see if slowing the dry time is possible and what the company recommends.

How to Fix It:

The best way to repair these issues is to abrade and recoat.



Lap Lines

In this photo you can see where someone tried to back out of a hallway using a T-bar and left lap lines where the finish didn't completely flow and level. This can happen anywhere in the floor but is especially common when backing out at the end of a job. Many of the techniques for avoiding lap lines are the same as those we just discussed for overworked finish. Here are some more:

Prevention:

Choose the Right Applicator: Always use the applicator your finish manufacturer recommends applying their finish. If your finish can be rolled, use a roller instead of a T-bar. You'll prevent most lap lines when rolling due to how the roller applies finish to the floor. A roller simply picks up the finish and then lays it back down uniformly, rather than pulling or dragging the finish as we do with T-bars or lambswool applicators. Rolling finish is an excellent method to alleviate lap lines. If you need to use a T-bar, it's easier to back out of a space using a lightweight T-bar than a heavyweight T-bar.

Use a Tape Line: If you have big areas you need to coat, use a tape line along board edges at tie-in areas. You can coat right up to that tape line, and then when you pull the line you have a nice straight edge you can cut back into. I always coached my guys to treat that taped-off area as if it were expensive white carpet—cut into it carefully so that you don't overlap to potentially create a new set of issues.

Coat a Walk-Off Area First: This is a trick I learned in the gym floor business that also works great for residential jobs. It takes some extra time, but it's worth it if you have difficulty backing out of a room. Say you have a hallway where you know you'll be ending the job. Start by using a tape line to coat half the length of the hallway and let it completely dry. Once it has dried, begin coating on the opposite side of the room. When you're almost done coating, you can walk on the already-coated half of the hallway and pull the finish straight over the uncoated half of the hallway instead of having to back out.

Push Off Instead of Pulling Back: When you're feathering with a T-bar, it's easier to push your applicator away from you than it is to reach out and try pulling it back toward you. Push off no further than 3 feet out in order to maintain a workable area. Again, think of the airplane taking off rather than landing. (This is where you also need to make sure you don't have excessive finish on your applicator.)

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How to Fix It:

If you have lap lines in your final coat of finish, you will likely need to abrade and recoat the floor using one of these methods to avoid getting them again.

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Streaks

In this photo you can see streaks in the finish that are apparent even where the finish was applied with the grain. There are many potential causes for these extreme streaks: excessive airflow during application, stiff bristles on the application tools, improperly mixed finish, improper coverage rates and more.

Prevention:

Everything I've said about extending dry times applies here, as well as the advice about using a roller when possible, especially when coating a multi-directional floor like this one. One very common cause for streaks comes back to how important it is to use the proper applicator on the job and always making sure you have a new applicator for final coats:

Avoid Hard Spots on Your Applicator: Streaks can easily be caused by hard spots/stiff bristles on your applicator. Check your applicator carefully and remember what I said before about always using a new applicator for your final coat.

How to Fix It:

An abrade and recoat is almost always necessary to repair this issue. Sometimes the floor may need to be abraded with coarser grits, then repeat abrading as necessary with proper grit sequences in order to completely remove the ridges and scratch patterns prior to recoating.



Blisters

This photo shows a good example of blisters that are caused when the sun is coming through a window, making a hot spot on the floor. The finish has skinned over too fast while still in its drying stages. Blisters are caused when the solvents in the finish are still trying to escape from the finish.

Prevention:

Again, manage your air flow so the finish isn't skinning over too fast. Also:
Avoid the Sun: You have several ways to do this. You can cover the windows with clear plastic, which lets in the light but prevents the heat from coming into the room. Better yet, you can plan your coating around the times when the sun is hitting the floor. If you have a two-story bank of windows with sunlight baking the floor, for example, you'll want to get in there early in the morning or late in the day, so coordinate accordingly. I always hear the argument that "it's too hard to schedule this way because we've got other jobs scheduled," but at the end of the day, you've got to ensure the best conditions for every aspect of your job so that you don't end up wasting time and money going back.

How to Fix It:

Blisters can usually be addressed by isolation repairs or a complete abrade and recoat once the source has been eliminated.



Contamination

Here's a classic shot of a contaminated floor. A contaminant on the floor caused what you see here. Fortunately, in the second shot you can see that when you're dealing with a contaminated floor it will usually happen right as you're coating. If you see this, you should stop before you waste more time and finish.

