Flooring Issues Knowledge Base

WFI seeks to expeditiously handle complaints in a professional manner in the interest of maintaining satisfied customers. Proper expectations of the performance and use of wood flooring must be considered when looking at issues/complaints about it. WFI has gone to great lengths to explain how each species and format (solid or engineered) can be expected to perform under normal use over time. There are comprehensive sections in or web site that covers specific species issues, installation methods, care and maintenance, sanding and finishing etc. As we do not sell to the end user we know that the end user may not have been educated as to the realistic expectations of the performance of wood flooring over time. We request that all parties involved in complaint resolution be reasonable in their participation.

Note: as in all professional wood flooring inspection processes the keystone is: inspect the flooring in a standing position in the lighting in which it is normally being used. Esthetic issues must constitute a prominent feature seen in the conditions that the floor is normally used, not under projected temporary lighting or based on a specific time of day scenario.

This site will cover specific issues taken from actual complaints and will highlight problems, their causes and how to resolve them.

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JOB SITE PROBLEMS

I. Buckling: (insert picture)

What it looks like: The wood flooring becomes separated from the sub-floor. It is accompanied by cupping and swelling

Cause:

- Excessive job site moisture
- A house left vacant with no ventilation (see Greenhouse effect)
- Improper Grade condition; solid wood installed below grade
- Pipe leaks, appliance leaks, leaks in structure.
- A wet slab

Cure: *SOLID WOOD.* Fix the excessive moisture condition and allow the flooring to dry to normal levels. In some cases spot repair can be done, weaving in new flooring then sanding and refinishing the entire floor. Do not re-finish until all of the flooring is at the proper moisture content and stabilized. Sanding too soon will cause crowing (See crowning section #4). If the flooring has become loose throughout the installation, complete replacement is necessary.

ENGINEERED WOOD: Fix the excessive moisture condition and allow the flooring to dry to normal levels. Determine which WFI collection you have. If the wear layer on your flooring is 2mm or more the floor may be professionally sanded and refinished after new planks are installed in the areas that buckled. Make sure all of the existing flooring is still well bonded to the sub floor, and all of the flooring is dry to normal levels because if the wood is sanded too soon it will crown (a convex appearance) See crowning in section #4.

2. Chatter/Wave/Telegraphing marks

What it looks like: Chatter marks are consistent imperfections across the grain of the wood varying from ¼" to1" apart. Wave marks appear farther apart and as they are usually caused by a problem with a sanding machine they will follow the track of the sander. Telegraphing marks look like close chatter but may be more random in spacing. Chatter and Wave marks are easy to see in normal lighting.

Cause: Most chatter marks are caused by a problem with the sanding machines drum. It may have a flat spot, be out of balance, out of round have a hard spot in the rubber, have the sandpaper installed improperly or have compressed rubber on the drum. Further, machine related problems:

- Poor splice/seams on sanding belts or improper storage of sanding belts
- Worn or cracked drive belts
- Bad bearings
- Worn Pulleys
- Running a belt sander in the wrong direction; right to left instead of the reverse
- Loose flooring

Waves may be caused by the following:

- Out of round wheels on the sander
- Improper electrical hookup; voltage too high or too low
- Excessive movement of the floor due to inadequate joist design

Telegraphing is caused by excessive moisture entering an engineered floor from the bottom. Moisture will reach the face of the flooring between small gaps in the core layer more quickly than

moisture traveling through the entire core. This shows up as a change in the color of the face above each core gap and looks like sander chatter.

Chatter or Waves in solid factory finished flooring looks very much like what is seen on job site finished flooring but it will be uniform as to being on each individual board and does not cross over to adjacent boards. These marks are caused by the milling of the wood (planer marks) and *depending on the grade* of the flooring may be considered a defect. Clear and select grade flooring should be free of planer chatter, but it may be seen in natural grade as well as Cabin or Tavern grade flooring.

Cure: First determine the problem with the sanding machine and have it repaired and tested. Unfortunately imperfections such as chatter and waves often do not show up until a finish coat is applied, so sand the floor with as fine a paper as possible to remove the finish, *sand at a 7 to 15 degree angle, then straight with the grain.* Once down to bare wood, hard plate the floor using either a buffer with a sandpaper driver or a multi disc machine such as the Lagler Trio or Clark 3DS. If using a buffer orient the machine so the sandpaper attacks the wood "with the grain". Looking at the machine from behind the handle; it is most aggressive at between 3:00 o'clock and 3:30; starting on the right move up and down the floor overlapping half of the width of the machine on each pass. Using a multi disc machine allows you to sand in any direction, but it is always advisable to do the perimeter or the floor first. Start the hard plate sanding with one grit lower than what you finished sanding with the drum/belt machine, i.e. finished sanding with 100 on the drum/belt start with 80 on the hard plate, then go to 100 grit. This will insure that you remove all of the chatter/wave and drum scratches. Finish by re-screening the floor, vacuum, tack and coat as usual.

