

WOOD FLOORING PRODUCT

PART I

Wood Flooring Options

Wood is the hard fibrous material that forms from the main substance of the trunk or branches and beneath the bark of a tree. A wood floor is any flooring product that contains real wood as the top-most, wearable surface of the floor.

Wood floors come in many different options. These include, but are not always limited to, the following:

Hardwood/ Softwood

- A. **Hardwoods** come from deciduous, broad-leaved trees that lose their leaves annually. Hardwood comes from angiosperm trees. Angiosperm trees produce enclosed seeds such as pecans, acorns, or walnuts. Hardwood trees include oak, maple, ash, cherry, and others.
- B. **Softwoods** come from conifers, which are needle-bearing and usually remain green throughout the year. Softwood comes from gymnosperm trees. Gymnosperm trees produce uncovered seeds, such as pinecones. Softwood trees include pine, spruce, Douglas fir, cedar, and others.
- C. It's important to remember that being hardwood or softwood does not necessarily reflect density. Some softwoods are harder than hardwoods and some hardwoods are softer than softwoods.



Domestic/Imported

- A. **Domestic woods** are wood species grown and harvested within the United States and Canada.
- B. **Imported woods** (also known as exotic or tropical species) are wood species grown and harvested outside the United States and Canada.

Solid/Engineered

A. Solid Wood Flooring

1. Solid wood flooring is exactly what the name implies, a solid piece of wood from top to bottom.
2. Solid wood floors can be sanded and refinished numerous times during their service life.
3. Solid wood floors should not be installed below grade, which means below ground level, unless otherwise recommended by the manufacturer.



B. Engineered Wood Flooring

1. Engineered wood flooring is real wood flooring as well, but instead of a solid piece of wood from top to bottom, it is made using several layers of wood veneers or lumber core that are bonded together using adhesives.
2. No matter what the thickness of the engineered product, it is the top layer that determines the final appearance of the wood floor. This wear layer will be the species of wood that is selected.
3. The construction of engineered wood flooring can vary. The construction varies by manufacturer and by product.
4. The thickness of the finished product can range from 3/8" to 3/4".
5. The top layer of engineered wood flooring typically is referred to as lamina or lamella. Each layer is bonded to adjoining layers using adhesive.
6. The middle layers, which are called core layers, can be made of the same species as the wear layer, or an entirely different species. The bottom layer is called the backing.
7. In general, due to its' construction, engineered wood flooring can be installed above- on- or below-grade.



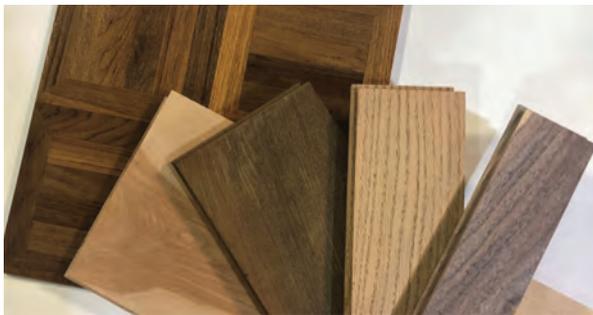
C. Engineered Composite Wood Flooring

1. Engineered composite wood flooring uses real wood on the wearable surface that is bonded to a multitude of composite platform materials using adhesives.
2. In general, due to its construction, engineered composite wood flooring can be installed above- on- or below-grade.



Jobsite-Finished/Factory-Finished

- A. Jobsite-finished floors are manufactured and installed in a raw state and sanded and finished on-site.
- B. Factory-finished floors are just as the name implies. The flooring has finish applied at the factory prior to installation.



Strip/Plank/Wide Plank/Parquet

- A. Strip wood flooring is manufactured in linear widths less than 3”.
- B. Plank wood flooring is manufactured in linear widths greater than or equal to 3”, and less than or equal to 5”.
- C. Wide plank wood flooring is manufactured in linear widths greater than 5”.
- D. Parquet flooring is any pattern that is geometric in shape as opposed to linear. The traditional finger block pattern is a very common and simple parquet pattern, but parquet can vary in style, width, complexity, and pattern.

Saw Cut

How wood is cut from the log will affect appearance and performance of wood flooring. There are several sawing methods used for the production of both solid and engineered wood floors.

- A. **Plainsawn/Flatsawn:** Wood cut parallel to the growth rings so that the growth rings are mostly parallel (0° to 45°) to the wide face of the board (a tangential cut) is called plainsawn in hardwoods, and flatsawn in softwoods. Plainsawn flooring is more dimensionally stable in thickness (radially) and less stable in width (tangentially).



