

PALLET DESIGN SYSTEM Version 6.7

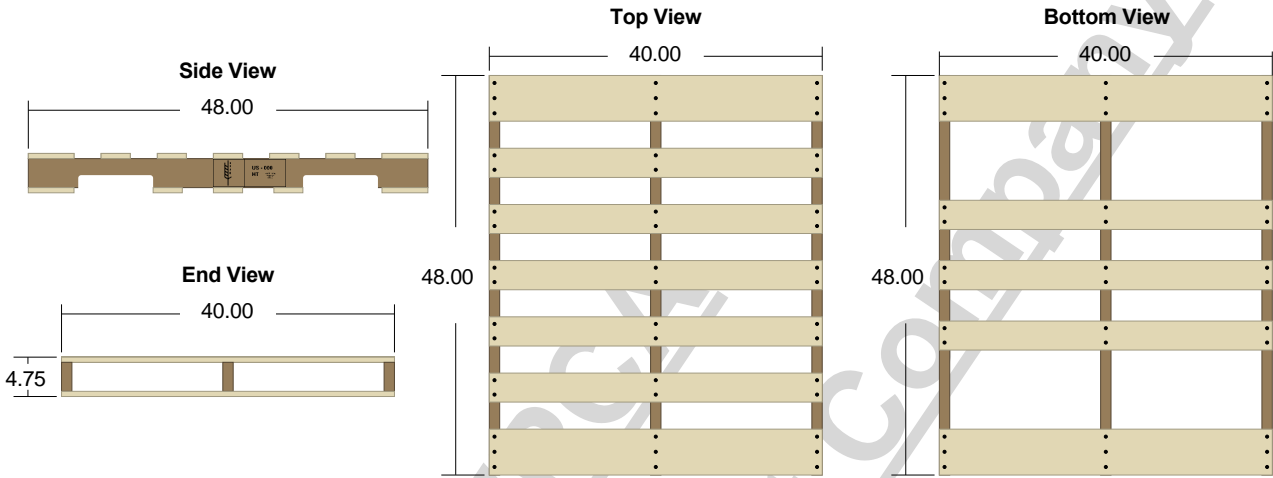
Pallet Specification Sheet

All dimensions in inches

Customer:
SAMPLE PDS SPEC

Prepared by:
Great Lakes Pallet Company
Greg Skolrood
1110 Windsor Road
Loves Park, IL 61111
PDS License: 753 Printed: March 02, 2023

Pallet ID: 48x40 4-Way, NEW, Hardwood, Heat Treat SAMPLE SPEC
Specification Date: March 02, 2023 **Revision Date:** March 02, 2023
Classification: 48.00 x 40.00, Stringer-Class, Double-Face Non-Reversible, Partial 4-Way, Reusable, New Manufacture
Pallet Treatments: ISPM-15 Compliance: Heat Treatment (HT)



Components

Materials

Top Deck:

Number	Thickness	Width	Length
5	0.625	3.500	40.00
2	0.625	5.500	40.00

Volume: 4.9 bd ft

Bottom Deck:

Number	Thickness	Width	Length
3	0.625	3.500	40.00
2	0.625	5.500	40.00

Volume: 3.7 bd ft

Stringers:

Number	Width	Height	Length
3	1.250	3.500	48.00

Volume: 4.4 bd ft
 Partial 4-way Entry Notch:
 Depth: 1.500 Length: 9.00 Location: 6.00 Radius: 0.75

Fasteners:

Fastener ID:	2 x .112 SS
Fastener Type:	Helically Threaded Nail
Fastener Length:	2.00
Thread Length:	1.50
Thread Diameter:	0.128
Wire Diameter:	0.112
Head Diameter:	0.280
Flutes:	4
Helixes:	5.4
Pitch:	0.278
Thread Angle:	70
MIBANT Angle:	36
FWC:	2.27
Total Number:	84

New Lumber:

Lumber ID: Mixed Eastern Hardwoods		
Species Class	Grade	Lumber Mix
High Density Eastern Hardwoods	Standard &BTR	50 %
Medium Density Eastern Hardwoods	Standard &BTR	50 %
Moisture Content (at manufacture and assembly): Green		
Total New Lumber Volume: 13.1 bd ft		

Spec Sheet Notes:

SAMPLE PALLETS AT NO COST, AND WILL BE DELIVERED FOR FREE TO EVALUATE AND SEE THE QUALITY FOR YOURSELF

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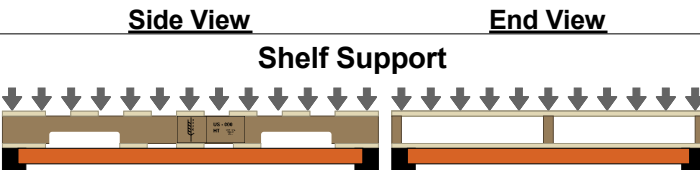
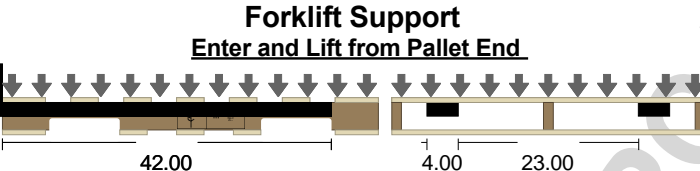
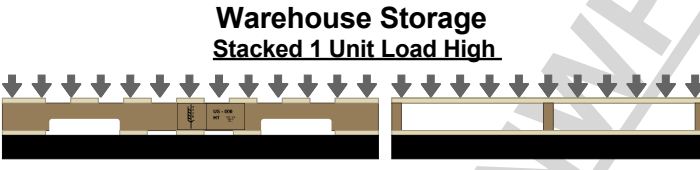
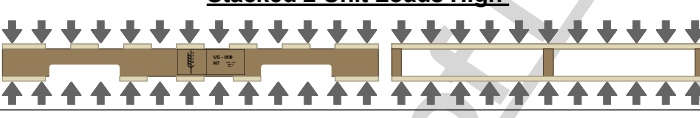

Pallet Structural Analysis

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General Load Type: Uniformly Distributed - Full Pallet Coverage
Load Weight Variability: Medium
Service Environment: Dry Environment (EMC <= 19%)

Support Condition	Safe Maximum Load	Deflection at Maximum Load	User Specified Deflection Limit	Maximum Load for Deflection Limit	Critical Member or Connection
<p>Shelf Support</p> 	4451 lbs.	0.21 in.	----	----	Interior Top Deckboard
<p>Forklift Support <u>Enter and Lift from Pallet End</u></p> 	2538 lbs.	0.65 in.	----	----	Interior Top Deckboard
<p>Warehouse Storage <u>Stacked 1 Unit Load High</u></p> 	5481 lbs.	0.26 in.	----	----	Interior Top Deckboard
<p><u>Stacked 2 Unit Loads High</u></p> 	3426 lbs. per pallet	0.26 in.	----	----	Interior Top Deckboard
<p>Lateral Collapse Resistance</p> 	<p style="text-align: center;"> Low Medium Good Excellent </p> <p style="text-align: center;">↑ LCR Indicator = 1.77</p>				

Pallet Design System (PDS)

Developed and owned by:

National Wooden Pallet and Container Association (NWPCA)

Research and development for early versions of PDS were conducted in cooperation with:
 Center for Unit Load Design, Virginia Tech Department of Wood Science and Forest Products;
 U.S.D.A. Forest Service and Forest Products Laboratory; APA - The Engineered Wood Association;
 Software Technologies Laboratory, Virginia Tech Department of Industrial and Systems Engineering

The results from PDS are based on the NWPCA's continuing program of laboratory and field research. While the engineering outcomes reflected in the results are based on sound science, the quality of workmanship, the input data, and the conditions in which pallets are used may vary widely. Therefore, the Association cannot accept responsibility for pallet performance or design as actually constructed, and specifically disclaims any responsibility for such. Notwithstanding the history of the PDS system, users of the PDS system are strongly encouraged to undertake individual, unique analysis of the results as they then pertain to specific applications and the production process. 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.

Pallet Design System - Version 6.7.1 (C) Copyright 1985-2023

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PALLET DESIGN SYSTEM Version 6.7

Pallet Physical Property Analysis

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	At Manufacture	At 25% MC	At 19% MC	At 15% MC	At 12% MC
Average Pallet Weight	58 lbs.	42 lbs.	40 lbs.	39 lbs.	38 lbs.