Telegraphing cannot be removed by sanding and re-finishing and if it is extremely prominent, the floor will have to be replaced. NOTE: Telegraphing is a moisture related condition and is not a factory defect. Proper testing and documentation of the job site conditions will prevent this from happening. When testing a job site for moisture, if there is even a question as to what the long term conditions will be, ALWAYS install a vapor retarding system. Slabs that read dry in the winter often read high in the summer especially in low lying and costal areas. (add recommendations)

3. Color/Decoration/Grain

What it looks like: There are as many variations in the color, decoration and grain of wood as there are species of trees and more! There are two separate issues; one is the natural grain, color and decoration by species and grade of wood and the other is color change over time or "patina".

- First patina; all wood will patina or change color over time due to many factors, such as: UV light, the finish used on the wood, the species photosensitivity to light and oxidation. (show pictures of color change) As all wood will patina over time and exotics and some domestic species such as American Cherry with change drastically, care must be taken to keep these natural changes as uniform as possible over time. Make sure there are window coverings in areas with strong direct sunlight, or use a UV film on windows. This will protect you furnishings, rugs and any artwork you may have as well. Do not put down area rugs as soon as your floor is installed. Wait for at least one

month and then move them and your furnishings around from time to time to allow the flooring to patina evenly. Remember, all wood will change color due to oxidation over time as well. This is the natural reaction of the wood and or the finish on it, to oxygen. This is a gradual occurrence and most people do not notice it until a room is rearranged or the floor is re-finished. Oxidation will amber wood finish over time, especially oil modified or wax finished floors. To slow these processes ask for an aliphatic (non-yellowing) floor finish as opposed to an aromatic (ambering) finish. Most factory applied floor finish is aliphatic.

- Next, grade; wood flooring is graded as to color, grain, knots, bird pecks, pin worm holes, burls, bright sapwood, checks, brown streaks, mineral streaks, silica and biological content, machine burns, sticker stain, splits, cracks, how the wood is sawn, and the length of the boards. Obviously the less of these in a piece of flooring the higher the grade, for example: Clear grade plane sawn wood flooring is made from predominantly heartwood with a minimum number of character marks, and discoloration, providing a uniform appearance while allowing for all natural color variations seen in heartwood. Each subsequent grade is allowed to have more of each character as you move from Clear Grade to Select Grade to number one Common Grade to number two Common Grade. NOTE: Exotic wood species by the nature of where they are grown may contain silica, crystal formations, or biological elements even in CLEAR grade. These may appear as small white specks or lines in the grain of the wood. If prominent, the installer can cull out (not install) boards that contain these characters or use them in unseen areas such as the back of closets or under cabinets. Here are examples of the four most common grades of wood flooring starting with clear at the top left, select top right, #1 common bottom left and #2 common bottom right:

Cure: Color/Decoration/Grain issues are in fact a matter of customer expectations, so the "cure" is an educated consumer. Do your homework as to what wood floor will work well with your décor and lifestyle; use the WFI web site to get a good idea of color, grade and just as important which specie of wood will stand up to the traffic you expect in use. Ask if you can see a large enough sample to give you a good idea of what the floor will look like realistically, or if there is an installation you can go look at. After you have made your selection, be there when the installer begins and have him do a dry lay out with flooring from several different boxes. This will insure that there won't be any surprises later. The dry layout is the time you need to express what your expectations are as to color/decoration/grain, as well as direction.

4. Crowning:

What it looks like: The center of the pieces of wood flooring appear to be higher than the edges (convex) the opposite of cupping. (Show picture)

Cause: While it is possible that excessive moisture could cause crowning, especially in wider plank flooring, it is more likely that the floor cupped and then was sanded flat before it could dry and flatten on its own. (See cupping) It is imperative that moisture testing be done on a cupped floor and that it not be re-finished until it has returned to the proper moisture content for that species of wood and the environment it is used in.

Cure: As noted above WAIT until the flooring is dry and has stopped moving. Once it has stabilized it can be sanded and finished.

5. Cupping:

What it looks like: Cupping happens across the width of the individual boards, with the edges of the boards becoming higher than the center. It is sometimes called the washboard effect. It usually happens slowly over time and can be from mild to severe.

Causes: Cupping is caused by the wood absorbing moisture above the amount that it should have for a particular application. In most cases excessive moisture is absorbed from beneath the wood, but lack of proper acclimation will also cause cupping. Some causes of excess moisture:

- Building leaks
- Poor drainage
- Plumbing leaks or overflows
- Appliance leaks
- Plywood sub-floors with excessive moisture
- Poor or no adequate ventilation
- HVAC system not working
- Wet concrete slabs that have not cured
- Damp crawl spaces or basements
- Improper maintenance, wet mopping using Wet Swiffer machines or the like.

