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[Doormerica.com](http://Doormerica.com)

Made in USA

# Flush Doors 101



Program # 17-1211

Points – 3 CEP

Flush Doors 101



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# Questions!



- Please hold any questions until the end of our session.

- Thank you...



# At the end of this hour you will have learned:

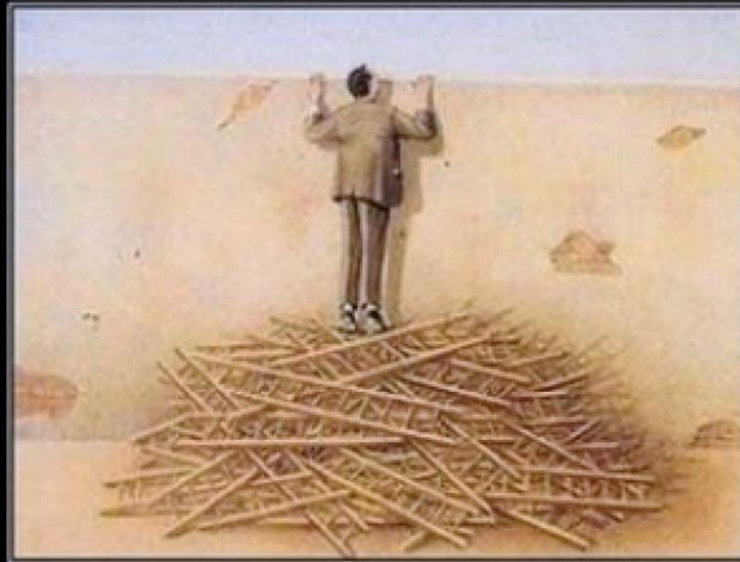
- Veneers
  - Face Veneer cuts / Appearance / Video
  - Matching between individual face veneer
  - Assembly of sliced face veneers
- Ply Construction
- Cores
  - Type of cores
- Fire-rating
  - Smoke and Draft Video Cat “A”
- Lay-up (Bonded vs Non-Bonded)

Learning  
Objectives

# The Problem With Doors!

## Education + Application = Success

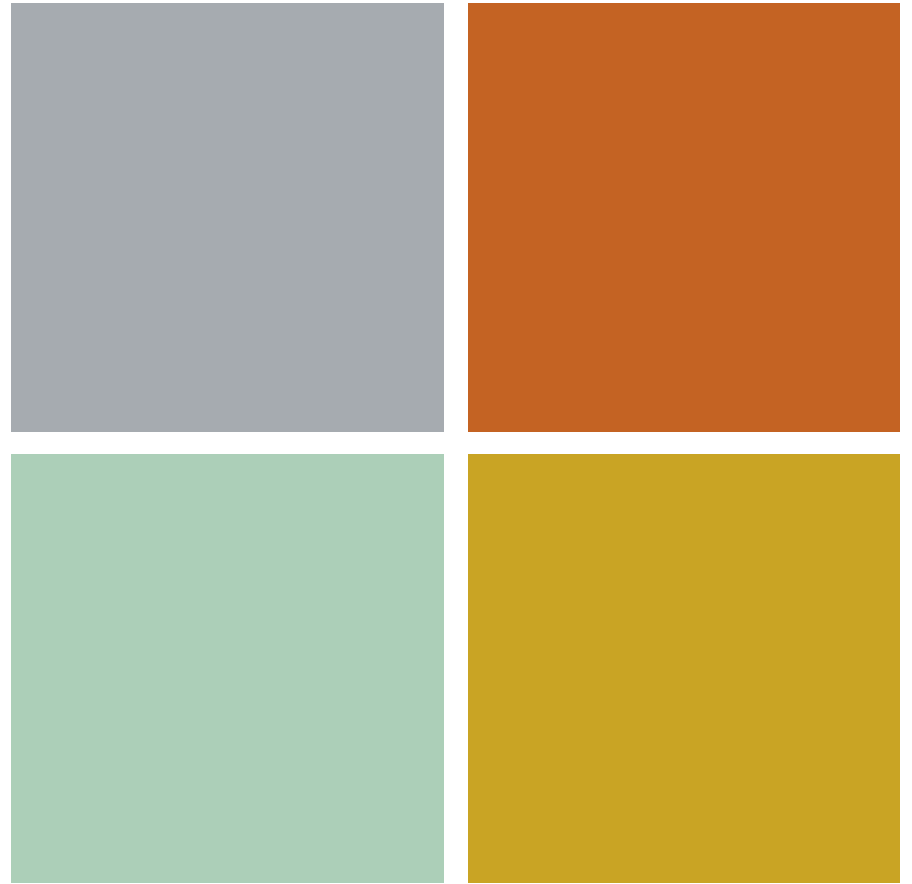
- Interior
- Security
- Accessibility
- NFPA
- are, Mechanical
- Paint/Stain
- Size
- Quantity
- Exterior
- Specie
- Location



It doesn't matter how many resources you have  
if you don't know how to use them, they will never be enough

The actual problem with doors is; lack of knowledge and an understanding of the required application.

