



Mr. Arnie Mazza
Wood Wizards
State Lic # 493792

Subject: Testing Results for Polymer-X.

Arnie,

Thank you for allowing my company to conduct Hardness and Buckling tests on the Wood substitute **Polymer-X**. The tests results shown below are quite favorable for the desired intent of the product. **Buckling Testing was done using the ASTM E 9 standard.** Toughness was measured using a Rockwell Hardness test, standard E384.

In Summary the Radial Toughness value for the **Polymer-X** is as follows:

At 50% Wood + 50% Resin the Resin had an Ultimate strength = **1450 lbf**, and a corresponding **645 psi**. @ A 2.25 Cross-sectional Area

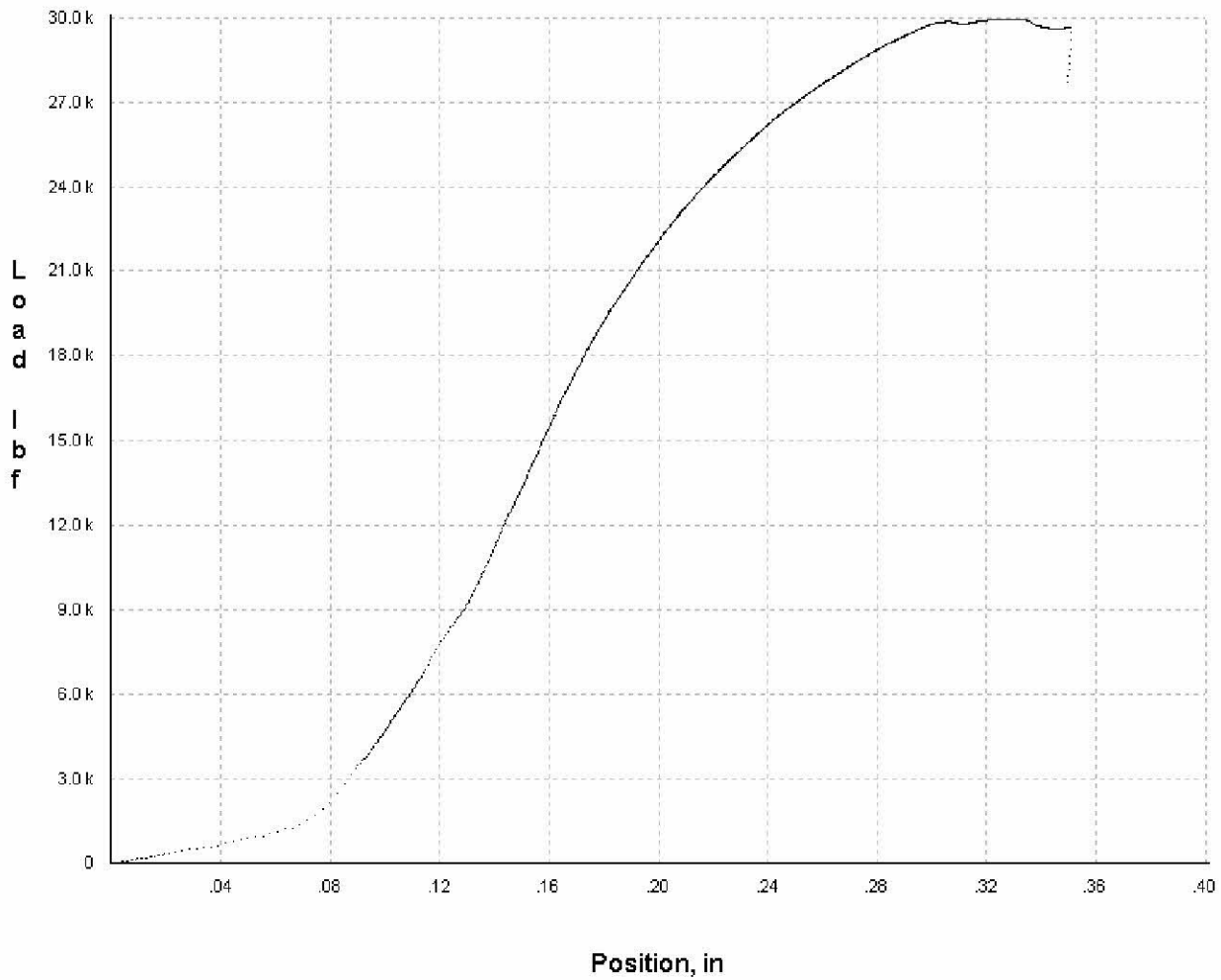
At 100% Polymer-X, the Ultimate strength = **1548 lbf**, and a corresponding **688 psi**. @ a 2.25 Cross-sectional Area

These results are based of Radial Compression values (the toughness of the wood) Essentially toughness is defined as the energy required to cause rapid complete failure in a centrally loaded bending specimen. (Mechanical Properties of Wood, CH. 4 Pg. 24, David Green, 1996) Here is a list of Average Toughness Values for a few hardwood Species (Mechanical Properties of Wood, CH. 4 Pg. 24, David Green, 1996):

Birch, Yellow:	500 lbf	=	500 psi
Hickory:	700 lbf	=	700 psi
Maple	370 lbf	=	370 psi
Oak	730 lbf	=	730 psi
Yellow-Poplar	220 lbf	=	220 psi
Douglas Fir	210 lbf	=	210 psi

The results show that the Resin when not supported by any wood fibers reaches an average of 688 psi. Which places it stronger than Birch and slightly less stronger than Hickory and Oak. When mixed with 50% wood, the Resin produces an Ultimate Strength of 645psi, which is comparable to the Polymer-X at 100%.

In most cases the Polymer-X is three times as strong as regular softwoods, including Douglas Fir. The Polymer maintained its adhesion to the wood during the buckling test; hence the product is an equitable replacement for Wood, with a superior toughness factor in most cases.



Stress-Strain Curve Polymer-X



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Compression Test

Lot Number: Research

Specimen ID	Specimen No.	Width in	Thickness in	Area in ²	Ultimate lbf	Ultimate psi	Break Distance in
Polymer X	1	1.5	1.5	2.25	1450	645	0.0
Polymer X	2	1.5	1.5	2.25	1548	688	0.0
Average		1.5	1.5	2.25	1499	666	0.0
SD		0.0	0.0	0.0	69	30.7	0.0

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Page 1

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Wood Wizard – Toughness Testing Polymer - X