Flooring may also cup when it experiences rapid drying on the surface; this condition will cause gaps along with cupping as the flooring shrinks. As noted, cupping will occur if a solid wood floor is not properly acclimated to the job site before it is installed. Typically wood flooring is kiln dried to between 6 and 9%, it must be acclimated to any situation which calls for an in use moisture content outside of these numbers. When wood absorbs moisture it grows, when it expels moisture it shrinks. This is not a problem if this change happens BEFORE the flooring is installed. If say the floor is being installed in South Florida, the moisture content should be between 12 and 13%. The flooring should be brought to the jobsite, removed from boxes or cartons (solid wood only), cross stacked so air can circulate around it and checked with a moisture meter. The meter reading should be documented in the Permanent Jobsite Record, and the flooring should not be installed until it has reached the proper moisture content. Communicate with the homeowner as to what their lifestyle is; do they use the HVAC year round, do they use a dehumidifier? Check the inside environment with a hygrometer, thermometer, over a period of time as the flooring is acclimating to verify what the inside of the building is. Using the Florida example, some people use both HVAC and dehumidifiers year round causing the interior of the building to be more like what would be seen in West Texas, so a floor at 12 to13% would shrink and gap over time, where in MOST cases in Florida a floor installed at 6 to 9% moisture content is GUARANTEED to cup. The reverse is also true, a floor installed “out of the box” in Western Colorado, will gap over time. (See Recommended moisture content map)

Cure: Never attempt to repair a cupped floor until all of the sources of moisture have been identified and corrected. Once the source of the excess moisture is eliminated the flooring will return to its original size. This may take months or even

an entire season. Check to insure the flooring is both dry and or acclimated by using a moisture meter and checking through the board in increments using insulated pins all the way to the sub-floor. Once the wood is dry, it can be sanded and finished to remove any peaking due to edge crushing and gaps can be filled. If the cupping was caused by over drying the floor, install a humidifier and wait until the gaps have closed as much as possible before re-finishing.

6. Delaminating:

What it looks like: Wear layers are separating and may be lifting in a engineered floor. In wide plank engineered delaminating may be detected as soft or bubbled areas on the wear surface. Solid wood may present with areas where the wood separates along the lines between the spring and summer grain in plane sawn wood; this is referred to as wind shake. Solid wood may also separate due to unseen honeycomb cells or incipient decay in a board. Glued down wood floors may also loose the bond between the adhesive and the sub-floor where the flooring itself is intact but is coming off the sub-floor. (Show pictures)

Cause: Excessive moisture will cause engineered flooring to separate along the plies or delaminate. This can be caused by the following:

- Building leaks
- Poor drainage
- Plumbing leaks or overflows
- Appliance leaks
- Plywood sub-floors with excessive moisture
- Poor or no adequate ventilation
- HVAC system not working
- Wet concrete slabs that have not cured
- Damp crawl spaces or basements
- Wet mopping the flooring or using Wet Swiffer machines or the like

Wind shake is a natural phenomenon caused by the bending of the tree during storms which cause tearing of the fiber inside of the bole (trunk) of the tree. Often shake does not show up until the wood is sanded or undergoes normal season changes. Unseen decay or honeycomb may come apart during seasonal changes.

Cure: Eliminate the cause of any excess moisture, institute proper maintenance guidelines. Remove and replace any damaged boards. If the condition is due to an ongoing wet slab the flooring will have to be removed the slab sealed and new flooring installed. Solid boards with wind shake or rot should be removed and replaced. Hollow spots where adhesive is not bonded to the wood but is bonded to the concrete can be fixed by injecting 3M epoxy under the flooring. Large loose areas may be caused by the installer not placing the wood into the adhesive during its appropriate open time. Once the adhesive “skins” over it will not hold the wood. The installer should check for adhesive transfer frequently as the floor is being installed. Excessive moisture in the sub-floor will also cause adhesive failure. Remove enough flooring to do a moisture test on the sub-floor to determine it this is indeed the problem.

7. Dents/Scratches:

What it looks like: Dents appear as crushed spots on the surface of the wood, scratches can be fine lines in the finish to deep gouges through the finish into the wood fibers… dents and scratches come in various degrees depending on what caused them.

Cause:

1. Dents can be caused by the following:
   - High heels
   - Dropped heavy objects
   - Metal tips on furniture

2. Scratches can be caused by:
   - Sand tracked in from outside
   - Objects dragged across the wood
   - Pebbles trapped in the tread of shoes
   - Pet claws or nails
   - Unprotected furniture legs especially chairs
   - The wrong vacuum cleaner tools
   - Lack of proper maintenance

Cure: Dents… First make sure all of the furniture has felt floor protectors on the legs, keep high heel shoes in good repair. If the wood fibers are not broken, attempt to draw fibers back up with an electric iron over a dampened cloth. If the fibers are broken and it is a small dent, fill it with color match water based wood filler; once the filler has dried it can be polished with a soft cloth to bring up the sheen of the repair. If there a multiple dents and or they are large the affected boards will have to be replaced. If it is a job site finished floor the entire floor may have to be screened and re-coated.

