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WOOD FLOORING IN THE COMMERCIAL SPACE

The following article is written by our guest author, Brett Miller, Vice President of Technical Standards—Education—and Certification at the NWFA. This article is designed to assist Builders, Architects, Contractors, and Design Professionals in understanding all of the considerations of wood flooring when specifying and installing in commercial projects. https://www.nwfa.org/

The Green Story of Wood Flooring:

Of all the flooring options available in today's ever-changing commercial marketplace, wood is the only one that is completely sustainable. The raw materials used to make real wood floors (trees) can be re-grown to replace those that have been harvested. For example, it normally takes hardwood trees about 40 to 60 years to grow to an age where they are harvestable, depending on the species. The raw materials needed to replace wood floors won't be needed for 100-plus years, due to the fact that wood floors can last well over 100 years.

The United States Department of Agriculture, Forest Service, reports that, in the United States, the average annual net growth of hardwood trees is greater than the average annual removals. They further report that the growth to removal ratio is about 1.66. This means that for every tree harvested in the United States, another 1.66 is regrown in its place. As a result, the total standing US hardwood volume is now about 328 billion cubic feet, more than existed 60 years ago in North America.

To completely understand the environmental friendliness of wood as a flooring material, it is important to also understand the life cycle of wood floors. A life cycle analysis is a total cradle to grave assessment of a material. For wood floors, this includes every stage of the process for the manufacturing of wood floors, from a sapling growing in the forest, to the end of the service life of the wood flooring material.

The Psychology behind the Desire for Wood Flooring:

Not only is wood a green and sustainable flooring option for the commercial space, there is a growing body of research that suggests that real wood may be good for our health and well-being when incorporated into the built environment. According to an article written in Think Wood:

- In four different independent studies, the presence of wood was found to have an immediate effect of lowering sympathetic nervous response, akin to reducing stress and anxiety.
- A study of stress levels in students found long-term exposure to wood interiors was correlated with an activation of the parasympathetic nervous system, which acts to reduce overall stress levels and promote healing.
- A range of independent studies found that participants self-report a preference for wood interiors and believe that it promotes health and well-being.

Neuroscientists have found that the use of wood in interior designed spaces promotes health and well-being in the mind and body.

Visual access to nature can promote positive feelings and reduce negative feelings such as anxiety and anger. Wood is perceived as natural and that wood products are often preferred over other products because of their naturalness.

Some of the design theories surrounding this psychological design trend include:

- ***Shinrin-yoku:*** roughly translated as “forest bathing” for improving one's sense of well-being and overall health. Surrounding oneself with the forest.
- ***Biophilia:*** The biophilia hypothesis suggests that humans possess an innate tendency to seek connections with nature and other forms of life. Biophilic design is a concept used within the building industry to increase occupant connectivity to the natural environment through the use of direct nature, indirect nature, and space and place conditions.
- ***Teleological Design:*** The physi-theological argument, also known as the argument from design, or intelligent design argument, is an argument for the existence of God or, more generally, for an intelligent creator "based on perceived evidence of deliberate design in the natural or physical world."
- ***Attention Restoration Theory (ART):*** Nature possesses fascinating qualities that induce involuntary attention. In contrast to the directed attention that is often required in our daily life, the involuntary

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attention requires no effort, and our attentional capacity can rest. Thus, nature can provide a setting for effortless attention, and we get gradually refreshed by being in nature.

- ***Ulrich's Psychoevolutionary Theory:*** Positive emotions evoked by nature or natural scenes are presumed to block negative emotions and thoughts and in turn enable a decline in arousal.

It is obvious that real wood is the most environmentally friendly floor covering option, and also promotes mental and physical health. So why is it that the commercial builders, architects, contractors, and design professionals do not specify wood, and in-turn are specifying products that just look like wood?

The answer is actually quite simple, their perception is that it is an easy sell, and it won't scratch, which it actually will and it's a cheap alternative.

Specifying Wood Flooring

Wood floors are installed successfully in commercial applications daily. Most of these wood floors that are installed perform incredibly well and often become more appealing with age, use, and patina.

There are, however, a few critical items that should be taken into account when a commercial space has been specified to receive a wood floor. These three questions should be asked during the specification process to ensure a successful wood flooring installation.

- Is the wood selection appropriate for the facility and the region it is going in to?
- Is the facility ready to receive wood flooring?
- Can the facility sustain an environment conducive for the wood flooring to perform as it is intended to perform?

