

# How to Avoid Swirl Marks in Your Floor Finish

A Special Report to help avoid swirl marks in your hardwood floor finish.



**CITY FLOOR**  
— SUPPLY —

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## How to Avoid Swirl Marks in Your Floor Finish

Perfectly finishing a hardwood floor without any swirl marks is often a challenge. Swirl marks are visual scratches that appear in a circular pattern usually caused by the buffer. Following several instructions and tips can help you avoid swirl marks in your hardwood floor and give your customer a beautifully finished floor. It is worth the time and effort to get it right the first time!

The dreaded swirl marks are scratches in the wood or finish, and sometimes are only visible with intense light, such as “High Hats” lights. Once the stain and finish are applied, removing visible scratches that are in the wood is impossible without removing everything and starting over. Re-doing tasks are never on a project to-do list, and wastes precious time and money. One of our most commonly asked questions at City Floor Supply is, “Why do swirl marks happen on one project and not on the next?”

Some reasons for this are

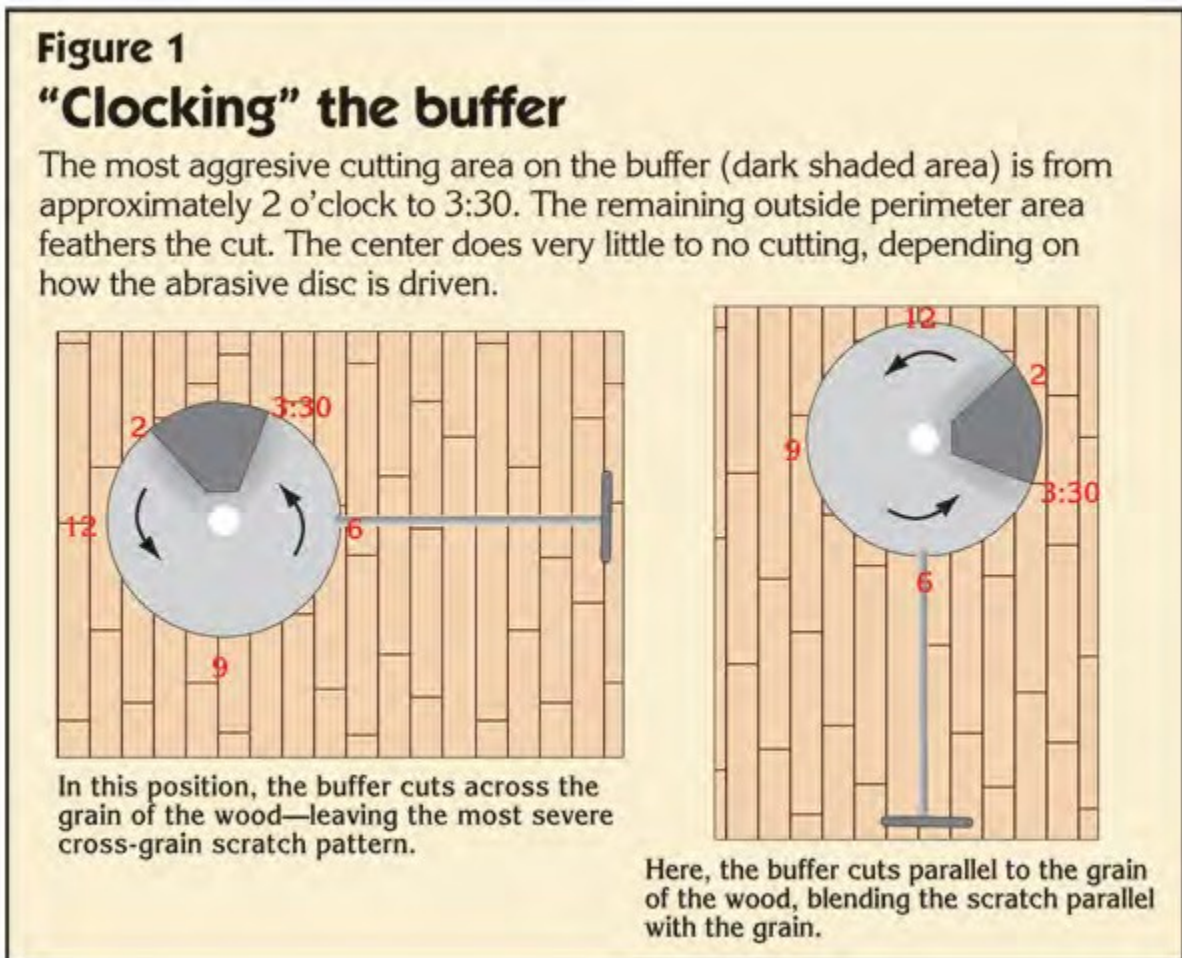
- 1) Too aggressive a grit
- 2) Screening too fast
- 3) Particle or debris is caught under the screen
- 4) Machine not balanced
- 5) Finish is not cured
- 6) Floor is not flat
- 7) Finish is not clean

