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# TECHNICAL BULLETIN

## Naturally Durable Hardwood Grading Rules

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### Grade Selection

Choosing the correct grade and specifications will significantly affect how wood products look and how well they work in any given application.

NHLA's (National Hardwood Lumber Association) grading rules only go so far, allowing more defects in its highest grades than we allow in our own production. Because of this, Tropical Forest Products has made and published grading standards and a product specification language for our decking, cladding, lumber, and timber products.

When tropical hardwoods are specified or purchased without clearly defining grade expectations, there is no assurance of the quality and consistency of the product delivered and no accountability standard set for the supplier. And since grade affects price, what looks like a good deal on paper might not look nearly as good on your project. The grade directly impacts mechanical properties and load performance if the product is used in structural applications like decking.

Based on our published grading rules and ASTM D143 physical properties testing, Tropical Forest Products has developed and certified ASTM D245 Allowable Design Values for hardwoods based on grade.

It is important to note that TFP Tropical Forest Products Premium Select Architectural Grade hardwood decking has almost twice the strength of generic FAS grade hardwood decking. Because of the establishment of definitive grading rules, TFP can offer hardwood decking, stringer, and beam products available with structural engineer certified and stamped span charts and code-compliant submittal documents.

We strongly encourage specifiers, consumers, and contractors to use these standards when making decisions and to mention them in their purchase orders.

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## Grading Rule Definitions

As with most natural wood products, tropical hardwoods possess natural "Appearance Characteristics" that add to their unique beauty. Those that are appreciated include color variation and distinctive grain patterns. Other characteristics in all types of lumber that develop naturally or through manufacturing are known as "Physical Characteristics," "Sound Defects," "Unsound Defects," and "Milling Defects." The following is a summary of the typical characteristics one might find in a wood grade specification.

It is important to note that the industry standard allows for a 5% subgrade in all production to account for human error in the grading process.

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### **Appearance Characteristics**

- 1) Color Variation
- 2) Mixed Grain
- 3) Drying Checks
- 4) Reverse Grain
- 5) Birdseye
- 6) Pin Knots
- 7) Water Stain
- 8) Discoloration
- 9) Sticker Marks
- 10) Molder Knife Marks

### **Physical Characteristics**

- 1) Bow
- 2) Crook
- 3) Cup
- 4) Twist

### **Milling Defects**

- 1) Skip
- 2) Torn grain
- 3) Non-compliant profiling
- 4) Hit or Miss

### **Sound Defects**

- 1) Pin holes
- 2) Sound knots
- 3) Torn grain

### **Unsound Defects**

- 1) Large borer holes
  - 2) Splits
  - 3) Unsound knots
  - 4) Shake
  - 5) Sapwood
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## Characteristics and Defects



Pin Knot (Tight)



Tight Reverse Grain



Grain/Color Variation



Loose Knot



Knife Marks



Torn Grain



Sapwood (light color)



Split/Crack



Grub Hole



Shake



Planar Marks



Sticker Mark



Worm Hole



Hit or Miss / Skip



Birdseye / Makula



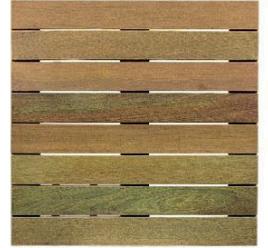
Surface Checking

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**TROPICAL FOREST PRODUCTS Premium Select Architectural Grade Clear Mixed Grain**

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**TROPICAL FOREST PRODUCTS PREMIUM SELECT- Architectural Grade ... Hand Selected for Premium Appearance on 4 Sides 4 Edges.**

**Grading Face, Back Face, and Edges – 100% All Heart, Free of Heart Center, Free of Sapwood:**

- Include - Appearance Characteristics with a maximum of 5% tight reverse grain.
- Include - Physical Characteristics which can be removed using typical installation methods, tools, or sanding.
- Exclude - Sound Defects.
- Exclude - Unsound Defects.
- Exclude - Milling Defects.
- For Structural Application – Not Allowed... pin knots bigger than ½" at any face and/or edge, the maximum permitted slope of grain 1" in 10", length of end split, and surface split shall be as per ASTM D245 (5.43).

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## TFP FEQ Commercial Grade

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### **Tropical Forest Products FEQ (First Export Quality/) - Commercial Grade...Hand Selected for Serviceable Appearance on 1 Face and 2 Edges.**

- Include - Appearance Characteristics. Unlimited Tight Reverse Grain.
- Include - Physical Characteristics that can be removed using normal installation methods, tools, or sanding.
- Include - Sound Defects.
- Grading Face – Clear All Heart: Free of Heart Center, Free of Sapwood.
- Exclude - Unsound Defects.
- Exclude - Milling Defects.
- Back Face and Edges:
  - Include – Unsound Defects.
  - Include – Milling Defects.

For Structural Application – Not Allowed...knots bigger than  $\frac{3}{4}$ " at narrow face or edges, centerline knots bigger than  $1\frac{3}{4}$ " at the wide face, edge knots bigger than  $\frac{3}{4}$ " at the wide face, the maximum permitted slope of grain 1" in 8", length of end split and surface split shall be as per ASTM D245 (5.4.3).

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## FAS B Grade (First and Seconds) – Mill Run Grade

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**FAS B Grade represents the standard market export grade and is typically uninspected. It is not uncommon to hear FAS qualities described as Mill Run, Prime, #1, Select and Better, and First Quality.**

It is important to understand that grade representation does not assure quality or consistency if not backed up by clearly defined grading rules. As such, TFP has established rules for FAS quality. It is important to note that the FAS grade, except for sapwood, is just as resistant to rot as other grades. It is simply lower in strength and less attractive in appearance than higher grades.

- First and Seconds ratios - Undefined.
- Include - Appearance Characteristics.
- Include - Physical Characteristics which can be removed using normal installation methods, tools, or sanding.
- Include - Sound Defects.
- Include - Unsound Defects.
- Include - Milling Defects.
- For Structural Application – Not Allowed... knots bigger than  $\frac{3}{4}$ " at narrow face or edges, centerline knots bigger than  $1\frac{3}{4}$ " at the wide face, edge knots bigger than  $\frac{3}{4}$ " at the wide face, the maximum permitted slope of grain 1" in 6", length of end split and surface split shall be as per ASTM D245 (5.4.3).

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## Character Grade

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Character Grade is 100% Reverse Grain

- Include - Appearance Characteristics.
- Include - Physical Characteristics that can be removed using normal installation methods, tools, or sanding.
- Include - Sound Defects.

**Character Grade** is an aesthetic grade with 100% of boards containing the characteristic of Tight Reverse Grain.

### Grade Notes – Under Tropical Forest Products Grading Rules

- **AD** - Lumber is air dried with a moisture content of 18% or higher after milling.
- **KD** - Lumber will be kiln dried to have a moisture content of 12-14% before milling.

Subgrade Allowances – Industry standards allow any grade to include up to 5% of the next lower grade in any volume supplied to account for human error in the grading process.

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## **Color and Grain Variation**

Color and grain variation are typical of materials created by nature and are recognized as part of the beauty that sets natural products apart from manufactured ones. This is particularly true where wood products are concerned, though some species have more or less color variation than others. This should always be considered when looking at wood samples, as Tropical Forest Products Decking is supplied with a mixed grain and is not sorted for color. Some color consistency can be achieved by staining the wood or allowing the wood to weather or grey out naturally.

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