

## SPECIES CHARACTERISTIC MATRIX

The attached Species Characteristic Matrix is intended to provide a summary of the collective experience of Booth Veneers personnel relative to working with a wide variety of veneer species, and to provide a reference document that can be used to quickly understand and evaluate the risks and opportunities that specific veneers present. It is important to note that this summary is based upon generalities and the experience of those that provided input; exceptions to any description or characterization found in this documentation can and will be found.

*Please keep in mind that higher risk values are not inherently bad.* For example, burls are rated high risk relative to grain/figure consistency. It is this natural inconsistency that makes them so beautiful and distinctive. For each unique customer/design situation, the level of risk should be evaluated and the appropriate risk strategy or strategies selected.


To be very clear, the attached information is not intended in any way to limit the range of selection for any designer and/or aircraft owner. Quite simply, this information is being shared to enable all parties involved to understand and properly manage risks.

In addition to the risk assessment data, general information regarding log size and most common cut(s) for each specie has been included.


Finally, a "comments" field has been included in the matrix to provide additional miscellaneous information. As the matrix is used, customer comments can be added as well.

The matrix will be updated as necessary, with the goal being to keep the matrix accurate, concise, and user-friendly for our customers. The Document Number, Rev. Level and Release Date in the lower left corner will be used to control the document. Tracking of all Revisions will be documented on the Revisions page. Please direct questions, comments, and update recommendations to Customer Service (812-704-5200) at Booth Veneers.


# BOOTH VENEERS SPECIES CHARACTERISTIC MATRIX

Veneer Species	RISKS							Common Characteristics / Defects	Cuts and Patterns Usually Available							<div style="text-align: center;">  <p>UTC Aerospace Systems</p> </div> <p style="font-size: small;">Assessments described here are based on over 40 years of experience in working with aviation veneers and aviation customers. <b>These evaluations are general and do not necessarily predict properties of veneer from specific logs. Within any species, there is great diversity in the veneer's physical properties, patterns, grades, colors, and chemical properties.</b></p>									
	Aviation Use	Log Size	Availability	Pattern Consistency	Color Consistency	Color Change	Burn		Mineral	Flares / Pins	Blue Stain	Dark Spots or knots	Cracks / Splits	White Spots	Open Holes		Sugar streaks / Gum streaks	Flat Cut (Plain Sliced)	Flat Cut Figured	Quartered or Rift	Quarter Figured	Rotary	Pommele	Birdseye Patterns	Flake
	1 = Frequently Used 2 = Limited Number of AC Projects 3 = Rarely Used for Aviation	1 = Large multiple aircraft logs 2 = Usually 1 AC per log 3 = Always small log	1 = Readily Available 2 = Usually Available in Limited Choices 3 = Rare or not available	1 = Usually Consistent 2 = Some pattern changes are common 3 = Usually rapid pattern change	1 = Consistent within log 2 = Some color changes common 3 = multiple color should be expected	1 = Minimal color changes or unknown 2 = Color changes have been noted	1 = Minimal burn issues or unknown 2 = Burn issues have been reported																		
<b>LONGWOODS</b>																								<b>General Comments</b>	
Afrormosia	2	2	2	2	2	2	2	√	√	√									√					Narrow cuts, small sequences	
Andiroba	3	3	3	2	2	1	1	√	√	√								√	√					Narrow cuts, small sequences	
Anigre	1	1	1	1	1	1	1		√							Rare		√	√					Tan to Yellow	
Ash (European)	2	2	2	2	1	1	1		√							√		√	√						
Ash (Olive)	2	2	2	2	1	1	1									√		√	√						
Aspen	2	3	2	2	2	1	1		√										√					Similar to grissard	
Avodire	2	2	2	2	2	1	1		√									√							
Beech (European)	2	2	1	1	1	1	1									√		√	√					Spotches have been noted after finish	
Birch	2	2	2	2	2	1	1												√					Comments refer to red birch	
Birdseye Maple	1	3	2	2	2	1	1				√	√		√	√					√		√		Large consistent logs are very rare	
Bosse	2	2	2	2	2	1	1					√								√	√			African cedar	
Bubinga	1	1	3	1	1	1	2	√	√	√	√	√				√	√	√	√	√	√			Exporting issues from Africa have reduced supply. Waterfall pattern is especially difficult.	
Cedar	3	2	2	2	2	1	1		√											√	√			Sometimes called Spanish cedar	
Chen	3	2	2	2	2	1	1		√										√					Soft wood	
Cherry	1	2	1	2	2	2	1		√					√		√	√	√	√					North American Black Cherry	
Chestnut	2	2	3	2	2	1	1		√							√		√	√						
Curupixa	3	2	2	2	2	1	1		√									√	√						
Ebony	1	3	3	3	3	1	2		√							Rare		√						Usually takes 3-8 logs to do a large plane	
Elm	3	2	3	2	1	1	1		√							√		√							
Etimoe	1	1	1	2	2	1	2	√	√	√						√		√						Wide range of colors and patterns	
Eucalyptus	1	1	1	2	2	1	2	√	√	√	√							√	√	√	√			Wide range of colors and patterns	
Eucalyptus (Smoked)	1	1	2	1	2	1	2	√			√								√						
Frake	2	2	2	2	2	1	1											√							
Gaboon	2	2	2	2	2	1	1		√									√	√						
Goncalo Alves	3	2	2	2	2	1	1	√	√		√					Rare		√							
Gum, red	2	2	2	3	2	1	1				√					Rare		√						Sap in the cuts can produce strong 2 toned appearance	
Hickory	3	2	3	2	1	1	1		√							√		√							
Imbuia	3	2	2	2	2	2	2	√	√							√				√	√				
Ipe	3	2	3	1	2	2	2	√	√							Rare		√	√					Flares are common; Tape can pull out grain. Very difficult to pass burn. Not Recommended	