Reaffirming the accepted buffing techniques used by floor mechanics for the past 70 years and combining them with some of the new abrasive and new machine technologies should eliminate visually apparent swirl marks. It is important to know that you are putting scratches in the wood for a very specific reason. The goal is to make sure these scratches are not apparent on the wood or in the finish. Our aim is to provide techniques to avoid “visually apparent” swirl marks. You should first stand in a natural way on the floor and look at it. Then follow these helpful tips to avoid swirl marks:

- 1) **Be concise in your approach**, and buff with great purpose. Quickly prep your screen or sandpaper by rubbing two pieces together; making certain that the “mineral” is all attached. When buffing raw wood, make sure you buff the edges first, and then buff the field. You must know how many square feet you are preparing and be certain to use similarly sharp abrasive on the entire project. To put it simply, use the appropriate amount of screens or sandpaper. Most manufacturers have a general specification for their abrasive. The common rule has been 500-700 sq. ft. per screen for Silicon Carbide abrasive (black). For this specification, flip the screen at 250 sq. ft. – 350 sq. ft.

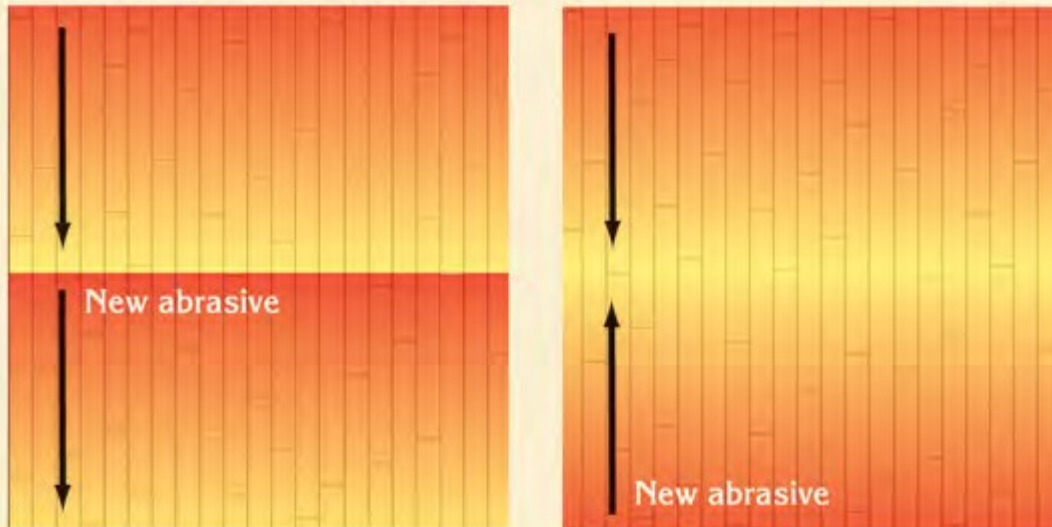
**Slow and steady.** Pace and balance with the machine definitely matter, as does the quality of your drive block and drive pad. Over the years, we have seen some contractors so frugal that they will not throw away the first buffer pad they have ever bought. If your pad has chunks missing from it, you will not be balanced when the machine spins at the recommended 175 rpm's. Most contractors know that a thick white pad will remove less stock than a thick red pad. The new thin, dense white pads are ideal backup pads for screening raw wood and uniform stock removal. The new no load hook it sandpaper from 3M does an excellent job creating a flat substrate and prepping the floor for stain. To achieve a flat substrate without undulation on hard and soft grain wood is possible with a stiffer backup pad rather than a softer one.

