



Steel Door + Window Systems

1885 Kinser Road
Ceres CA USA 95307

T 209 / 538-3667

F 209 / 538-2776

www.stilesdoor.com

Wood Veneer Manual

A Comprehensive Guide for
Specifying Stiles Wood Veneered Doors

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Our technical manuals are prepared as tools designed to inform our customers of technical data as it relates to our products and services. It is our goal to help you make informed decisions when designing, specifying, ordering, installing, or maintaining Stiles products.

Stiles makes no guarantee as to the accuracy of information obtained from outside sources. Whenever possible, links will be provided for additional information, and sources cited.

Specifying Door Veneers

For many, the process of properly specifying veneer is a challenge. The wide selection of available hardwood species, veneer cutting methods, and natural figure types and characteristics combine to confront the potential veneer specifier with a vast array of possibilities. Add to that mix the fact that there are no set veneer grades upon which a specifier can rely, and the process of specifying veneer can seem overwhelming.

However, the process need not be confusing or complicated. The key to success is effective communication. To get the right veneer, you need to have a complete understanding of what it is you need, and you have to be able to communicate those needs.

Although there is no set veneer grading standard to refer to, there are some basic questions that Stiles will want answered when taking your order. By having answers to those questions ready before you pick up the phone to call, you'll have much of the information we need ready at your fingertips.

When making your veneer choice, however, please give some thought to the cut, appearance, and grade of the veneer you specify. Many busy specifiers go straight to a request for a top quality veneer because they view it as the easiest way to get an acceptable product that will do the job. However, they may be doing themselves a disservice by not considering alternate veneers that would work just fine in their application. The typical hardwood veneer log produces only a very small amount of AA panel grade veneer. If you insist on only high grade veneer, you may not only be paying too much for your veneer, but you are also putting an unnecessary strain on our valuable hardwood resources.

To facilitate effective communication with Stiles, we offer the following list of veneer considerations. While not all-encompassing, these questions cover much of the basic information we'll need to know to generate your veneered door quote and/or order:

Basic Veneer Considerations:

1. What wood veneer species do you want?
See [Wood Veneer Species](#)
2. What veneer grade do you want?
See [Veneer Grades](#)
3. What veneer cut do you want?
See [Veneer Cuts](#)
4. Do you want figured or non-figured veneer?
See [Veneer Figure Options](#)
5. What are your veneer matching requirements?
See [Veneer Matching Options](#)
6. What natural aesthetic characteristics will you accept?
See [Veneer Design Solutions](#)
7. Can you send digital photos or samples of the look that you want?
8. Have you selected a standard finish color, or will you require custom finish matching?
See [Factory Veneer Finishing](#)

Wood Veneer Species

Stiles offers a vast selection of door types, style options, and veneer species for INTERIOR LOCATIONS, in addition to virtually unlimited hardware machining, factory glazing, and factory finishing capabilities.

When ordering wood veneers, specify the species, grade, cut, figuring, matching, and finish.

NOTE: Samples below are shown sanded and unfinished.

Domestic Species



BUTTERNUT
(Canada, USA)



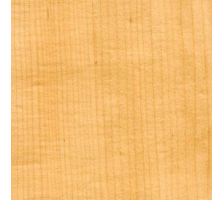
CHERRY
(Northeastern USA)



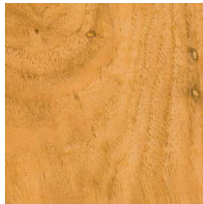
DOUGLAS FIR
(Western USA, Canada)



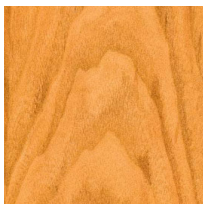
HICKORY
(Southeastern USA)



MAPLE (SOFT)
(Oregon)



PECKY PECAN
(South-Central USA)



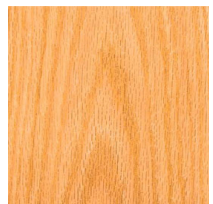
PERSIMMON
(Southeastern USA)



RED ALDER
(Western Canada, USA)



RED GUMWOOD
(Southeastern USA)



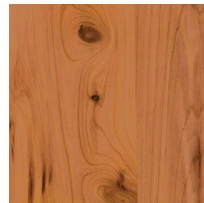
RED OAK
(Eastern USA, Canada)



REDWOOD
(California)



SOUTHERN CYPRESS
(Southern USA)



WESTERN RED CEDAR
(California, Oregon)



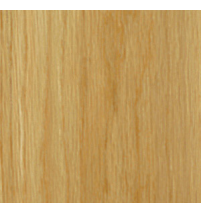
WESTERN MAPLE
(Oregon)



WHITE ASH
(Eastern USA, Canada)



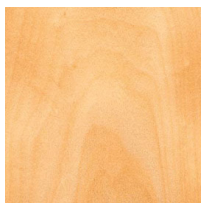
WHITE BIRCH
(Northern US, Canada)



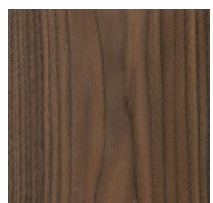
WHITE OAK
(Eastern USA)



WHITE MAPLE (HARD)
(Eastern USA, Canada)



WHITE PINE
(Western USA, Canada)



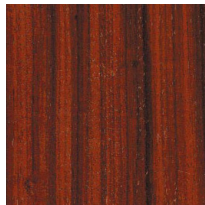
WALNUT
(Eastern USA)

Wood Veneer Species

When ordering wood veneers, specify the species, grade, cut, figuring, matching, and finish.

NOTE: Samples below are shown sanded and unfinished.

