### Pallet Design System

**Pallet Specification Sheet**

**All dimensions in inches**

**Customer:**
National Wood Pallet and Container Association  
1800 North Kent Street, Suite 911  
Arlington, Virginia 22209-2109  
Phone: 703-527-7667  
http://www.nwpca.com

**Prepared by:**
The Pallet and Container Research Laboratory  
Department of Wood Science and Forest Products  
College of Natural Resources  
Virginia Polytechnic Institute and State University  
Blacksburg, Virginia 24061

**PDS License:** 100  
**Date:** April 05, 2001

**Pallet ID:** 2800 - Hardwood  
**Classification:** 48.00 x 40.00, Stringer-Class, Double-Face Non-Reversible, Partial 4-Way, Multiple-Use

#### Top Deck
- **Style:** Deckboard  
- **Type:** Lumber  
- **Thickness:** 0.750  
- **Length:** 40.00  
- **Wing:** 0.00

<table>
<thead>
<tr>
<th>Number</th>
<th>Width</th>
<th>Fasteners Per Connection</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>5.500</td>
<td>3</td>
</tr>
<tr>
<td>5</td>
<td>3.500</td>
<td>2</td>
</tr>
</tbody>
</table>

Endboards Flush, Interior boards Equally Spaced  
**Volume:** 5.9 bd ft

#### Bottom Deck
- **Style:** Deckboard  
- **Type:** Lumber  
- **Thickness:** 0.750  
- **Length:** 40.00  
- **Wing:** 0.00

<table>
<thead>
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</thead>
<tbody>
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</tr>
<tr>
<td>3</td>
<td>3.500</td>
<td>2</td>
</tr>
</tbody>
</table>

Endboards Flush, Interior Cluster Equally Spaced  
**Volume:** 4.5 bd ft

#### Stringers
- **Type:** Lumber  
- **Height:** 3.750  
- **Length:** 48.00

<table>
<thead>
<tr>
<th>Number</th>
<th>Width</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>1.750</td>
</tr>
</tbody>
</table>

**Partial 4-way Entry Notch:**  
- **Depth:** 1.250  
- **Length:** 9.00  
- **Location:** 6.00  
- **Radius:** 0.75

**Volume:** 6.6 bd ft

#### Lumber
- **Lumber ID:** Mixed Hardwood

<table>
<thead>
<tr>
<th>PDS Species Class</th>
<th>PDS Grade</th>
<th>Lumber Mix</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eastern Oaks</td>
<td>Multiple-Use &amp; BTR</td>
<td>50 %</td>
</tr>
<tr>
<td>High Density Eastern Hardwoods</td>
<td>Multiple-Use &amp; BTR</td>
<td>25 %</td>
</tr>
<tr>
<td>Medium Density Eastern Hardwoods</td>
<td>Multiple-Use &amp; BTR</td>
<td>25 %</td>
</tr>
</tbody>
</table>

**Moisture Content:** Green

#### Fastener
- **Fastener ID:** 2-1/4 x .112 SS
- **Fastener Type:** Helic ally Threaded Nail
- **Fastener Length:** 2.25
- **Thread Length:** 1.50
- **Thread Diameter:** 0.126
- **Wire Diameter:** 0.112
- **Wire Thickness:**
- **Wire Width:** 0.280
- **Head Diameter:**
- **Crown Length:**
- **Helixes:** 6.5
- **Flutes:** 4
- **Thread Angle:** 67
- **Rings:**
- **MIBANT Angle:** 36
- **FWI:** 66
- **FSI:** 67

**Total Number:** 84
# Pallet Structural Analysis

**Pallet ID:** 2800 - Hardwood  
**Classification:** 48.00 x 40.00, Stringer-Class, Double-Face Non-Reversible, Partial 4-Way, Multiple-Use  
**Unit Load Type:** Uniformly Distributed - Full Pallet Coverage  
**Unit Load Weight Variability:** User-Specified  
**Weight Coefficient of Variation:** 49.5%  
**Maximum to Average Weight Ratio:** 2.15  
**Service Environment:** Dry Service Environment (EMC <= 19%)