- 2) **Clock the buffer**, and make sure to buff the grain with the front of the buffer from 12 O'clock to 3 O'clock are sanding with the grain. The idea is to buff slowly, overlapping approximately 1/2 of your previous path each pass.



- 3) **Vacuum** the floor before screening. Leaving grit from previous cuts is just asking for trouble. At City Floor Supply we believe that attaching a vacuum setup to your buffer is extremely important. Vacuuming will help to significantly reduce the potential for dirt or grit to cause that irregular depth of cut which causes the dreaded swirl.
- 4) **Water popping.** When you are prepping for stain on raw wood- particularly very hard and dense woods- consider water popping your floor. This will produce an even depth of color in both the hard and soft grain. In addition, the water popping will help to expand the fibers of the wood in those fine scratches and help reduce the potential of a swirl mark. We also use this technique when working with extremely soft wood, such as white pine. Popping the grain when prepping white pine significantly reduces visually apparent scratches.
- 5) **Red Heat Screens.** The new red heat screens from Norton are great for very dense woods such as IPE, CUMARU, BRAZILLIAN CHERRY, MAPLE, and HICKORY because they will sand and not polish. These screens cut longer on harder substrates like the above mentioned species. However, we would not recommend this screen on pine or American Cherry or American Walnut. We also recommend these screens regardless of the species when preparing Aluminum Oxide prefinished floors. Aluminum Oxide mineral used in prefinished floors finish is an extremely hard mineral, but the ceramic fired alumina mineral of the red heat is harder and will prepare these finishes more uniformly, maintaining a similarly sharp abrasive longer than other screen mineral compositions.
- 6) **Do not use damaged screens.** It seems like this is an pretty obvious statement, but it is important to avoid major problems. If your abrasive screen or the abrasive pad strips, gets torn, frayed or folded and creased, the potential for swirls increases dramatically. As stated when buffing with a purpose, be mindful of floor vents, sockets, and transitions.
- 7) **Equipment for final prep.** Consider the OBS 18 DC attached to a vacuum for your final prep. Consider the FA 8 abrader for prepping for a recoat when a floor is not flat.

## Figure 2 Blending scratch patterns



When it's time for a new screen or other abrasive, don't start using the new one in the middle of the room. The severity of the new abrasive will be obvious compared with the duller scratch pattern.

