

'And wel we weren esed atte beste...'

by Bob Bedier

Next Meeting:

- Tuesday, May 20th

April doesn't have much to recommend it, what with all those showers, the hockey playoffs and the looming income tax deadline. So it was a welcome diversion to attend the **PWG's 13th Annual 2x4 Challenge**. And what a treat it was! I've come to expect excellent woodworking from this event and clever solutions to seemingly impossible problems. The unexpected, the inventive, the creative are standard fare and we had that in full measure again this year. But that's not what impressed me. The organization, the presentations, even the coffee and cookies were flawless. But that's not what impressed me. No, what I loved about the evening was the camaraderie, and the

generosity of spirit that typifies this event. Just think about it. It's not a contest; it's a challenge. Individuals challenge themselves then willingly share their triumphs, and sometimes, failures with all of us. It's not about winning. At one point Phil had to explain that contestants were not to score their own entries as zeros. An interest shared with cheerful and supportive people is a wonderful thing. That's what impressed me. 'And wel we weren esed atte beste...' As I left the hall last month that phrase kept coming to mind. It's from Chaucer's Canterbury Tales. In modern English it reads: 'And we were entertained in the best possible manner'.



2003 2x4 Challenge Winners

From left: Pauline Laberge, Harry Taylor, Steve Hansen, Marco Berera



Pacific Woodworkers Guild

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Please direct
newsletter
submissions to the
newsletter editor,

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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Next Meeting

The next meeting of the Pacific Woodworkers Guild will be held on Tuesday, May 20th starting at 7:15pm. Pre-meeting demo at 6:30.

Guest Speaker—Bill Gier will do presentation on hand planes

President's Challenge—Something for the garden



2003 2x4 Challenge

Photos by Marco Berera, Guy Lautard and Steve Fairbairn



Gordon Bednard—Novice
Chair



Bill Fox—Novice
Jewelry Box



Ted Fromson—Novice
Table & Bowl



Paulin Laberge—Novice
Music Stand
Winner—Novice Category / Winner—First Time Entry





Steve Hansen—Intermediate
Culinary Items
Winner—Intermediate Category / Winner—Most Practical



Denis Reid—Intermediate
Blanket Stand



Phil Laliberte—Expert
Mitered Dilemma



Dan Lemire—Expert
Art & Easel



Phil Laliberte—Expert
Five Nested Tetrahedrons



Marco Berera
Printing Press
Winner—People's Choice



Harry Taylor—Expert
Clock Towers
Winner—Expert Category / Winner—Most Original / Winner—Best Use Of 2x4

Vacuum Kiln

by Lynn Diel

This article was originally published in World Wide Woodcarver Ezine, Volume 2 Issue 4 and is reprinted here in its entirety with the kind permission of the author.

“If you are planning on building a vacuum kiln, invest in a good pump”

First, I would like to thank Mr. Judt for the undertaking of such a worthwhile endeavor of an Electronic Magazine. I await each issue with anticipation. I truly feel that this medium is the wave of the future. Besides this publication, Mr. Judt maintains a listserve for woodcarvers. There are a great bunch of folks who are members.

Introduction

I have been involved with technology and wood for quite a few years. Over the years, I have become an avid reader of technology and wood information. A while back, I ran across an article talking about a company that was using a vacuum chamber as a kiln. Further researching the topic, I found that Vacuum drying was first introduced by Dr. Pagnozzi in the early 1960's. His design consisted of a round pressure vessel in which the lumber was placed between heating elements and a vacuum was then drawn.