# Flush Doors 101



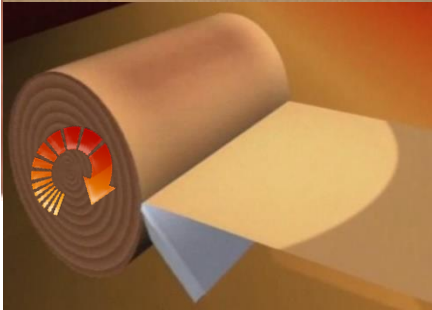
**Understanding Veneer Cuts and Appearance**



# Flush Doors 101

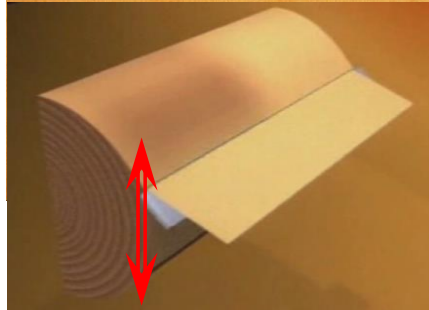
Face Veneer cuts - The way in which a log is cut, in relation to the annual growth rings. These are the four most common.

Up to one piece  
skin  
potential for wide  
variations in  
appearance  
\$



**Rotary**

Flitches are  
definite, visual  
variance  
apparent, barber  
pole possible  
\$\$



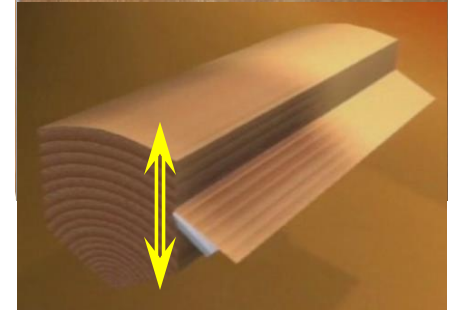
**Plain**

Available in  
limited specie  
Most Common  
Is Oak  
\$\$ +/-  
Can be ordered as  
comb grain



