

FastenerSync™ Newsletter

Issue 1
March 2014

**National Wooden Pallet and
Container Association**

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The FastenerSync™ Newsletter is intended to keep Users informed about FastenerSync and its integration with the **Pallet Design System™** and the *Uniform Standard for Wood Pallets*.

This FastenerSync Newsletter was created by
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Introducing... FastenerSync™

Software for **suppliers** of fasteners to the **wood pallet** industry
integrated with the **Pallet Design System™**
and the *Uniform Standard for Wood Pallets*.

The **National Wooden Pallet and Container Association (NWPCA)**
has developed new **software** called **FastenerSync™** that will
enhance the **communication** of **fastener specifications** between
fastener suppliers and **wood pallet manufacturers**.

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FastenerSync™ can be used to create complete and professional **documentation** of all the **fastener specifications** defined in the *Uniform Standard for Wood Pallets* and required as input to the **Pallet Design System™ (PDS)**.

FastenerSync™ can also be used to create **fastener specification** data files directly readable by **PDS** – allowing **fastener suppliers** to easily provide **specifications** for their **fasteners** to customers that use **PDS**.

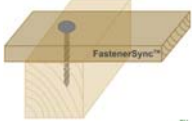
FastenerSync™ computes the characteristics required to compare to minimum **fastener** requirements in the *Uniform Standard for Wood Pallets*.

Finally, **FastenerSync™** can be used to perform calculations of **fastener withdrawal resistance** and **lateral resistance** in a **pallet** connection (e.g. **deckboards** fastened to **stringers** or **blocks**).

FastenerSync™ is available via an annual license to **fastener suppliers** to the **wood pallet** industry that are **Members** of **NWPCA**.

(**PDS Users** may wish to encourage their **fastener supplier** to obtain **FastenerSync™** and provide **fastener specifications** and data files for all **fasteners** they purchase.)

The **objective** of this *Newsletter* is to introduce **FastenerSync™** and enable **Users** to quickly and efficiently learn to use the software.



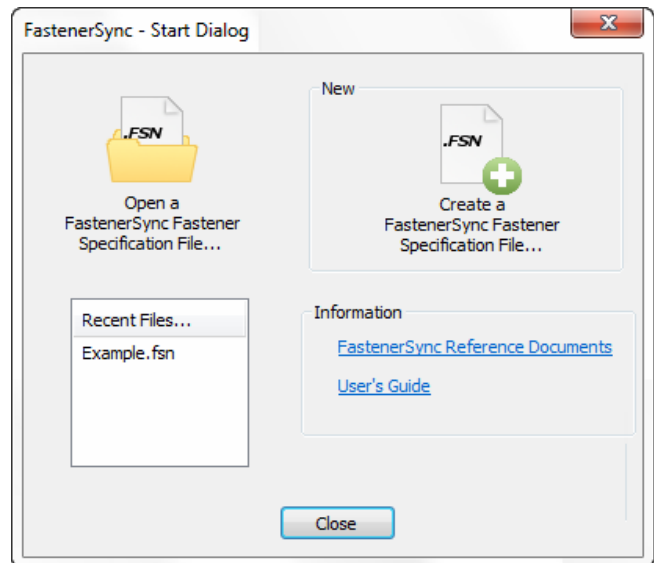
Getting Started...

When you start **FastenerSync**, the **Start Dialog** will appear.

This provides initial quick access to either Open an existing **FastenerSync** file or Create a new **FastenerSync Fastener Specification File**.

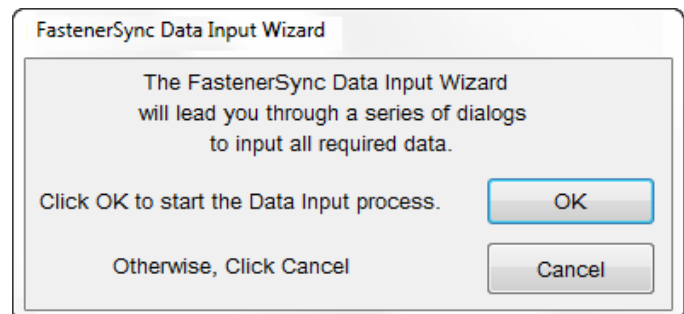
An **Example** file is provided.

The next sections of this **Newsletter** provide a walk-through of the complete process of Creating a **FastenerSync Fastener Specification File**.



