

DIMENSIONS

Newsletter of the Pacific Woodworkers Guild

At a Glance:

- Next meeting is Tuesday March 18th.

When Last We Met

By Derek Yee

To start the meeting, three visitors Arnold, Doug, and Don were welcomed to the Club. Then, **John Bell** introduced the guest speaker for the evening: **Graham Laurence**, past instructor of interior design at BCIT. Graham presented a slide show to illustrate the "The History of Furniture and the Evolution in Design". Graham started the show off with a slide of "One Tree" a project where 75 artisans created works of art from the "One Tree".

A number of different themes were highlighted: The evolution of fashion from 1950 to 2000. Other perspectives presented were: looking at furniture as an art form versus a functional object; hand-made jointed furniture versus manufactured molded plywood; and simple Shaker furniture vs. the ornate French Provincial works. The slide show stimulated a lot of discussion from the guild.

During our meeting, we conducted our "AGM". The following people were confirmed

or elected. In their new roles are: **Phil Laliberte** as President; **John Weir** is onboard for the *2x4 Challenge*; **Dave Adshead** will help out on the *Christmas Toy Workshop*; **Kelly McClay**, **Tony Carter**, **Ed Brennan**, **Matt Buss**, **Bill Fox** for both *Woodworking Shows*. **Bill Fox**, **Steve Wegwitz** for Fundraising/Raffle.

The following are taking a well needed breather from official duties (I think): **Jan Dicks** and **Ted Fromson**. All past and present volunteers and executive members should be given a heart-felt thanks for their dedication and time toward the success of the guild! Please consult the Guild Directory in this newsletter for a complete list of all the positions and the incumbents.

Next Meeting

The next meeting of the Pacific Woodworkers Guild will be held on Tuesday March 18th, starting at 7:15 pm. Pre-meeting demo at 6:30 pm.

Unclassifieds

Tools for Sale

High quality European made (Ulmia) workbench and complete set of hand tools for sale. Used but well cared for. Everything you'll need except for a table saw! Owner has had to give up woodworking for health reasons.

Contact Eleanor Cermak - 604-464-6623 for more information.





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Please direct newsletter submissions to the newsletter editor, Steve Hansen, via email: urquell@shaw.ca or call 604-986-5471.

The Pacific Woodworkers Guild is a non-profit association of British Columbia Craftspeople dedicated to excellence in woodworking. Guild members meet on the third Tuesday of each month (except July and August) in Richmond, B.C.

The newsletter is published monthly, ten times per year, and distributed free to members and associate members. Membership is available to anyone interested in any form of fine woodworking. Membership fees are \$25 for twelve months; Associate membership fees (newsletter only) are \$15 for ten issues.

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Guild Directory

Elected Officers

<i>President</i>	Phil Laliberte
<i>Vice-President</i>	Dan Lemire
<i>Treasurer</i>	Lou Hafer
<i>Secretary</i>	Paulin Laberge
<i>Members-at-Large</i>	Paul Townsend Bill Fox Art Liestman Bob Bedier

Committees

<i>Newsletter -</i>	
<i>Publisher</i>	Steve Fairbairn
<i>Editor</i>	Steve Hansen
<i>Labels</i>	Lou Hafer
<i>Mailout</i>	Fred Otte
<i>Reporters</i>	Denis Reid Gordon Bednard Merv Graham Steve Hansen Derek Yee
<i>Webmaster</i>	Steve Fairbairn
<i>Entertainment/Workshops</i>	Bill Ophoff Derek Yee
<i>2x4 Challenge Assistants</i>	Paulin Laberge Phil Laliberte Mike Leahy John Weir
<i>Woodworking Shows</i>	Kelly McClay Tony Carter Ed Brennen Bill Fox Matt Buss
<i>Christmas Toy Workshop Assistant</i>	Denis Reid
<i>Fundraising/Raffle Assistant</i>	Dave Adshead Steve Wegwitz
<i>Library</i>	Bill Fox Bob Bedier

