



Subject: Variation in Engineered Hardwood Flooring

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Wood is usually chosen as a flooring option because of the natural beauty, distinct color and graining characteristics. While a more traditional graded and sorted material is still marketed, a good amount of today's factory finished engineered hardwood flooring is made from a live-sawn cut of the log (see Info Bulletin #150 for more information). Each board is unique in its characteristics and can vary in color and grain appearance from piece to piece. With all that beautiful variation, unfortunately a small sample board (even an 18" x 24" display panel would be considered a small sample), may not show all the variation the flooring could have. Below are a few reasons these variations can exist.

Natural Board Variation

In the above opening paragraph, we explained that the live-saw cut has become more commonly used to produce factory finished engineered hardwood. With this cut, the manufacturers can maximize the yield out of a log, allowing all color and grain differences. In most cases, there is little to no grading in this cut; you receive all the beauty the log provides. Each plank can vary from a clean to rustic visual and contain small to large filled knots and splits, sap wood, and a high contrast within the natural and lighter stained visuals. Texture variation can also exist depending on the surface treatment. If the collection has a wire-brushed texture, some planks may have more texture due to the density of that particular plank.

This can also vary by specie. It is important to take heartwood and sapwood into consideration before choosing your floors. The difference between the inner part of the tree (heartwood) and the outer part of the tree (sapwood) can be seen as variations of light and dark. The natural contrast between heartwood and sapwood plays a major role in the color of wood floors. Variations can occur from board to board, as well as in the same board. This occurs naturally, and is not an "unfinished" board. This sapwood is depicted in the Oak flooring image below. The Sapwood is light/yellowish mineral streak in the photo. Some species will have greater levels of variation, for example, Hickory or Maple. Two examples of specie variation are shown below.

Hickory Live-Sawn Factory Finished Engineered Flooring



Oak Live-Sawn Factory Finished Engineered Flooring



Natural Color Changes Over Time

The natural board subtleties may become more distinct over time due to exposure of direct sunlight. Exposure to UV rays from sunlight, florescent, LED and incandescent bulbs can change (patina) each board. Window coverings, UV resistant tint, solar screens can minimize but not eliminate this natural occurrence. Certain species are more susceptible to light and development of varying degrees/shades of patina, due to their high content of natural oils & tannins. Occasional rearranging furniture and rugs will help reduce the potential effects of the sun.

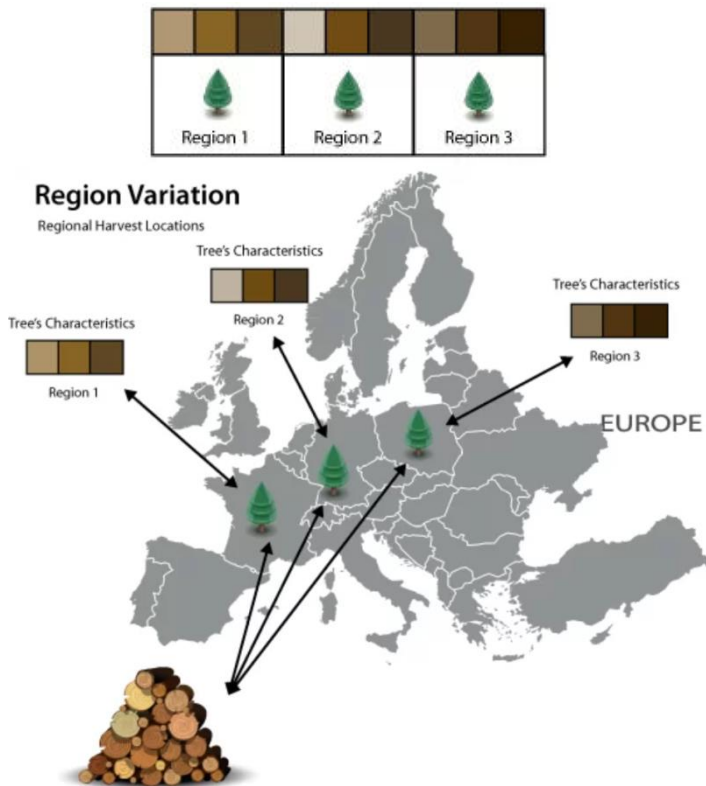
This color change is depicted in the image to the right. The darker section of the flooring had been covered by a rug. The lighter portion was uncovered. While this may eventually catch up, most homeowners may see this as a product defect when in fact, it is a naturally occurring scenario.