Exotic Species



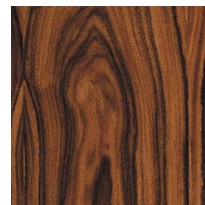
AFRICAN PADOUK
(West Africa)



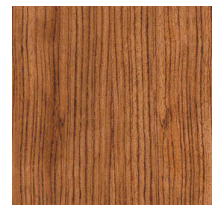
ANIGRE
(East Africa)



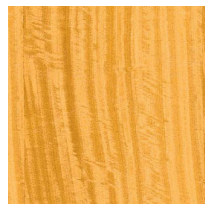
AVIDORE
(West Africa)



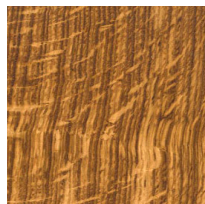
BRAZILIAN ROSEWOOD
(Brazil)



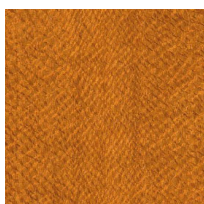
BUBINGA
(West Africa)



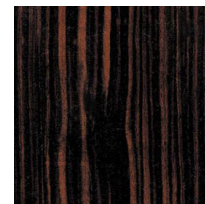
CEYLON SATINWOOD
(Sri Lanka, S. India)



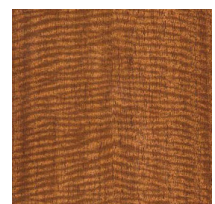
ENGLISH BROWN OAK
(United Kingdom)



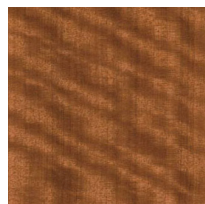
LACEWOOD
(Australia, S. America)



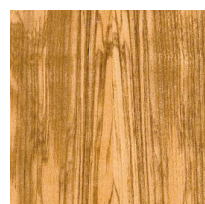
MACASSAR EBONY
(Celebes Islands)



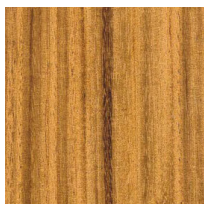
AFRICAN MAHOGANY
(Central & West Africa)



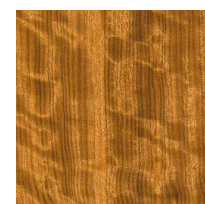
HONDURAS MAHOGANY
(Central America)



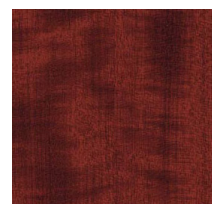
OLIVE ASH
(Europe, N. Africa)



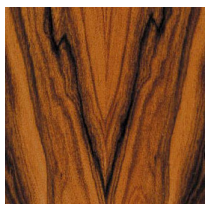
ORIENTALWOOD
(Australia)



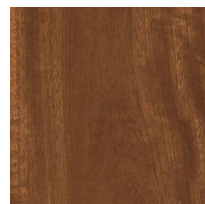
PALDAO
(Philippines)



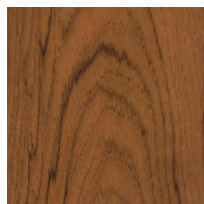
PURPLEHEART
(Central, South America)



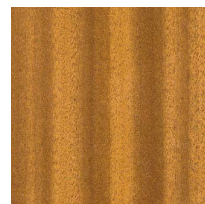
SANTOS
(Brazil)



SAPELE
(West, East Africa)



TEAK
(Southeast Asia)



TIGERWOOD
(Brazil)



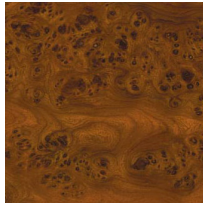
WENGE
(Tropical Africa)

Wood Veneer Species

When ordering wood veneers, specify the species, grade, cut, figuring, matching, and finish.

NOTE: Samples below are shown sanded and unfinished.

Burls



CARPATHIAN ELM
(Europe)



ENGLISH SYCAMORE
(United Kingdom)



EUCALYPTUS
(Australia)



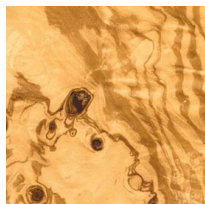
KARELIAN BIRCH
(Europe)



MAPPA
(Central Europe)



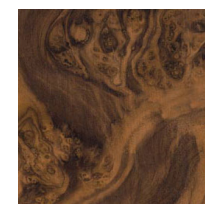
MYRTLE
(Oregon, California)



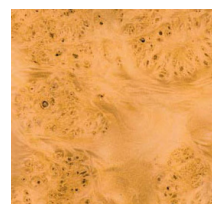
OLIVE ASH
(Europe, N. Africa)



REDWOOD
(California)



WALNUT
(USA)



WESTERN MAPLE
(Oregon)

The following are the accepted face grades utilized by Stiles, as established by the HPVA (Hardwood Plywood & Veneer Association):

Grade AA

The veneer shall be smooth, tight cut and full length. When the face consists of more than one veneer component or piece, the edges shall appear parallel and be edge matched as described for the various species in 200-S-9. Rotary cut faces may be whole piece or multi-piece with edge joints tight and no sharp color contrasts at the joints. Species specified for natural color will allow color contrasts, but must be book matched or conform to the type of matching specified. The components of plain sliced (flat cut) faces will be book matched, unless otherwise specified, and arranged, at the option of the woodworker, with a running, balanced, or center match, unless otherwise specified. Plain sliced faces will consist of two or more components and rotary faces will consist of one or more components with no component less than 152 mm (6") wide except for outside components which may be less than 152 mm (6") to allow for certain types matching or panel edge trim loss. No plain sliced components will have a split heart. No full quarter cut is allowed in plain sliced faces. The width of any single component in quarter-cut rift cut or comb grain faces shall not be less than 76 mm (3") except for outside components which may be less than 76 mm (3") to allow for matching and edge trimming.

Hardwood veneer faces from species not covered in 200-S-9 may contain small burls and occasional pin knots not to exceed 6 mm (1/4") in total diameter and 3 mm (1/8") in diameter of the dark pin knot centers. Color streaks or spots: two repaired, tapering hairline splits not to exceed 1.5 mm (1/16") by 152 mm (6"); and small inconspicuous repairs are also permitted. Unfilled wormholes. rough cut veneer. knots (other than pin knots), shake, and doze and other forms of decay will not be permitted.