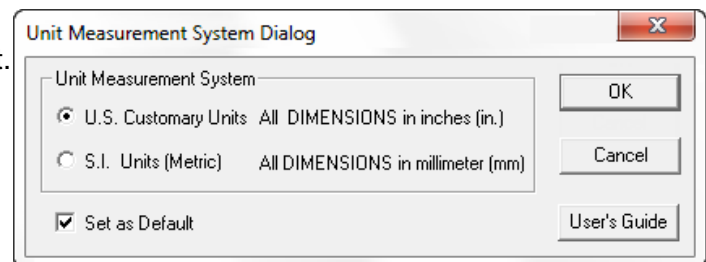
Creating a FastenerSync Fastener Specification

After selecting to Create a **FastenerSync** File, the **FastenerSync Data Input Wizard** will lead the **User** through the entire process of specifying all the required data.



The **Unit Measurement System** Dialog will open first.

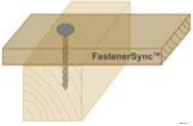
FastenerSync can operate in either **S.I Units** (metric units) or **U.S. Customary Units**.



For the **S.I Unit** Measurement System, all dimensions are in **millimeters** (mm), all loads are in **kilograms** (kg), and Yield Strength is in **MPa**.

For the **U.S. Customary Units** Measurement System, all dimensions are in **inches** (in.), all loads are in **pounds** (lbs.), and Yield Strength is in **ksi**.

(Later, you can **convert** a **fastener specification** from one measurement system to the other.)



Creating a FastenerSync Fastener Specification (continued)

The **Fastener Specifications** Dialog opens next. After selection of **Fastener Type**, fields for all appropriate fastener measurements will be enabled.

Fastener ID will also be used as the default filename.

Fastener Types include:

- Helically Threaded Nails
- Annularly Threaded Nails
- Twisted Square Wire Nails
- Plain Shank Nails
- Rectangular Wire Staples
- Round Wire Staples

Thread Diameter

measurements are entered on a separate dialog.

Specification of the **steel** used to manufacture the fastener can be either **Carbon Content**, **Steel Grade**, or **Stock Steel** - and whether the fastener has been **Hardened**.

Specification of **Point**, **Head**, **Feed Type**, and **Finish** is optional.

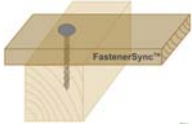
Bending Resistance

measurements are entered on a separate dialog.

Fastener Withdrawal Characteristic

is calculated for threaded nails. It is a measure of the increased **withdrawal resistance** due to the threads compared to that for a plain shank nail of the same length and wire diameter.

The **FastenerSync User's Guide** provides details on all fastener specifications, including tips on how to perform measurements.



Thread Diameter Measurement Data

Thread Diameter measurements from a representative sample of the fasteners are entered on the **Thread Diameter Measurement Data Dialog**.

Measurement of a minimum sample of 12 fasteners is suggested. FastenerSync accommodates reporting **Thread Diameter** measurements for up to 25 samples.

Measuring Thread Diameter



The average Thread Diameter will be reported on the **Fastener Specification Dialog**.

All Thread Diameter measurement data will be reported on the **FastenerSync Specification Sheet**.

Sample	Measurement	Sample	Measurement
1.	0.120	13.	0.000
2.	0.121	14.	0.000
3.	0.121	15.	0.000
4.	0.120	16.	0.000
5.	0.122	17.	0.000
6.	0.120	18.	0.000
7.	0.119	19.	0.000
8.	0.120	20.	0.000
9.	0.121	21.	0.000
10.	0.121	22.	0.000
11.	0.119	23.	0.000
12.	0.120	24.	0.000
		25.	0.000

Statistics

Minimum	0.119
Maximum	0.122
Average	0.120
C.V. %	0.7

Compute

OK
Cancel
User's Guide
Clear All

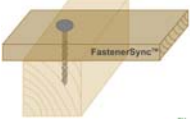
Bending Resistance Measurement

FastenerSync specifications must include a measure of the fastener's **Bending Resistance**. Either the **MIBANT Angle** or the **Bending Yield Strength** can be specified.

The **MIBANT Angle** is a measure of the **impact bending resistance** of the fastener. *Historically*, this convenient quality-control test has been used primarily for **pallet** fasteners.

Bending Yield Strength indicates the **bending resistance** of the fastener determined from **static-load** tests.