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Jarrah	3	3	2	2	2	2	2	✓	✓								Rare		✓						CFBV does not recommend the use of this species.
Jatoba	3	2	3	2	2	2	1	✓	✓								Rare		✓						Inconsistent color
Koa	3	2	2	2	2	2	2	✓	✓										✓						From Hawaii
Kosipo	2	2	3	2	2	2	1	2	✓	✓									✓						Similar to sapele
Lacewood	2	3	1	3	2	1	1					✓							✓				✓		Inconsistent patterns, narrow cuts, small flitches
Laurel	3	2	3	2	2	1	2	✓	✓								✓		✓	✓					Many looks and patterns available.
Limba	2	2	2	2	2	1	1		✓										✓	✓					
Louro Preto	3	3	2	3	2	1	2	✓	✓		✓						✓		✓	✓	✓	✓			Includes Khaya which is African mahogany
Mahogany	1	1	1	1	1	1	2	1		✓							✓	✓		✓	✓				Similar to padauk
Mai Dou	3	2	2	2	2	1	1		✓								✓		✓						Usually clean. Sometimes called "African Cherry"
Makore	1	1	1	1	1	2	2		✓		✓						✓	✓	✓	✓	✓	✓			Sugar streaks are common. Large logs are rare
Maple	2	2	1	2	1	1	1	✓	✓								✓		✓	✓					
Maple (Curly)	2	2	2	2	1	1	1	✓	✓										✓						
Maple (Quilted)	2	3	3	2	2	1	1		✓										✓						
Maple (Wormy)	3	2	3	2	2	1	1				✓								✓						
Movinque	2	2	2	2	1	1	1		✓										✓	✓					narrow cuts and small flitches
Mozambique	2	2	2	2	2	1	2	✓	✓										✓	✓					narrow cuts and small flitches. Called Ovangkol
Nyatoh	3	2	3	2	2	2	1	✓	✓			✓							✓						Usually not available
Oak	1	2	1	2	2	2	2		✓								✓	✓	✓	✓			✓		Many looks and cuts.
Oak (Bog)	2	2	2	2	2	1	1	✓	✓								✓		✓						
Oak (Smoked)	2	2	2	1	2	1	1	✓	✓								✓		✓						
Padauk	3	2	2	2	2	1	2		✓								✓		✓						
Paldoa	2	2	2	2	2	1	2		✓										✓	✓					narrow cuts and small flitches
Pearwood	3	3	2	2	2	2	1		✓								✓	✓	✓	✓			✓		Rich color change with age
Planetree	3	2	2	3	2	1	1		✓		✓								✓				✓		Small flitches and rapid change of pattern
Prima Vera	3	2	2	2	2	1	1		✓										✓	✓					
Rosewood (Brazilian)	3	2	3	3	1	1	2	✓	✓		✓						✓								Expensive
Rosewood (East Indian)	2	2	2	2	2	1	2	✓	✓								✓		✓						
Rosewood (Santos)	2	3	2	3	2	2	2	✓	✓								✓		Rare						Small logs
Sapele	1	1	1	2	1	1	1	✓	✓		✓						✓	Rare	✓	✓	✓	✓			
Sassafras	3	2	3	2	1	1	1		✓								✓	✓	✓	✓					Similar to ash or hickory
Satinwood	3	2	3	2	1	1	1		✓										✓						