- B. **Riftsawn/Bastard-Sawn:** Wood cut neither parallel nor perpendicular to the growth rings so that the growth rings make angles of 30° to 60° to the face of the board is called riftsawn in hardwoods, and bastard-sawn in softwoods.



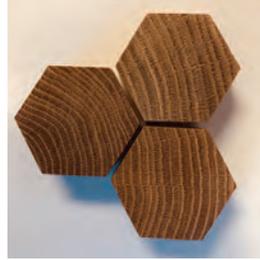
- C. **Quartersawn/Vertical-Grain:** Wood cut perpendicular to the growth rings so that the growth rings are mostly perpendicular (45° to 90°) to the wide face of the board (a radial cut) is called quartersawn in hardwoods, and vertical-grain in softwoods. Quartersawn lumber is more dimensionally stable in width (radially) and less stable in thickness (tangentially).



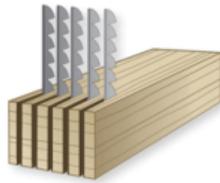
- D. **Livesawn:** Wood cut from the outside diameter through the heartwood incorporating the full range of the above characteristics on the face of the board is known as live-sawn material. This cut is typically wider and incorporates all of the dimensional stability and aesthetic characteristics of the other cuts.



E. **End-Grain:** Wood cut so that the face of the floor surface exposes the ends of the growth rings is the transverse cut, more often known as end-grain. End-grain flooring will shrink and swell according to the tangential value in the direction across the circumference of the growth rings and according to the radial value in the direction perpendicular to the growth rings, with essentially no movement in thickness.



F. **Sawn Veneers:** With engineered wood flooring, the top veneer (or lamina) is sawn in the same way as normal solid wood flooring, and is available in any of the cuts previously mentioned. The only difference is the thickness of the cut, which varies from product to product.



G. **Sliced Veneers:** With engineered wood flooring, the top veneer is sliced from the lumber (called a cant). This process of producing veneers has thickness limitations and can stress the wood fibers, but has very similar natural, physical, and strain characteristics as a sawn veneer.



H. **Rotary-Peeled Veneers:** With engineered wood flooring, the top veneer is produced by positioning full logs onto a large lathe, which spins the log against a sharp blade, producing a distinct, purely tangential grain-pattern. The grain pattern repeats on larger sheets.



Grade

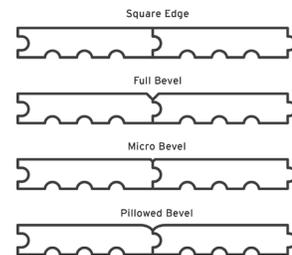
- A. Grading is an essential part of doing business in the hardwood floor industry. Grades group flooring with similar qualities, bringing a degree of consistency to products from different mills. Grades tell the purchaser what to expect when buying product, including surface characteristics, required lengths, and milling tolerances.
- B. Grades are established through industry mill certification programs such as NOFMA (formerly

the National Oak Flooring Manufacturer's Association, and Wood Flooring Manufacturer's Association; currently the wood flooring mill certification program administered by the NWFMA), or by hardwood flooring manufacturers that determine their own classifications and create their own grades, or "proprietary grades."



Beveled edges

- A. Beveled edges are a feature of most factory-finished wood floors. A bevel refers to an edge of a board that is not perpendicular to the face.
- B. The degree of beveling varies depending on the manufacturer and the specific product. Typical bevel styles include the following:
 - Square edge
 - Full bevel
 - Micro bevel
 - Pillowed bevel
 - Chiseled edge



Antique Reclaimed/Recycled/Salvaged

- A. **Post-Consumer Recycled/Antique Reclaimed Wood:** Wood or wood fiber that has been reclaimed from an end-user after being used for its original intended purpose. End-users may include individuals, households, or industrial users of the product.



- B. **Pre-Consumer Recycled Wood:** Wood or wood fiber that is created as a by-product of a secondary manufacturing process and is not typically re-used on-site in the same process that generated it (also called post-industrial recycled wood).



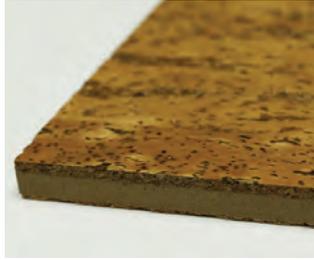
- C. **Salvaged Wood:** Wood or wood fiber that comes from logs that have been salvaged from the following sources: post-agricultural (e.g., fruit and nut orchards); urban forests (street trees); waterways (sunken logs raised from rivers, reservoirs, and lake bottoms); and other sources that are otherwise not intended to be harvested.