Component	Original Dimension	Shrinkage from Manufacture to 19% MC	Shrinkage from Manufacture to 15% MC
Top Deckboards	0.625 in. Thickness	0.015 in. (+/- 0.004 in.)	0.021 in. (+/- 0.006 in.)
	3.500 in. Width	0.081 in. (+/- 0.023 in.)	0.117 in. (+/- 0.034 in.)
	5.500 in. Width	0.128 in. (+/- 0.037 in.)	0.184 in. (+/- 0.053 in.)
Stringers	3.500 in. Height	0.081 in. (+/- 0.023 in.)	0.117 in. (+/- 0.034 in.)
	1.250 in. Width	0.029 in. (+/- 0.008 in.)	0.042 in. (+/- 0.012 in.)
Bottom Deckboards	0.625 in. Thickness	0.015 in. (+/- 0.004 in.)	0.021 in. (+/- 0.006 in.)
	3.500 in. Width	0.081 in. (+/- 0.023 in.)	0.117 in. (+/- 0.034 in.)
	5.500 in. Width	0.128 in. (+/- 0.037 in.)	0.184 in. (+/- 0.053 in.)

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Great Lakes Pallet Company
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PALLET DESIGN SYSTEM Version 6.7

2-D Pallet Drawings

All dimensions in inches

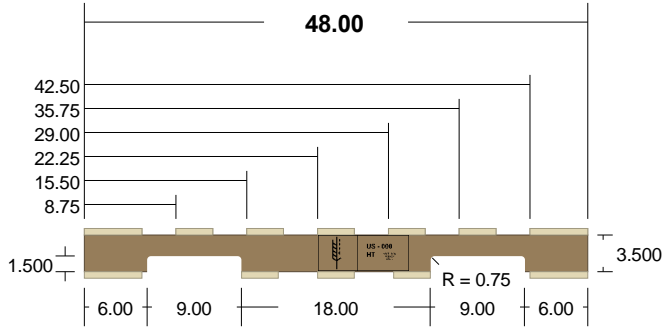
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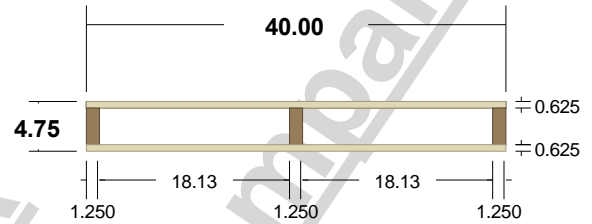
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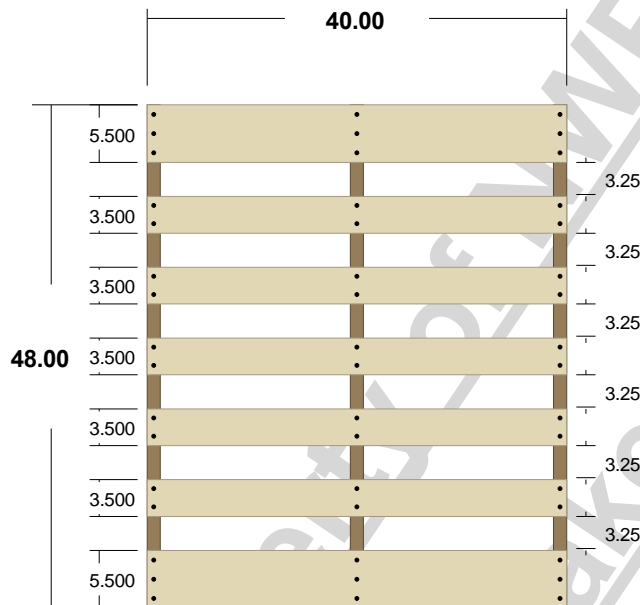
Side View



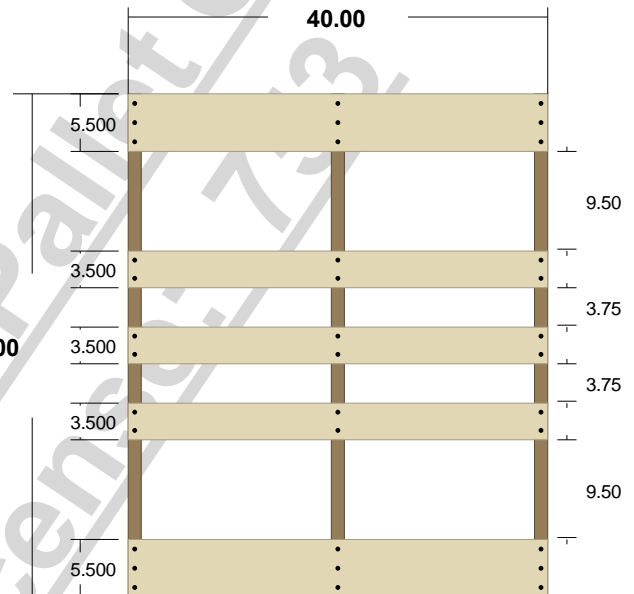
End View



Top View



Bottom View



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Pallet Drawing - Side and End View