Scratches: First do preventative measures, as all wood will scratch to some degree:

- Use floor protectors on all furniture
- Keep walk off mats at all entry doors
- Check shoe soles for pebbles stuck in the cleats
- Keep pet nails trimmed short
- Never use “beater bar” vacuums, machines with metal wheels or tools without felt protectors for wood floors. Self stick felt strips can be purchased at any hardware store and added to the vacuum tools you have.
- Dust mop and vacuum regularly. Consider micro fiber dust mops which are now available in most grocery and home improvement stores.
- Never allow the use of children’s toys with metal wheels or sharp edges which may damage the floor.
- MAKE AN EDUCATED CHOICE AS TO THE HARDNESS OF THE SPECIES OF WOOD YOU CHOOSE BASED ON YOUR LIFE STYLE

Very light scratches can be buffed out, but this should be done by a professional as over buffing will burnish the finish and change the sheen level. Many small scratches may be

filled with a color match filler pencil or touch up pen such as the ones made by MinWax. These are available at home stores, hardware and paint stores. Scratches through the finish into the wood can be repaired by a wood floor professional finisher on most job site finished floors. Factory finished floors with deep scratches will require individual board replacement. Consider having your wood floors re-coated once they show signs of wear in heavily trafficked areas. Remember, you walk on the finish, not the wood; keep it clean and it will last for many, many years.

8. Flooded Floors

What it looks like: Standing water on the floor.

Cure: Remove the water and dry the flooring as quickly as possible. Elevate the room temperature, dehumidify and increase air flow by the use of fans. In houses with basements, dry from below, add portable dehumidifiers and keep the air moving. BE SURE TO EMPTY THE DEHUMIDIFIERS OFTEN! In homes with a crawl space, use exhaust fans to dry out under the building, while dehumidifying the inside. If water was on the surface for a long time, drying can be accelerated by removing the finish. Only sand enough to remove the finish try to not remove any high edges at this time.

Do not attempt to repair the floor until all moisture levels are normal and the floor has stabilized. Using a moisture meter check the wood from top to middle to the sub-floor, if the sub-floor and joists are accessible check them as well. When the floor has stabilized, determine the extent of the damage. If the flooring has come loose from the sub-floor repair the necessary areas or the entire floor. If the floor remains cupped, sand it flat filling any gaps caused by edge crushing. If the floor is flat, fill screen and re-coat. DO NOT SAND AND FINISH UNTIL YOU ARE SURE THE FLOOR HAS STABILIZED; THIS WILL CAUSE THE FLOOR TO CROWN LATER.

If the floor system is plywood over concrete it may have to be removed and replaced due to the fact that the concrete will take so long to dry it may promote the growth of mold. Water gets trapped between the vapor barrier and the ply-wood and can take many months to dry completely. If only a portion of the floor was flooded, quickly remove that area down to bare concrete and allow it to dry. New sub-floor and flooring can be “woven” in once the flooring is stable.

9. Gaps, Normal

What it looks like: Gaps between strips/planks that appear between individual boards and open and close with changes in humidity.

Cause: Most normal gaps are caused by seasonal changes in relative humidity. Wood expands with higher humidity and contracts during periods of lower humidity. This type of expansion and contraction and the gaps it produce are considered normal and expected for solid wood floors. In a 2-1/4” floor seasonal gaps may be as wide as the thickness of a dime (1/32”, .031”) or wider. Note that the wider the boards the larger the gaps will be.

Cure: Normal gaps can we somewhat controlled by the use of humidifiers and or dehumidifiers; this will diminish the fluctuation in humidity and lessen the movement of the flooring.

10. Gaps, Abnormal

What it looks like: Gaps in the floor that remain the same with seasonal change. If entire sections of flooring have moved and appear to be "glued" together by the finish (job site application) see Sidebonding/Panelization #17 in the Finish Problems section.

Cause:

- Edge crush from prior exposure to extreme moisture; especially in plain sawn wood.
- Hot spots in the sub-floor caused by poorly insulated heating ducts, hot water plumbing lines, radiant heating systems not set up for wood floors, register openings, and refrigerator motors.
- Debris between boards during installation
- Improper nailing, nail position, wrong fasteners.
- Flooring installed with excessively high moisture content or over a sub-floor with excessive moisture.
- Flooring not installed tight enough to begin with.
- Foundation settling.
- Improper sub-floor materials that will not hold flooring cleats or staples such as particle board or non-deck certified USB.
- For glue down floors, early foot traffic, incorrect adhesive, the wrong amount of adhesive (wrong trowel), the wrong amount of flash time for the adhesive being used, or not rolling when it is recommended.