I was intrigued and since the article lacked details, I consulted with a friend (who happens to be a Refrigeration Engineer). After

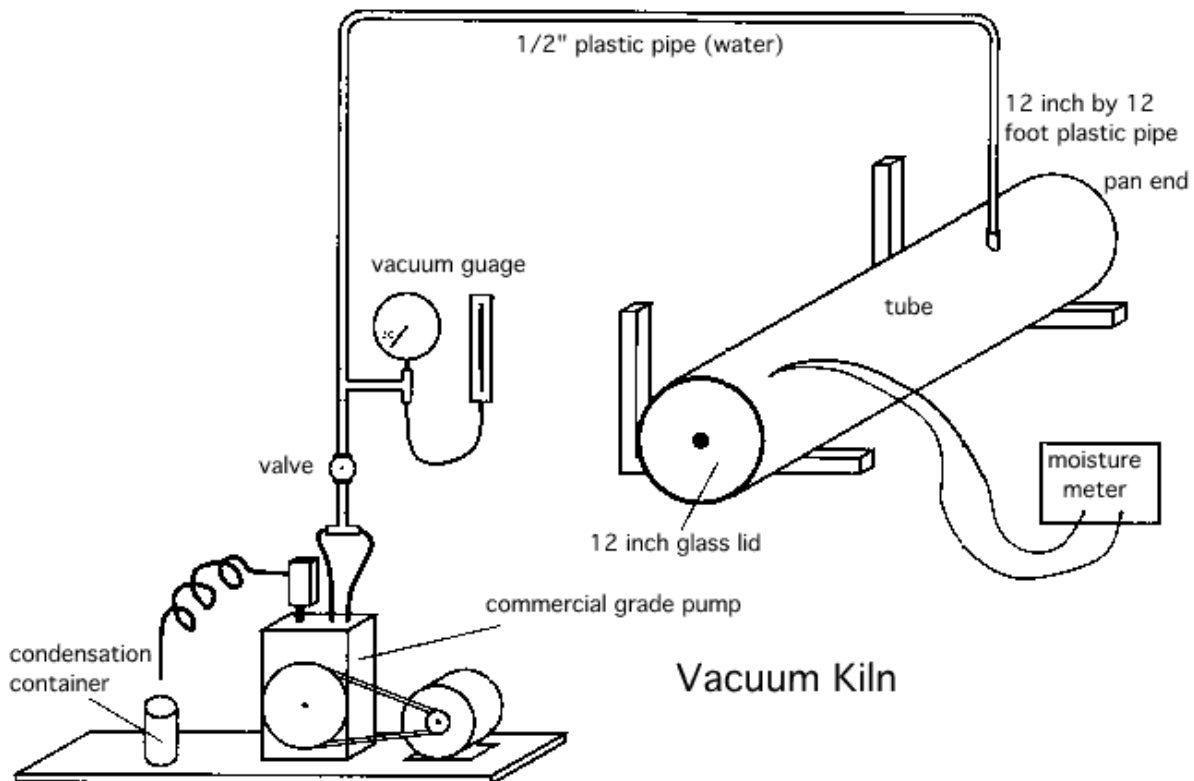
our discussion, he decided to construct a vacuum kiln. Since he was in the process of remodeling his house and he wanted to use oak wherever he could, but didn't want to pay the local price for oak, which is quite expensive.

We are blessed to have a Mennonite community about 25 miles north of where we lived and they harvest oak trees and sell to the "English" (what they call people who are not part of their group). My friend bought the 1" x 4", newly sawed oak very economically and brought it for me to his kiln. After about a week in the drying process of the vacuum kiln, the wood was dried to moisture content of 10.6%. After letting it acclimate in his house for another week, the moisture content was 12.1%. After milling, sanding, installing and finishing, he has a beautiful house for a fraction of the cost.

The Drying Process

The wood is stacked in the tube and the end (of the tube) is sealed. The vacuum pump is

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Vacuum Kiln (con't)

(Continued from page 6)

turned on and let run. How long you let the pump runs depends on several things; 1) the quality of the vacuum pump, 2) the quality of the seal on the holding tube, and 3) how good the piping is constructed.

If you are planning on building a vacuum kiln, invest in a good pump. The better pumps will pull a higher vacuum than a cheaper one. However, you should be able to do an adequate job using old automobile air-conditioning compressors.