Other (Non-Wood) Flooring Products

A. Cork Flooring

1. While cork technically is not considered a hardwood, it does come from a tree. Cork comes from the cork oak tree. While wood flooring is harvested by



- using the wood of the tree, harvesting cork utilizes the bark of the tree.
2. Cork is a natural product that remains largely unchanged by processing. It is a naturally fire-resistant material that does not release any toxic gases during combustion.
3. Cork absorbs ambient sound, which makes it an excellent sound insulator. Because it has an elastic nature and miniature cell composition, cork is an extremely durable flooring material. Cork resists the growth of mold, mildew, and bacteria. It also repels bugs and dust mites due to the presence of a naturally occurring substance called suberin.

B. Bamboo Flooring

1. Bamboo is not wood; it is a grass. It is one of the fastest growing plants in the world. In fact, some shoots have been observed to grow more than three feet in a single day. Bamboo can regrow itself without replanting, so it is a highly sustainable resource.
2. Bamboo is one of the oldest building materials known to man.
3. Bamboo flooring comes in three common styles: vertical, horizontal, and strand-woven.



PART II

Trim and Mouldings

Mouldings are used to cover the expansion area, to hide cut ends, to adjust height differences or transitions between floors, and to aesthetically finish the area. Profiles, species, and availability vary through the industry.

Baseboard Mouldings (Skirting Board)

Baseboard mouldings are used where the floor and walls meet. They form a visual foundation and are important in establishing the character of a room. Traditional baseboard profiles measure from 3/8" to 3/4" thick, and vary in height. Functionally, they protect the walls from kicks, bumps, furniture, and cover perimeter expansion space where the floor meets the wall.



Base Shoe (Shoe Moulding)

A narrow moulding that is normally used in conjunction with, or instead of, baseboard to conceal the required expansion space between the wall, cabinets, or steps, and the wood flooring. It is flexible enough to conform to irregular surfaces. Base shoe profiles normally measure from 3/8" to 5/8" thick, and can vary from 1/2" to 1" in height. It is important when installing base shoe to avoid nailing it to the flooring. Only nail it to the wall or baseboard.



Quarter Round

Quarter round is, as the name insinuates, one quarter of a full round. It is normally used as an alternative to base shoe to conceal the required expansion space between the wall, cabinets, or steps, and the wood flooring. It is important when installing quarter round to avoid nailing it to the flooring. Only nail it to the wall or baseboard.



Reducer

Reducers are used to provide a smooth transition between floors of uneven heights. Reducers are often used between wood floors and thinner floor coverings such as vinyl or low pile carpet. It also can be used to cover expansion space around vertical surfaces such as fireplace hearths when mounted directly to the surface of the flooring. Reducer profiles normally measure from 5/16" to 3/4" thick, and can vary from 1" to more than 3 1/2" wide.



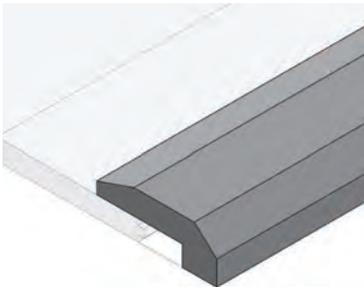
Overlap Reducer

Overlap reducer is typically used in floating floor installation methods. This multi-purpose moulding is used to provide a smooth transition between floors of different heights, or different types of flooring. Overlap reducer should never be fastened to the wood flooring. It must be attached only to the subfloor, in order to maintain adequate expansion space.



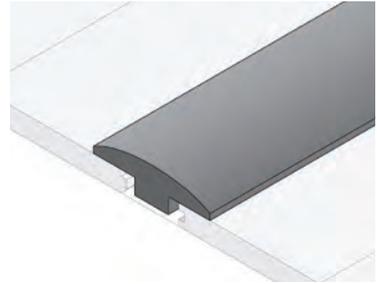
Threshold (Baby Threshold)

Thresholds are designed for the transition between floors of different heights, and are commonly used to make the transition at doorways, between interior rooms, and to the outside. Threshold profiles normally measure from 5/16" to 3/4" thick, and can vary from 1" to more than 3 1/2" wide.