Cure: If possible eliminate the cause. Stabilize the interior environment as to relative humidity then fill all of the smaller gaps with quality wood filler (up to 3/32"). Repair the larger gaps using the sliver repair method ("Dutchman") as follows: on a table saw with a sharp carbide blade, carefully cut the top ¼" wear layer off of several boards with the same color and grain pattern as the boards next to the large gaps. Now, set the table saw so the blade will just clear the piece of wood as it passes over it, and set the angle at 7 degrees. Adjusting the gate, cut several "slivers" of different thickness one from each side of the stock piece. Flip the stock piece after every two cuts and return the blade to 90 degrees to keep the wedge shape of the slivers; repeat. Cut the slivers which you have matched as to thickness color and grain to the length of the gap being filled. Glue ONE SIDE of the sliver with Titebond adhesive and carefully tap it into the gap until it is snug. Using a utility knife, score the sliver on each side using the floor as a guide, and break off the excess. Hand scrape (corner scraper) flat. When the flooring is sanded and finished this repair is completely invisible, and it will move with the normal seasonal changes in the floor. It works for gaps up to 3/16". Large gaps in factory finished floors can only be repaired by sanding and re-finishing the entire floor. Loose floors may have to be removed and replaced, especially if the wrong fasteners were used.

11. Grade Problems: Unhappiness with a floor due to the appearance of knots, grain pattern, color variation, etc.

Cause:

- Unrealistic customer expectations. If the floor is indeed the grade that was sold, ordered, delivered and installed; a chain of errors were made. First the customer should be educated as to what to expect with each grade of wood flooring (See item #3) as to color, decoration, grain, knots etc. A sample showing the variation, pictures of actual installations of that species and grade and just as important the consumer should have been included in the dry layout process to insure the floor was what they expected. If this process is followed each and every time all other grade issues are moot.
- Ordering mistake by supplier, distributor or installer
- Poor grading at the mill
- Improperly labeled product

Cure: At best the most offensive boards can be replaced, at worst the floor will have to be replaced.

12. Greenhouse Effect

What it looks like: Floors shrink or swell due to an abnormal level of humidity in a vacant house.

Cause: When a building is closed up with no air flow, no ventilation, sunlight through windows creates heat, humidity and condensation. This in turn creates problems with wood flooring causing it to swell. When the occupants return and turn on the HVAC the floors will release the excess moisture and shrink. You may see both cupping and gaping in the same floor system.

Cure: After the environment returns to within the normal range for wood floors they can be repaired as per sections number 5 and 11. Never turn off the HVAC system completely even in a vacant building. Turn the thermostat up to 80 degrees, so the system will cycle from time to time removing humidity and keep some air movement in damp climates. Leave a humidifier on and the HVAC system on the "fan only" setting in very dry climates.

13. Insects

What it looks like: A sagging surface or small fresh holes surrounded by white powder on the surface of the floor.

Cause:

- If the surface of the floor is sagging, it is likely termites. The bugs are white to cream colored.
- If fresh holes about 1/16" wide appear with white powder on the surface of the wood, it is powder post beetles, or lyctid beetles.

Cure: First positive identification of the infestation should be done by a professional exterminator, and a course of action be taken stop the infestation. Then any structural damage should be repaired. Damaged floorboards should be pulled and replaced as well as any sub-floor or other structural wood products. Note: all wood used in the manufacture of WFI wood flooring is kiln dried. This process kills any insects and their eggs. However, new material quickly can become infested by insects entering through windows, in firewood, etc, and the life cycle from egg to live insect is very short. Check all surrounding areas for infested wood molding and furniture, especially bamboo, mesquite and ash.

Once the infestation is cleared up the floor can be repaired, sanded and re-finished. With factory finished product board replacement may be a better option.

14. Shell Out/Dishing of Spring Wood

What it looks like: uneven wear between segments of annual rings.

Cause:

- Heavy traffic
- Repeated sliding of heavy furniture
- Water used in maintenance
- Seen especially in peeled engineered products under desks with heavy foot and chair castor use.

Cure: Sand and re-finish, then implement better maintenance practices. Change castors on chairs to wide, non-marring rubber. Use chair pads made for use over wood floors

15. Slivers/Splinters

What it looks like: Sharp or rough pieces of wood protruding from the surface of the floor, especially at the edges of boards.

Cause:

- Unevenness caused by expansion, cupping, sub-floor irregularities, edge crushing from expansion or grain raise from moisture.
- Damage during nailing or tapping during installation.
- Wind shake (associated with annual rings, spring wood fractures during storms)
- May tend to occur more frequently in beveled Prefinished products and wire brushed products
- Improper grading.