**Rift**

Lots of symmetry  
and a wide range  
of species  
\$\$\$ +/-

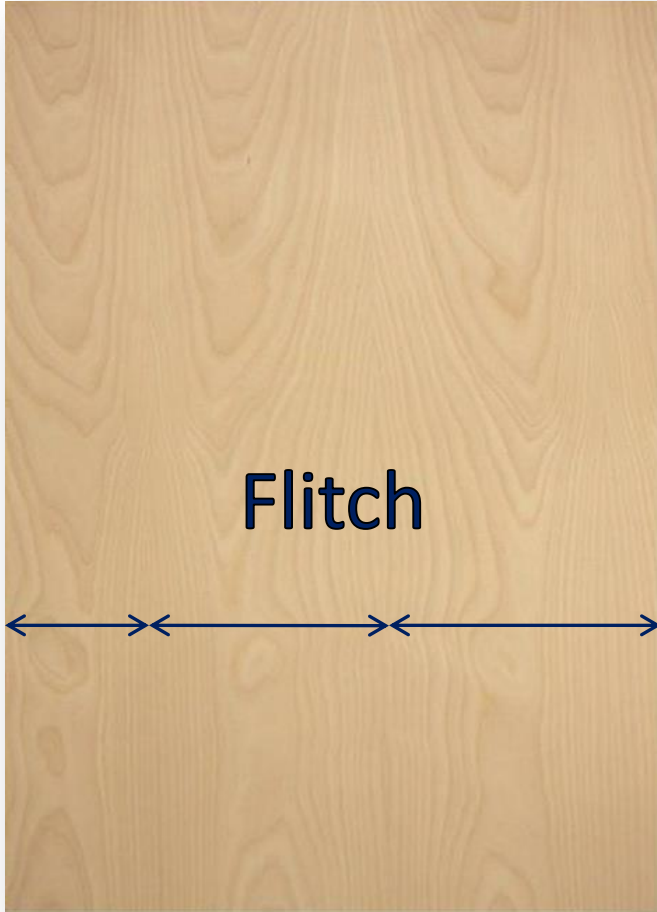


**Quarter**

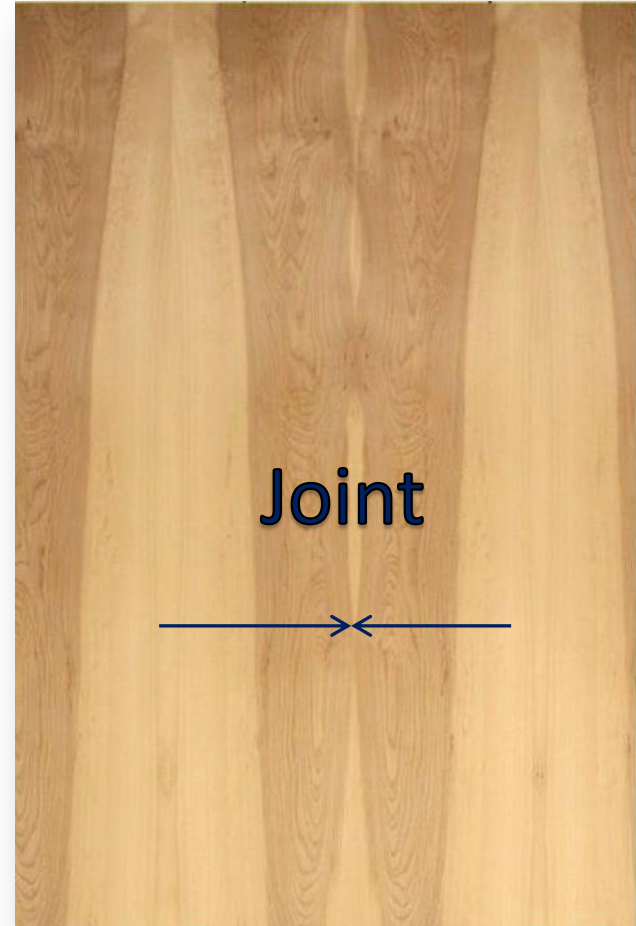
# Flush Doors 101

**Flitch** – Independent band of veneer, could be up to 13 per door  
(depending on door width)

**Joint** – The seam where the two flitches meet



**Plain Sliced White Birch**



**Rotary Cut Natural Birch**



- B Grade
  - Plain Slice – 3"
  - Rotary – 4"
  - Quarter or Rift – 3"
- A Grade
  - Plain Slice – 4"
  - Rotary – 4"
  - Quarter or Rift – 3"
- AA Grade
  - Plain Slice – 5"
  - Rotary – 5"
  - Quarter or Rift – 3"

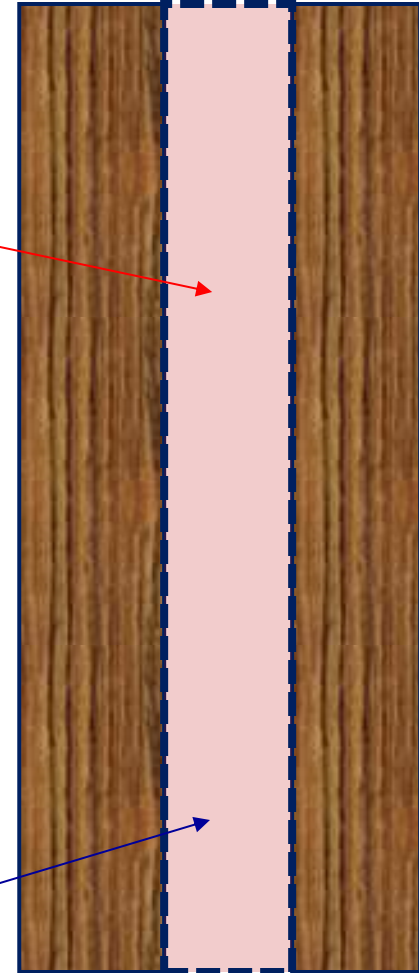
## Flitch & Joint

Definitions based on skin grades

**Flitch**

Sizes listed are manufactures minimums, there are no published maximums in our library.

**Joint**



# Flush Doors 101

**Range of colors on the same species with different flitches.**

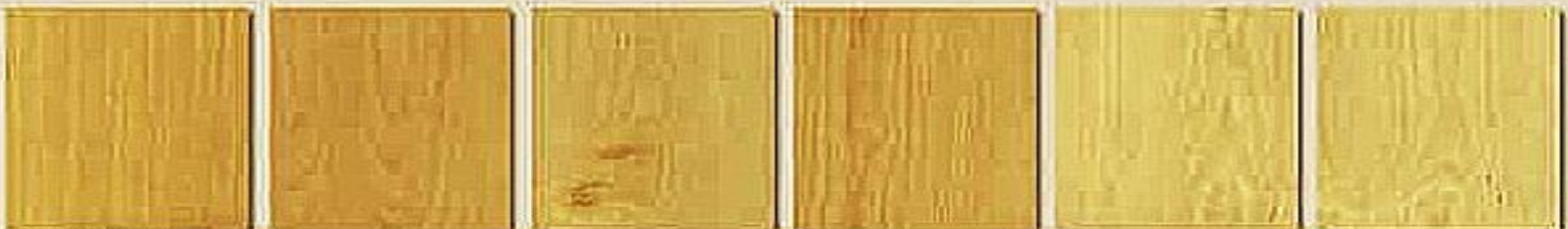
*The photos below show a range of wood color variations using different flitches of the same species. Veneers have a clear finish – no stains were added to the sample.*