Bending Yield Strength is used as the basis of engineering calculations of the **lateral resistance** of **connections**. *Therefore*, if **MIBANT angle** is reported, **Bending Yield Strength** must be estimated (based on MIBANT Angle and wire diameter) in order to calculate **connection performance**.

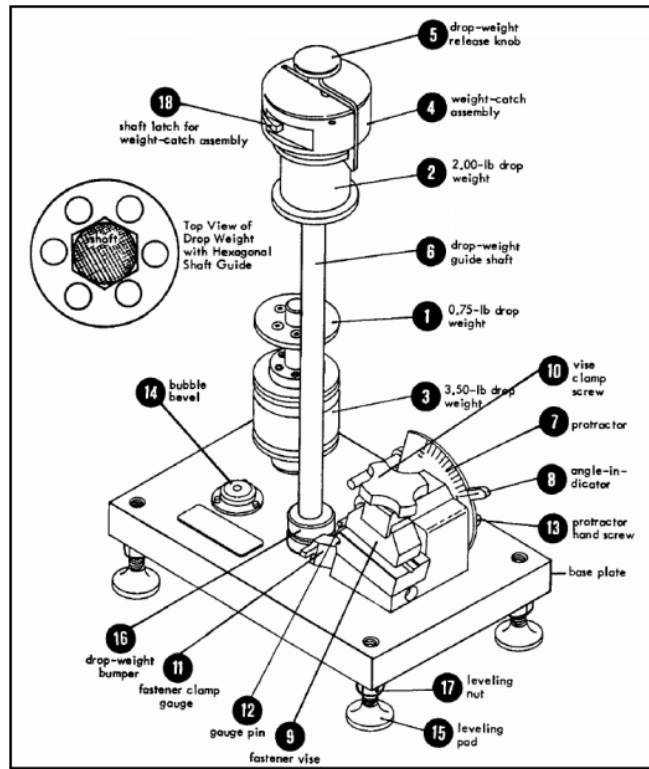


MIBANT Angle Measurement Data

The **MIBANT Angle** is a measure of the impact resistance of the fastener, and is related to its ductility, pliability, toughness, and brittleness.

MIBANT angle measurements from a representative sample of the fasteners are entered on the **MIBANT Angle Measurement Data Dialog**.

Morgan Impact Bend Angle Nail Tester (MIBANT)



The **MIBANT Tester** utilizes 3 different **drop weights** to accommodate a range of **wire diameters** and **steel specifications**.

Measurement of a **minimum** sample of 12 fasteners is suggested. **FastenerSync** accommodates reporting **MIBANT Angle** measurements for up to 25 samples.

The **MIBANT Test** is useful in identifying any **brittleness** in fasteners, exhibited as shank or head-to-shank failures during test.

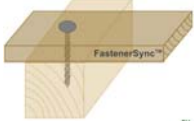
The **average MIBANT Angle** (adjusted to the **standard drop weight**) will be reported on the **Fastener Specification Dialog**.

All MIBANT Angle measurement data will be reported on the **FastenerSync Specification Sheet**.

MIBANT Angle Measurement Data

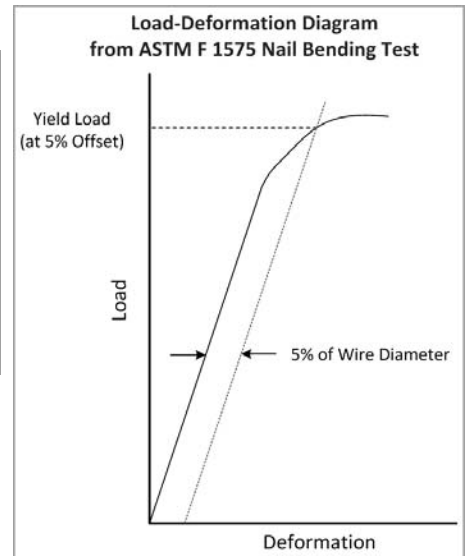
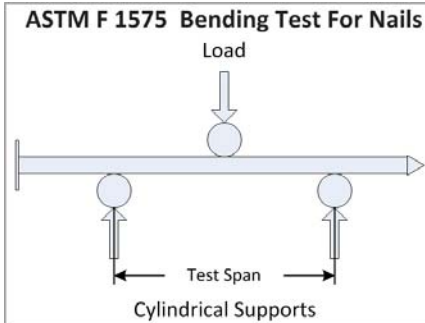
MIBANT Drop Weight: 3.50 lb. (Standard)