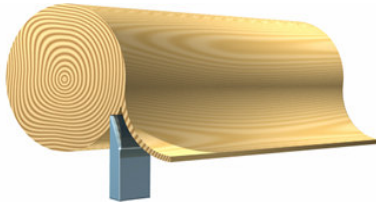
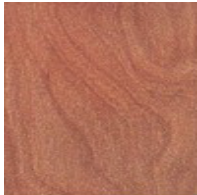
Grade A

The veneer shall be smooth, tight cut and full length. When the face consists of more than one veneer component or piece, the edges shall appear parallel and be edge matched as described for the various species in 200-S-9. Rotary cut faces may be whole piece or multi-piece with tight edge joints; however, no sharp color contrasts are permitted at the joints and the face will provide a good general appearance. Species specified for natural color will allow color contrasts, but must be book matched or conform to the type of matching specified. The components of plain sliced (flat cut) faces will be book matched, unless otherwise specified, and arranged, at the option of the woodworker, with a running, balanced, or center match, unless otherwise specified. Plain sliced faces will consist of two or more components and rotary faces will consist of one or more components, with no component less than 127 mm (5") wide except for outside components which may be less than 127 mm (5") to allow for certain types matching or panel edge trim loss. Split heart is permitted if manufactured cathedral is achieved. No full quarter cut is allowed in plain sliced faces. The width of any single component in quarter cut, rift cut or comb grain faces shall not be less than 76 mm (3") except for outside components which may be less than 76 mm (3") to allow for matching and edge trimming. In some species sapwood is permitted: in other species it may be permitted by agreement between buyer and seller.

Hardwood veneer faces from species not covered in 200-S-9 may contain small burls and occasional pin knots not to exceed 6 mm (1/4") in total diameter and 3 mm (1/8") in diameter of the dark pin knot centers. Color streaks or spots, two repaired, tapering hairline splits not to exceed 1.5 mm (1/16") by 152 mm (6"); and small inconspicuous repairs are also permitted. Unfilled wormholes. rough cut veneer, knots (other than pin knots), shake, and doze and other forms of decay will not be permitted.

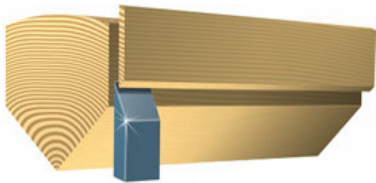
Veneer Cut Options

The size of the log, the wood species, the grain pattern desired, and other factors determine which type of cut will be made to create veneer. Below are some of the more common methods of cutting logs.



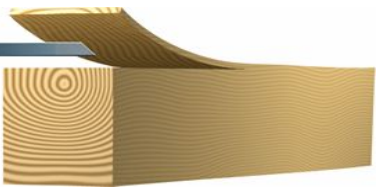
Rotary Cut

The log is centered on a lathe and turned against a broad cutting knife set into the log at a slight angle.



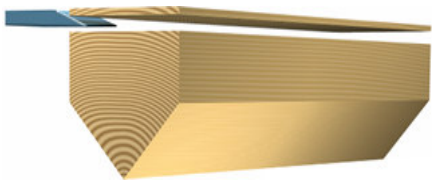
Quarter Sawing

The slicing is made perpendicular to the annual growth rings of the tree. This creates a straight grain appearance.



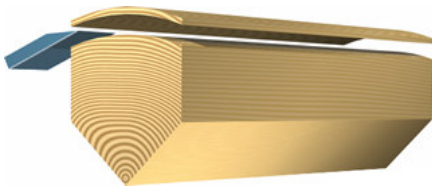
Lengthwise Slicing

This is done from a board of flat sawn lumber rather than from a log. A variegated figure is created with this slice.



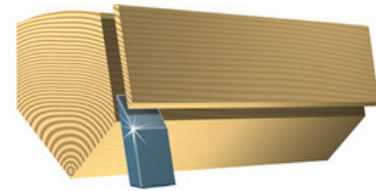
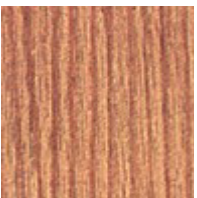
Plain Slicing

By slicing parallel to the center of the log, a raised "cathedral effect" is formed by the innermost growth rings.



Half-Round Slicing

Sliced on an arc parallel to the center of the log, this cut achieves a flat-cut veneer appearance.

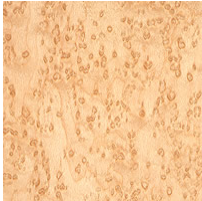


Rift Cut

This straight grain cut is derived by slicing red and white oak at a slight angle to minimize the irregularities in the wood.

Figured Veneer Options

Some, but not all species are available in "figured" veneer. Figures are patterns or surface effects, resulting from the various porous structures of each tree. They're highly variable from specie to specie and from log to log. Here are some of the most common veneer figures:



BIRD'S EYE MAPLE

Bird's Eye

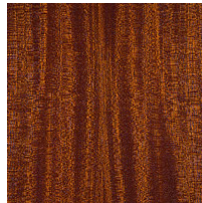
This figure, which looks like "eyes," is the result of depressions in the surface of the trunk which distort the succeeding growth rings. This figure is found almost exclusively in Northern Maples and is always rotary cut.



POMMELE MAKORE,
BLISTER FIGURE

Blister

This smooth veneer surface appears to be covered with small blisters and is the result of rotary cutting across an uneven contour of growth rings.



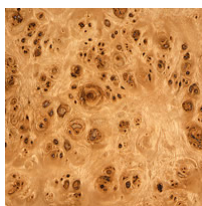
AFRICAN MAHOGANY,
BROKEN STRIPE



S. AMERICAN
MAHOGANY, WIDE
BROKEN STRIPE

Broken Stripe

This figure appears as a stripe that runs down under the surface and then out again, in a more or less "broken" pattern. It develops only in quarter-cut veneer, most commonly in the end wood of a flitch.



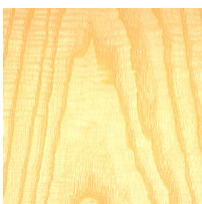
MAPPA BURL



WALNUT BURL

Burl

This figure appears as a close pattern of many small "eyes" surrounded by wildly distorted grain. Burls are the result of a wart-like growth on Walnut, Maple, Mappa, or Redwood, which is rotary cut to produce veneer.



FLAT CUT FIGURED
OLIVE ASH

Cathedral

This is actually a grain pattern produced in flat cut veneers which results in the cathedral or loop-grain in the center of the veneer and straighter grain along the edge.

Figured Veneer Options

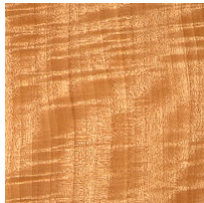
Some, but not all, species are available in “figured” veneer. Figures are patterns, or surface effects, resulting from the various porous structures of each tree. They’re highly variable--from specie to specie and from log to log. Here are some of the most common:



Cluster

This figure shows scattered clusters of burl figure, intermingled with what is often called a “muscle” figure surrounding the burl. It results from half-round cutting veneer from the trunk of certain trees.