Cure: If a new floor is producing fibers, not splinters, buff vigorously with commercial buffer and nylon polishing pad (this should be done by a professional floor finisher). For slivers/splinters on bevels, carefully trim off with a utility knife and touch up if stained. For expansion, cupping and grain raise, correct the moisture source and re-finish once the floor is stable. For wind shake it may be possible to re-attach the fibers with CA (cyanoacrylate) adhesive, better known as Super Glue. Apply the adhesive under the seam of the shake, it will wick down and hold the shake. As the adhesive is clear, it can also be used between coats of finish. If the shake is too large or flaking, remove and replace the board.

16. Squeaky/Loose floors

What it sounds like: Excessive crackling, popping or squeaking noise.

Cause:

- Movement of the wood floor system, sub-floor system or under floor supports.
- Inadequate or improper nailing; wrong fasteners
- Wear or damaged sub-floor
- Improper sub-floor material such as particle board, or flake board
- If glued down; wrong adhesive or not enough adhesive
- Floor subjected to excessive moisture or excessively dry conditions

Cure: Some noises can be stopped by injecting adhesive into the problem area, re-screwing a loose sub-floor from below, adding bracing to the joists, face nailing loose boards or using screws and plugs. Squeaks also may be lubricated with graphite, wax or baby powder, although such solutions may contaminate the floor for future finishing.

Floors that are noisy and loose throughout the entire installation, may have to be pulled up and reinstalled- correcting the underlying problems, such as sub-floor issues, wrong fasteners nailing schedule or adhesive.

17. Sticker Stain

What it looks like: Light brown marks that appear on the wood surface, especially on maple, ash or other light woods. They occur across the width of the strip, measure ¾" to1 inch wide and repeat about every 20 to 24 inches down the length of individual boards.

Cause: Discoloration is caused by the stacking strips used during the kiln or air drying before the wood is milled into flooring.

Cure: Sticker stain is allowed in second and better grade maple and #1 common grade of other species. If the marks are objectionable to the owner do not install boards with sticker stain as it will not sand out.

18. Unevenness or the entire floor

What it looks like: The entire floor as a unit appears uneven.

Cause:

- In a joist system, causes include warped and loose sub-floors, joists that are warped or broken, settled support pillars or perimeter foundation settlement.
- In a concrete slab system, a cracked and or settled slab
- Uneven sub-floor

Cure: Structural integrity of the sub-floor system is not the responsibility of the wood floor manufacturer. The wood flooring contractor has to check the sub-floor for structural integrity, as well as being flat to industry standards: 3/16" in a ten foot radius or 1/8" in a six foot radius. If any sub-floor is out of specification, or in need of structural repair this work must be done before a wood floor can be installed. Installing a floor over an improper, weak, loose, or uneven sub-floor voids the warranty on the flooring material.

FINISH PROBLEMS

1. Alligatoring

What it looks like: The finish pulls away from itself, causing ridges in the finish that look like alligator skin. This condition can happen in both water based and oil modified finishes.

Cause:

- Poor wetting of the finish.
- Contamination of the finish.
- Finish application under cold temperatures.
- Application of new finish coat before the previous coat has dried.
- Application of a heavier finish coat than is recommended.
- Use of thinners that cause the finish to dry too soon.
- Application of oil modified finish over waterborne finish or vice versa when the finish is not completely cured.

Cure: Screen and recoat when the finish has dried sufficiently. Make sure the finish "powders" during the screening process and is not loading on the screen.

2. Applicator Streaks

What it looks like: After the floor dries, marks are still visible from the path of the applicator. This condition is usually associated with water based finish, but may be seen in other types of finish.

Cause:

- Using an old applicator that has hard spots on it.
- Improper spread rate; too much or too little finish is applied.
- The finish is not applied evenly, poor applicator technique.
- Excessive air movement and abnormally high temperatures causing the finish to dry too quickly, resulting in a wet edge of finish being pulled over on already dried finish.
- Applying a satin or semi-gloss finish that has not been stirred properly.
- Applying finish in areas with direct sunlight causing the floor to become too hot.

Cure: Screen and recoat when the finish has dried sufficiently. Make sure the finish "powders" during the screening process and is not loading on the screen.

3. Bleed Back

What it looks like: Happens when excess stain seeps up from the grain or from the spaces between boards.

Cause:

- Excessive stain application.
- High viscosity or highly pigmented stain.
- Excessive heat during application.
- Knots or areas that contain higher amounts of sap.

Cure: Wipe off the excess stain or burnish/buff the floor with a white pad or a piece of new carpet cut to the size of the buffers pad driver to even out the stain color. Then, let the stain dry thoroughly before applying another coat. If finish has been applied over bleed back, a complete re-sand is required. Trowel filling will help prevent bleed back; cover windows during application to prevent hot spots on the floor. Check for areas with board movement and pay special attention to wiping the stain in those areas.

4. Bubbles

What it looks like: Dried bubbles are visible on the surface of the finish.