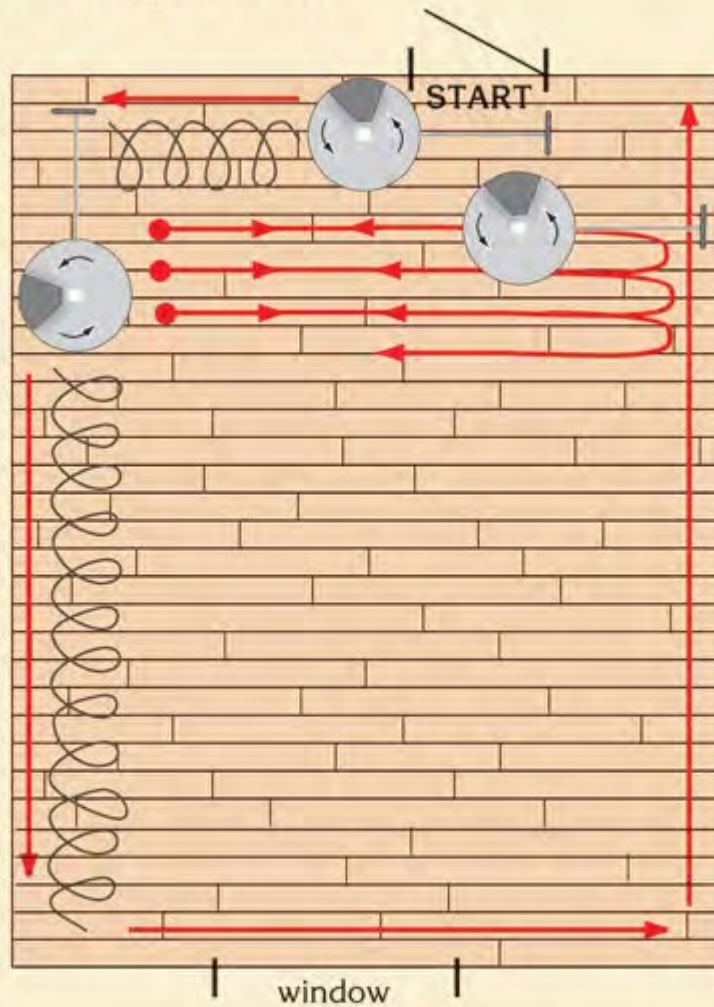
Instead, start the new abrasive on the other side of the room and work back to the middle, blending two similar scratch patterns together.

Screening is usually the final step to preparing the wood for finish or stain. The purpose of this final step is to blend the edges (which is done using an edger), and the field (done with the big machine). Some very talented professionals with incredible ability can sand, edge and hand sand without needing to do the final screening preparation which obtains a uniform color and sheen is void of any sanding marks. Even the most skilled floor mechanics do screen floors or sand with the OBS 18 DC. If a professional gets a swirl mark or an edger mark while he is staining, he will wet sand (using the stain) the scratch using a 100 or 80 grit sandpaper to remove the mark. Yes, swirl marks get missed even by the best!

Quality assurance is important and it requires looking carefully for swirl marks, and if present, there is no magic that will make them disappear. You must re-screen using good technique and a finer grit with the goal to make the scratch pattern even tighter. This makes the previous circular scratch non evident. For example, if you used 100 grit, you should consider 120 or 150 grit for the next pass. You must make certain that when doing this, you are sanding, not polishing. Polishing can occur when using an abrasive for too long, and going too fast.

To obtain optimal adhesion, screening is also the technique to prepare one coat of finish for the next coat of finish. New media, like the abrasive pads or Norton's Sand Dollars are great on certain finishes in their early stages of cure. Adhesion is the number one most critical part of your job in finishing a hardwood floor, yet the potential for swirl marks exist because of the need to prep for adhesion. Numerous factors can affect adhesion that we will discuss in a future white paper.

**Figure 3**  
**Buffer room pattern**



To take advantage of the best scratch patterns, try using this technique for buffing a room. Start around the perimeter using an egg-shaped motion. Then, abrade the middle of the room. Complete your first pass, turn the buffer 180 degrees, and go back down the same path. Then, move over half the width of the buffer and make another pass. Following this technique helps avoid the "zebra," or striped, effect on the floor.

Just do not forget! Good buffing techniques are critical for great adhesion and no swirl marks.

To conclude this discussion on swirl marks, always buff using a vacuum assist on your buffer. Buff using the OBS 18 DC with a vacuum. These are the two most important recommendations to avoid swirl marks in your work.

*This white paper is for informational purposes only. Always consult the manufactures' guidelines when using machinery or applying product. Although the paper may include some discussion of installation and/or application techniques, the paper is not intended as an instructional manual.*



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