CURLY CLUSTER
MAPLE



QUARTERED FIGURED
ANEGRE, BROKEN
FIDDLEBACK



QUARTERED FIGURED
ANEGRE, HEAVY
FIDDLEBACK

Fiddleback

This figure produces a small roll appearance (similar to curly figure) across the grain, most commonly in Maple or Mahogany. The name harkens back to its prized use of Fiddleback Maple in violin production.



LACEWOOD, SMALL
TO MEDIUM FLAKE



LACEWOOD, MEDIUM
TO LARGE FLAKE

Flake

This figure only appears in species that have a very heavy medullary ray growth—Oak, Lacewood, and Sycamore, for example, and is the result of slicing close to parallel with the medullary ray.



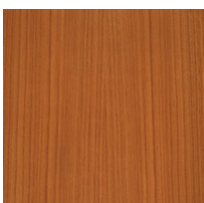
QUARTERED FIGURED
MAKORE, BLOCK
MOTTLE



QUARTERED FIGURED
EUCALYPTUS, BEE'S
WING MOTTLE

Mottle

This figure appears as broken-up cross markings across the grain. Broad cross markings produce a block or patchy effect called block mottle. A very small, fine cross marking creates the bee's-wing mottle.



Plain Stripe

This straight, uniform stripy effect with very little distortion is the result of quarter slicing veneer when the porous structure is parallel with the length of the veneer.

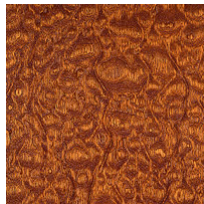
QUARTERED PLAIN
MAKORE

Figured Veneer Options

Some, but not all, species are available in "figured" veneer. Figures are patterns, or surface effects, resulting from the various porous structures of each tree. They're highly variable--from specie to specie and from log to log. Here are some of the most common:



POMMELE
EUCALUPTUS



POMMELE SAPELE

Pommele

This figure resembles tiny apples across the surface of the veneer. It comes from the French word for "apple " (pomme).



QUILTED WESTERN
MAPLE

Quilted

This figure is a larger version of the pommele or blister. In a quilted figure, the "blister" is elongated and crowded giving it a softly raised 3-D effect. Common in Maple, Mahogany, Moabi, and Sapele.



QUILTED AFRICAN
MAHOGANY

Ribbon Stripe

This figure appears as a ribbon, slightly twisted and is actually something between a broken stripe and a plain stripe. Found in some quarter cut veneers.



FLAT CUT FIGURED
CHERRY, ROPE



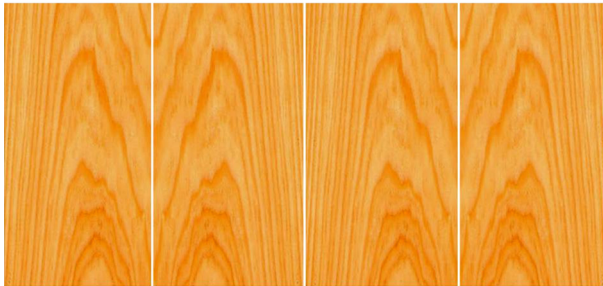
QUARTERED FIGURED
GABOON, ROPE

Ropey

In this "broken stripe" figure, the twist of the grain is all in one direction, creating the appearance of a ropey figure.

Veneer Matching Options

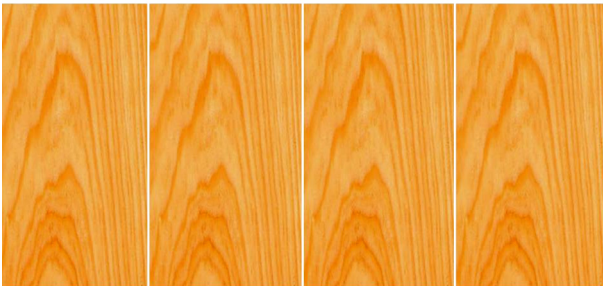
The way you match veneer sheets can create visual rhythm and enhance your project. Here are some of the more common veneer matching approaches:



Book Match

Every other leaf of veneer is turned over like the pages of a book. The grain is mirrored in each adjacent leaf. The visual effect created is that veneer joints match, creating a symmetrical pattern.

NOTE: Because the "tight" and "loose" faces alternate in adjacent pieces of veneer, they may accept stain differently, resulting in a noticeable color variation, called "barber pole". These variations are not considered manufacturing defects. See [Veneered Door Design Solutions](#)



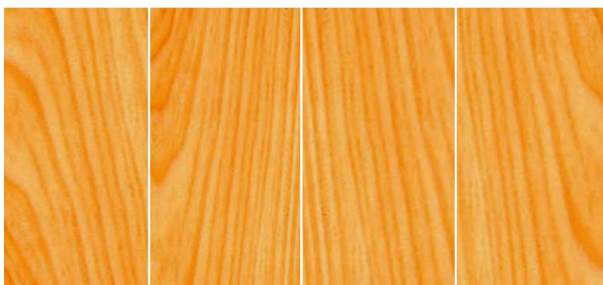
Slip Match

Often used with quarter sliced and rift sliced veneers, this is the process in which a sequence of matching veneer leaves or consecutive sheets of veneer are slipped out one after the next. This results in all the same face sides being exposed. The visual effect shows a grain figure repeating, but joints do not show grain match. Minimizes potential "barber pole" effect.



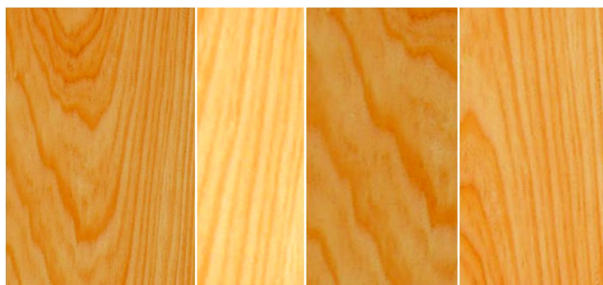
Reverse Slip Match

In reverse slip matching, the veneer leaves are slipped out from under each other and every other veneer leaf is flipped end to end. This balances the character of the veneer in the panel face.



Pleasing Match

Care is taken to match up color of each of the veneer pieces, but not necessarily the grain. Patterns result in no color contrast at the joints.