Most types of wood flooring can be installed successfully in commercial projects. However, in order to achieve the performance one would expect from a floor covering in a high-traffic environment, there are some wood flooring types that perform better than others. The flooring categories to take into account include:

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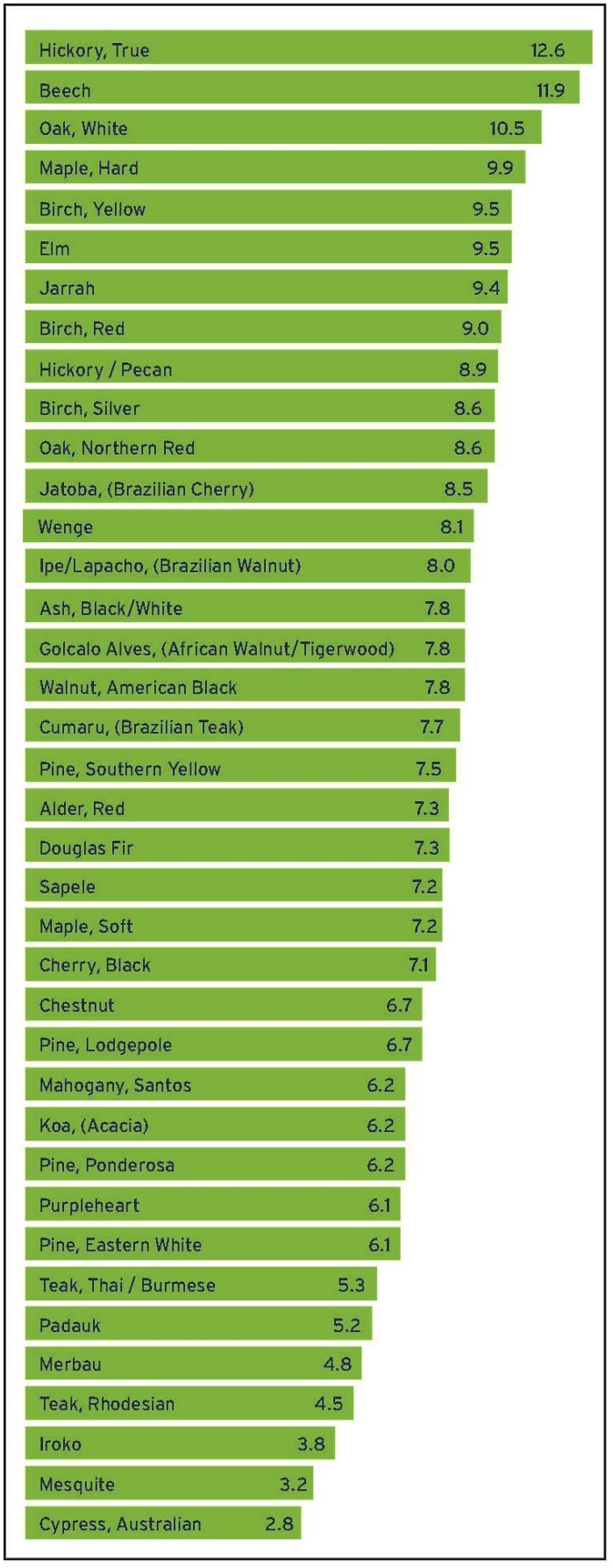
- ***Flooring Cut***- Wood is a hygroscopic and anisotropic material, meaning it takes-on and throws-off moisture, and it shrinks and swells differently in each direction depending on change in moisture. How wood changes dimension is largely influenced by the way in which it was cut from the tree. For solid wood flooring these cuts are classified as plainsawn, riftsawn, quartersawn, livesawn, and end-grain. The hardest and most durable cuts are end-grain and quartersawn. The most stable cuts are quartersawn and riftsawn.
- ***Flooring Width***- Wood changes dimension proportional to the width of the plank. Narrower boards expand and contract less than wider boards of the same species and cut.
- ***Flooring type***- Engineered wood flooring is, in general, more dimensionally stable than solid wood flooring. However, not all engineered wood flooring is recommended or appropriate for use in commercial settings. End-grain flooring is by-far, the hardest and most durable wood flooring option for commercial spaces, but a controlled environment is key to the long-term performance of this material.
- **Species**- In solid and engineered flooring options, certain species are known for their inherent dimensional stability. More-stable species such as Mesquite, Merbau, and Eastern White Pine are better options for less-stable environments. Whereas less-stable species such as Hickory, Beech and Birch are less suitable for less-stable environments.