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Sen	2	2	2	2	1	1	1		√	√	√	√						Expensive	
Sycamore (European)	1	2	1	2	1	1	2		√		√	√					Pin knots almost always present		
Tamo Ash	1	2	2	3	1	1	1						√	√			Usually has a range of looks		
Teak	2	2	1	2	1	1	2		√	√	√						Oily wood.		
Timborana	3	2	3	2	2	1	1		√	√									
Tineo	2	2	3	3	2	1	1		√		√	√							
Walnut	1	2	2	2	2	2	2	√	√		√	√					American Black walnut		
Walnut (European)	1	2	1	2	2	2	2	√	√		√	√					Often called French walnut or Circassian walnut		
Walnut (Australian)	1	2	2	2	2	1	2		√		√	√					Sometimes called Queensland walnut		
Walnut (Italian)	2	3	2	2	1	1	1		√	√									
Wenge	2	2	2	1	1	1	2	√	√		√						White Spots in grain before and after finishing.		
Zebrano	2	2	2	1	1	1	2		√		√						Called Zebrawood		
Ziricote	3	2	2	2	2	1	2	√			√	√					sometimes called Sharkwood--Circote mineral		

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**Booth Veneers**

UTC Aerospace Systems

Cuts and Patterns Usually Available

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<b>BURLS</b>																							
Amboyna	2	3	3	2	2	1	1				✓		✓										
Camphor	2	3	3	2	2	1	2				✓		✓										
Chestnut	2	2	3	2	2	1	1			✓	✓		✓										
Elm	2	2	3	2	3	1	1	✓		✓	✓		✓										
Eucalyptus	2	3	3	2	2	1	1			✓	✓		✓										
Imbuia	2	3	3	2	2	1	2	✓		✓	✓		✓										
Birch, Karelian	2	3	2	3	3	1	1			✓	✓		✓									Sometimes called ice birch	
Laurel	2	2	2	2	2	1	1			✓	✓		✓										
Madrona	2	2	2	2	2	2	1		✓	✓	✓		✓										Dyed logs are more common.
Maple	2	3	3	2	2	1	1			✓	✓		✓	✓									Nothing available in high grade.
Maple Burl Cluster	2	2	3	3	2	1	1			✓	✓		✓	✓									
Mappa	2	2	2	1	1	1	1			✓	✓		✓										Plugs and wood fill required
Myrtle	2	3	3	2	2	1	1			✓	✓		✓										
Oak	2	3	3	3	2	1	1			✓	✓		✓										Very limited availability in high grade
Olive Ash	2	3	3	3	2	1	1		✓	✓	✓		✓										large logs are rare
Planetree	2	2	3	2	2	1	1			✓	✓		✓										
Redwood	2	1	2	2	1	2	1			✓	✓		✓										
Walnut	1	2	2	2	2	2	1	✓		✓	✓		✓										
Walnut (European)	2	2	2	2	2	2	1	✓		✓	✓		✓										
White Ash	2	2	3	2	1	1	1			✓	✓		✓										
Yew Tree	3	3	3	3	2	1	1			✓	✓		✓										Expensive
<b>Crotch Veneers</b>																							
Etimoe	3	3	3	3	2	1	1				✓			✓									
Mahogany	2	2	1	3	2	1	1				✓			✓									
Walnut	2	3	2	3	2	1	1				✓			✓									
<b>Man Made Products</b>																							
Composite veneer	1	1	1	1	1	2	1							✓		✓			✓	✓			Wide and consistent
Bamboo Panels	2	1	1	1	1	2	2																Wide and consistent; Does not accept stain; 12 week if not in stock
Dyed Veneers	2	3	2	3	1	2	1							✓		✓				✓			Custom dyed logs can be an option. 12 weeks required. Limited samples

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<b>REVISIONS:</b>			
<i>Doc. #</i>	<i>Rev.</i>	<i>Date</i>	<i>Description</i>
QC-0182	IR	04/29/10	Initial Release of Document
QC-0182	A	06/22/10	<b>Added long wood and burl specie to better reflect information provided on veneer index CD. Also added crotch veneer sections. Added rotary to cuts and patterns usually available</b>
QC-0182	B	09/14/10	<b>Removed DeCrane logo, email address</b>
QC-0182	C	10/08/10	<b>Added Goodrich Logo, GCS-BV to Header</b>
QC-0182	D	04/12/11	<b>Changed the Bubinga availability and added note</b>
QC-0182	E	09/23/11	<b>Changes to Afromosia, Bubinga, Chestnut, Goncalo Alves, Hickory, Ipe, Kosipo, Laurel, Q. Maple, Pearwood, Sapele, Sassafras, Tamo Ash, Timborana, Tineo, Walnut, Ziricote; Also Elm, Laurel, Maple Cluster, Olive Ash, Planetree, White Ash, Bamboo, Dyed Veneers</b>
QC-0182	F	10/23/12	<b>re-brand with UTC to comply with stnds.</b>
QC-0182	G	06/02/14	<b>Revised ratings for burn etc based on recent experience</b>
QC-0182	H	09/02/15	<b>Per RFC 0328 changed title of form</b>