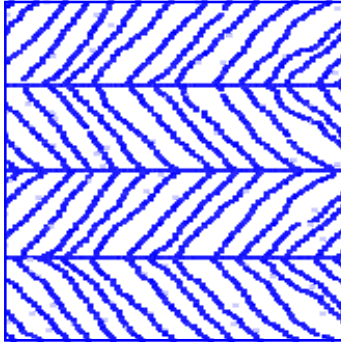


Random Match

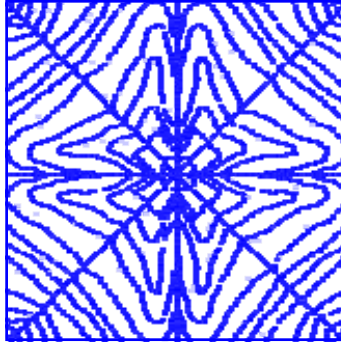
Typically done only on lower grades of veneers, where knots, stains and other natural markings are allowed. Colors and grains vary, and pieces are often of different widths.

Special Veneer Matching

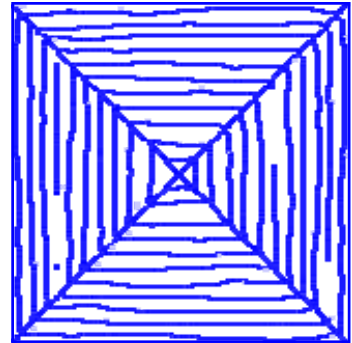
There are regional variations in the "names" of the following veneer leaf matching techniques. It is strongly recommended the design professional use *both* names and drawings to define the effect desired.



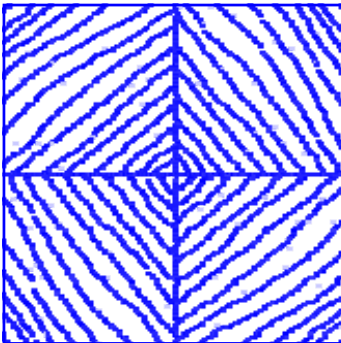
HERRINGBONE OR
V-BOOK MATCH



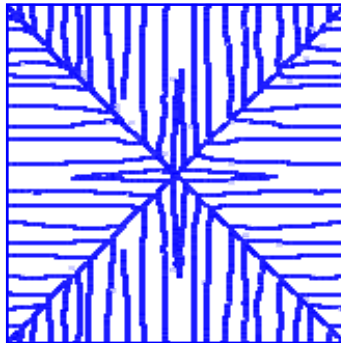
8-PIECE SUNBURST



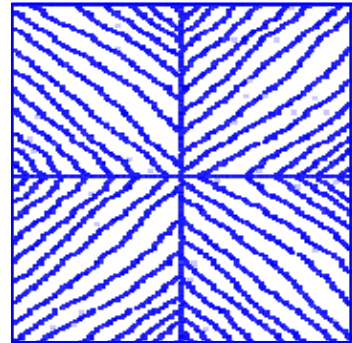
BOX MATCH



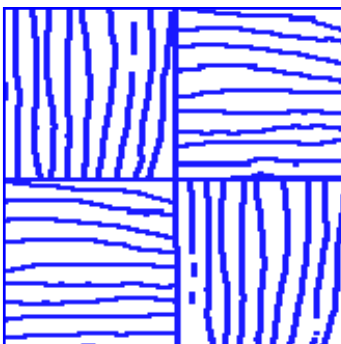
DIAMOND MATCH



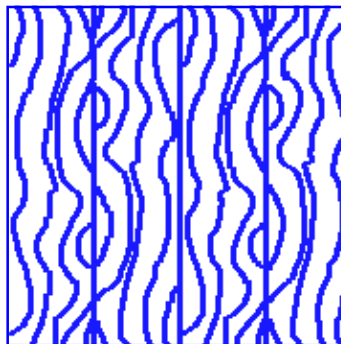
REVERSE
OR END GRAIN MATCH



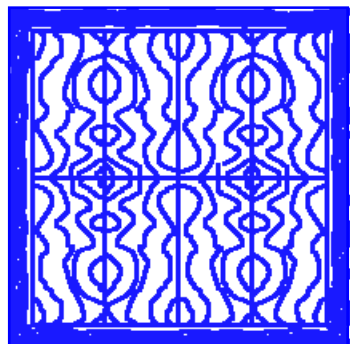
DIAMOND MATCH



PARQUET MATCH



SWING MATCH



BOOK & BUTT MATCH
WITH BORDER

Assembly Match Options

The type of "assembly match" must be specified to obtain a desired appearance. Any sequence matching from opening to opening must be specified. Here are some of the more common types of veneer assembly matching:



Running Match

Non-symmetrical appearance on any single door face. Veneer pieces of unequal width are common. Each face is assembled from as many veneer pieces as necessary.



Balance Match

Symmetrical appearance. Each face is assembled from an even or odd number of pieces of uniform width before trimming. This match reduces veneer yield.



Center Balance Match

Symmetrical appearance. Each face is assembled from an even number of veneer pieces of uniform width before trimming. Thus, there is a veneer joint in the center of the panel. This match further reduces veneer yield.

PROBLEM

Barber Pole Effect

"Barber Pole" is an effect often noticed in book-matching veneers, and is a result of "tight" and "loose" sides of veneers exhibiting different light reflections after finishing. Barber pole is not considered a defect.

SOLUTIONS

1. Barber pole can be minimized through proper sanding and finishing techniques.
2. Barber pole can be minimized by employing slip-matching in lieu of book-matching.
3. Consider specifying White Birch rather than Natural Birch door veneers.



BARBER POLE EFFECT ON
A FLUSH BOOK-MATCHED
BIRCH VENEER DOOR



UN-SQUARE EFFECT ON
A FLUSH SLIP-MATCHED
BIRCH VENEER DOOR

Slip Matching

Barber poll may be greatly minimized in rift-cut oaks by specifying slip-matching. By slip-matching each leaf, all of the "tight" sides are of similar porosities and will accept stain and reflect light identically, thus minimizing the barber pole effect.

The visual effect of slip-matching is a repeating grain figure without grain match at the seams. This reduces barber polling, but may create another (less severe) dilemma. Angled symmetrical wood grains can cause the door to appear "un-square."

By careful veneer selection, along with proper sanding and finishing techniques, the "un-square" effect can be greatly minimized.



WHITE BIRCH



NATURAL BIRCH

Natural Birch or White Birch?