All dimensions in inches

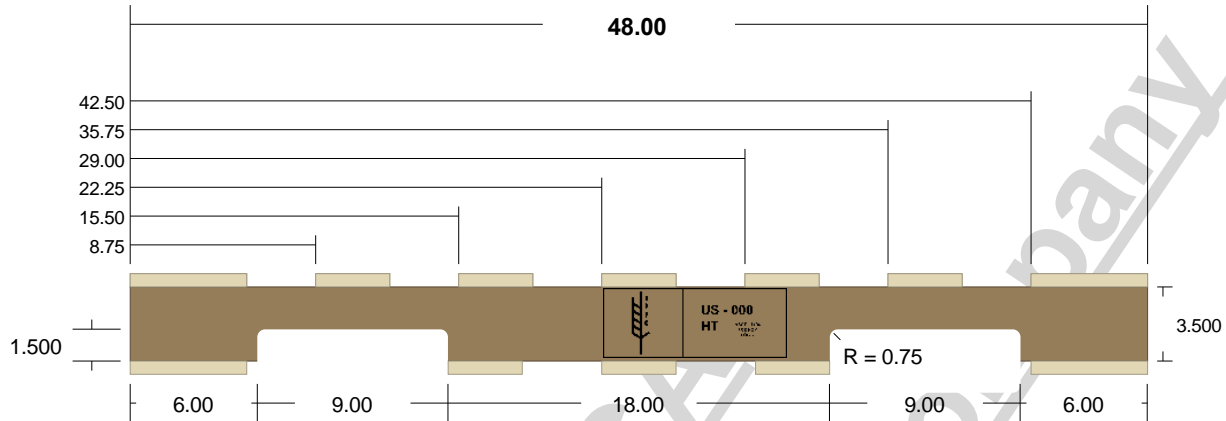
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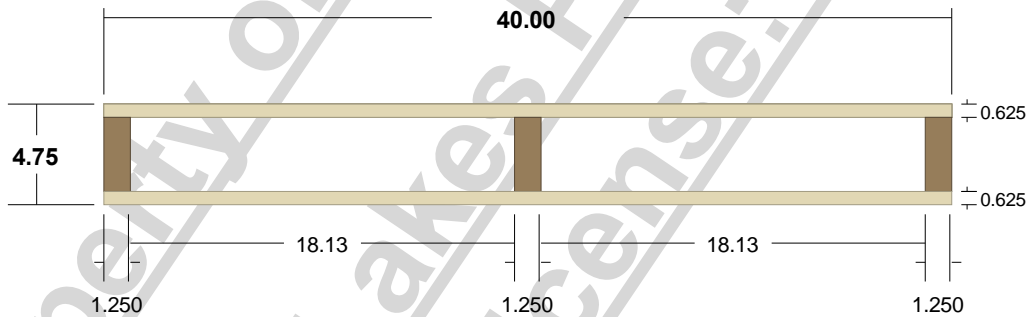
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Side View