Problems with contamination can happen on the whole floor, or they can just occur in one small area. I've seen spot contamination due to overspray from granite countertop cleaners, stainless steel cleaners, and even Windex.



Prevention:

Test an Area: Always do a test area before recoating. You must pick the area carefully, because it should be in an inconspicuous area but should also be somewhere that would have had cleaning products applied (in closets and under area rugs don't usually work). Some manufacturers offer kits that allow you to test for contamination.

Investigate: Ask homeowners what they use to clean the floor, but never believe them. They will always tell you what they think you will want to hear. I remember a customer who showed me the recommended cleaner that she used daily on her floors, then further into the conversation she said, "Oh, my cleaning lady uses this shiny polish every Christmas on our floors, but that stuff wears off by St. Patrick's Day." I always got in the habit of being snoopy and looking in the cabinets in the laundry room or under the kitchen sink to see what cleaning products I could find. If there is a specific cleaner you find out has contaminated the floor, sometimes you can call the manufacturer of that product to find out how to remove it.

How to Fix It:

Unfortunately, many times you'll need to completely resand the floor. If you determine contamination is present before coating, don't try screening the floor and think that's going to effectively get rid of the contaminant. Without removing the contamination first, you are only pushing the contaminant around the floor and driving it down into the open grain and gaps of the floor.



Prevention:

Use Compatible Finishes: Even if products are from the same manufacturer, don't assume they're compatible. We did a job once where we coated a hickory floor with two coats of one finish and did the topcoat with the same manufacturer's commercial-grade finish. We got a call about a month later that the finish was peeling off in big sheets. Had we checked with the manufacturer or read the instructions first, we would have known that those two finishes weren't compatible.

Know Your Window: Many finishes have a "hot-coat" window in which they will chemically adhere to the previous coat without physical abrasion; this window of opportunity varies from product to product and manufacturer to manufacturer. If you miss that window, you'll likely need to mechanically abrade the floor, so the next coat of finish has something to stick to. If you don't, you risk peeling.

Abrade Well: When you abrade between coats, use the abrasive recommended by the manufacturer and make sure you do it well. Don't leave shiny areas on the floor, and maintain a sharp abrasive using recommended abrasive coverage rates.

Know If the Floor Can Be Recoated: In today's market there are some factory-finished products that simply cannot be recoated, no matter what you do. Test first!

How to Fix It:

A floor that is peeling usually must be resanded. If you're not sure why the floor is peeling, you can send peelings into a finish lab. They can typically determine the number of coats within the sample, the scratch patterns, which finishes are on the floor and whether contamination or stain residual is present, all of which can give you the cause for failure.



Chipping Finish

In this picture you can see that finish is chipping away from the stain, most likely due to either the stain not being dry or too much pigment left behind from the stain.

Prevention:

Watch Stain Dry Times: Make sure your stain has enough time to dry. Especially now with all the quick-dry stains out there, it's common to see guys rushing the job and not giving the stain its recommended dry times. Finish will not properly adhere to stain that hasn't thoroughly dried. Cooler, more humid conditions will also cause stains to dry much slower.

Wipe All the Pigment Up: You need to wipe all stains but be especially careful with highly pigmented (darker) stains. An ebony or mahogany stain contains more pigment than a nutmeg stain contains. Get in the habit of wiping the floor with a white towel right before you coat (or a colored towel for white stains). If you get any color transfer onto the towel, you've still got pigment on top of the floor that needs to be removed.

Use the Right Finish Over Stain: Not all finishes are made to be applied over stain; check with the manufacturer before coating over stain.

How to Fix It:

Unfortunately, if your finish is chipping away from the stain on a floor, you will likely be resanding the floor. There is no shortcut to fixing this problem, which is all the reason why it's so important to follow these simple steps to achieve success.



Poly Beads

When poly seeps down into open gaps in the floor, it tends to dry slowly and can remain liquid for a long time. When seasonal changes happen and humidity levels rise, the floor closes and the boards squeeze the liquid finish up to form what we call “poly beads.” They tend to be common with gym floors, which often are installed with expansion gaps and lack good climate control.

Prevention:

There isn't much you can do to prevent poly beads except for keeping the job site conditions as stable as possible.

How to Fix It

Poly beads aren't usually difficult to deal with; typically, you can pop them off with your fingernail or a scraper. Sometimes the floor may need to be abraded and recoated.