The wood flooring product selection specified for the project should be aligned with the conditions in which the facility is capable of sustaining. It is the responsibility of the specifier, the builder and any individual who influences the buyer to make a flooring selection, to ensure these conditions are aligned with the flooring selection.

Installing Wood Flooring

Concrete is the most common commercial building material for a variety of reasons. It is one of the most cost-effective building materials available. It provides superior fire resistance in commercial projects, and it provides good energy efficiency as well. Concrete also provides excellent sound control, so works well as a subfloor material in commercial spaces, especially for projects like condominiums or apartment buildings.

When installing wood flooring over concrete, the following guidelines for concrete should be addressed:

- Moisture must be accounted for by the flooring contractor installing the wood floor. Common concrete moisture tests include relative humidity tests (ASTM 2170), calcium chloride tests (ASTM 1869), calcium carbide tests (ASTM 4944), and electrical meter tests (ASTM 2659). The results of these tests might indicate where further testing may be required, and/or that the presence of moisture exists. It is critical to use an appropriate vapor retarder to help minimize future moisture issues.
- The slab must be free of contaminations such as wax, oil, grease, paint, and curing compounds.
- It may be necessary to scarify, shotblast, or grind the concrete to properly prepare it for wood floor installation. Removal must be deep enough to eliminate all contaminates and produce necessary concrete surface profile (CSP) for the installation method being used.
- Concrete Subfloor Joints such as construction joints, contraction joints and isolation joints must be honored and not be filled with underlayment materials or other products. A wood floor secured directly to the concrete slab should not bridge moving joints without allowing for a breaking point. When concrete decides to move, it is going to move.
- The compressive strength of the concrete must be accounted for when specifying an installation system to use for the wood floor. Normal weight concrete has a compressive strength between 3,000psi and 4,000psi. Anything less than this will require additional preparation, such as an application of surface densifiers or hardeners.
- Flatness tolerance for wood floor installation is 1/8” in 6-feet, or 3/16” in 10-feet. No slab is poured to these specifications. Professional contractors can remove high spots by grinding, and fill depressions with approved patching compounds. Concrete subfloors also can be flattened using a self-leveling concrete product. (NOTE: The disparity between concrete floor flatness tolerances in the wood flooring industry (Division 9) as compared to the tolerances for concrete flatness within 72 hours of it being poured (Division 3), has been detailed in the American Concrete Institute (ACI) standard.

The building must be within tolerance prior to any wood flooring delivery or installation. This includes the following:

- Building must be enclosed.
- Wet Trades must be completed.
- HVAC system must be in fully operational mode, including fully operational heating/cooling systems as well as fully functional humidification/dehumidification systems. Temporary HVAC may be used if it is capable of mimicking the expected in-use conditions of the space. Temporary heaters fueled by propane are not acceptable sources of heat, as the combustion of propane produces high volumes of moisture.

And finally, installation of any wood flooring product must strictly adhere to the flooring manufacturer’s instructions. Where manufacturer instructions do not exist, NWFA Installation Guidelines should be followed.

If you have any questions on any substrate or flooring material issues or installation call us at LGM, we have the answers and the contacts to get you the information you need.

Brett Miller is Vice President of Technical Standards, Education, and Certification at the NWFA.

Brett can be reached at brett.miller@nwfa.org—800.422.4556—The National Wood Flooring Association is an international not-for-profit trade association representing all segments of the hardwood flooring industry.

Excess Inventory Offer

Most of you have flooring material sitting around that's taking up space and costing you money.

Dispose of your excess inventory - remnants, hospitality carpet, carpet tile and any hard surface flooring materials. Avoid paying insurance or taxes on flooring materials taking up rack space and convert it into cash.

We have a contact in Calhoun, GA that will pay you for this material and arrange for shipping from your location. They'd need a complete inventory of what you have so they can make you an offer. This firm is well financed and established with a stellar reputation.

This is a great opportunity to get rid of merchandise taking up space and make some money in the process. Call or email Kolt or Cynthia with any questions so they can help you.

surplus@overstockfloorzusa.com

Kolt Privett - 770-530-4709

Cynthia Potts - 706-271-6767

Thanks,

Lew Migliore