

# ALASKA WOOD PRODUCTS BULLETIN



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## SAWDUST

Sawdust, Sawdust, what a heck of a name  
I'm not dust at all, thanks just the same  
I'm a chip. I'm a chip. Off the old block  
I get in your hair, your shoe and your sock  
I'm a nuisance and a pest, I just lay around  
You can find me most everywhere, all over the ground

But if you look closely, you would soon know  
I'm really a friend with something to show

If I'm too big, you had better slow down  
Or you'll be breaking teeth and going to town.  
If I'm too small, you had better speed up  
Because then I'm a sneak and I'll heat you up.  
I'll slip and I'll slide and go past the tooth  
And onto the saw blade; I'm on the loose

Although I'm not boastful, I've something to say  
Pay heed to my size and you'll be OK

Rick Campbell of Spear and Jackson

**BALANCED SAW PERFORMANCE -- PART 1** (much of the following information was obtained from publications by Stan Lunstrum, of the USDAFS Forest Products Laboratory, P.S. Quelch of Armstrong Manufacturing Co. and Jim Peek of the Lake Erie and Ontario Sawyers and Filers Association)

I started off this issue of the Alaska Wood Products Bulletin with an article on Balanced Saw Performance and quickly found the topic too big for a newsletter, at least all in one chunk. I got into discussions about saw sizing, gullet sizes, cutting edge width, side clearance, saw speed, bite, feed rates, depth of cut, sawing times, etc. I had 8 pages written before I realized it, and there were still other things I needed to cover in this newsletter. Too bad -- everything would have meshed so well with the poem on the cover. Sawdust really can tell us a lot, and with that in mind I am going to kick off my discussion of Balanced Saw Performance with a discussion of bite and feed rate. Other topics will be presented in future issues of the AWPB.

**Bite.** To have the saw perform correctly, the sawdust must remain in the gullet until the gullet exits the cut. If sawdust spills out of the gullet while in the cut, it will rub the side of the saw and heat the saw in the area of the rim. Sawdust spillage is usually unequal (usually greater on one side of the saw than the other) and that alone can force the saw away from cutting in a straight line. The situation can be aggravated when sawing frozen timber as the spilled sawdust can freeze onto the log or the board or both, causing additional friction and tracking problems. One critical factor in preventing sawdust spillage is to produce a chip (in reality, sawdust is a chip not "dust") that is larger than the side clearance, so that it can't spill out. To produce the optimal "chip", each tooth must take an appropriate "bite". [NOTE: Gullet size and side clearance are topics for another time.]

There are two kinds of bite, maximum bite and minimum bite. Saw experts generally agree that maximum bite for hardwoods is 1/10 inch (0.100") per tooth and for softwoods, 1/8 inch (0.125") per tooth.

The minimum bite per tooth is a bit more complicated and two methods have been used to determine its value. Method 1: Older references say that the minimum bite per tooth should be equal to the side clearance (the clearance between the corner of the tooth and the saw plate) plus 0.010 inches. In order to calculate this value,

- a) Determine the average kerf by measuring 10 teeth and dividing the sum by 10 (eg., 0.281")
- b) Measure saw plate thickness (eg., an 8-gauge saw is 0.165" thick) \*
- c) Determine total saw clearance [subtract saw plate thickness from average kerf (0.281 - 0.165 = 0.116)]
- d) Determine side clearance per side [divide total saw clearance by 2 (eg., 0.116 / 2 = 0.058)]
- e) Add 0.010 (eg., 0.058 + 0.010 = 0.068)

\* NOTE: Inserted point (I.P.) circle saws must have shanks with square corners that are **at least as wide** as the saw plate in order to chamber sawdust properly. New shanks are usually a gauge or two thicker than the saw plate. If you are using new(er) shanks, substitute *their* thickness for the saw plate thickness in the above calculations.

Method 2: More recent research conducted at the University of Maine determined that, for circular saws, the minimum bite per tooth should be approximately 32 percent larger than the side clearance of the saw (as opposed to the earlier standard of side clearance + 0.010"). To use this new information to calculate minimum bite per tooth, follow steps a) through d) above, then:

- e) Multiply the result of d) by 1.32 (eg., 0.058 x 1.32 = 0.07656)

**Feed Rate.** Bite (per tooth) is a function of side clearance, which is a function of saw gauge, tooth style, and kerf (cutting edge width), but how do you measure it? The answer is feed rate.