Sidebonding

This is a problem that happens most often with waterborne finishes in which the finish glues the sides of the boards together. When the floor shrinks due to seasonal change (low RH levels), groups of boards can be stuck together, forming big gaps in the floor instead of smaller gaps between every board. Or, like in the second photo, the floor (here, Australian Cypress) splits at its weakest point, which happens to be in the middle of the boards.

Prevention:

Use the Right Sealer: Some sealers help to prevent sidebonding of the topcoats.

Use Poly Sealer or Stain as Your First Coat: When we did gyms where they wanted waterborne topcoats, sometimes we use oil-modified sealers or stains before using waterborne finishes.

Maintain Consistent Job-Site Conditions: If the RH levels are consistent year-round, sidebonding won't be an issue.

How to Fix It:

Many times, going through a few cycles of seasonal change will help the boards break apart and the gaps will dissipate among several board runs. We had one high-profile gym job with such bad sidebonding we had to rip the floor out and put in a new one to appease the client.



White Line Syndrome (WLS)

Some finishes are more elastic than others. When wood shrinks due to low relative humidity levels, some finishes will stretch with the wood and form a bridge at the gap between two adjacent boards. Elasticity of finishes is not a bad thing and can be beneficial in some circumstances; however, on a dark floor these white lines can look horrible.

WLS is often confused with finish delamination (or peeling/chipping). I've seen cases (like in this photo) where the white lines are only at board butt-ends. Since this is solid oak, there's very little longitudinal shrinkage in the wood itself, which leads me to believe this is either a case of deflection (vertical movement) at the ends of the boards or that there was high/low variation between the ends of the boards and the finish wasn't abraded properly. This can cause the finish to release just in those areas as well. If I were to take these finish samples to a lab, they would be able to determine the actual cause.

Prevention:

Maintain Environmental Controls: The more consistent the conditions in the home, the less shrinkage and movement you'll have in the floor.

Use the Right Finish: Some finishes tend to show more white lines than others. More elastic finishes tend to be more prone to this.

Use Lighter Colors: If white lines are a concern, try to steer customers to a lighter floor that won't show the white lines.

How to Fix It:

Check with specific manufacturer for recommended repairs or allow floors to go through a few cycles of seasonal change to allow it to correct itself.

- **Sanding and Refinishing Factory-Finished Wood Flooring**

ANSWER:

You get the anxious call from a homeowner who just bought a house in a new housing development. She loves the home but is unhappy with the wood flooring. It has obvious wear patterns, scratches and scuffs. Now that she's about to host a black-tie dinner party, it seems unbearable. She doesn't know much about the history of the floor, just that the home was built two years ago. Before you agree to do the job or quote a price, you wisely decide to drive out to the house and see what you're dealing with.

At first glance, you notice micro-bevels, which tip you off that it's probably an engineered floor. You're familiar with other homes by the same builder in the subdivision that have similar floors with aluminum oxide finish. Upon further inspection, you notice the unsightly wear patterns and scratches in the finish the customer was lamenting about. Now it's up to you to deliver a fresh new floor before guests arrive. Her big soiree is in four days — can you revive this worn floor by then?

While many contractors may not face the dinner party dilemma, they increasingly must tackle resanding or refinishing factory-finished floors. Some factory-finished floors are a solid 3-inch product with urethane finish. These floors can simply be sanded and finished using traditional methods. But newer types of engineered flooring with durable aluminum oxide and ceramic oxide finishes and paper-thin wear layers are becoming more prevalent, presenting a host of challenges to contractors. Here are some tips to help you add new life to a factory-finished floor and get the check signed on the bottom line.

Examine the Wear

Look around the house and assess the wear of the floor to determine if you can simply recoat or if you need to get out the big machine. The simple guideline is that if wear is only in the finish, it can probably be padded/screened and recoated, while wear through the finish to bare wood requires resanding. Do a visual check and question the customer on maintenance of both the floor and the furniture on the floor. For example, overspray from furniture polish sprayed on the homeowner's cherished hutch could cause adhesion problems during a recoat. If a scraped sample of finish balls up when you rub it between your fingers, then there's probably something contaminating the finish. If in doubt, do a test patch to be sure the finish will adhere. Also, inspect underneath the furniture for scratches and dents. If the homeowner isn't using floor protectors, it may take lots of extra work to repair the floor.

A simple test to determine wear is to take a damp towel that's wrung out well and rub it over a worn area on the floor — this simulates a coat of polyurethane. If the worn area disappears then most likely a recoat will suffice; if the area still looks bad, then you'll need to resand.