**Cherry**



**Red Oak**



**White Maple**

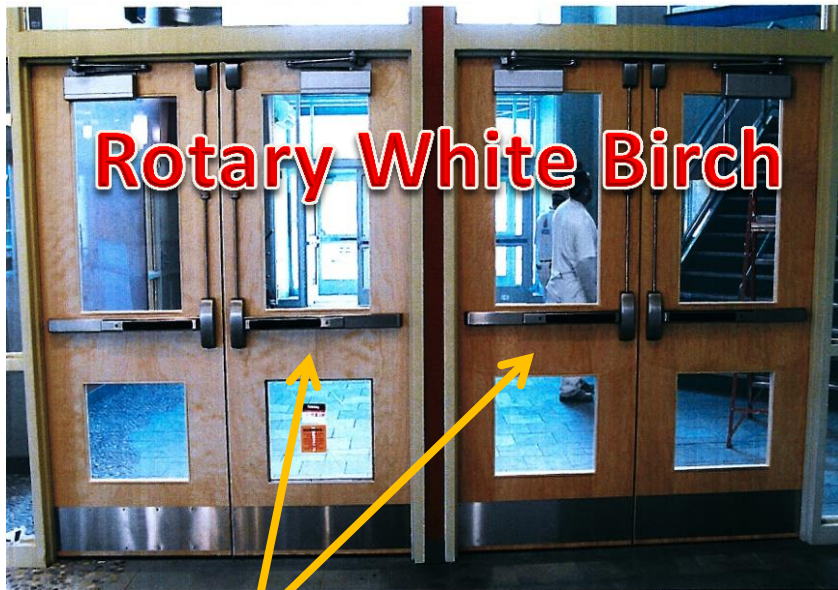


## Flush Doors 101

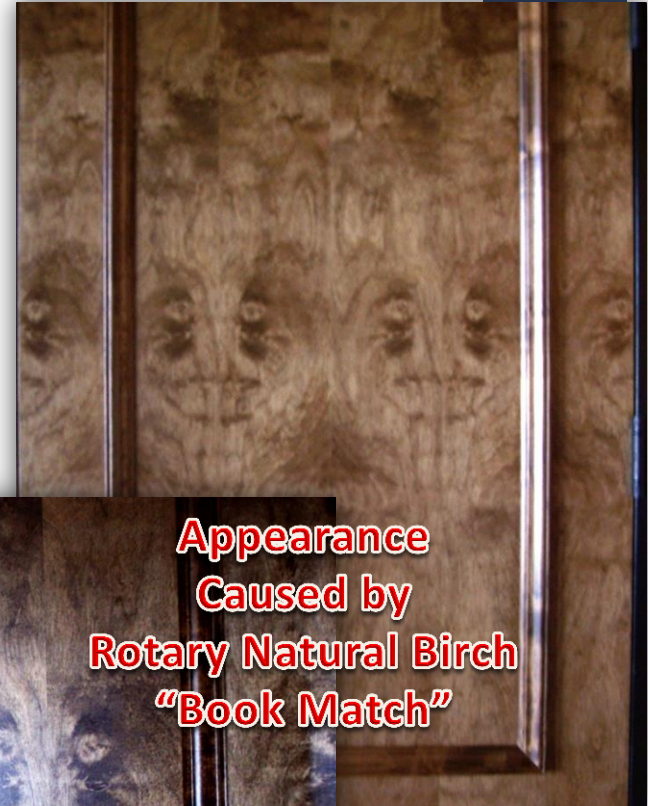
**Let's face it,  
natural wood  
grain, color, and  
variations can  
have unexpected  
appearances.**



# Flush Doors 101 – Let's Face It, Unexpected Appearances using certain species and “Book Match” and “Rotary Slice” skins.



**Appearance  
Caused by import verse  
domestic**



# Natural Variations

## Grading Standard (Yes, No, & ???)



Plain Sliced Natural Birch

### ROTARY BIRCH CHARACTERISTICS

Specie Type	Type & Cut	Grade	Sapwood	Heartwood	Color Streaks or Spots	Color Variation	Mineral Streaks	Small Burls, Pin Knots	Cross Bars
Birch	Rotary Natural	A	Y	Y	Y	Y	S	1per 3sq'	S
Birch	Rotary White	A	Y	N	S	S	S	1per 3sq'	S
Birch	Rotary Red	A	N	Y	Y	Y	S	1per 3sq'	S