Cause:

- Soap or some other contaminant was not removed before coating.
- Applying hot oil modified urethane to a cold floor.
- Applying finish to a hot floor.
- Overworking the finish during application.
- Too much air movement across the floor that dries bubbles into place before they can flow out.
- Floor not screened or sufficiently cleaned between coats of finish.

Cure: If the bubbles are in the top coat of finish they can be removed by screening and re-coating; while cases where the bubbles are in underlying coats or are delaminating the floor will have to be re-sanded. Cover windows during finish application to prevent hot spots. Re-direct or close HVAC vents during the coating process.

5. Chipping

What it looks like: Dried finish separates from the surface in the form of chips or flakes.

Cause:

- Applying a less elastic finish on top of a more elastic one.
- Improper abrasion between coats.
- Spot contamination.

Cure: Screen and re-coat. Problem areas can be hand sanded and pre-coated, then screen and re-coat the entire floor. More than one coat of finish may be needed.

6. Cloudy Finish

What it looks like: The finish appears cloudy or milky.

Cause: Applying finish over a coat that was not dry.

Cure: Screen and re-coat making sure the cloudy finish "powders" during the screening process. Wipe the screened finish with a damp rag to make sure it looks clear when wet; if so re-coat.

7. Cratering

What it looks like: Often mistaken for bubbles, this problem resembles craters on the moon.

Cause:

- Contamination on the floor or in the finish.
- Application of finish over previous coats that are not dry or have not gassed off.

Cure: Carefully hand scrape the craters out paying attention to removing only the crater and not the underlying finish. Hand sand the areas making sure the "circle" from the crater is gone. Screen and recoat. If the problem is severe the floor may have to be re-sanded. Trowel filling the floor will prevent contaminants in the cracks from getting on the surface.

8. Dish Out

What it looks like: Low or concave areas on the wood floor where softer fibers of the wood appear to have been sanded more than adjacent areas. This happens between the annual rings of the wood (see Shell-out/Dishing of Springwood #16). Dish out also happens between mixed species of different hardness such as in borders, medallions and feature strips.

Cause: Improper sanding technique.

Cure: Re-sand the floor, sanding at a 7 to15 degree angle with the big machine and do the first cuts across boarders or feature at a 45 degree angle. Hard plate or multi-disc sand the entire floor using graduated sandpaper grits beginning with on grit lower than the last grit used on the big machine, i.e., finished sanding with 80 grit on the big machine, start hard plating with 60 grit on the hard plate then progress to 80, 100 even 120 paper

9. Discoloration: See item 3# in job site issues.

10. Excessive/Early Finish Wear

What it looks like: The appearance of too much wear on a relatively new finish.

Cause:

- Improper maintenance procedures that may include failure to fully remove grit from the floor's surface, using water to clean the floor, or using strong cleaners on the floor.
- Pet nails and chair legs may contribute to the problem.

- The wrong finish used for a particular job site; for heavy use as with a large active family, choose a commercial wood floor finish.
- Not enough finish applied to the floor initially.
- Applying finish over coats that have not enough time to off gas and dry.
- Improper sanding procedures, leaving the floor too rough. When the floor is left too rough, finish accumulates in the bottoms of the grooves (left by the sandpaper) in the floor, leaving little coverage on the "peaks" where the finish then wears through. This may give the appearance of ridges in the flooring.

Cure: Institute proper maintenance procedures, including regular dust mopping with an approved wood floor cleaner, use throw rugs and floor protector under furniture. If the problem is from improper sanding, the floor will have to be re-sanded.

11. Fisheyes/Crawling

What it looks like: A circular, cloudy haze with a clear center. They can measure up to about one inch in diameter.

Cause:

- Contamination in the surface; the new coat "crawls" away from the wet or contaminated areas, giving the appearance of fisheyes when the finish sets.
- If the finish container has sat undisturbed for some time and has not been properly agitated, a disproportionate amount of flow and leveling agents may be put on the floor, causing a fish eyed appearance.

Cure: Screen and re-coat.

Iridescent Finish

What it looks like: The finish dries with a metallic, colored cast to it.

Cause: Inadequate ventilation during the drying of a coat of finish, causing solvent saturation in the air. The solvent then settles on the floor and is coated over.

Cure: Screen and re-coat using proper ventilation.

12. Orange Peel

What it looks like: The surface of the finish has a texture that resembles the peel of an orange.

Cause: Rolling a finish that is not designed to be rolled on, causing it to dry too quickly. When that happens the texture is "frozen" into place before the finish has a chance to flow out and level.

Cure: Screen and re-coat.

13. Peeling

What it looks like: The finish delaminates from the floor in sheets.

Cause:

- Stain or previous coat of finish was not dry.
- Skipping abrasion between finish coats.
- Stain not sufficiently wiped up.
- Finishes that are not compatible.

Cure: Re-sand and re-coat.

14. Picture Framing

What it looks like: The edges of a room appear to be a different color than the rest of the room.