Other signs that the floor needs the big machine are deep scratches or gouges, exposed wood, pet and water stains, cupping and buckling. In cases of moisture damage, make sure the original moisture source is now eliminated. If there's severe damage, board replacements may be in order.

In many cases where the floor is visually unacceptable to the customer — if the surface is rough, has lost gloss or shows slight wear patterns — a recoat will be enough. A floor can be

recoated an unlimited number of times, and factors such as wear layer thickness don't come into play. In most cases, you'll be able to recoat the floor using standard procedures.

Get the Floor Facts

Before you start any work, try to determine exactly what kind of floor was installed. Familiarize yourself with new products on the market. The more information you gather, the better off you'll be. The first step is to question the customer. The best-case scenario is to find out the manufacturer, brand and date of install. Manufacturers provide the best information on how to properly sand and finish their products. However, unless the original owner still occupies the home, it's unlikely this information will be available. At the very least, knowing the age of the home and floors may provide clues to the type of floor and finish.

Perform a quick visual check of the floors. A glance is all most experienced installers need to tell if the floor is prefinished or not. Floating floors are easily recognizable by their pattern of veneers glued onto long, wide strips. Instant tipoffs to engineered floors are beveled or micro-beveled edges and rotary-cut veneers, which usually have a rougher, plywood-type appearance. However, you can't always judge engineered products by their faces; many are now made from sliced veneers, making it almost impossible to distinguish them from the grain of solid products without looking below the surface.

To do this, you can either pull up a vent cover or remove molding around the perimeter. Either allows you to check the edges of the boards. If the floor is laid on a concrete slab and there are no vents, or there is insufficient expansion space, then you may need to remove a board to inspect beneath the surface. This may take extra time up front, but it could save aggravation, time and money when you work on the floor.

Determine the Finish

If you're going with a simple recoat, this is the most important piece of information you need before starting the job. What's on that top layer determines the methods you use to restore the floor. One way to help determine the finish type is to take a scraping (in an inconspicuous place such as in a closet) and rub it between your finger and thumb. If it turns to powder, then it's a polyurethane finish. If it's a wax finish, mineral spirits applied to a white rag will typically rub both the finish and some of the stain off, leaving a yellowish color. If the test finds wax and the customer now wants a topcoat finish such as waterborne or oil-modified, the floor will have to be totally resanded. Although it may not be unheard of, resanding a waxed floor and applying topcoat finish is a crapshoot — there's always the risk for contamination and adhesion problems.

Another thing to watch out for is aluminum-oxide and ceramic-type finishes. They may take more effort and different products to recoat them successfully. (See "The Hard Truth" sidebar at bottom of this article)

The Need for Screen

If the floor doesn't need to be completely resanded, you have several options based on the floor manufacturer's and the finish manufacturer's recommendations. If the floor has a urethane finish, you can screen/pad and recoat almost as you would a jobsite finished floor. When screening, use a fine screen and move to a coarser screen if the finer screens aren't aggressive enough. Using too sharp of a screen risks leaving swirl marks on the floor.

For pad and recoat jobs on engineered beveled floors, two maroon pads stacked on top of each other, along with a sandpaper strip system will abrade the surface uniformly and cut through the high beveled edges.

One option some finish manufacturers have created is a chemical sandless recoating system. This can be particularly useful for aluminum-oxide and ceramic oxide finishes (see "The Hard Truth" sidebar). The process of how the products work varies, but the result is a chemical bond for the finish that the screen would normally create. These products work well in lieu of padding and recoating, but obviously can't remove scratches and gouges.

Determine the Wear Layer

If the wear on the floor indicates that a total resand is necessary, it's vital that you determine the wear layer thickness. If you don't, you could end up buying the customer a new floor. The only accurate method to measure the wear layer is to pull up a vent cover and check below the surface. Some newer engineered factory-finished products have very thin wear layers that may barely allow one sanding with the big machine. Also, there are more products on the market that have only the thinnest of wood veneers — trying to sand them even once with the big machine would destroy the floor. Even solid floors, which typically allow up to seven sandings, may have little wear remaining, depending on how many times they've already been sanded and how aggressive the sanding technique was. If the wear layer is too thin, there may be little that can be done to the floor besides a simple recoat.

Start Anew with Sanding

If you need to sand a factory-finished floor, the sanding golden rule still applies: Always use the finest grit necessary to get the job done.

If your grit is too aggressive, you risk sanding through the veneer or down to the tongue and groove.