The question of how hard to pull on the carriage feed lever has probably been around as long as feed levers themselves. Go too fast with a circle saw and it may wander out of the cut, or teeth and shoulders may break. A circle saw fed so hard that it that it plugs the gullets and stops in the cut will likely shear pins and rub metal off the collar. Feed a bandsaw too hard, and you can push it off the wheels, and if you've never seen that happen, pray that you never do.

If you look at any board, from a circle saw or bandsaw, you can probably find a pattern left by the saw teeth. One tooth usually cuts a bit wider than the rest and leaves a characteristic kerf mark, that is repeated over and over, down the length of the board. If you measure the distance between the marks left by that tooth, you will get the feed rate per revolution of the saw. If you divide that measurement by the number of teeth in the saw blade you will get the average bite per tooth. For example, if the distance between two repeating saw marks (i.e., the feed rate) is 2 inches and the saw has 50 teeth, then average bite per tooth is 2" divided by 50 teeth, or 0.040 inches per tooth. If this were the case, you should actually be able to find sawdust chips as wide as the face of the saw teeth and 0.040 inches thick.

Given this information, are you underfeeding, overfeeding or feeding within acceptable limits? One way to answer this critical question is to look at your lumber. Is the within-board-sawing-variation within acceptable tolerances consistently? If not, this may be an indication that your saw is performing poorly. Maximum feedrate for the example shown above (assuming we're sawing unfrozen softwood) would be 6.25 inches per revolution, so you would not be overfeeding in this example. [If you are wondering how I got that, I multiplied the maximum bite per tooth (0.125 inches) times the number of teeth (50).]

The minimum feedrate, as stated at the beginning of this section, is a more complicated function of saw gauge, tooth style, kerf and side clearance. Without getting into all that, let's say side clearance is 0.067 inches. Our desired minimum bite, per tooth, according to Method 1, would be 0.067" plus 0.010" for a total of 0.077". According to Method 2, if the side clearance was 0.067, the minimum bite would be 0.067" plus 32 percent (0.067 x 1.32), or 0.088 inches. So, per revolution of a saw with 50 teeth, the minimum feed rate should be 3.85 to 4.4 inches per revolution, depending on which method you use. In the example presented earlier, with a distance of only 2 inches between saw marks, we can conclude that the saw was being underfed.

If 4 to 6 inches per revolution sounds like a pretty respectable feed rate to you, that's because it is. There are a lot of saws out there, operating everyday, that never reach their minimum feed rate, and they are bound to have sawdust spillage-related problems. Steps you can take to control spillage include:

- Reduce side clearance by reducing kerf width (but not to the point where the saw plate will rub against the wood in the cut). Frozen timber is more brittle than unfrozen timber and cuts cleaner. Therefore, when sawing frozen timber, it is possible for the saw plate to pass through a narrower path with less risk of fuzzy grain contacting and heating the saw. Although sawing frozen wood generally requires more power (because the wood is harder) you can reduce power requirements by reducing the width of the kerf (and cut less wood). To help offset the tendency to underfeed in winter sawing because of increased power demands, use the smallest side clearance practical.
- Consider using a saw with a reduced number of teeth. Having fifty percent fewer teeth means each remaining tooth can take twice as large a bite (i.e., a larger chip). However, bear in mind that saws with fewer teeth also have a tendency to dodge knots and can't be fed quite so hard. [NOTE: A cheap way to reduce the number of teeth, without buying a new saw, is to "chipmunk" an existing saw, i.e., set it up so that only every other tooth cuts. This is done by alternating a new bit with a worn down or ground-down bit. But DO keep a bit and shank in each socket in order to maintain the tension in the saw.]
- When sawing frozen timber, change worn shanks. Also, use a *bit* with a built-in chip breaker (like a Standall) or a *shank* with a built-in chip breaker (like a Super Shank). A chip breaker will break up the swirling action of the sawdust in the gullet -- action that tends to pulverize the dust into even smaller particles that can escape the gullet even easier than normal sawdust particles. NOTE: don't use both chip breaker shanks and chip breaker bits together or they'll cancel each other out.
- When sawing frozen timber, reduce rim speed to the recommended 6,000 to 7,000 feet per minute to reduce sawdust pulverization.