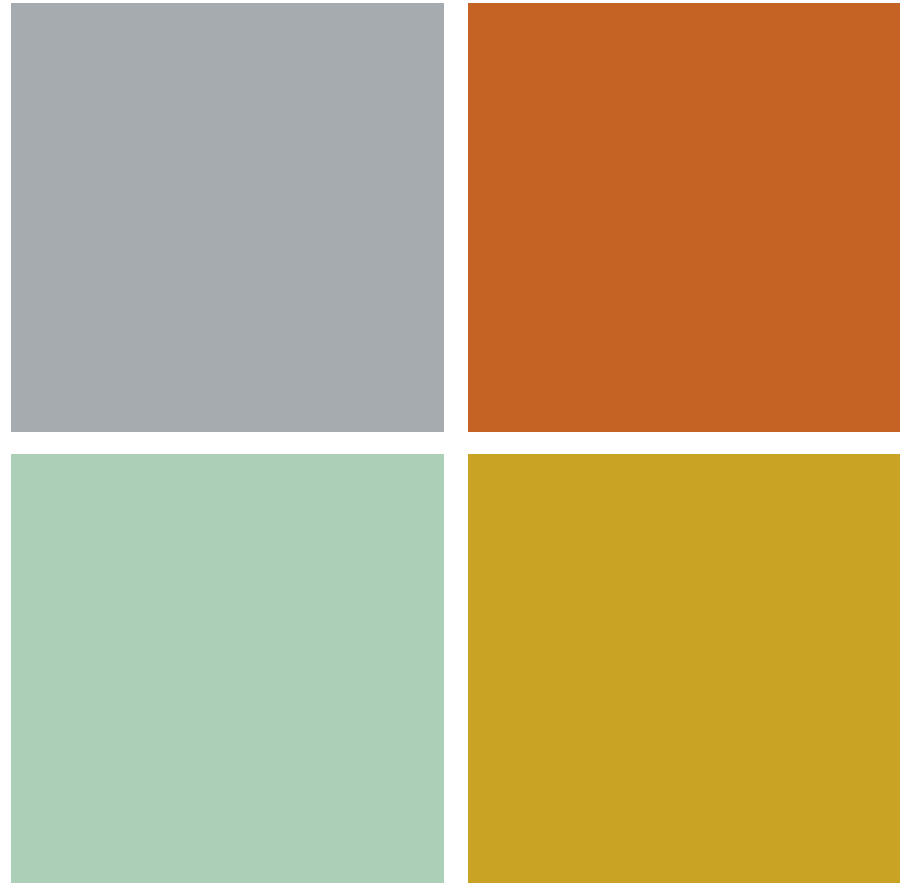
Y = Yes

N = No

S = Slight

Chart information referenced from WDMA I.S. 1-A

# Flush Doors 101

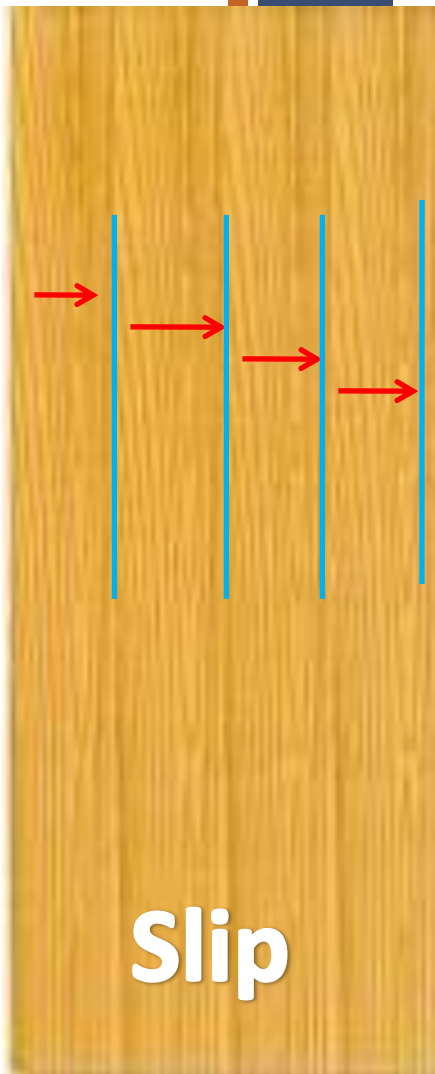
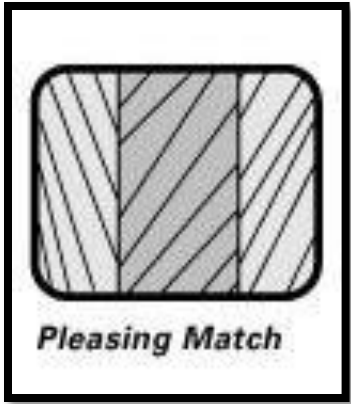
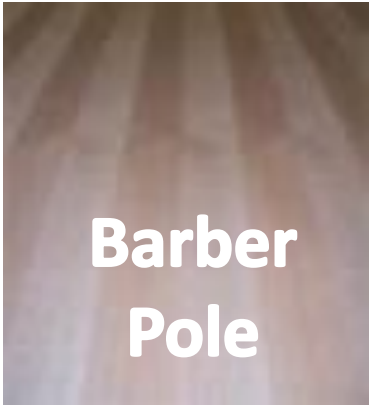
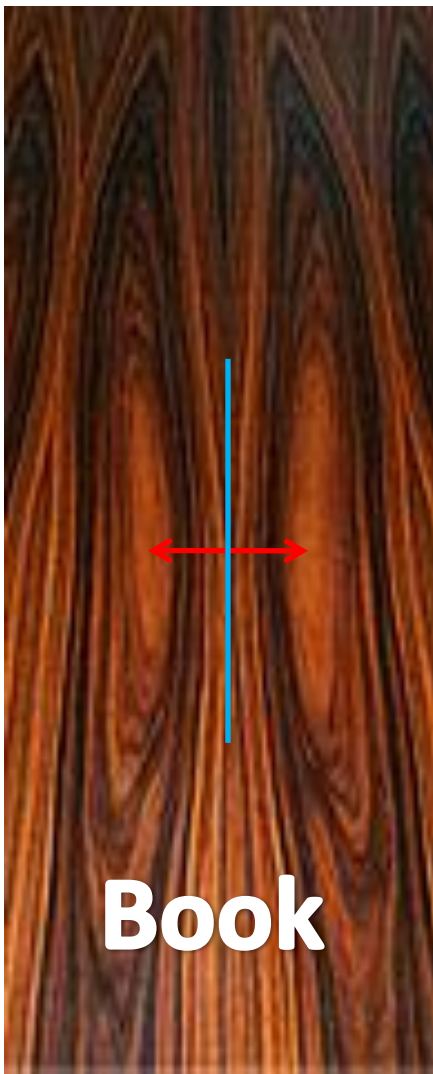