On some thin-veneered engineered products, the big machine may be too aggressive, so you may need to use a buffer with a hard plate and sanding disc or one of the other specialty sanding machines on the market. Some manufacturers offer oscillating sanders and triple-headed sanders that allow you to perform fine sanding procedures. You may find these machines work best for such floors because they apply less pressure while still allowing enough of a cut.

Bevels also are a factor in determining how aggressive your sandpaper will be. Micro bevels can be sanded right out, but deeper bevels may not sand uniformly, causing problems when applying the finish. If the floor has a v-groove, your best bet is to hand-scrape out the bevels.

Finish It Off

The finishing technique for factory finished floors can require special precautions. At the factory, such products generally have multiple (up to seven or more) light coats of finish, rather than the two or three relatively heavy coats typical of site-finished floors. Also, some floors are prefinished first and later cut, leaving exposed wood. This means that applying two heavy coats of water-based finish could trap water in the unfinished grain, causing the boards to swell. One way to combat this problem is to use a painter's pad for the first coat of water-based finish. This can help apply a lighter first coat of finish and seal up the ends. Another challenge with finishing engineered floors is finish pooling up in the bevels and v-grooves. Using an appropriate brush or painter pad for the first coat of finish can help prevent that. This may take a bit more time, but the result will be worth it.

So, what about that floor at the beginning of the story? Can the contractor save the day by restoring the floor to like-new condition in the four days before the party? If the floor wear is minimal, and the floor hasn't been contaminated with maintenance products, then an abrade and recoat can be accomplished in as little as a single day. Depending on the type of finish used, the guests may be able to dance on the floors a few days later.

The Hard Truth

Many floors installed in the last three to four years may contain layers of aluminum-oxide or ceramic-oxide finishes. While these finishes are marketed to the consumer to withstand almost anything, contractors are left with the challenge of trying to abrade them for recoats. This isn't impossible, as many believe, but there are special techniques and equipment that can make the daunting task a little easier.

First, try to identify the finish. Because the finish itself is an abrasive, you may be able to notice tiny particles in the finish. Other telltale signs are a ropy, string-like pattern in the finish and a slight grayish tint. When dealing with these finishes, it's helpful to know the manufacturer and brand of the floor. Not all factory-finished floors with these types of finishes are the same. The coating sequence and ingredients in the topcoat of finish can vary. Factory-finished floors have several coats, some consisting entirely of aluminum oxide-type finishes, and others having a traditional urethane finish on the top layer. Knowing the finish sequence can save you time, materials and aggravation.

Another factor to keep in mind when dealing with aluminum- or ceramic-oxide finishes is the extra labor and materials needed when estimating the job. Typically, floors with these finishes require one-third more sandpaper and take two to three times longer. This means in order to cover costs; jobs should typically be bid 30 to 40 percent higher than similar jobs with traditional finish.

Here are some general guidelines to help you refinish aluminum oxide and ceramic-oxide floors. However, above all else, be sure to follow the flooring and finish manufacturers' recommendations.

Resanding: Because you are essentially grinding abrasive in the finish with abrasive in the sandpaper, it's going to be tougher to get a decent cut. A good rule of thumb is to start with 80- or even 100-grit sandpaper, which opens the top layer of the finish. Once the finish is removed, then you can drop down to a 50- or 60-grit sandpaper and work your way back up.

Screening and recoating: You need a sharp screen just to cut into the abrasive finish, but if the screen is too sharp, you risk the buffer grinding swirl marks into the floor. And, if you leave too deep of a scratch, the finish may not hide the swirl marks. If you're going to use a traditional screen and recoat system, start with a fine-grit screen, such as 120- or 150-grit, and work your way up if you need a more aggressive screen to abrade the floor. The easiest option may be a sandless chemical recoat system.

Aesthetic Warranty?

Many factory-finished hardwood floor manufacturers are touting warranties that last longer than the Ice Age. It's important that the homeowner understand that these are "wear-through" warranties and not "look-bad" warranties. It's true that today's finishes are tougher than ever, but they are not impervious. The floors are abrasion-resistant, not abrasion-proof. Traffic patterns and other wear marks can still appear in the finish. The floors also can be susceptible to moisture and stains. This means that many customers will want to have their floors recoated during the warranty period. The problem is that part of the manufacturer's

warranty will be invalidated once the floor is refinished. The best bet is to contact the manufacturer and get the warranty specifics before you do any work on the floor. If the customer still wants the floor recoated, be sure she understands that the warranty will probably be null and void once your abrasive or finish touches the floor.