End View



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Pallet Drawing - Top View

All dimensions in inches

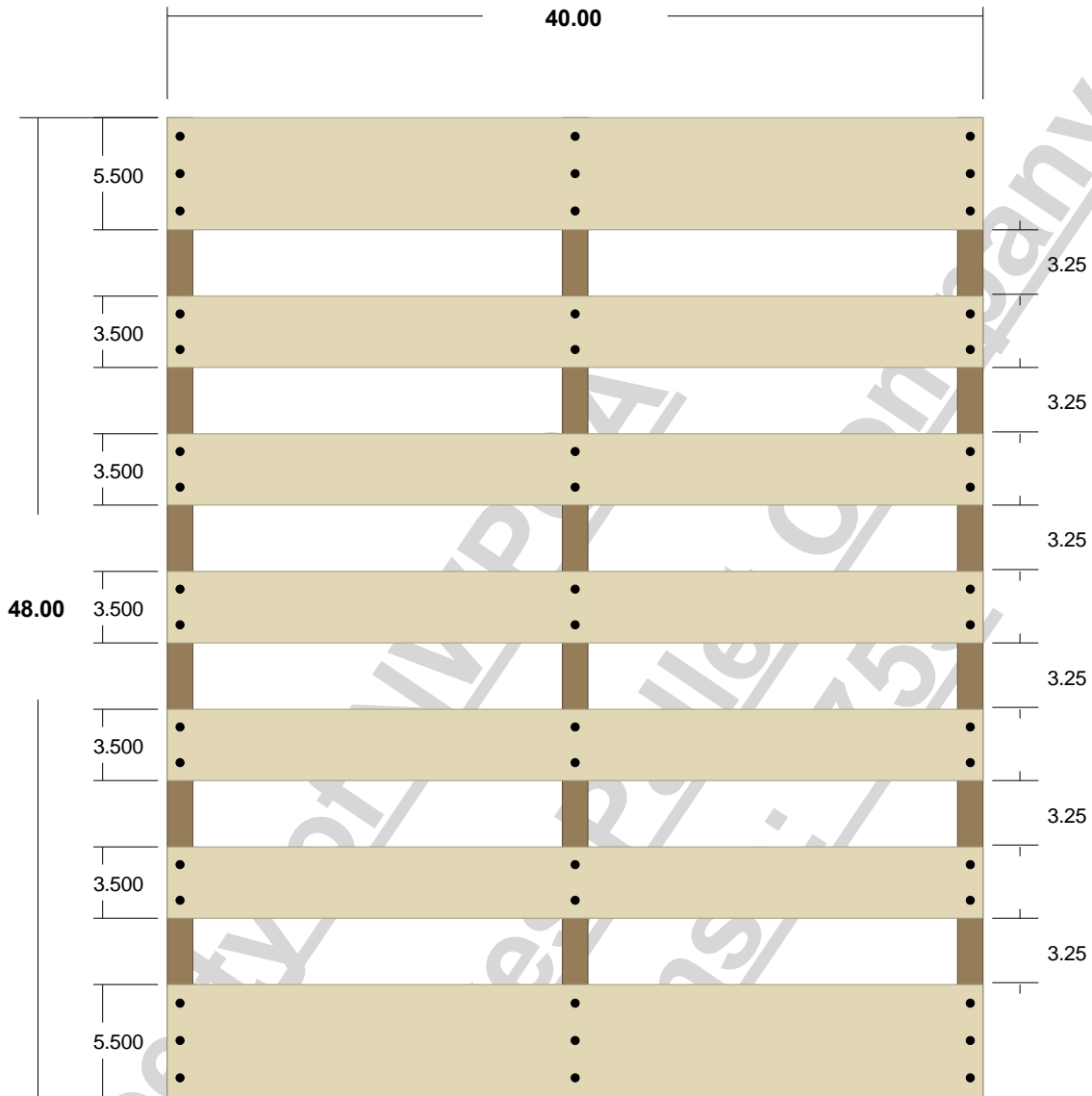
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Top View



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Pallet Drawing - Bottom View