1.	36	13.	0	Partial Shank Failures	0
2.	37	14.	0	Complete Shank Failures	0
3.	36	15.	0	Head Failures	0
4.	37	16.	0	Statistics	
5.	37	17.	0	Minimum	34
6.	36	18.	0	Maximum	37
7.	35	19.	0	Average	35
8.	36	20.	0	C.V. %	2.9
9.	37	21.	0	Average Adjusted to Standard Drop Weight: 35	
10.	34	22.	0	Compute	
11.	36	23.	0	OK	
12.	36	24.	0	Cancel	
		25.	0	User's Guide	
				Clear All	



Bending Yield Strength Measurement Data

Bending Yield Strength is determined from the load-deformation curve during static-load bending tests conducted in accordance with **ASTM F 1575** (*Standard Test Method for Determining Bending Yield Moment of Nails.*)



Test Load at 5% offset measurements from a representative sample of the fasteners are entered on the **Bending Yield Strength Measurement Data Dialog.**

Appropriate **Test Span** is based on wire diameter (see ASTM F 1575).

Testing a minimum sample of 12 fasteners is suggested. FastenerSync accommodates reporting **Test Load measurements** for up to 25 samples.

FastenerSync calculates **Bending Yield Strength** based on Average Test Load, fastener **Wire Diameter**, and **Test Span**.

Bending Yield Strength will be reported on the **Fastener Specification Dialog.**

All Test Load measurement data will be reported on the **FastenerSync Specification Sheet.**

Bending Yield Strength Measurement Data

Cylindrical bearing point spacing (test span) in.

Test Load at 5% offset (lbs.):

1.	<input type="text" value="100"/>	13.	<input type="text" value="0"/>
2.	<input type="text" value="101"/>	14.	<input type="text" value="0"/>
3.	<input type="text" value="102"/>	15.	<input type="text" value="0"/>
4.	<input type="text" value="103"/>	16.	<input type="text" value="0"/>
5.	<input type="text" value="104"/>	17.	<input type="text" value="0"/>
6.	<input type="text" value="105"/>	18.	<input type="text" value="0"/>
7.	<input type="text" value="100"/>	19.	<input type="text" value="0"/>
8.	<input type="text" value="101"/>	20.	<input type="text" value="0"/>
9.	<input type="text" value="103"/>	21.	<input type="text" value="0"/>
10.	<input type="text" value="100"/>	22.	<input type="text" value="0"/>
11.	<input type="text" value="104"/>	23.	<input type="text" value="0"/>
12.	<input type="text" value="105"/>	24.	<input type="text" value="0"/>
		25.	<input type="text" value="0"/>

Statistics

Minimum

Maximum

Average

C.V. %

Average Bending Yield Strength (ksi)

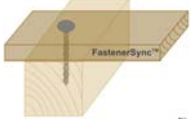
Compute

OK

Cancel

User's Guide

Clear All



Connection Performance Estimates

Based on the **fastener specification** and the **wood components** to be connected, FastenerSync can compute estimates of the:

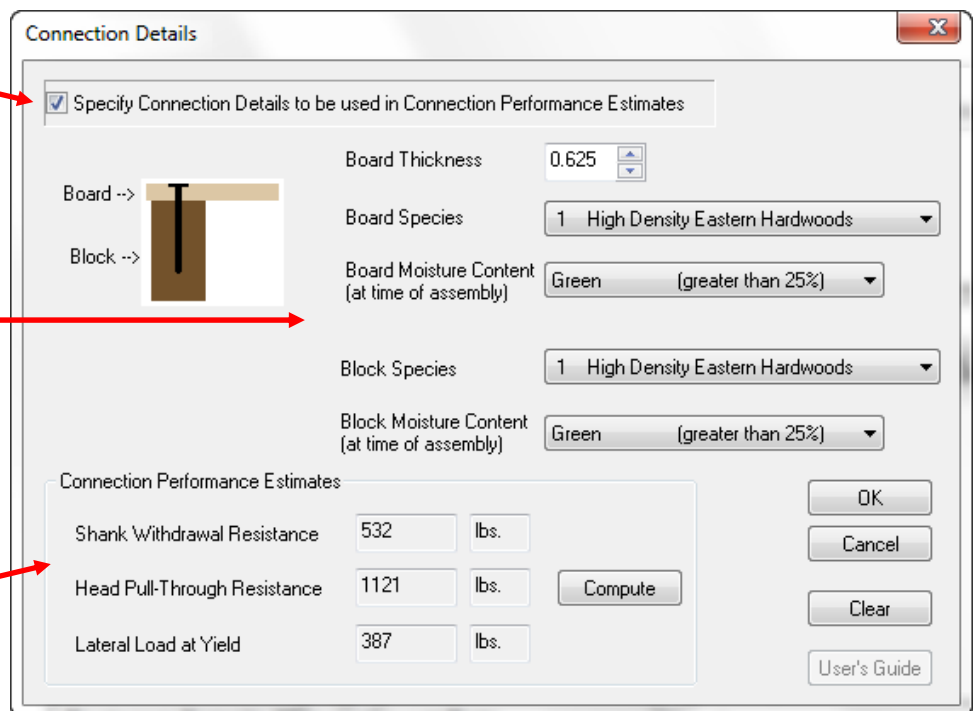
- **Shank Withdrawal Resistance**
- **Head Pull-thru Resistance**
- **Lateral Load at Yield**