T-Moulding

T-mouldings are commonly used to join two areas of flooring that are the same thickness or to join floating hardwood floors between two rooms, in doorways, or where the flooring manufacturer requires additional expansion space based on the floor span. T-moulding can also be used to conceal concrete construction joints or internal expansion joints left during the installation. T-moulding should never be fastened to the wood flooring. It must only be attached to the subfloor, in order to maintain adequate expansion space.



Nosing (Stair Nosing, Bullnose, Landing Tread)

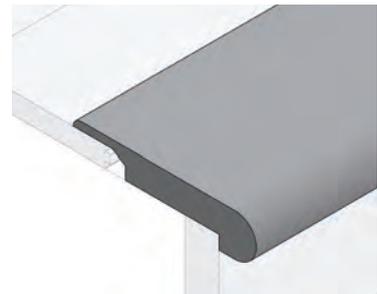
Nosing is the horizontal, protruding edge of a stair where most foot traffic frequently occurs.



The nosing provides a transition from the floor level to any space below the floor elevation. It starts flush with the flooring and makes a finished edge on the outer face. They are used to cover the outside corner of a step, milled to meet the hardwood floor in the horizontal plane, or to meet the riser in the vertical plane. Be sure to check with local building codes for stair nosing overhang, rise/run, and proper installation requirements for stair nosing.

Overlap Stair Nosing

Overlap stair nosing normally is used with floating floor installation methods, where the flooring meets a step down or landing.



It is used to protect the edges and provide a finished look. It is different from flush stair nose; overlap step nose has a slightly raised profile that overlaps the flat flooring surface, in order to maintain adequate expansion space. Be sure to check with local building codes for stair nosing overhang, rise/run, and proper installation requirements for stair nosing.

Stair Tread

The horizontal part of a stair upon which the foot is placed.



A. **Solid stair treads** are pieces of wood that are used as the actual stair steps themselves or, more commonly, to cover the existing sub treads beneath.

B. **False tread end caps** are used to create the look of steps with solid treads and a carpet runner. In this case, caps are placed at one or both sides of the stair and it is carpeted in between.



C. **Overlay stair treads** are used specifically to cover existing sub treads with less impact on the height/rise gain in a remodel project.



Stair Riser

The vertical component of a step filling the space between the treads

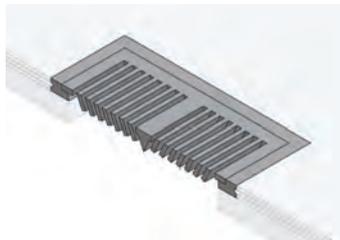


Floor Vents

A. **Self-Rimming Vents (Drop-In):** A floor vent that drops into an existing HVAC vent. These vents normally overlap the floor on all four sides, and easily replace the builder-grade metal vents in any floor. These vents normally are available in any species, in any size, and with or without dampers.



B. **Flush-Mount or Trim-Line Vents:** A floor vent that is installed flush with, or cut into, the wood floor. They may contain a frame in which the removable vent rests. These vents are normally



available in any species, any size, and any thickness to match different flooring profiles, and with or without dampers.

C. **Horizontal Baseboard Registers:** A baseboard vent that is installed with the replacement of baseboard mouldings where wall ventilation exists. They are often used to replace the builder-grade metal baseboard vents. These vents are normally available in selected species and at standard wall vent sizes, with or without dampers.

Custom Mouldings

Mouldings created for unusual circumstances may be manufactured to jobsite requirements to complement the wood floor and allow for proper transition and coverage of expansion space. Custom mouldings can be custom milled to any shape or size, overlapping or flush, and out of any material.

PART III Packaging

- A. Factory-finished hardwood flooring is normally packaged in cartons or boxes.
- B. Unfinished hardwood flooring is usually packaged in bundles. Bundles may be available in two types: bundled flooring (also referred to as "random-length bundles") and nested bundles.
 1. **Bundled flooring** consists of flooring pieces that range from 6" +/- the nominal length of the bundle. A run in bundled flooring is a single piece of flooring.
 2. **Nested bundles** consist of flooring that is placed end-to-end continuously in runs, with the run length equaling the 6" +/- nominal bundle length.
- C. **Square Foot:** Most wood flooring is packaged in square feet or square meters. This is the area that the flooring will cover.
- D. **Board Foot:** A board foot is a measurement of volume that is 12" by 12" by 1" thick. The board foot measurement indicates the amount of lumber necessary to create flooring from a board.
- E. **Lineal Foot:** Lineal foot is a measurement used for ordering material when length is the only concern. Baseboards, transitions, feature strips, and borders are examples of materials commonly ordered by the lineal foot.
- F. **Equal Lineal Foot:** Random-width plank flooring laid in a repetitive pattern normally is ordered by the equal lineal foot to ensure that the floor gets the same length of each width of flooring.
- G. **Cubic Foot:** A cubic foot (or 12" by 12" by 12") is a measurement normally only used when flooring is being shipped in containers or via airfreight, making volume a concern.

