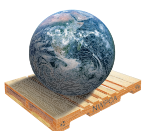


ACHIEVING THE PERFECT PRODUCTION BALANCE

Reducing Manufacturing Costs While Building A Better Pallet

WHITE PAPER



**National Wooden Pallet
& Container Association**
Pallets Move the World®



Pallet Design System™
with LoadSync



I think the greatest asset of PDS is our ability to use it internally in our plant, so from a quality standpoint we can put something in front of our builders and our workers and they know exactly what we need, down to the number of nails, the type of nails that we are using, the type of wood, the thickness of the wood.

— STEVE YELLAND, JFR HOLDINGS, INC.





Designing a pallet by hand or through the use of a CAD system can be time-consuming and prone to over-design or errors. Testing of that hand-drawn or CAD designed pallet to ensure it meets your clients' weight carrying specifications and performance requirements is generally cost-prohibitive for the average pallet manufacturer.

The solution is the Pallet Design System™ (PDS), an engineering, design and marketing tool available exclusively from the National Wooden Pallet & Container Association (NWPCA).

For any given application, PDS can design the optimum pallet by scientifically determining the safe load-carrying capacity, performance and material quantity needed. PDS takes end-user requirements into consideration as it uses fundamental engineering principles to calculate and examine each possible solution. The pallet manufacturer can design the best, most efficient and cost-effective pallet for any specific need, and can integrate PDS with assembly machinery and ERP systems.

For more than 30 years, pallet purchasers have increasingly demanded PDS designed pallets.



KEY ADVANTAGES TO USING PDS:

- Reduces manufacturing costs
- Automatic certification into the USDA BioPreferred® Program
- Provides specifications and validation to ensure accuracy of unit load design
- Increases the efficiency of an existing pallet design without increasing its manufacturing cost
- Determines the safe carrying load for all pallets
- Determines the lowest cost-per-use and cost-per-trip for a company or division
- Designs a new custom pallet for any application

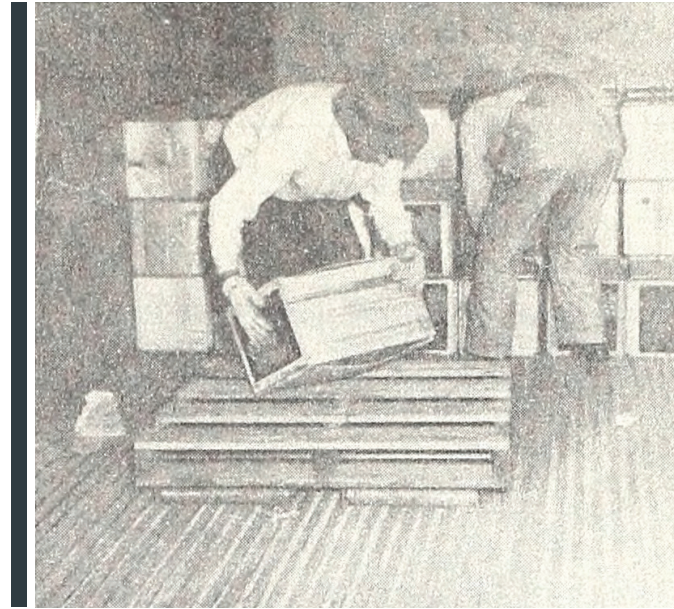


PDS REPORTS PROVIDE:

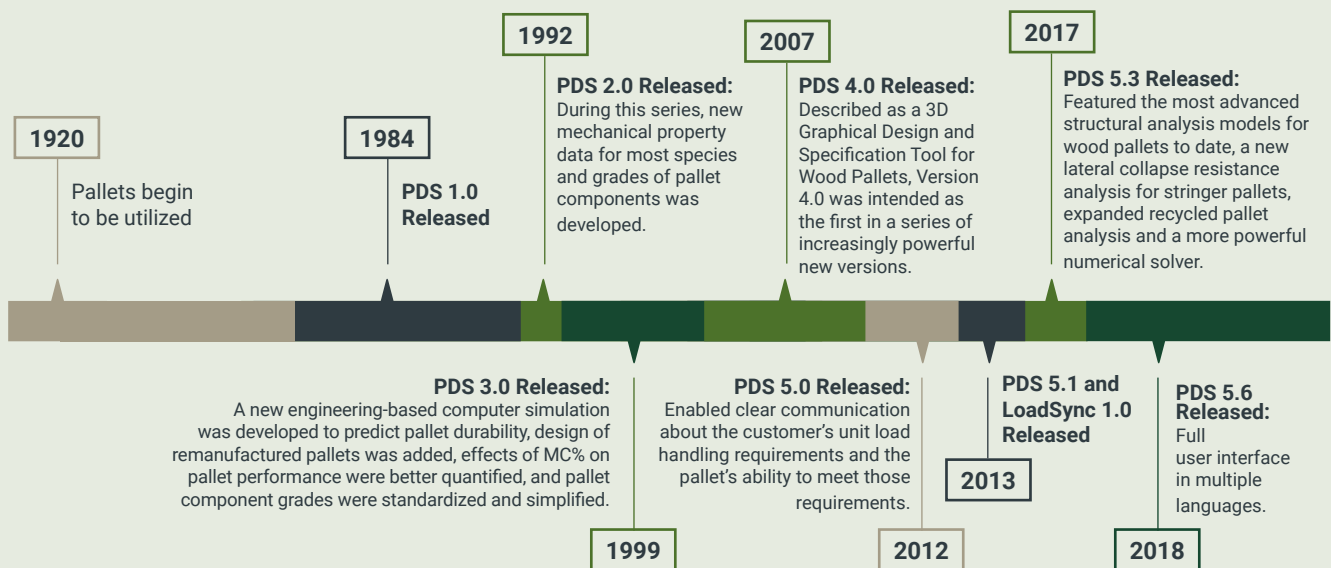
- The maximum safe load a pallet can carry, regardless of the type of load
- How much a pallet will deflect under a certain load
- What resistance to lateral collapse a pallet will have in transit
- How many trips the pallet will make before needing its first repair
- Specifications, sketches and performance qualities for a pallet being designed, allowing a more informed purchaser

BACKGROUND

From their first use in the 1920s, wooden pallets have played a critical role in the world economy. Billions of goods are transported to market daily on wooden pallets. There are an estimated two billion pallets in the United States alone with 80 percent of all U.S. commerce carried on wooden pallets. This widespread use requires an inexpensive and reliable product by the end-user. To better understand the design of the pallet and its load, the NWPCA helped found the Pallet and Container Laboratory on the campus of Virginia Tech in 1976.



In 1984, PDS Version 1.0 was the culmination of a reliability-based design and methodology created by researchers. Each new version of PDS incorporates the latest data, engineering, and technologies, which result from NWPCA's continuous program of research and development. Tens of millions of dollars have been expended on PDS, not only for software development, but also on research toward increased understanding of the relationships between the design and performance of wood pallets and the entire unit load.



The biggest challenge without PDS is giving production personnel the needed materials lists and specifications for assembly. Speed is of the essence from direct labor costs to the indirect labor costs associated with planning, scheduling and meeting quality expectations.

Competing technologies are the CAD programs that can design boxes, crates and specialty pallets. It is time-consuming to develop those drawings in CAD programs such as SolidWorks and they can't be integrated into Palmate ERP, which is done manually. The simple fact that NWPCA has been open to integration has given PDS a big competitive advantage over the other CAD programs when designing pallets and using those customer approved designs for production and quality control purposes.

SOLUTIONS

PDS leads users through the complete specification of the pallet type, size, and style, from dimensions and arrangement of all components to all the materials used to construct the pallet.

PDS helps with the pallet production order in several ways, including waste reduction, assembly set-up and complete pallet drawings/blueprints. The visual drawings take the guesswork out of the deck board placement on a custom pallet and helps significantly in the quality control phase.

PALLET PRODUCTION WITH PALLET DESIGN SYSTEM™



IMPROVES WASTE
REDUCTION



PROVIDES ASSEMBLY
SET-UP & INTEGRATION



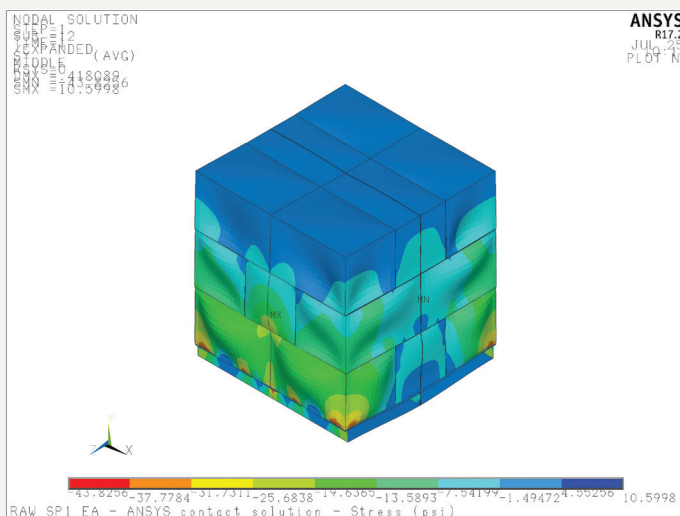
PRODUCES COMPLETE
PALLET DRAWINGS



PDS provides help in reducing set-up by integrating the various programs specific to planning and assembly. It allows you to do the engineering once, providing a complete blueprint to the customer for verification, and then integrating into your production process without extra labor. That in turns leads to the repetitive advantage that ERP and pallet assembly programs provide.