- **White Line Syndrome**

ANSWER:

The Problem:

Beads of finish forming in the joints.

The Cause:

Most finishes and stains dry from the top down. When the first coat is applied, (and especially when a very heavy coat is applied) whether it is a stain or finish, it seeps down into the cracks between the boards. The material therefore stays comparatively wet because there is no air movement. Usually, at this point three things happen:

- Additional coats of finish are applied
- The floor is covered
- As additional coats are applied, the problem is compounded. Then covering the floor may affect the dry time by locking the solvents down in the cracks. In time the floor expands and contracts. Expansion pushes the boards together and the still wet material down in the gaps is squeezed up, forming the beads.

How to Fix the Problem?

It must be understood that this is NOT a finish problem. How to know? The finish looks great on the face of the boards for all coats; the only issue is the cracks.

The only real solution to the problem is time. Allow the floor to expand and contract and just keep removing the beads that have cured or hardened with a putty knife or scraper. DO NOT attempt to screen the beads off, this will cause circular scratches in the surface of the finish. If there are bubbles that are still soft, remove them with a scraper then wipe the area with a rag dampened with mineral spirits.

How to Avoid in The Future:

Apply the sealer, stain and or finish as per manufacturer's recommended instructions using the correct coverage rate. Remember more material is not better as the general rule of applying any finish is that 2 thin coats are better than 1 heavy coat. Watch for excessive space in the boards. These can be trowel-filled (as per manufacturer's instructions) Also pay attention to the factors that affect dry time. Floors should be installed at normal living conditions. That means, for new wood floor installations, all windows and doors should be in place, all wet trades done and the HVAC system running. It is important to control the job site environment. Avoid high relative humidity, above 90% R.H. and lower temperatures below 50 degrees F (10 C) that can seriously slow the drying time of sealers, stains and finishes.

Once the floor is finished, allow it to cure appropriately before covering. Check the manufacturers technical sheets for correct dry times.

- **[Recoat Prefinished Wood Floors Doesn't Have to be a Gamble](#)**

ANSWER:

When this prefinished floor was recoated, the finish formed a nice, even film, and abrasion marks on the bottom of the peeling indicated plenty of abrasion, but this was one of those floors that simply could not be recoated. No pre-test for adhesion had been done before coating. (Photo courtesy of Bona US)

For wood flooring contractors, doing a recoat on a factory-finished floor can feel like playing the slots—when you arrive at the job site, you never know whether you're walking into a straightforward job with a nice profit or stumbling into a complicated mess. Can the floor be recoated at all? Can the floor be abraded easily? What is the finish on it? Is it contaminated with maintenance products? Will new finish adhere to the textured surface or bevels? Can the floor be recoated at all? What does the customer expect? With the right education, products, techniques and experience, recoating these floors should feel less like a risky gamble and more like a solid bet. Here are 10 key factors to know about when recoating prefinished floors:

1) You Might Be Dealing with Upset Customers.

Many customers are sold on the beauty and durability of prefinished wood floors without being informed about the details of the warranties and the simple maintenance necessary to ensure performance and satisfy expectations. Perhaps they thought their floor would look brand-new for 30 years and have since been informed that their warranty doesn't cover general wear and tear. The good news is that you often can help make their floors look much better. The bad news is that sometimes you just can't. Sometimes, the wear layer on such floors is so thin that they can't be resanded, and the finish is worn so badly that a recoat won't give them the appearance they want, so a new floor is the only option. This is also the case with some new floors that simply can't be recoated. (For more on that, see #6).

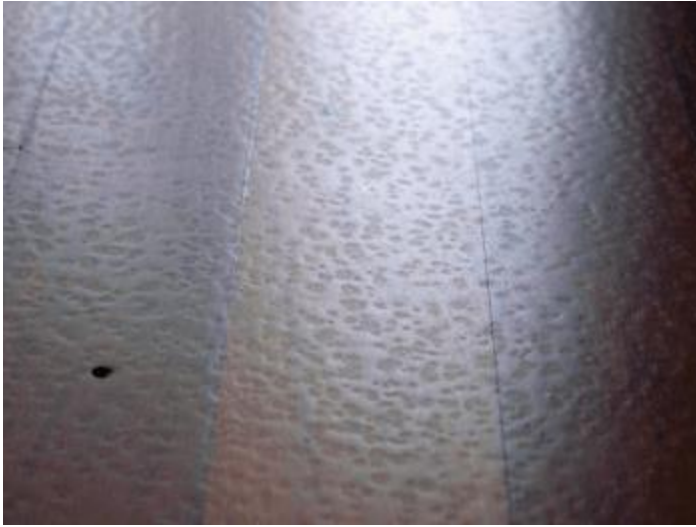
2) Try to Figure Out What the Product Is.