PART IV Conversions and Calculations

- A. Square Footage in a Bundle: (# of runs X bundle length in feet X width in inches)/12 = ft².
- B. Square Footage to Lineal Footage: (square feet X 12)/width in inches = lineal footage.
- C. Equal Lineal Footage (for Multiple-Width Flooring): Total square footage/total pattern width X width in question = ft².
- D. Average Length (with nested bundles): total lineal feet/# pieces.
- E. Average Bundle Length (of bundled flooring): total lineal bundle feet/# of bundles.
- F. Converting fractions, decimals, and millimeters:

Fraction - Decimal - Metric (mm)		
FRACTION	DECIMAL	METRIC (MM)
1/64	.0156	.4
1/32	.0313	.79
3/64	.0469	1.19
1/16	.0625	1.59
5/64	.0781	1.98
3/32	.0938	2.38
7/64	.1094	2.78
1/8	.1250	3.18
9/64	.1406	3.57
5/32	.1563	3.97
11/64	.1719	4.37
3/16	.1875	4.76
13/64	.2031	5.16
7/32	.2188	5.56
15/64	.2344	5.95
1/4	.2500	6.35
17/64	.2656	6.75
9/32	.2813	7.14
19/64	.2969	7.54
5/16	.3125	7.94
21/64	.3281	8.33

Fraction - Decimal - Metric (mm)		
FRACTION	DECIMAL	METRIC (MM)
11/32	.3438	8.78
23/64	.3594	9.13
3/8	.3750	9.53
25/64	.3906	9.92
13/32	.4062	10.32
27/64	.4219	10.72
7/16	.4375	11.11
27/64	.4219	10.72
7/16	.4375	11.11
29/64	.4531	11.51
15/32	.4688	11.91
31/64	.4844	12.30
1/2	.5000	12.70
33/64	.5156	13.10
17/32	.5313	13.49
35/64	.5469	13.89
9/16	.5625	14.29
37/64	.5781	14.68
19/32	.5938	15.08
39/64	.6094	15.48
5/8	.6250	15.88
41/64	.6406	16.27
21/32	.6563	16.67
43/64	.6719	17.07
11/16	.6875	17.46
45/64	.7031	17.86
23/32	.7188	18.26
47/64	.7344	18.65
3/4	.7500	19.05
49/64	.7656	19.45
25/32	.7813	19.84
51/64	.7969	20.24
13/16	.8125	20.64
53/64	.8281	21.03
27/32	.8438	21.43
55/64	.8594	21.83
7/8	.8750	22.23
57/64	.8906	22.62
29/32	.9063	23.02
59/64	.9219	23.42
15/16	.9375	23.81
61/64	.9531	24.21
31/32	.9688	24.61
63/64	.9844	25.00

INVOLVED PARTIES

The guidelines defined in this chapter generally are considered to be typical responsibilities of each involved party within the supply-chain. It is important to identify each of the relevant parties, along with their specific roles, prior to beginning each flooring project. Each party may be referenced by an alternative name or classification, may have more than one designation, or may be called something different from what is defined in this chapter. Defining responsibility will help all involved parties clearly understand their roles in the process, and assist in minimizing potential future claims.

PART I

Involved Party Definitions

Manufacturer: Any individual or entity that physically manufactures a product, or has a product designed or manufactured for the wood flooring industry, and places it on the market under its' own name or trademark.

Specifier: Any individual or entity (including, but not limited to, architects, builders, consultants, design centers, interior designers/decorators, end-users, general contractors, flooring contractors, sales professionals) that recommends, specifies, or in any way advises the buyer prior to ordering, purchasing, and/or installing the wood floor products.

Supplier: Any individual or entity (including, but not limited to, distributors, wholesalers, importers) that receives product from a manufacturer and supplies the wood flooring products to a reseller or buyer.

Seller: Any individual or entity (including, but not limited to, retail stores, big box stores, internet sales, interior designers, vendors, direct sales) that physically supplies/sells the wood flooring products to the buyer.

Buyer: Any individual or entity (including, but not limited to distributors, end-users, installers, flooring contractors, general contractors) that is the first to use/handle/possess/receive/deliver the wood flooring material prior to installation of the wood flooring product.