Older display panels that have gone through this natural change may be different from new flooring being delivered to the jobsite as the new flooring has not been exposed to the same conditions. In time, when exposed to similar conditions, the floor should catch up to the sample panel.



Regional/Seasonal Harvesting Variation

Many things can change the final color and grain definition of a cut piece of wood. From the length of a growing season, the soil a tree was planted in to the final cut of material from the log. With this, we experience differences in color and mineral streaking in our lumber depending where in the US or Europe the material comes from. As the increased demand of hardwood flooring continues, manufacturers may source their material not only from additional regions of the country, but possibly from all over the world. The graphic to the left is showing the possible variation in color depending on what portion of Europe a log may have been sourced from. This same regional variation exists in the US.



In addition to region, the time of year that the lumber was harvested can also change its color due to the amount of natural sugars and oils traveling through the tree at that particular time of year.

All the above scenarios can create a slight variation between batches of the same collection and/or color.

Fuming Characteristics

There are multiple ways manufacturers can accentuate the natural beauty of wood. Some manufacturers utilize a process called Fuming. Fumed hardwood is a natural accelerated aging process used to enhance the dark to light subtleties within every wood plank, batch and region. The deepening in color and variation is created by adding a natural oxidizing agent in a controlled environment to react with the naturally present tannins in the wood – Time, Temperature & available Tannins (naturally present in the wood) mix to create one of kind planks that are added to the color options of a collection. While this process is done in a very controlled environment, it is not 100% precise. As mentioned in the previous section, Regional/Seasonal Harvesting Variation; every region, grove and tree produces an individually unique and high contrast color palette. This fuming process can accentuate that contrast. The finish system usually used with this process is natural oil which can cause additional contrast. Additional information regarding the different finish systems is explained in the next section.

The below image is an example of a natural oak vs. a fumed oak.



Different Finish Systems

There are multiple finish systems that manufacturers utilize to create their collection of colors. Some finish systems can change the overall color of a floor as it ages or oxidizes. As mentioned above, some may start with a reactive type of coloring process like fuming, and then add penetrating oil to provide a two-tone or layering appearance. While this may provide the color and ‘raw’ appearance that has become popular, this finish system can come with inherent risks. A fumed, naturally oiled floor will have the most variation and can experience a large color change over time. Most retailers will purchase a box of flooring to sample to their prospective customer as their display sample panel may not show the overall variation well.

Another finish system would be a more traditional stain/urethane finish system. Some also utilize stains, glazing or tint coats in a urethane system to produce a layering effect similar to a fumed/oiled system that can be more consistent between batches. These systems can also minimize the color change due to UV exposure or oxidation. In these multi-layered urethane systems, they have a very low sheen to provide that ‘raw’ appearance.

So How Do We Sell Wood Flooring?

After reading this, you may be asking yourself, how am I supposed to sell wood flooring? Well, first off, knowledge. The whole reason this information bulletin exists is to help inform you about the natural varying beauty of hardwood flooring. Wood flooring is the most replicated appearance in other flooring types. From laminate to LVP, even ceramic tile has imitated the look of wood. But none will ever be able to claim the true natural beauty or variation that a real wood floor will have, as no plank and/or floor for that matter is really ever the same. Real wood floors will never have a repeating pattern across the floor. Continue learning about real wood floors by reading our other [Information Bulletins](#) or [Did You Know Episodes](#).

Content (including some written content and images) was sourced from the websites of [Naturale Elegance Flooring](#) and [Hallmark Floors](#). Additional information can be acquired from the manufacturer’s technical department of the products used on your floor. The National Wood Floor Association (NWFA) can be an additional resource. They can be reached at 800-422-4556 or online at www.woodfloors.org.