To eliminate the problems associated with barber polling, "un-square" door effects, and other aesthetic issues associated with contrasting wood grains and colors, it may be advisable to specify more consistent veneers such as White Birch, White Maple, and other species offering color and grain consistency.

Factory Applied Wood Stain Options

With over two decades of experience, Stiles provides finishes that are as beautiful as they are durable. Stiles offers a selection of 18 different factory-applied wood stain colors for interior locations, along with clear polyurethane UV protective finishes in gloss or satin.

Custom Colors

With an unlimited range of custom stains, you have the flexibility to match or complement casework, furnishings, or other interior elements. Send us your color chip (minimum 4" x 4") for accurate matching.

Stain colors below are shown on Red Oak. Colors will vary on different wood species. Rely only on an actual stained sample of wood for color accuracy.



Glossary of Veneer Terms

10 Mil Veneer	A veneer face of any specie applied to a 10 mil paper back. Although face thickness may vary, the paper back thickness is consistent.
2 Ply Veneer	A decorative wood veneer face with a utility grade wood backer applied at an opposing direction to the face veneer. Also referred to as wood on wood.
Bird's Eye	Due to local sharp depressions in the annual rings, accompanied by considerable fiber distortions. Once the depressions are formed, succeeding growth rings follow the same contour for many years. Rotary veneer cuts the depressions crosswise, and shows a series of circlets called bird's eyes. It occurs only in a small percentage of Maple trees.
Bee's Wing	Small and tight mottled figure similar in appearance to a bee's wing. Occurs mostly in East Indian Satinwood, also occasionally in mahogany and eucalyptus.
Blister	Produced by an uneven contour of the annual rings. The veneer has the effect of being blistered. Must be cut rotary or half-round.
Block Mottle	An irregular variegation in the cellular structure of the wood which shows as blocky patches across the grain of the veneer. It is commonly found in Makore and Anigre.
Book Matching	Achieved when successive veneer leaves in a flitch are turned over like the pages in a book and are glued in this manner. Since the reverse side of one leaf is a mirror image of the succeeding leaf, the result is a series pairs. Individual panels can be matched this way or you can achieve this look over many panels by sequence-matching the panels. Book matching is the most common match. A common problem in book matching is when the "tight" and "loose" sides are matched and reflect light and stains differently. This may yield color variations in some species which may be minimized by proper finishing techniques.
Bubble Free Veneer	A veneer face of any specie applied to a double paper layer of two 10 mil papers. With moisture resistant thermo-set glue, the overall backer thickness is 22 mils.
Burl Veneer	Produced from a large, wart-like growth on the trunk of the tree. The grain pattern typically resembles a series of eyes laid side by side. Obviously the veneers leaf sizes are generally small and additionally are defective. While producing beautiful patterns, burl veneer is difficult to work with.
Butt Matching	Achieved when veneers are matched as described for book matching but the ends of the sheets are also matched. At times, the veneer being used is not long enough to cover the desired panel heights. In this case the veneer leaves can also be flipped end for end and the ends matched.
Button Figure	Wood species with large medullary rays are quarter cut to reveal the harder and shiny rays which show up as flakes or buttons on the straight grained background. Species such as White Oak, Lacewood and American Sycamore are cut this way specifically to reveal this figure.
Cathedral	A grain appearance characterized by a series of stacked "V" and inverted "V". Pattern common in plain-sliced (flat-cut) veneer.
Center Matching	Each panel face is made with an even number of flitch sheets with a center line appearing at the midpoint of the panel and an equal number of veneer sheets on each side of the center line. The number of leaves on the face are always even, but the widths are not necessarily the same.

Checks	Small slits running parallel to the grain of wood, caused chiefly by strains produced in seasoning.
Core	There are four types of core construction used in plywood panels: a) Lumber Core: Consists of a heavy core of sawn lumber between crossbands. The thick center core permits doweling, splining and dovetailing. b). Veneer Core: Method of plywood construction consisting of 3,5,7 or more plies of veneer laid with grain direction of adjacent plies at right angles to each other. c). Particle Board: This type of core consists of chips or flakes of resin-coated wood fused together under heat and pressure to form a core for plywood. d). Mineral Core: Used for fireproof panel construction. Veneers are bonded to a hard noncombustible material.
Cross Fire	Figures extending across the grain as mottle, fiddle-back, raindrop and finger-roll are called cross figure or cross fire. Cross fire adds greatly to the beauty of the veneer.
Crossband	The veneer sheet between the core and face veneer. Its grain runs at right angles to the grain of adjacent layers, thereby providing the remarkable stability of hardwood plywood.
Crossbar	Type of figure or irregularity of grain resembling a dip in the grain running at tight angles, or nearly so, to the width of the veneer.
Crotch Veneer	Produced from the portion of the tree just below the point where it forks into two limbs. The grain is twisted, creating a variety of flame figures. Often resembles a well formed feather. The outside of the block produces a swirl figure that changes to full crotch flame figure as the cutting approaches the center of the block.
Curly Figure	Found mostly in Maple or Birch, and is due to the fibers being distorted and producing a wavy or curly effect in the veneer.
Domestic Veneer	A reference to wood veneers commonly found in the USA and N. America as a whole.
Edgeband	Thin strips of veneer used to cover the exposed edges of panel substrates. This veneer is usually available in rolls of various length and comes either pre-glued or unglued.
Exotic Wood Veneer	A common reference to wood veneers not indigenous to or grown in North America. Some burls and figured woods might also fall into this category.
Face	The better side of any plywood panel in which the outer plies are of different veneer grades. Also veneer spliced to a certain pattern and cut to exact size.
Fiddle Back	A fine, strong, even, ripple figure as frequently seen on the backs of violins. It is found principally in Mahogany and Maple; cut occurs sometimes in other woods.
Figure	The pattern produced in a wood surface by annual growth rings, rays, knots, deviations from natural grain such as interlocked and wavy grain, and irregular coloration. Appears across the grain. Mottle, Fiddleback and Raindrop are often called cross figure or cross fire.
Flake, Fleck Figure	Flake figure is developed only in those species which have very heavy medullary ray growth, specifically Oak, Lacewood, and Sycamore. When the saw or knife cut is directly on or near to the radial, it is close to parallel with the medullary ray and therefore develops the "Flake" effect.
Flat Cut	Also called Plain Slicing, it is the most common method of veneer manufacturing, producing a grain pattern known as cathedral. Because each leaf in the flitch is similar, a consistent and even matching pattern is possible. Flat cut veneer is ideally suited for wall panels and furniture. (also known as "Crown Cut")