Builder: Any individual or entity (including, but not limited to homebuilders, remodelers, general/restoration contractors, DIYers) that coordinates and oversees the different suppliers, trades, installers, and other experts involved in building or remodeling a home, office, or other building.

Installer: Any individual or entity that physically installs and places into service the wood flooring product.

End User: Any individual or entity that physically receives and uses the final wood flooring product.

PART II

Involved Party Responsibilities

A. Manufacturer Responsibilities

1. It is the responsibility of the **Manufacturer** to produce a product, that will perform as it is marketed and intended to perform based on the instructions provided.
2. It is the responsibility of the **Manufacturer** to design and manufacture a product in accordance with all standards and regulations that apply to the product being sold.
3. The product should contain labels identifying its contents, and should make available (in print or electronically), installation and maintenance instructions for the product being put to use.

B. Specifier Responsibilities

1. It is the responsibility of the **Specifier** to ensure that all jobsite conditions are capable of meeting or exceeding the minimum standards and requirements of the products being specified for the project.
2. The specified wood floor must coincide with the projected interior climate capabilities of the facility receiving the wood floor. Interior climate capabilities of the facility include type and functionality of the HVAC systems, humidification/dehumidification systems, interior and exterior insulation, types of windows, and methods of construction.
3. Interior environmental conditions vary from region to region and jobsite to jobsite. The wood floor selection should be determined by the interior climate capabilities of the facility receiving the wood flooring. The floor selection determination may include species, cut, width, installation method, manufacturer requirements, or whether to use solid or engineered flooring for each unique situation.

C. Supplier/Seller Responsibilities

1. It is the responsibility of the **Supplier** and/or the **Seller** to ensure all products being supplied meet or exceed the minimum federal and local regulations where it is being sold.
2. Product should be stored in dry, climate-controlled, and well-ventilated facilities that meet the minimum requirements of the products being stored and sold.
3. Products should not be sold to, or delivered to, a jobsite that does not meet manufacturer minimum requirements, or the minimum requirements detailed in the Jobsite Conditions chapter of this publication.
4. Expired/outdated product should not be sold without clear acknowledgment by the buyer.

D. Builder Responsibilities

1. If the wood floor installation is part of the scope of the construction project, it is the responsibility of the **Builder** to ensure that all wet work (e.g., drywall taping, painting, texturing, tile work, etc.) is completed and thoroughly dry prior to wood flooring installation.
2. Building codes establish minimum standards and not always best practices. The **Builder** must be aware of the materials specified within the home in order to build accordingly. Any additional building costs must be accounted for during the specification and planning phases of construction.
3. In new construction, it is the responsibility of the **Builder** and/or the **Specifier** to ensure the facility being built is designed and capable of sustaining an environment conducive to the building materials being used in it. The jobsite must meet or exceed all wood flooring manufacturer requirements and NWFA Guidelines prior to wood flooring delivery and installation.
4. It is the responsibility of the **Builder** to ensure moisture control policies have been put in place and implemented to protect all building components, including, but not limited to, wood flooring, prior to, and during, the entire construction process. Some porous materials (e.g., gypsum, plywood, and oriented strand board) can tolerate short-term wetting, but they must be dry before wood flooring installation (according to the US Environmental Protection Agency).
5. In water restoration projects, it is the responsibility of the **Builder** and/or the restoration company to meet the minimum moisture requirements as outlined in these Guidelines.

E. Installer Responsibilities

1. It is the responsibility of the **Installer** to recheck the jobsite conditions at the time of installation and to confirm that they meet or exceed the wood flooring manufacturer's requirements.
2. It is the responsibility of the **Installer**, and/or the **Buyer** and/or the **End-User** to ensure that the wood flooring product meets their expectations for visual appearance and manufacturing quality prior to installation. Prior to commencing installation, the **Seller, Installer, Buyer, and End-User** should, when possible, loose-lay several boards on the floor in the room where they will be installed. If the visual appearance, color, sheen, or manufacturing quality of the product is deemed unacceptable, it should not be installed.
3. Installation of flooring constitutes acceptance of the material and the site conditions at the time of installation.

F. End-User Responsibilities

1. It is the responsibility of the **End-User** to use the flooring product as it is intended to be used.
2. Post-installation, it is the responsibility of the **End-User** to maintain temperature and humidity levels year-round, as required by the flooring manufacturer.
3. It is the responsibility of the **End-User** to follow a maintenance routine and use the proper maintenance products as required by the flooring and finish manufacturers.