Given my friend's system, all three of the concerns were addressed and the pump was let to run for 24 hours. After that time, the pump had pulled a 29.7-inch of vacuum on the tube. Closing the valves and turning off the pump, he let the tube set for 48 hours. After that time, the vacuum had dropped to 27.1 inches of vacuum (due to pressure equalization of the wood and any minute leaks. The pump was run for another 8 hours or until it reached 29.7 inches of vacuum for three to four hours. Again the pump is shut-down and the valves are closed. The moisture content at this time was about 12%. After three days, the moisture content was down to 10.6% and the wood was removed from the tube. The wood was moved inside his house and was allowed to acclimate for a couple of days before milling and installation. (Editors note: the whole drying process took 7 days!)

Since the wood is dried without high-heat there is very little checking. In addition, there is no tempering, making for a very solid piece of wood. The wood machines beautifully with no warpage. Over the past year, the kiln has been used to dry over 1500 board feet of Oak.

The construction of the Vacuum Kiln is simple in nature and typically can be built for less than \$200.00.

How it Works

Bear with me (I am not an engineer), but in essence when the wood is placed in a vacuum, the pressure is greater inside the wood than on the outside, thus the moisture will migrate to the surface and then into molecules that move them to the lowest pressure (pump). In the study of physics, it is stated that: the higher the vacuum inside the drying chamber, the higher the water circulation

rate from wood core to surface; the higher the vacuum the lower the water evaporation point.

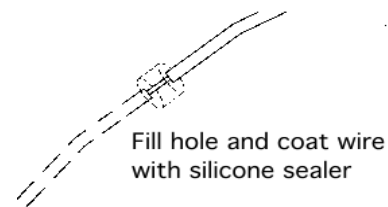
This process is based on this principle in that the water will boil (turn to gas) at a lower pressure thereby creating low-pressure steam. (Note that water boils at a lower heat temperature the on top of Pike's Peak than in Orlando, Florida, which is near sea level).

The wood dries from the inside out. In this carefully controlled humid environment, drying times are dramatically shortened, energy efficiency is greatly improved, and one of the advantages of this method is the kiln produces quality dried wood.

Construction

The tube is standard 12-inch plastic pipe, that was cut to a 12-footlength. The ends of the tube were trued and sanded to provide a good surface to seal. In looking around the local Wal-Mart store, suitable endcaps were located. A 12-inch frying pan with a glass lid works beautifully. The handle was removed from the pan end and attached to the end of the tube with a layer of silicon sealer and a soft rubber seal. The lid was held in place with bungee cords and duct tape until the silicon dried. The other end was prepared with a silicon bead and a soft rubber seal applied to the one side of the seal and the pipe. The glass lid was placed on the other side of the soft rubber seal.

A hole was bored into the plastic at 24" from the end. (Note this is not critical, it just happened that 24 inches placed the pipe in the ideal location to connect to the pump). A 1/2" plastic nipple was inserted into the pipe and was sealed using plastic pipe connection glue. Towards the front of the tube, two small holes were drilled to place wires through that would allow the connection of a moisture meter. To ensure a good seal, the insulation was removed from the wire where it would go through the tube (See Figure below). The wire and the hole were sealed us-



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“Since the wood is dried without high heat there is very little checking“

Vacuum Kiln (con't)

(Continued from page 7)
ing silicon sealer.

The tube is connected to the vacuum pump using standard plastic water pipe. Placing a tee somewhere along the line will allow the connection of a Vacuum gauge and/or manometer. Near the compressor end, a valve should be installed that will allow the pipe and tube to be sealed from the pump. At the end of the pipe, place a tee connector so that the pipe is connected to the compressor. You should use a flex type of connection in that the compressor does generate a vibration in the line. A simple flex connection can be constructed from 1/4 1/4 " inch I.D. copper pipe, coiled in a small loop. The output of the compressor should have a similar coil to provide a means to condense the water vapor back into a liquid.