**Skin faces and their attributes**  
**Assembly Matching**



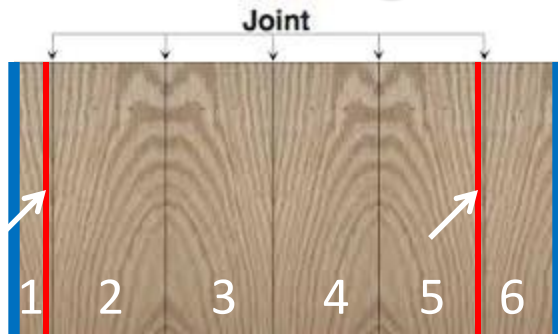
# Flush Doors 101

- Book Match
  - Most Common
- Barber Pole Effect in Book Match
  - **Because the tight and loose face alternate, they will accept stain and reflect light differently. This is not considered a manufacturing defect.**
- Slip Match
  - More commonly used in Rift or quarter cuts. A common remedy for barber pole effect. But can cause a slope effect in rotary and PS cuts .
- Pleasing Match
  - Provides an overall pleasing appearance. The grains need not match at joints. B grade faces are not permitted for pair match or set match.
- Random Match
  - Assembled with no regard to color, grain, width of veneer strips. Pleasing appearance is not required.



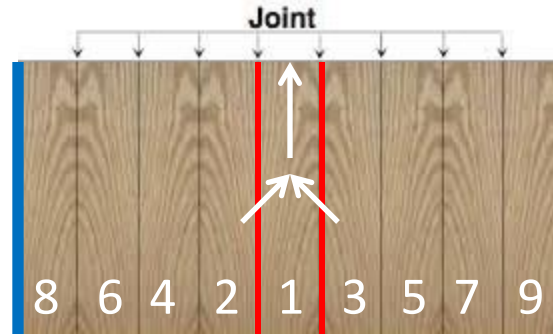
# Flush Doors 101

## Running



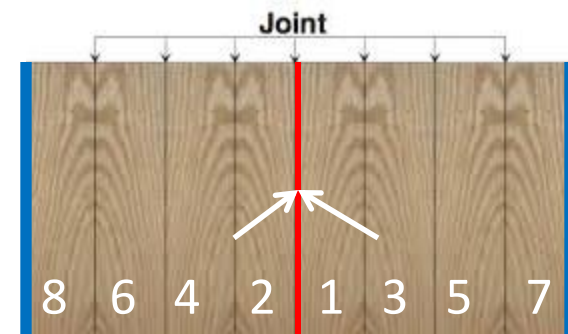
Can be specified as  
"Book", "Random", "Slip"  
No symmetry in veneer size

## Balance



Can be specified as  
"Book", "Random", "Slip"  
Symmetry in veneer size  
can be unequal after trim

## Center Balance



Can be specified as  
"Book", "Random", "Slip"  
Symmetry in veneer size  
and equal after trim

## Assembly of sliced face veneer

**Running Match** – A non-symmetrical appearance in a single door face where side edge pieces are of unequal width.. Each face is assembled from as many veneer pieces as necessary

**Balance Match** – A symmetrical appearance where each face is assembled from pieces of uniform width before trimming

**Center Balance Match** – A symmetrical appearance where each face has an even number of veneer pieces of uniform width before trimming. Thus, there is a veneer joint in the center of the panel

# Flush Doors 101

## Ply Construction Definitions

# Flush Door's 101

Think of "Plies" like an Oreo Cookie.  
Each layer represents a "Ply"