Before you do anything, try to find out as much as possible about the floor, and ask if the customer has any leftover flooring. If you can find out the manufacturer of the flooring and its age, that will give you valuable clues as to what the finish is and how difficult it may be to recoat, or if recoating is even possible (in the case of wax or most natural oils, for example, the floor usually must be either recoated with the same product or resanded). While you are asking questions, ask what maintenance products and tools have been used on the floor (but don't take that as fact—oftentimes they may tell you what they think you want to hear). Ask to see the maintenance area or closet.

3) You Don't Always Have to Abrade.

For decades, the industry standard for recoating wood floors involved screening with a buffer and recoating. These days, there are several options available to recoat the floor using a chemical recoating system or a chemical/abrasion combination recoating system. For some

floors that are difficult to abrade, such as distressed floors, beveled floors or older cupped floors, one of these newer systems may be the best or, in some cases, the only option.



4) Doing A Test Area Minimizes the Gamble.

Doing a recoat without trying a test area first is a reckless gamble. The recoat may go well ... or you may discover that the finish won't flow out. Or, the finish may flow out, but eventually you realize that the finish wasn't stuck very well to the floor—gravity is the only thing holding it down.

There are many possible pitfalls that can lead to these scenarios. One of the most common is contamination from a buildup of maintenance products, including overspray from maintenance products used on wood furniture, stone counters, appliances, etc. Some maintenance products, such as oil soaps, are usually relatively easy to remove from the floor with a strong wood floor cleaner from a finish manufacturer. Others—a notorious one is Orange Glo—say they are recommended for wood floors but leave an acrylic or oily residue that sticks and smears on wood floors, attracting even more dirt. One recommendation from Orange Glo is to remove such residue using a mixture of ammonia and water. Also, at least one of the chemical/abrasion recoating system manufacturers available in the industry guarantees successful removal of all contaminating residues on the floor.

If you aren't going to use a chemical recoating system, another important step in fact-finding is figuring out how hard the finish is to abrade. An older floor with a standard urethane finish may abrade just as easily as a typical site-finished floor, but many newer floors have finishes—contrary to popular belief, regardless of whether they have aluminum oxide or ceramic in them—that are extremely difficult to abrade. Abrading them will require more effort and many more abrasives, so that must be factored into the bid. Last, some floors can be abraded but still won't take a new coat of finish, as they are simply incompatible with recoating (see #6).

This was a test area on a prefinished floor that showed that the finish would not be compatible with the existing floor. (Photo courtesy of Bona US)

5) Choose Your Test Area Carefully.

Selecting a test spot can be tricky. It needs to be in an inconspicuous area, but also in a place on the floor where cleaning products have been used on a regular basis. So, inside a closet or

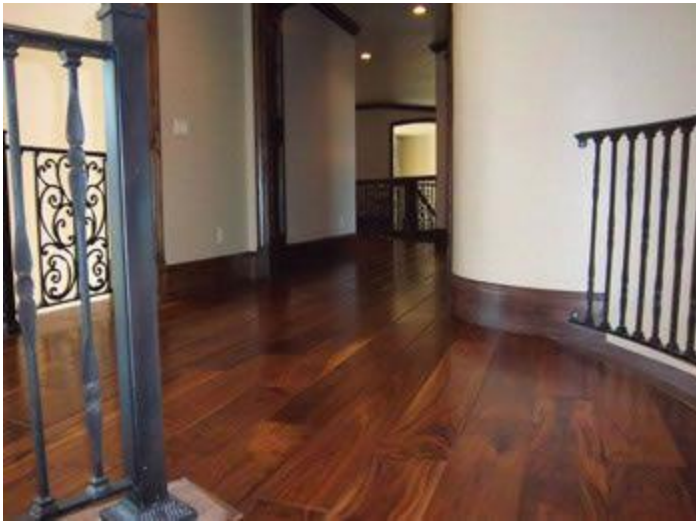
under a rug won't work, but an area out of direct sight—under a kitchen cabinet toe kick, for example—might do the trick.