A NEW Discovery..... The JANKA

By Phil Laliberte

Last summer I was called to service a CNC machine that was malfunctioning. I diagnosed the problem to a faulty linear bearing on one of the slider rails. (one pair of bearings per rail). I replaced the faulty bearing and recalibrated the machine. A week or so later I was called again to service the same machine. The problem was the second linear bearing on the same rail. This lead me to investigate a bit further; as one bearing failure I can live with but two in a row within a week on the same machine makes me suspect that something else is at play. I talked with the operator to help me pinpoint the problem. We went over the last two weeks of production records and found that they had started cutting ebony during that period. I used a 20-power magnifying glass to inspect the

failed bearings and sure enough I found that the 2.5 mm balls were jammed in the raceway of the bearing with tiny slivers of black wood. The slivers were very hard and pointed at the ends. It seems that the ebony slivers from the router bit were not actually sawdust as in softer woods but were rather little spear-shaped things. They were small enough and sharp enough to work their way past the seals of the bearing and gradually build up in the raceway as the machine moved back and forth and eventually building up to stop the balls from turning. To alleviate any further damage to the machine while cutting ebony, the operator and I implemented a few basic procedures. Namely locate the work in the center of the

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table and ensure that the dust collection system is functioning at peak efficiency and use temporary shields over the bearing rails to minimize the accumulation of ebony saw dust.

So what does this have to do with JANKA? Well, I wondered why the problem had showed up with ebony. I decided that the shape of the chips from milling were due to the hardness of the wood. This lead me to think: exactly how hard is ebony wood and are there (chips) in other woods that could potentially present the same problem?

I did a search on the internet for **wood hardness**. I eventually came across a number of pages that dealt with wood flooring suppliers. I found that wood flooring has a hardness test called the **JANKA**. Sure enough, ebony ranks at the top of the hardness scale second to lignum vitae.

The following is an excerpt from one of those pages:

The Janka (or side) hardness test measures the force required to embed a .444-inch steel ball to half its diameter into wood. It is one of the best measures of the ability of a wood species to withstand denting and wear. By the same token, it is also a good indicator of how hard or easy a species is to saw or mill.

A measure of the hardness of wood, produced by a variation on the Brinell hardness test. The test measures the force required to push a steel ball with a diameter of 11.28 millimeters (0.444 inches) into the wood to a depth of half the ball's diameter. The results are stated in various ways in different countries, which can lead to confusion, especially since the name of the actual units employed is often not attached. In the United States, the measurement is in pounds-force. In Sweden it is apparently in kilogram-force (kgf), and in Australia, Janka hardness ratings are either in newtons (N) or kilonewtons (kN). Sometimes the results are treated as units, e.g., "360 janka."

The hardness of wood usually varies with the direction of the grain. If testing is done on the surface of a plank, the test is said to be of "side hardness." End testing is also sometimes done (that is, testing the cut surface of a stump would be a test of end hardness). The side hardness of teak, for example, is in the range 3730 to 4800 newtons, while the end hardness is in the range 4150 to 4500 newtons.

The most common use of Janka hardness ratings is to determine whether a species is suitable for use as flooring.

Resources

Standards:

- ASTM D1037-99. Standard Test Methods for Evaluating Properties of Wood-Base Fiber and Particle Panel Materials.
- ASTM D143-94(2000)e1 Standard Methods of Testing Small Clear Specimens of Timber.
- ISO 3350:1975. Wood—Determination of static hardness.
- ISO 3351:1975. Wood—Determination of resistance to impact indentation.

Very comprehensive lists of woods with their Janka hardness are given in:

- Forest Products Laboratory.
- Wood Handbook: Wood as an Engineering Material. Agriculture Handbook 72.
- Washington, D.C.; U.S. Dept. of Agriculture, 1987 rev.