## ■ Face Assemblies

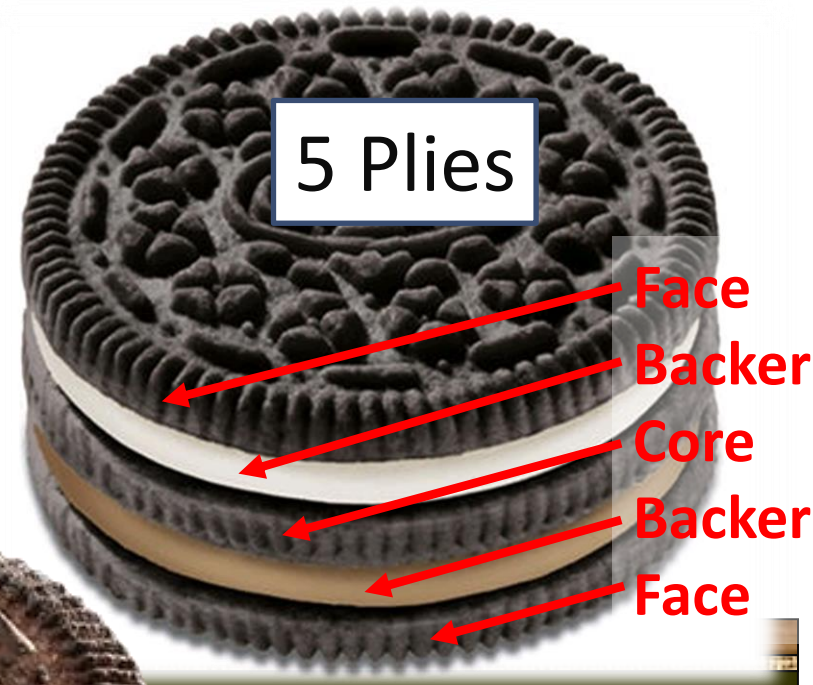
Face Veneer

Cross-b

Back

Face

Back



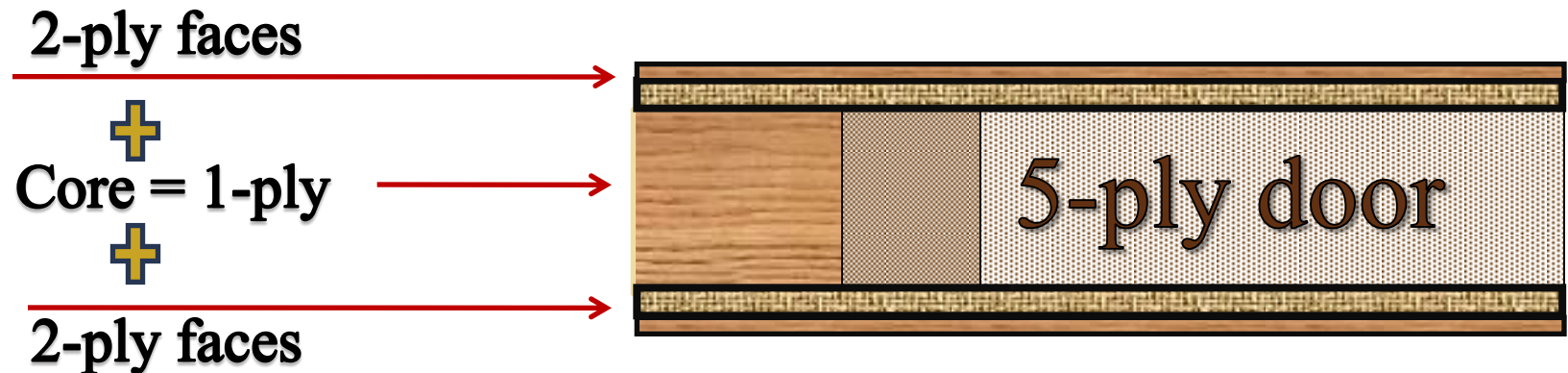
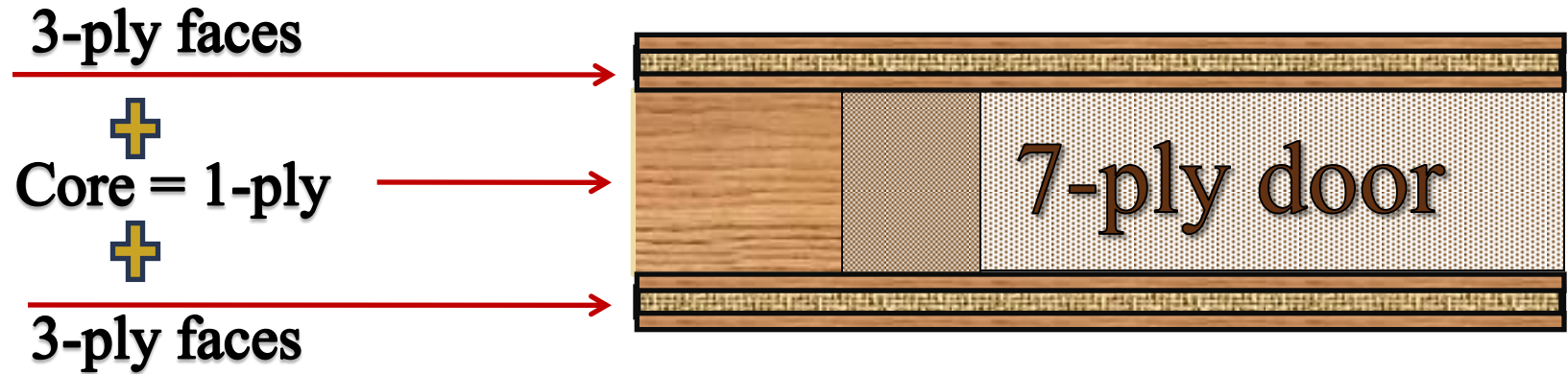
Faces

Ply Faces



# Flush Doors 101

## ■ Door Construction



# Flush Doors 101

**Core Definitions & Door Construction**



# Flush Doors 101

## Types of Door Core

### Particle Board Core

STC 29-31  
20M PP

Residential  
Commercial  
Mixed-Use  
Others

**PBC**

### Structural Composite Lumber Core

STC 35  
20-45M PP

Medical  
Institutional  
Educational  
Architectural

**SCL**

### Wood Stave Lumber Core

STC 34  
20M PP

Medical  
Institutional  
Educational  
Architectural

**WSL**

### Mineral Core

STC 35  
45-90M PP

Residential  
Commercial  
Institutional  
Architectural

**FD**

### Sound Retardant Core

STC 43-45  
20M PP

Residential,  
Commercial  
Educational  
Architectural

**STC**



# Flush Doors 101

## LD-1 Core vs. LD-2 Core

**LD-1 – Typically 28lb particle board core which have average 94lbs screw holding capabilities with minimum screw holding capabilities.  
(wood blocking is needed to hold hardware)**

