


**INTERNATIONAL CFI**  
CERTIFIED FLOORING INSTALLERS

## Wood and Laminate

Instructor – Dave Garden, CFI #6269  
Carpet MASTER II / Laminate I-II / Hardwood I-II / Resilient Residential I / Ceramic I / Carpet Installation Inspection



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## Overview

- Product Knowledge
- Nail/Staple Down Installation Techniques
- Direct Glue
  - Proper Adhesive Application
- Laminate Floors
- Tools



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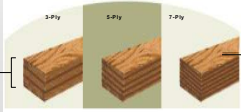
## Wood Construction

**Solid**




5/16" Thickness    Lumber (1" thick)    3/4" Thickness

**Engineered**



3-Ply    5-Ply    7-Ply    Face

Layers of Plywood



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## Dimensional Changes

Less than 1% Change

Engineered wood expands the same percentage in each direction – but less overall

Less than 1% Change

Solid wood – majority of expansion is in the width

**Importance of Acclimation**

**Acclimation**  
The physical adaptation that occurs when exposed to a new climate or conditions.

**Do the math:** Solid Red Oak changes dimensions at the rate of .0365 for every 1% change  
A 3% gain = 3 X .00365 = .01095 or 1.09%. In a room 20' wide (240") that's 1.09 X 2.61 inches = assuming the floor was laid tight.  
Engineered floors under the same circumstances would expand less than .2 (3/32) inches.

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## Subfloor Requirements

<p>Clean</p>	<p>Flat</p>
<p>Dry</p>	<p>Sound</p>

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## EMC CHART

**MOISTURE CONTENT OF WOOD  
AT VARIOUS TEMPERATURES AND RELATIVE HUMIDITY READINGS**

Temperature (° Fahrenheit)	30	40	50	60	70	80	90	100												
1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.6	15.5	16.5	18.5	21.0	24.3	26.9
1.4	2.6	3.7	4.6	5.5	6.3	7.1	7.9	8.7	9.5	10.4	11.3	12.4	13.5	14.6	15.5	16.5	18.5	21.0	24.3	26.9
1.3	2.5	3.6	4.6	5.4	6.2	7.0	7.8	8.6	9.4	10.2	11.1	12.1	13.1	14.0	15.0	16.2	18.2	20.7	24.1	26.8
1.3	2.5	3.5	4.5	5.4	6.2	6.9	7.7	8.5	9.2	10.1	11.0	12.0	13.1	14.4	16.0	17.9	20.5	23.0	26.6	
1.3	2.4	3.5	4.4	5.3	6.1	6.8	7.6	8.3	9.1	9.9	10.8	11.7	12.9	14.2	15.7	17.7	20.2	23.6	26.3	
1.2	2.3	3.4	4.3	5.1	5.9	6.7	7.4	8.1	8.9	9.7	10.5	11.5	12.6	13.9	15.4	17.3	19.8	23.3	26.0	
1.2	2.3	3.3	4.2	5.0	5.8	6.5	7.2	7.9	8.7	9.5	10.3	11.2	12.3	13.6	15.1	17.0	19.5	22.9	25.6	
5	10	15	20	25	30	35	40	45	50	55	60	65	70	75	80	85	90	95	99	
	Relative Humidity (percent)																			

Chart taken from Wood Handbook: Wood as an Engineering Material, (Agronomy Handbook 73), Forest Products Laboratory, U.S. Department of Agriculture.

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## Moisture Related Issues

- Cupping & Crowning – Moisture imbalance through thickness of the product
- Abnormal cracks – larger than normal
- Edge Crush – due to extreme moisture
- Loose, noisy floors – excessive moisture/dry
- Buckling
- Discoloration
- Delamination



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## Laminate

- Check all measurements before you start.
- Add 10% cutting allowance.
- Add 20% cutting allowance for diagonal and tile patterns.
- Confirm product quantities before installation.
- Floating floors are never to be installed over a drain.
- Identify all transitions before beginning installation.
- When possible, install planks parallel to the light source.
- Balance your layout.



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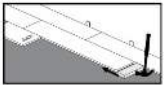


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## Interlocking Systems

There are many different interlocking/click systems.

- Drop-Lock
- Angle/Angle

Technology is advancing very quickly.

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## Wood Construction

**Strip** – Solid or engineered boards **less than 3 inches** – installed in parallel rows.

**Plank** – Solid or engineered boards **3 inches or wider** – install in parallel rows.

Adhesive *may be required*

- Along with mechanical fasteners.
- Along end joints on plank floors.

**VERIFY with MANUFACTURER!**

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## Wood Terms

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**CUPPING** ☹️

- Concave or "dish" appearance of individual strips.
- Edges raised **above** the center.
- Sides **higher** than the center.

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**CROWNING** ☹️

- Convex appearance of individual strips.
- Center of the strip is **higher** than edges.

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## Moisture Content Map

- Each pair of numbers shows the average moisture content of wood inside a home in January (lower number) and July (higher number).
- Source: USDA Forest Productions Laboratory

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## Substrate Requirements for Wood Floors

Difference between the moisture content of the wood substrate and the wood flooring **MUST NOT EXCEED 4%-Strip 2% for Plank**

Confirm the **MANUFACTURER** specifications! Verify substrate moisture content is **NO MORE** than 12% - 14%.

All concrete substrates should be tested for moisture content!  
**VISUAL OBSERVATION IS NOT RELIABLE!**

**DOCUMENT! DOCUMENT! DOCUMENT!**

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## Laminate

- A. Wear layer
- B. Design Layer
- C. Inner Core
- D. Backing
- E. Underlayment
  - This can be attached or separate.

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### DPL vs HPL Laminate Construction

Although each plank has the same layers, there are two types of laminate flooring construction - Direct Pressure Laminate (DPL) and High-Pressure Laminate (HPL). As you browse through various types of flooring, you'll undoubtedly see these terms used on the types of laminate you consider. Here's what they mean.

- **DPL flooring** is constructed using 300 to 500 pounds of pressure. The planks created using this wood floor construction method are often made for residential or low-traffic areas. Typically, this construction process is used with AC1 through AC4 ratings.
- **HPL flooring** is constructed using an additional layer of paper sheets and treated with a stronger resin, making the top layers stiffer and more durable. In addition, the materials are pressed together using 1,300 or more pounds of pressure. This maximizes their strength. Often, these floors are used in commercial areas with high levels of foot traffic.

For homeowners, DPL flooring is the most affordable and still offers the durability you'd expect from laminate. For business owners, depending on how much foot traffic your floors will experience, an HPL flooring construction might be the better option.

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