Janka hardness ratings can also be found on the Web, mainly at sites selling flooring, such as:

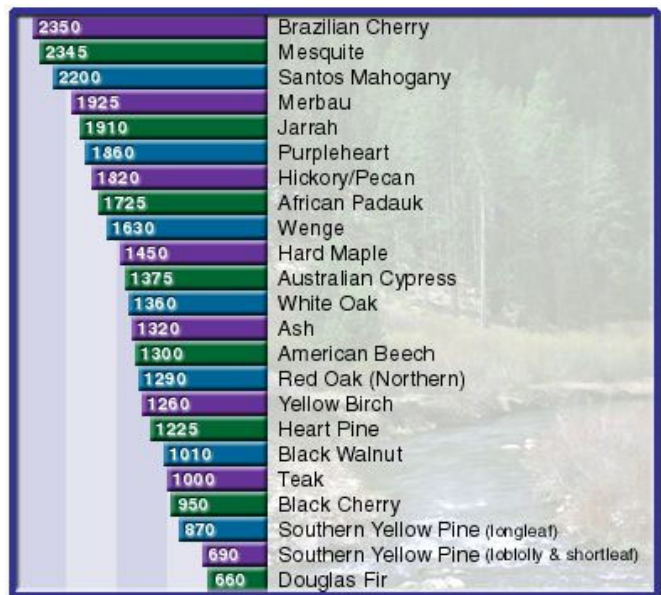
www.wflooring.com/Technical_Info/Species_Tech_Info/species_hardness.htm

www.zoltanfloors.com/tech.html

Some information sources say or imply, incorrectly, that Janka hardness is measured in units of pressure, such as pounds per square inch, and that side hardness is a synonym for Janka hardness.

End of excerpt.

I have tabulated the following information on some common woods.



JANKA wood Hardness charts:

Sorted by name	
Alder	590
Ash	1320
Ash, Mountain	1080
Balsa	75
Bamboo, Natural	1450
Basswood	410
Beech, American	1300
Bloodwood	2900
Brazilian Cherry	2350
Bubinga	1980
Camphor	726
Canalete	2200
Cedar, red	506
Cherry	950
Douglas Fir	660
Ebony, Brazilian	3692
Goncalo Alves	2160
Hickory/Pecan	1820
Ivory	2345
Jarra	1910
Jellutong	350
Lacewood	840
Lignum vitae	4500
Mahogany, African	845
Mahogany, Honduras	800
Maple, China	760
Maple, Hard	1450
Mesquite	2345
Oak, Northern Red	1290
Oak, White	1360
Padauk, African	1725
Pine, white	380
Poplar	540
Purpleheart	1860
Redwood	420
Rosewood	3170
Rosewood, Bolivian	1820
Sapele	1500
Spruce Sitka	510
Teak, Brazilian	3540
Tigerwood	2160
Walnut, Black	1010
Wenge	1630
Yellow Birch	1260
Yellow Pine Shortleaf	690
Yellowheart	1820
Zebrawood	1575

Sorted by hardness	
Balsa	75
Jellutong	350
Pine, white	380
Basswood	410
Redwood	420
Cedar, red	506
Spruce Sitka	510
Poplar	540
Alder	590
Douglas Fir	660
Yellow Pine Shortleaf	690
Camphor	726
Maple, China	760
Mahogany, Honduras	800
Lacewood	840
Mahogany, African	845
Cherry	950
Walnut, Black	1010
Ash, Mountain	1080
Yellow Birch	1260
Oak, Northern Red	1290
Beech, American	1300
Ash	1320
Oak, White	1360
Bamboo, Natural	1450
Maple, Hard	1450
Sapele	1500
Zebrawood	1575
Wenge	1630
Pedauk, African	1725
Hickory/Pecan	1820
Rosewood, Bolivian	1820
Yellowheart	1820
Purpleheart	1860
Jarra	1910
Bubinga	1980
Goncalo Alves	2160
Tigerwood	2160
Canalete	2200
Ivory	2345
Mesquite	2345
Brazilian Cherry	2350
Bloodwood	2900
Rosewood	3170
Teak, Brazilian	3540
Ebony, Brazilian	3692
Lignum vitae	4500