“There are companies that sell this technology which have chambers big enough to park a semi-truck trailer”

Parts List

Description	Comments
12-inch by 12-foot plastic SD Drain Pipe	Check with contractors for scraps.
Vacuum pump	Surplus - University, auto wreckers
Vacuum gauge	Refrigeration or plumbing suppliers
Manometer	Refrigeration or plumbing suppliers
Ball Valve	Refrigeration or plumbing suppliers
Copper Tubing	Hardware store
1/2 " Plastic Pipe	Hardware store
1/2 " Plastic Pipe tees and elbows	Hardware store
12" Frying Pan	Wal-Mart or equivalent stores
Moisture Meter	Wood working supplies (or borrow One from a friend during the initial setup.
Silicon sealer	Hardware store
Soft rubber for seals	Hardware store

In closing, since this E-zine is primarily for carvers, you may not want to invest in a 12-foot pipe. For small volumes of wood (i.e. carving blanks) a pressure canner could be utilized for a tank. If you have any questions, please feel free to email me.

Good luck and happy carving!

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Vacuum Kiln Follow-up

By Steve Hansen

Lynn writes: “In regards to (my inquiry on kiln size versus pump size) the volume (of the chamber) does matter, in that it will take longer to pull the vacuum. There are companies that sell this technology which have chambers big enough to park a semi-truck trailer.”

“If you design a chamber, make sure someone checks the numbers for the pounds per square inch of pressure that will be applied to the chamber. Round chambers work best since the pressure is trying to make the chamber smaller. Flat panels will tend to warp towards the low-pressure side. The first test that was made with the one designed was with a flat covering on the ends of the pipe and they failed. We switched to a domed (glass frying pan lid) and it worked great!”

“The wood referred to was harvested in the first part of March and was cut and stickered about a week before he picked it up. He then stickered and stored it in his shop until he was able to use it all. We did an experiment with a fresh cut branch of Oak (we took the bark off) and had similar results!”

Tree Quiz

By Phil Laliberte

This month I would like to present a tree quiz that I came across a while back. It will make you think and perhaps give you a chuckle or two and also it will enhance your knowledge of trees.

- How old are the oldest living trees?
 - 500 years
 - 1,500 years
 - 3,000 years
 - 6,000 years
- What tropical tree spreads by forming pillar roots, which grow down from branches?
 - Banyan
 - Ebony
 - Monkey puzzle
 - Fig
- How big are the largest pinecones, and what California tree do they belong to?
 - 1 1/2 foot cones of the knob cone pines
 - 2 foot cones of the redwoods
 - 1 1/2 foot cones of the giant sequoia
 - 2 foot cones of the sugar pines
- Catalpas, or Indian bean trees, have some of the largest simple leaves (one leaflet per leaf stem). How long do the leaves get?
 - 1/2 foot
 - 1 foot
 - 1 1/2 feet
 - 2 feet
- The world's biggest seed belongs to the coco-de-mer tree. This nut weighs up to...
 - 15 pounds
 - 25 pounds
 - 35 pounds
 - 45 pounds
- The heaviest living things that ever existed on earth are the giant sequoias of California, which can weigh how much?
 - 60 tons (120,000 pounds)
 - 600 tons (1,200,000 pounds)
 - 6,000 tons (12,000,000 pounds)
 - 60,000 tons (120,000,000 pounds)
- What are the baobab and kapok trees pollinated by?
 - Squirrels
 - Bats
 - Spider monkeys
 - Monarch butterflies
- In olden days, pigs were often turned loose beneath these trees to fatten up on the oil-rich seeds the trees drop once every year (their "mast").
 - Cashew
 - Beech
 - Russian olive
 - Pecan
- A relative of the Brazil nut tree produces its seeds in large wooden cups that South American Indians once used for catching what wild animal?
 - Toucans
 - Monkeys
 - Poison dart frogs
 - Capybaras
- About how many species of insects live on a mature oak tree?
 - 50
 - 100
 - 200
 - 300
- If your dog has fleas, what kind of wood should you put in Rover's doghouse?
 - Cedar
 - Arborvitae
 - Walnut
 - Teak
- What palm fruit has been cultivated for over 5,000 years?
 - Coconuts
 - Papayas
 - Bananas
 - Dates
- What kind of wood are wooden toilet seats made from?
 - Sycamore
 - Walnut
 - White oak
 - Pine
- A "catkin" is...
 - Superior to a "dogkin"
 - A drooping spike of small flowers without petals
 - An egg-filled cyst on the underside of leaves (made by gall wasps)
 - A parasitic relative of mistletoe that robs trees of water and nutrients
- Pneumatophores have a special type of root that grows above ground, absorbing more oxygen. Which 2 trees are pneumatophores?
 - Bald cypress
 - Black willow
 - Eucalyptus
 - Mangrove
- Most oaks don't start producing acorns until they are how old?
 - 20 years old
 - 30 years old
 - 40 years old
 - 50 years old
- "Witches brooms" are...
 - A species of tree found in England and related to weeping willows
 - A term used to describe the fast shoots trees grow after being topped
 - Made from birch wood
 - An uncontrolled growth of buds