Flexible Veneer	Wood veneer which is joined, processed, sanded and backed with paper or other material to create a fully ready to use dimensional sheet of real wood veneer.
Flitch	A Section of a log made ready for cutting into veneers. After cutting, all bundles are laid together in sequence as they were sliced.
Grading	Classifying veneers according to quality standards for each species.
Grain	Size and arrangement of the cells and pores of the living tree. Grain is not synonymous with figure. Woods fall into three groups: Fine grained (Birch, Cherry, Maple, etc.), medium grained (Walnut, Mahogany, etc.) and coarse grained (Oak, etc.) Coarser grained woods can usually be cut to develop a more conspicuous pattern.
Gum	Patches or black spots occurring primarily in American Cherry. This undesirable characteristic is acceptable in varying degree in most grades of Cherry.
Half Round Slicing	Similar to rotary peeling, also producing a high veneer yield. Used primarily to add width to narrow stocks by increasing the plane of cut. Also used to enhance a particularly wild grain pattern. Matching is possible because the leaves can be kept in sequence. Half round cutting may be used to achieve "flat cut" veneer appearance.
Hardwood	General term used to designate lumber or veneer produced from broad-leaved or deciduous trees in contrast to softwood, produced from evergreens or coniferous trees.
Heartwood	The non-active center of a tree generally distinguishable from the outer portion (sapwood) by its darker color.
Herringbone	Veneer strips are used and matched to both sides of the center line, at an angle. The resulting appearance is reminiscent of the bones of a fish as they are attached to the back bone.
Holes, worm	Holes resulting from infestation of worms.
Joint	The line between the edges or ends of two adjacent sheets of veneer or strips of lumber in the same plane.
Knots, Pin	Sound knots 1/4 inch or less that do not contain dark centers. Inconspicuous or blending pin knots are barely detectable at a distance of 6' to 8', do not seriously detract from the overall appearance of the panel, and are permitted in all grades.
Knots, Open	Opening produced when a portion of the wood substance of a knot has dropped out, or where cross checks have occurred to produce an opening.
Knots, Sound, Tight	Knots that are solid across their face and fixed by growth to retain their place.
Lamination	The process of gluing or bonding the component sections of the plywood into a single permanent unit stronger than the original wood itself.
Looseside	In knife-cut veneer, that side of the sheet that was in contact with the knife as the sheet was being cut. The bending of the wood at the knife edge causes cutting checks.
Medium Density Fiberboard / MDF	A panel or substrate material manufactured from wood fiber and resin. Generally considered the best substrate for laminating veneers.
Mineral Streak	A dark patch or discoloration in the wood which occurs because of the presence of minerals in the soil in which the tree is growing.

Mottle Figure	A variegated pattern which consists principally of irregular, wavy fibers extending for short distances across the face. If there is also some irregular cross figure in a log with a twisted interwoven grain, the broken stripe figure becomes a mottle.
No Black Line	Same as Wood-on-wood or 2-ply Veneer
Particleboard	A panel composed of small particles of wood and wood fiber that are bonded together with synthetic resin adhesives in the presence of heat and pressure.
Peanut Shell Figure	A type of figure occurring in some woods similar to quilted or blistered figure. These woods are typically cut to promote a random and wild grain effect with a three dimensional feel. Occurring most commonly in Tamo Ash and Bubinga.
Pecky	Pockets of disintegrated wood caused by localized decay, or wood areas with abrupt color change related to localized injury such as bird peck. Peck is sometimes considered as a decorative effect such as bird peck in pecan and hickory or pecks in cypress.
Pin Knot	See Knots, Pin
Phenolic Veneer	A flexible veneer face with a phenolic type backing material. Sometimes referred to as laminate veneer.
Plain Sliced	See Flat Cut
Pommele Figure	Comes from the French word, "Pomme" (Pomme = Apple). The term given to a regular veneer marking which resembles apples.
Premium Grade	A common reference to AA Grade veneer when veneer grading standards are applicable.
PSA Veneer	Pressure Sensitive Adhesive, often referred to as peel and stick veneer. This is a self adhesive veneer which doesn't require the application of glue and is used much the same way as contact paper.
Quarter Sliced / Cut	This cut requires the largest diameter logs and produces straight grained veneers. The quarter slicing of oak can result in the appearance of flake.
Quilted Figure	A larger , more exaggerated version of pommele or blister figure. The cellular figure is elongated and closely crowded giving it a pillowy three dimensional effect. It is most commonly found in Maple, Mahogany, Moabi and Sapele.
Random Matched or Planked	A panel having the face made up of specially selected dissimilar (in color and grain) veneer strips of the same species to stimulate lumber planking.
Raw Veneer	Wood veneer cut from any log by any slicing method that is dried and then used as a natural flitch or leaf of veneer. Much production and machining of this veneer has to be accomplished prior to the final application to a substrate.
Reconstituted Veneer	A man-made veneer which uses real wood fiber with natural colorants to simulate various color, figure and grain seen in real wood veneers.
Ribbon Stripe	Result of quarter-slicing a log and the appearance actually is between broken stripe and plain stripe. It gives the general appearance of a ribbon sometimes slightly twisted.