All dimensions in inches

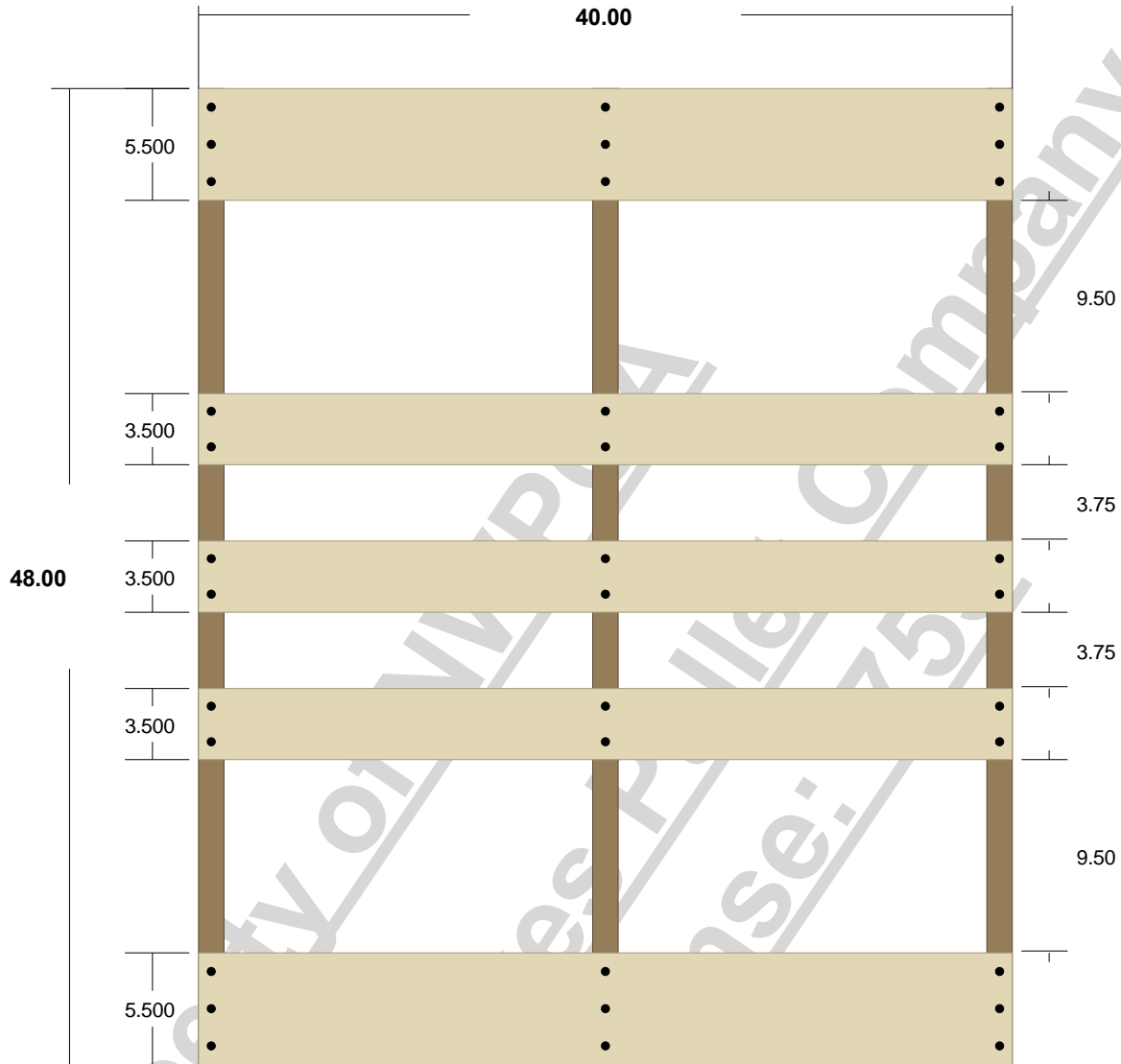
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Bottom View



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3-D Pallet Drawings

All dimensions in inches

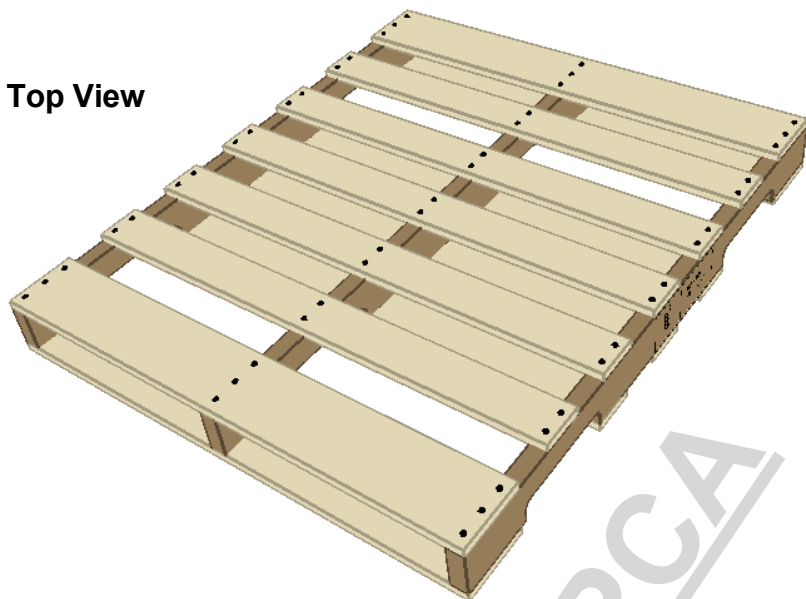
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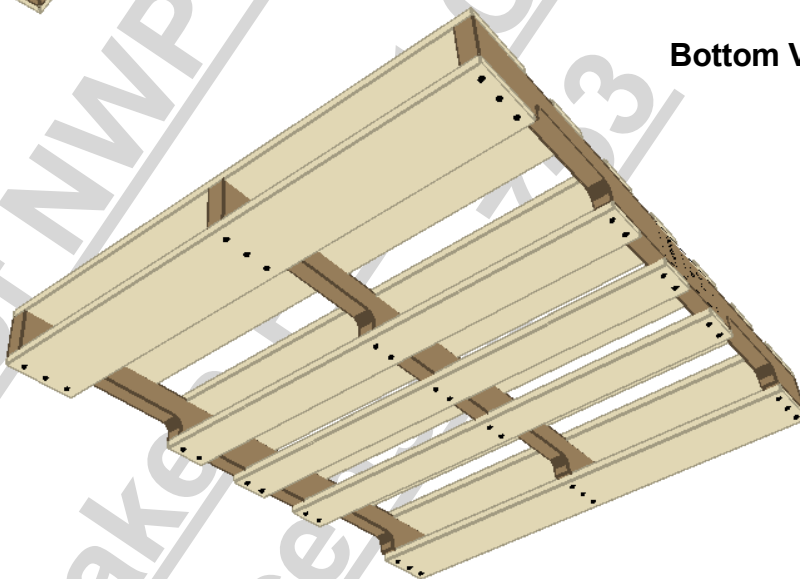
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Top View