The **connection performance estimates** are based on a **single** fastener and are calculated using the equations detailed in Annex F of the *Uniform Standard for Wood Pallets*.

The option to compute connection performance estimates is selected on the **Connection Details** Dialog.

Wood Species Classes and **Moisture Contents** are those used in **PDS**.

On the **FastenerSync Specification Sheet**, **Withdrawal Resistance** is reported based on whichever is limiting: **Shank Withdrawal Resistance** or **Head Pull-thru Resistance**.



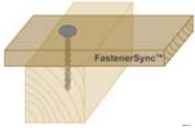
Fastener Image

If an **image** of the fastener is available, it can be displayed on the **Fastener Specification Sheet**.

Such an image could be produced from a digital photograph or by using a flat bed scanner.

To select an **image** to be displayed, open the image file on the **Fastener Image Dialog**.





Fastener Specification Sheet

The FastenerSync Specification Sheet provides complete details on the Fastener specification.

It can be printed or saved as a PDF and emailed to the Customer.

Company Name of the fastener supplier is identified under Prepared by: and via the Watermark.

Spec Sheet Notes can be used to display any additional notes or information.

FastenerSync Version 1.0

Customer:

Company Name of Customer
Address of Customer

Prepared by:

Fastener Supplier and NWPCA Member
Licensed to Use FastenerSync

FastenerSync License: 123 Printed: December 07, 2013

Fastener Specifications

Fastener ID: Example

Fastener Type: Helically Threaded Nail

Fastener Length: 2.25 in.

Thread Length: 1.50 in.

Thread Diameter: 0.122 in.

Wire Diameter: 0.112 in.

Head Diameter: 0.281 in.

Flutes: 4

Helixes: 6.0

Pitch: 0.250 in.

Thread Angle: 69 degrees

Bending Yield Strength: 119 ksi

FWC: 1.88



Stock Steel: Stiff stock

Point Type: Sharp Diamond Point

Head Type: Filleted

Feed Type: Bulk Machine

Finish Type: Bright

Fastener Sample Measurement Data

Thread Diameter (in.):					Bending Yield Load at 5% Offset (lbs.):		
0.122	0.121	0.121	0.121	0.123	100	105	104
0.121	0.121	0.121	0.122	0.121	101	100	105
0.122	0.122	0.122	0.121	0.122	102	101	
0.122	0.121	0.122	0.121	0.121	103	103	
0.123	0.122	0.121	0.121	0.122	104	100	

Minimum = 0.121 Maximum = 0.123 Average = 0.122 CV = 0.5% Minimum = 100 Maximum = 105 Average = 102 CV = 1.9%
Cylindrical bearing point spacing (test span) = 1.10 in.

Spec Sheet Notes:

This space can be used to include any Notes or Comments to be displayed on Fastener Specification Sheet.

Additional space for Notes or Comments here.

Connection Performance Estimates

Board

Thickness: 0.625 in.

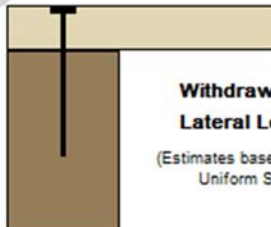
Species: High Density Eastern Hardwoods

MC (at assembly): Green

Block

Species: High Density Eastern Hardwoods

MC (at assembly): Green



Withdrawal Resistance: 532 lbs.

Lateral Load at Yield: 387 lbs.

(Estimates based on calculations documented in the Uniform Standard for Wood Pallets.)