PDS helps with product damage reduction in terms of structural, durability and physical analysis.

PDS also helps with pallet performance testing. It omits the need for testing by trial by error. Performance comparisons can be done by pallet design, wood species and grades, fasteners and component dimensions.

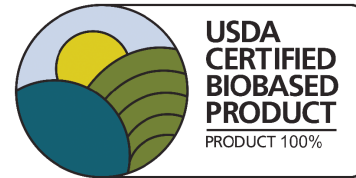


Preliminary unit load model calculations predicting the interaction between corrugated boxes and the pallet.

BENEFITS

There are numerous benefits to using PDS including the return on investment, ease-of-use and implementation.

Perhaps the biggest return on investment is in sales and marketing. Manufacturers that license PDS are listed in the USDA BioPreferred Catalog to help federal purchasers and their contractors identify biobased products. This



official USDA Certified Biobased product label has been specifically designed to empower consumers and purchasing contractors to readily identify products with verified biobased content. PDS users can proudly use the label:

- in product literature, for a certified product or package
- on a website to identify a certified product of package
- in advertisements where it is used next to or on a certified product or package
- in promotional and educational outreach materials; electronic media
- in collateral materials



We've been able to verify the Pallet Design System™ meets strict requirements of the USDA program, and allows PDS-users into the program

— KATE LEWIS, DEPUTY PROGRAM MANAGER, USDA BIOPREFERRED PROGRAM





The largest customer that I have purchases mostly one pallet from me that I spent over a year designing in PDS. This single pallet design has resulted in millions of dollars in sales. In fact, PDS made the sale...there was so much value to them in having data/research on the structural capabilities that was backed by NWPCA and Virginia Tech University.

– BUSINESS DEVELOPMENT MANAGER AND PDS USER



In addition, all the documentation produced with PDS make very impressive and useful presentations to customers. All PDS materials clearly display the company name, address and other contact information for both the PDS provider and the customer. Any special or custom notes you wish to add can be displayed on the pallet specification sheet. To make PDS even more effective as a marketing tool, guides to the PDS specification and analysis are created as customer handouts.

PDS is easy to use as it's specifically set up for pallet design. The built-in electronic User's Guide contains a wealth of information. The User's Guide not only explains how to use the PDS software, it contains extensive information on pallet design, construction and performance. Any part of the User's Guide can be printed for reference or to provide customers who have a question about some aspect of PDS or wood pallets.

In terms of implementation and training, no one comes close to NWPCA with software set-up and support.

CONCLUSION

PDS enables wood pallet manufacturers to assist their customers in significantly reducing costs and product damage, and significantly increasing safety throughout the unit load handling system. An increasing number of pallet manufacturers are finding they can't do business without it.



TRY THE PALLET DESIGN SYSTEM™ NOW

NWPCA has released a trial version of PDS. Prospective users can now obtain a fully functional version of PDS for a two-week period. Visit palletcentral.com/PalletDesignTrial to download your free trial and begin designing perfect pallets today.

RESOURCES

www.jfrohrbaugh.com/design-and-engineering/how-can-a-pds-pallet-design-system-save-you-money/

www.palletcentral.com/PalletDesignHistory

palletenterprise.com/view_article/4306/Pallet-Design-System-Keeps-Getting-Better

www.challengerpallet.com/pallet-design-system-pds

www.ufpi.com/en/products/pallets-and-skids/pallet-design-system.aspx

www.ufpi.com/en/products/pallets-and-skids/pallet-design-system/pallet-design-system-capabilities.aspx

www.jfrohrbaugh.com/processes-and-operations/four-ways-pallet-kpi-impacts-business/

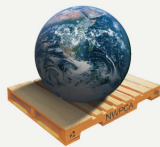
www.unitload.vt.edu/about/

www.palletcentral.com/PalletDesignSystem

www.palletcentral.com/AboutPalletDesign

NEED MORE INFORMATION?

For more information on Pallet Design System™, please contact the National Wooden Pallet & Container Association at 703-519-6104 x 207 or via email at info@palletcentral.com.



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