Cause: Poor sanding technique. The edges of the room were sanded differently than the rest of the room; either sanded too smooth or left too rough. Stain and finish are affected

by the degree to which a floor is sanded. The smoother the sanding the less stain will absorb into the fibers, the rougher the sanding the opposite is true.
Cure: Re-sand paying attention to marrying the edger and big machine processes as each machine sands differently. This can be done by hard-plating the floor or screening. When screening or hard-plating always do the perimeter of the job first when the paper or screen is sharpest; then work toward the field blending in the edges with the rest of the room.

15. Pin Holes
    What it looks like: Similar to fisheyes, but very, very small.
    Cause: A coat of finish being applied over a coat that was not dry.
    Cure: Make sure the previous coat is dry, then screen and re-coat. : Screen and recoat when the finish has dried sufficiently. Make sure the finish "powders" during the screening process and is not loading on the screen.
16. Poly Beads
    What it looks like: Droplets ('BB's") of finish that form along strip edges. They can be soft and sticky when first formed, but become quite hard if left undisturbed.
    Cause: Generally associated with a slow drying condition and excessive amount of sealer/finish that seeps between boards. As the floor moves this wet finish is pushed up through the finish film over the seams between boards in rows of beads.
    Cure: Over time the wet finish will be pushed to the surface due to the natural movement of the flooring. Oil modified finish can be removed with mineral sprits. Dried beads can be removed by carefully scraping them off with a sharp scraper or putty knife. If the finish is damaged during poly bead removal, screen and re-coat. Poly beads can be prevented by trowel filling the floor and by applying the finish in thin coats. Several thin coats work much better than a few heavy coats.
17. Roughness/Grain raise
    What it looks like: The surface of the wood floor is rough to the touch and grainy in appearance.
    Cause:
    - Inadequate sanding, including skipping too many grits.
    - Contamination of the finish during dry time (dirt, debris)
    - Not allowing enough dry time for water bourn sealers to flatten
    - Excessive moisture causing the wood grain to raise.
    - Not using enough coats of waterborne finish.

    Cure: It the problem is excessive moisture this situation must be addressed before the floor is repaired. Once the cause of the roughness is determined, screen and re-coat the floor. If the problem is caused by improper sanding and skipping grits the floor will show the scratch marks in relation to the direction of the sander; in this case the floor will have to be re-sanded.
18. Sidebonding/Panelization
    What it looks like: Large gaps in a pattern appear across the floor leaving "islands" or panels separated by these gaps.
    Cause: While sidebonding and panelization appear similar, they are different. 1. Sidebonding is caused by finish seeping through and "gluing" clusters of individual strips together. This is most often caused by waterborne finish. 2. Panelization is caused when the edges of boards are crushed and stick together.

Cure: Restoring normal humidity levels can return the floor to an acceptable appearance. If there still are gaps repair same (See section #10 Gaps, abnormal). If those methods will not repair the floor it will have to be replaced. There are now many sealers available that prevent side bonding; staining a floor will also prevent sidebonding.

19. Stains

What it looks like: Discoloration on one or more areas of the floor.

Cause:

- Spilled liquids.
- Pet stains.
- Residue from improper cleaners
- Continual moisture leading to mildew (black), decay (brown/white) or alkaline conditions (white).

Cure: Cloudy surface finish can be fixed by lightly rubbing with a proper wood floor cleaner and buffing, although some stains require screening and re-coating. Pet stains sometimes can be fixed by re-sanding, but frequently require total board replacement. One technique to eliminate pet stains is to apply naval gel (a phosphoric acid gel commonly available at hardware and home stores) to wick the tannins out of the area. This will not contaminate the floor for future finishing or leave a halo mark as bleaching the floor often does.

20. Sticky Board Syndrome

What it looks like: The finish will not adhere or cure properly on one or more boards.

Cause:

- Excessive tannic acid or pH imbalance in the wood. This syndrome is most often seen in white oak coated with oil modified urethane.

Cure: When one board or several boards scattered throughout the floor will not take stain or finish, the most common solution is to repair the floor by replacing the boards. Or, boards may be taped off (3M #2080) and scraped or hand sanded, then coated with a water based sealer. After proper dry time, they may then be coated with an oil modified finish. Trowel filling may help prevent sticky board syndrome.

21. Uneven Sheen Levels

What it looks like: The sheen of the finish is inconsistent across the floor.

Cause:

- Not mixing the finish properly before application
- Uneven sanding
- Uneven finish thickness
- Illusion caused by lighting.
- A contaminated finish applicator, such as a lanolin rich lamb's wool applicator that hasn't been thoroughly cleaned.

Cure: Screen and re-coat. If lighting is the cause, discuss with the customer the reasonable and proper inspection position for looking at a hardwood floor: from a standing position under normal lighting conditions.

Bob Goldstein