Rift Cut	Produced by cutting at a slight angle to the radial to produce a quartered appearance without excessive ray flake. The rift cut method, commonly used for Oak, can only be used on sizable logs. Rift cut veneer can easily be sequenced and matched.
Rotary Slicing	The log is turned in a circular motion against a knife, peeling off a continuous thin sheet of wood veneer (like unrolling wrapping paper). It is the most economical method of producing veneer, resulting in the highest yield. The grain is inconsistent and leaves are most difficult to match. This veneer is best suited for paint grade or utility surfaces.
Running Match	The panel face is made from components running through the flitch consecutively. Any portion of a component or leaf in starting the next panel.
Sapwood	This is the outer portion of the tree. As additional layers of growth accumulate on the outer perimeter, the inner layers of the sapwood becomes heartwood.
Select Grade	A common reference to A Grade veneers when veneer grading standards are applicable.
Sequence Matching	A method of arranging veneer faces such that each face is in order relative to its original position in the tree and has features of grain and figures similar to adjacent faces.
Sketch Face	A method of joining individual leaves of veneer together to create a single, standard dimensional sheet veneer. This method uses a combination of book matching and butt matching and is commonly used with burl and crotch veneers.
Sliced	Veneer produced by thrusting a log or sawn flitch into a slicing machine which shears off the veneer in sheets.
Slip Matching	Means that veneer leaves in a flitch are "slipped." Successive veneer leaves in a flitch are "slipped" one alongside the other and edge-glued in this manner. The result is a series of grain repeats, but no pairs. Sometimes a grain pattern "runs off" the edge of the leaf. A series of leaves with this condition could usually make a panel look like it is leaning. In the book matching the pairs balance each other.
Softwood	General term used to describe lumber or veneer produced from needle and/or cone-bearing trees. (See Hardwood)
Spliced Face Veneer	Face veneers that have been joined in any one of several matching effects through the careful factory process of tapeless splicing.
Streaks, Mineral	Natural discolorations of the wood substance.
Stump Veneer	Produced from the base of the tree. Here the grain pattern is always swirly twisted and often accompanied by cross fire and patches of burl. The sizes are normally small.
Swirl Grain	A lesser degree of crotch figure. The grain tends to swirl around in a random pattern. This figure frequently appears in cherry, mahogany, walnut and maple.
Tight Side	In knife-cut veneer, that side of the sheet that was farthest from the knife as the sheet was being cut and containing no cutting checks (lathe checks).
Veneer	A thin sheet of wood, rotary cut, sliced or sawn from a log or flitch. Veneering goes back to the early days of the Egyptians, about 3,500 years ago. Through the years, veneering has enriched furniture and architectural interiors with sheets of rare and beautiful woods bonded to other plain, sturdy wood based substrates to form a panel.
Veneer Log	Logs, either hardwood or softwood, which have specific characteristics or traits which qualify them to be sliced for veneer only. Less than 5% of all logs are of veneer quality.

May 15, 2009

Subject: Specifications for Veneer Grading

Two associations publish standards for wood doors: 1) The Window and Door Manufacturers Association (WDMA) and, 2) The Architectural Woodwork Institute (AWI).

The wood veneers that Stiles Custom Metal, Inc. includes in our product lines are generally graded as Premium, Custom and Economy. These three grades have many similarities. However, in the most recently published standards, there are some differences that should be noted.

The primary difference in the current standards relates to the veneer face grades for "A" grade doors. While WDMA indicates that "A" grade running match veneer is the standard for "A" grade doors, AWI indicates that "AA", balanced match, is required on "A" grade doors. This difference has caused some confusion in specifications.

Although AWI issued a bulletin to their members that stated, "most building standard doors are and should be AWI Custom Grade wood doors." (which allows "A" grade, running match veneers). Many specifications still show AWI "A" grade, which would require "AA" balance matched veneer faces. While a manufacturer may be able to obtain these faces, the specifier should be aware that supply is limited and cost increases will occur.

The major differences between "AA" and "A" grade is that the flitch width is slightly narrower on A grade, and balance matching requires each individual leaf in the face to be approximately the same width, whereas on running match, there exists no such requirement.

Our standard door construction meets the WDMA "A" Grade standard. However, on special requests, we will construct doors as required, i.e. "AA" faces, balanced match, etc. Please be aware that these options add cost and extend lead-times.

For more information / sources:

*See next page for Comparison Chart from WDMA

WDMA (Window & Door Manufacturer's Association): www.wdma.com

AWI (Architectural Woodwork Institute): www.awinet.org

Our technical bulletins are prepared as tools designed to inform our customers of updates and other technical data as it relates to our products and services. It is our goal that the data herein will help you to make informed decisions when designing, specifying, or ordering Stiles products.

Stiles makes no guarantee as to the accuracy of information obtained from outside sources. Whenever possible, links will be provided for additional information, and sources cited.

Comparison chart courtesy of WDMA at:

<http://www.wdma.com/i4a/pages/index.cfm?pageid=3519>

Comparison Chart I.S.1A 2004 and AWI Section 1300 (.pdf file)



Window and Door Manufacturers Association
1400 E. Touhy Ave., Suite 470
Des Plaines, IL 60018-3337
Phone 847-299-5200
Fax 847-299-1286
E-mail admin@wdma.com
www.wdma.com

TECHNICAL BULLETIN COMPARISON CHART

WDMA I.S. 1A-2004 and AWI Section 1300-2003

Characteristic	WDMA I.S.1-A	AWI Section 1300
Door Grades	Premium, Custom	Premium, Custom, Economy
Additional Veneer Species	Anegre, Beech, Makore, & Sapele Included	Not Included
HPVA Face Grade Charts	New Door Face Grade Charts	Panel Face Grade Charts
Premium Door Veneer Grade	"A" Grade (minimum)	"AA" Grade (minimum)
Premium Door Veneer Match	Running / Balance Match (minimum)	Center Balance Match (minimum)
Plastic Laminate Grades	HPDL, LPDL	HPDL
Door Construction	Performance Specifications <ul style="list-style-type: none"> • 3 Duty Levels • 8 Performance Attributes 	Prescriptive Specifications
Crossbanding	Wood, Composite	Wood, Composite With Internal Bond \geq 200 psi
Suggested Installation Chart	Included	Not Included
TR / OP Finishing System Descriptors	Included	Not Included
Guide Specifications	Specification Checklist Format for key aspects of the doors that must be addressed	Text Specification Format
ANSI Approval	Pending	No

Note: AWI standards for Premium Grade doors are typically used in installations where the doors are blueprint matched with wall paneling and/or the doors are adjacent to millwork. Therefore, the higher veneer grades and match requirements on the doors will be consistent with the surrounding millwork.

Most architectural and commercial doors are not directly associated with panels/millwork and are normally Premium Grade in WDMA I.S.1A or Custom Grade in AWI.

Architects should be aware that "Premium Grade" doors under AWI 1300 specifications have different requirements that can significantly affect door costs. AWI Premium Grade doors require higher veneer grade and match than WDMA I.S.1A Premium Grade doors. The important point to be made is that specifiers understand the differences, making their grade designations based on what type of appearance and cost is consistent with the requirements of the project.

Recommended Specification Language

Building standard doors to comply with WDMA I.S.1A Premium Grade. Doors adjacent to paneling or millwork to comply with corresponding AWI millwork grade.

NOTE: There are other minor differences not listed here which do not materially affect the comparison.