**LD-2 – Typically 34lb particle board core which has average 124lbs screw holding capabilities. Limits the need for additional blocking.  
(wood blocking is needed to hold surface mounted hardware in high traffic, or high use applications)**

**LD-2 Wood – Has minimum 450lbs of screw holding power. Great for all application  
(Except fire rated above 45 minute)  
(no wood blocking needed to hold hardware)**



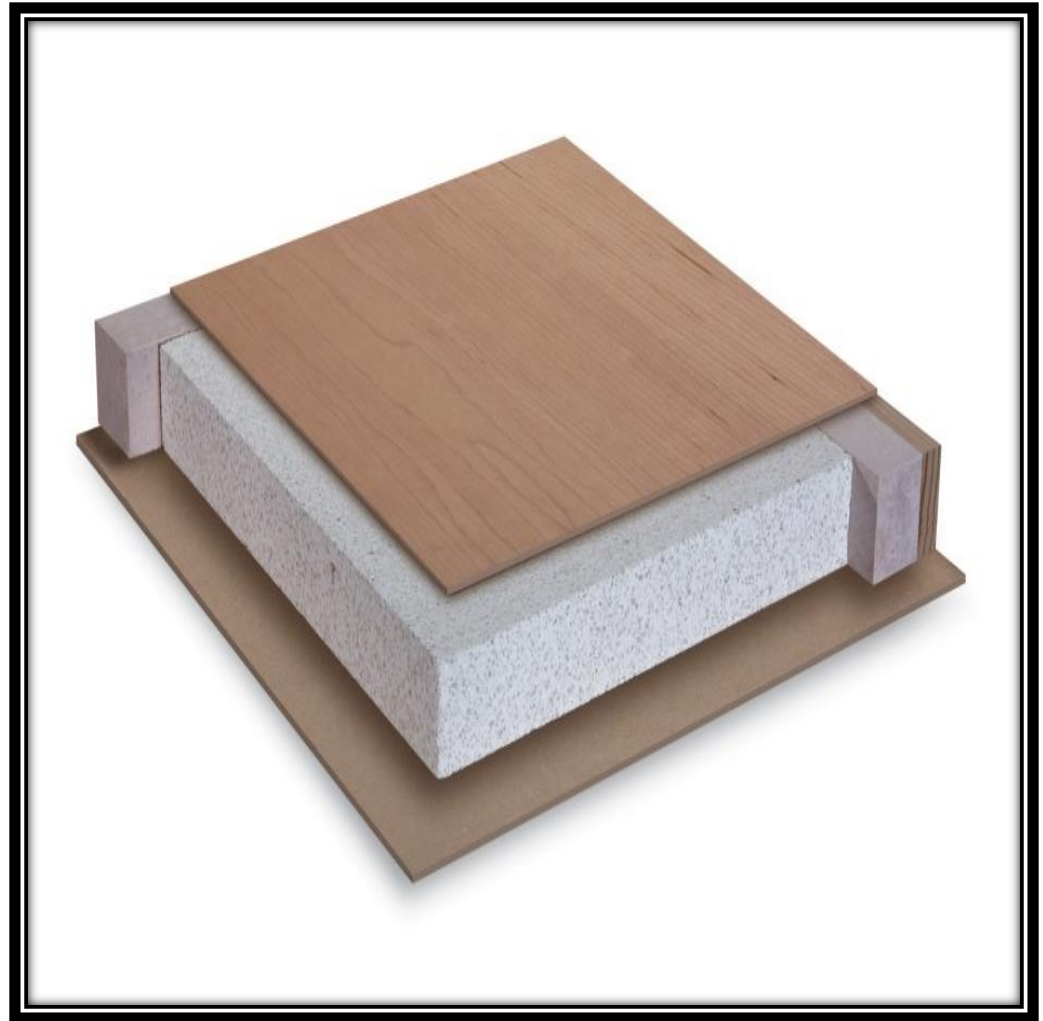
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**Fire Rated Construction**

# Flush Doors 101

## Flush Fire Rated Door

- 20 minute fire rated doors only requirements are, 1-3/4" thick, and particle board core.
- 45- 90 minute fire rated doors use gypsum core
  - (Structural Composite Lumber, (SCL) can be used to achieve 45 Minute Rating).
- What is gypsum core?- Mineral core that is relatively light in density ranging between 28-35 pounds per cubic foot and is a excellent insulator. It has little to no screw holding capability. Mineral core is made of a proprietary mix of various minerals, fiberglass and binders



**Cat A & B Doors Available**

# Flush Doors 101

**Bonded vs. Non-Bonded  
Construction**

# Flush Doors 101

## Non-Bonded Door Assembly

- “Floating Core”
- Stiles and Rail not glued to the core. All to face only
- “Two-way grain of face Provides Stability
- “Telegraphing” Possible





# Flush Doors 101

## Bonded Door Assembly

- Bonding of Stiles and Rails to the Core and the Faces
- Best Long Term Performance.  
No space for flexing.
- Abrasive Sizing of Core
- “Telegraphing” Eliminated or Reduced!



On behalf of;  
American Building Supply, Inc.  
Doormerica Manufacturing &  
Door Hardware Institute

Thank You for your participation  
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