Of course, your one test area isn't a guarantee—be aware of the risk of spot contamination from products like furniture polish, glass cleaner and even fabric softener sheets. And, even if the finish on your test area looks like it went down well, once the film is formed, do an adhesion test to see how well the finish is stuck to the floor. You should be able to scrape the floor hard enough with a coin to almost dent it while the finish stays firmly adhered. If it doesn't, consider the recoat process you tried a no-go.

6) Beware: Some Factory-Finished Floors Are Impossible to Recoat.

For years, contractors have been wary of trying to recoat newer prefinished floors because many have finishes that are difficult to abrade. Now there are some prefinished floors that simply cannot be recoated. For example, prefinished wood floors that have well-known brand names for non-stick and anti-stain ingredients (Teflon and Scotchgard, to be exact) may not accept a new coat of finish, no matter what abrasion or chemical recoating product is used. Of course, this can come as a shock to customers if they weren't informed of this when they bought the floor ... and are now told that if they want their floor to look better, it must be totally resanded (if the wear layer is thick enough) or replaced.

When testing finish on these floors, depending on the chemistry of the UV finishing system, the finish applied may crawl immediately, or it may flow out and appear to dry fine but have no adhesion.



7) Cleaning Is Crucial.

Detailed cleaning is a critical step in the chemical recoating products available on the market, and that speaks to how important cleaning the floor is to any recoat, even one with a standard abrade-and-recoat process. Contractors may think that they don't have to clean the floor when they're doing a standard buffer abrasion—“I'll just sand it off”—but that doesn't work and, in fact, can make any problems worse. If all the dirt and contamination isn't removed from the floor before buffing, both will be ground into the floor, scratching the floor and driving contaminants into the soft grain and gaps. Instead, use a high-quality cleaner from a finish manufacturer, and if you really want to clean deeply, consider using techniques common to gym floor contractors: using a small auto scrubber or “wet-screening,” in which the cleaner is applied to the floor, buffed with a screen or pad and then

vacuumed up with a wet vac. Whatever method is used, completely removing the contamination from the floor is critical.

This prefinished, hand-scraped walnut floor was cleaned and recoated using a chemical recoating system; the floor had extensive surface scratches and excessive grime build-up after five years of use. (Photo courtesy of Basic Coatings and Provo, Utah-based Jerry Nielson Hardwood)

8) There Are Many Different Products Available to Help with Recoating.

You need all the weapons possible in your arsenal to handle the situations you come across, so make sure you are up to date on the latest products available specifically for recoats. They range from chemical recoating systems, to kits that test for contaminants on the floor, to sanding machines equipped specifically for abrading recoats, to floor scrubbers specifically for wood floors. One size does not fit all when it comes to recoats, so being familiar with all the options will increase your chances of success.

9) You May Need to Get Creative.

Finish manufacturers may shudder when the words “get creative” are in the same sentence with “wood floor finish,” but some contractors have experimented with their own techniques enough to feel confident using them on a customer’s floor—even knowing that if something goes wrong they won’t be able to turn to the finish manufacturer for help. That may include using a coat of de-waxed shellac (notorious for sticking to almost anything and drying rapidly), or it may mean adding some dye to a finish coat to help blend a worn area. Specialized wood repair kits and color matching kits, wood-tone permanent markers, graining pencils and epoxies mixed with color powders are among the techniques sometimes used to help disguise blemishes before recoating, and amber tints/dyes or aging some poly are techniques to match the appearance of an older wood floor.

Be confident in any “creative” finish process you use, because if something goes wrong, you’re on your own. Remember that using a low-gloss finish helps disguise scratches and dents.

10) Leave Your Contract Open and Your Customers Informed.

Since you don’t know what to expect on a recoat, the language in your contract must be flexible enough to leave your options open, and the customer must be aware of what could happen. Just as important, be clear about realistic expectations for a recoat. Customers may expect that a fresh coat of finish will make the floor look new but, of course, that isn’t usually the case. A new coat won’t totally disguise gouges from pet claws, for example, and some factory-applied finishes turn white when scratched and stay white, even with a new finish coat. If there are traffic patterns down to bare wood but the customers won’t or can’t have the floor resanded, explain that you’ll do your best to clean the area and build up the finish, but it probably won’t look the same. Finally, it can’t be said enough: Go over basic maintenance practices with the customer so they can keep your new finish coat looking as good as possible. (Consider giving them the maintenance PDF formatted for customers at www.hardwoodfloorsmag.com/Maintenance101.) If you can get customers to be in contact with you for maintenance products, you will be the first person they call when their floors need a recoat.