<table>
<thead>
<tr>
<th>Support Condition</th>
<th>Safe Maximum Load</th>
<th>Deflection at Maximum Load</th>
<th>User Specified Deflection Limit</th>
<th>Maximum Load for Deflection Limit</th>
<th>Critical Member</th>
</tr>
</thead>
<tbody>
<tr>
<td>Racked Across Length</td>
<td>3174 lbs.</td>
<td>0.24 in.</td>
<td>0.50 in.</td>
<td>NA</td>
<td>Center Stringer</td>
</tr>
<tr>
<td>Racked Across Width</td>
<td>2855 lbs.</td>
<td>0.46 in.</td>
<td>0.50 in.</td>
<td>2331 lbs.</td>
<td>Bottom Deckboard</td>
</tr>
<tr>
<td>Stacked 1 Unit Load High</td>
<td>9602 lbs.</td>
<td>0.12 in.</td>
<td>----</td>
<td>----</td>
<td>Top Deckboard</td>
</tr>
<tr>
<td>Stacked 4 Unit Loads High</td>
<td>3693 lbs. (each pallet)</td>
<td>0.12 in.</td>
<td>----</td>
<td>----</td>
<td>Top Deckboard</td>
</tr>
</tbody>
</table>

**Lateral Collapse Resistance**  
- Low  
- Medium  
- Good  
- Excellent  
  - H/V = 2.84

**Pallet Durability Analysis**  
- Low  
- Medium  
- Good  
- Excellent  
  - Durability Rating = 53
Pallet Design System - Version 3.06

Pallet ID: 2800 - Hardwood
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### Average Pallet Weight

<table>
<thead>
<tr>
<th></th>
<th>At Manufacture</th>
<th>At 25% MC</th>
<th>At 19% MC</th>
<th>At 15% MC</th>
<th>At 12% MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Weight</td>
<td>75 lbs.</td>
<td>53 lbs.</td>
<td>51 lbs.</td>
<td>49 lbs.</td>
<td>48 lbs.</td>
</tr>
</tbody>
</table>

### Dimensional Change due to Wood Drying

<table>
<thead>
<tr>
<th>Component</th>
<th>Original Dimension</th>
<th>Shrinkage from Manufacture to 19% MC</th>
<th>Shrinkage from Manufacture to 15% MC</th>
</tr>
</thead>
<tbody>
<tr>
<td>Top Deckboards</td>
<td>0.750 in. Thickness</td>
<td>0.018 in. (+/- 0.006 in.)</td>
<td>0.026 in. (+/- 0.008 in.)</td>
</tr>
<tr>
<td></td>
<td>5.500 in. Width</td>
<td>0.131 in. (+/- 0.042 in.)</td>
<td>0.189 in. (+/- 0.060 in.)</td>
</tr>
<tr>
<td></td>
<td>3.500 in. Width</td>
<td>0.083 in. (+/- 0.027 in.)</td>
<td>0.120 in. (+/- 0.038 in.)</td>
</tr>
<tr>
<td>Stringers</td>
<td>3.750 in. Height</td>
<td>0.089 in. (+/- 0.028 in.)</td>
<td>0.129 in. (+/- 0.041 in.)</td>
</tr>
<tr>
<td></td>
<td>1.750 in. Width</td>
<td>0.042 in. (+/- 0.013 in.)</td>
<td>0.060 in. (+/- 0.019 in.)</td>
</tr>
<tr>
<td>Bottom Deckboards</td>
<td>0.750 in. Thickness</td>
<td>0.018 in. (+/- 0.006 in.)</td>
<td>0.026 in. (+/- 0.008 in.)</td>
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### Fasteners/Connection:

- Top Deck: 3 2 2 2 2 2 3 (Total: 48)
- Bottom Deck: 3 2 2 2 2 3 (Total: 36)

### Material Volume:

- Top Deck: 5.9 bd ft
- Stringers: 6.6 bd ft
- Bottom Deck: 4.5 bd ft

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The recommendations from PDS are based on the NWPCA’s continuing program of laboratory and field research. They represent the best available engineering information compiled to date. Therefore, the Association cannot accept responsibility for pallet performance or design as actually constructed. Wood pallets bearing the NWPCA SPEQ trademark are manufactured to the Uniform Voluntary Standard for Wood Pallets established by the Association which define the prescriptive and performance criteria. Wood pallets manufactured to this PDS design are for the sole purpose of storing and/or transporting material. Under no circumstance should any person stand, step, or lean upon them or otherwise use them for support.
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### Top View

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<th>Dimension</th>
<th>Measurement</th>
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<td>40.00</td>
<td></td>
</tr>
<tr>
<td>5.50</td>
<td></td>
</tr>
<tr>
<td>3.50</td>
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Bottom View

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