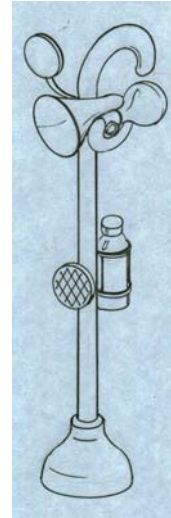
Designer's Corner—Canadian Pension Stick

By George Radke

A memorable (and sometimes practical) retirement gift for that someone who has everything. A Saturday morning fun project with a utility knife and electric drill.

First stop, the hardware store, for a plumber's plunger and bicycle items: horn, mirror, reflector and water bottle with holder. Next, find a wooden cane that is close to the same diameter as the plunger handle.

Remove the rubber plunger from the handle and transfer the thread pattern to the bottom of the cane - masking tape can help. Use a utility knife (rasp or veining tool?) to cut the threads. Drill appropriate holes to bolt your hardware in place. Refer to the drawing for possible placement options.



Tree Quiz Answers

- 1) D) 6,000 years—Many bristlecone pines are at least 6,000 years old (some estimate 10,000 years)! A stand of this uncommon pine exists in New Mexico, in fact. For their age, bristlecone pines are relatively small, averaging 40 feet tall. This is due to their habit of living in harsh climates and at the edge of forested areas where the winds stunt and gnarl growth.
- 2) A) Banyan—One banyan in Calcutta has over 1,000 pillar roots, giving it the largest spread of any tree..
- 3) D) 2 foot cones of the sugar pines—Tourists often assume the large cones come from the redwoods (whose cones are actually quite small), but it's their neighbors, the sugar pines, which produce the record breakers.
- 4) D) 2 feet—Yes...talk about the ultimate shade tree!
- 5) D) 45 pounds—Better hope one of these never falls on your head. The coco-de-mer nuts are divided into two lobes, each containing hundreds of seeds.
- 6) C) 6,000 tons—Sequoias could squash the biggest dinosaur or anything else that has ever walked, swum or grown.
- 7) B) Bats—These trees produce big flowers with lots of nectar that are open at night. The feeding bats get pollen stuck on their noses and tongues.
- 8) B) Beech—Pigs, with their excellent sense of smell, have also been used in Europe to hunt truffles (underground tubers).
- 9) B) Monkeys—what do you think this species of tree is called? They are "monkey pot trees".
- 10) D) 300—most trees are homes or restaurants for dozens of species of insects, birds and mammals.
- 11) C) Walnut wood has a chemical that repels fleas!
- 12) D) Dates are one of the oldest cultivated foods.
- 13) A) Sycamore—I know that question has troubled you for years. Now you know, for sure, what wooden toilet seats are usually made of.
- 14) B) A drooping spike of small flowers without petals—Some trees that produce catkins are poplars, walnuts and cottonwoods.
- 15) A) Bald cypress and D) Mangrove—Two species that pops special roots up through the oxygen starved soil it lives in.
- 16) D) 50 Years—It takes half a century before they even start to produce acorns; luckily they produce piles of them.
- 17) D) An uncontrolled growth of buds—Witches brooms result from infection and mostly happen to birches.