Bottom View



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Carbon Impact Declaration



Qualifications

The impacts presented in this report are developed directly from life-cycle assessment data(1) and the associated Environment Product Declaration on Wooden Pallets that were verified by UL in accordance with ISO 14025, 14040, and 14044.

Applicability

The results represent an industry average 48x40 footprint and are tabulated on a per pallet basis and assuming one repair. Actual impacts may vary based on wood species, pallet design, actual number of repairs, and manufacturer business practices.

Carbon Footprint

Basis	1 Pallet	550 Pallets
	(kg of CO2)	(kg of CO2)
Carbon Impact(2)	4.88	2,684
Carbon Impact(3) with Potential Offsets	-0.51	-280
Stored Carbon(4)	-37.26	-20,493
Impacts Breakdown:	(kg of CO2)	(kg of CO2)
Carbon Impact for a New Pallet(5):	4.51	2,481
Carbon Impact from Pallet Repair(6):	0.37	204
Benefits Breakdown:	(kg of CO2)	(kg of CO2)
Coproduct Thermal Recovery (Boiler):	-1.28	-704
End-of-Life Thermal Recovery (Boiler):	-3.33	-1,832
Boards Reused for Remanufactured Pallets:	-0.76	-418
Steel Fastener Recycled:	-0.02	-11
Equivalencies(7):	(gallons of gas)	(cars per year)
Carbon Impact:	0.60	0.60
Carbon Impact with Potential Offsets:	-0.03	-0.03
Stored Carbon	-4.20	-4.40

References

- (1) Alanya-Rosenbaum, Sevda; Bergman, Richard D. 2020. Cradle-to-grave life-cycle assessment of wooden pallet production in the United States. Res. Pap. FPL-RP-707. Madison, WI: U.S. Department of Agriculture, Forest Service, Forest Products Laboratory. 82 p. <https://www.fs.usda.gov/treearch/pubs/61866>
- (2) Sum of carbon impact of a new pallet, including repair and transportation distance as specified (single repair)
- (3) Sum of carbon impact and offsets determined from GWP in Table 11 in Module D of the Wooden Pallet EPD
- (4) Determined from Biogenic Removal from Product (BCRP) in Table 9 of the Wooden Pallet EPD.
- (5) Determined by summing GW impacts from Product Stage (A) in Table 6 of the Wooden Pallet EPD.
- (6) Determined from GW impacts from Use Stage (B) in Table 6 of the Wooden Pallet EPD.
- (7) One gallon of gasoline is equal to 8.887 kg of CO₂, estimated fuel economy of 22 miles per gallon, and 11,500 miles driven per year. Environmental Protection Agency (EPA) document EPA-420-F-18-008.

All determinations are made by converting the functional unit of 100,000 lbs. of pallet load to a per pallet basis. The reported values in the EPD are divided by industry average number of pallets required to transport 100,000 lbs. of product, as reported in Table 4.