**Sawing Time.** Before moving on to other topics, I thought I would just offer a little more information about the *application* of the information regarding bite and feed rate. The question posed in the preceding section (i.e., how fast to feed the saw) can now be answered, given some information about the saw, the mill, etc. We need to be turning our 50" circular saw at between 764 and 840 RPM to achieve the recommended minimum rim speed for sawing unfrozen softwoods (10,000 to 11,000). Let's say our RPM is 780. At 780 revolutions per minute, we have 13 revolutions per second (780 / 60 = 13). Our maximum feed rate is 6.25 inches per revolution, so our maximum feed rate would be 81.25 inches per second (13 revolutions per second times 6.25 inches per revolution = 81.25 inches per second). At that rate, a 14-foot log could be cut in just over 2 seconds (14 feet times 12 inches per foot = 168 inches. 168 inches divided by 81.25 inches per second = 2.07 seconds). That would be the maximum feed rate (or the minimum sawing time) per line on a 14-foot log. [NOTE: rim speed calculation is a topic for another time.]

At a minimum (minimum feed rate), you would strive for about 4 inches per revolution (as per the current example). Given 13 revolutions per second and 4 inches per revolution, our minimum feed rate would be 52 inches per second. So, that same 14-foot log should take no more than 3.23 seconds per saw line.

**For more information read, Circular Sawmills and Their Efficient Operation by Stan Lunstrum, USDA Forest Service, Forest Products Laboratory, Madison, WI.**

## **USDA FOREST SERVICE, KILN-DRYING FACILITIES GRANT PROGRAM**

Thanks to the efforts of your Alaska Forest Association and Senator Ted Stevens, \$2 million was included in the current year's Federal budget to cost share kiln drying facilities in Southeast and South-central Alaska. Official notice of the program was sent out in February and notices have appeared in prominent newspapers. In order to apply, you must obtain, complete and submit an application. You can obtain an application on-line, via the Internet, at <http://www.fs.fed.us/r10/spf/kiln.html>, or at my web site <http://jedc.org/wood.htm>. To receive a copy by mail, contact Alan Vandiver at 271-2550 or Cheryl Gargrave at 271-2575 at the Forest Service Office in Anchorage. Applications must be received at the Forest Service Office in Anchorage by the close of business on April 16, 2001.

Facilities eligible for cost sharing specifically include lumber stacking/stickering equipment, air-drying sheds, pre-dryers, dry kilns, dry lumber protection facilities and planers. Anyone with an operation, or a proposed operation, or a satellite operation in Southeast Alaska or South-central Alaska (south of the Alaska Range) is eligible to apply. Typically, grants will be awarded in an amount not to exceed \$800,000 and the minimum match (in cash and/or in-kind contributions) is 20 percent. Funded projects must be completed in two years. Notice of selection is expected to take place in early May and funds should be available in June.

It is not known whether additional funds will be available in future years. If you do not qualify for these funds at this time, but have intentions or ideas for expanding or diversifying your wood products production capabilities, it may be an opportune time to make those intentions known. Perhaps if there is a demonstrated need for additional funding, additional funding will come . . .

If I can be of any assistance as you undertake to prepare your application, please feel free to contact me.

### **PRELIMINARY THOUGHTS ABOUT SMALL DRY KILNS**

Since many of you have been pondering the idea of installing a small dry kiln, I thought this would be appropriate time to offer some of my thoughts on the subject.

**How much?** One of the first things you will need to do is determine how much lumber you want to dry. Look at your species mix and product mix and then look at the time controlled dry kiln schedules. According to the published time controlled schedules, the time required to dry western hemlock, for example, varies considerably depending on thickness and grade. For lower grade stock ranging in thickness from 4/4 to 6/4, the schedules claim drying can take place in 2 1/2 to 3 1/2 days (exclusive of equalizing and conditioning). Low-grade 8/4 stock will take 4 to 4 1/2 days. Upper grades in thicknesses ranging from 4/4 to 8/4 will require at least 4 days, while 12/4 to 16/4 stock may require 13 days or more. Sinker stock is also likely to take two weeks (again, all exclusive of equalizing and conditioning). The drying times for white and Sitka spruces are similar to western hemlock and, though not published as such, drying times for white birch will range from 3 to 10 days.

All of these schedules are essentially green lumber schedules. Naturally, if your lumber is air-dried, significant time savings in the kiln can be realized. All of these schedules also assume that your kiln is capable of drying the lumber as fast as the lumber can stand to be dried. For planning purposes under typical applications and conditions, you might project drying one kiln charge per week, or about 50 charges per year. For less typical applications, half of that may be more realistic. Using a typical scenario, a 10 MBF kiln would dry 500 MBF per year. (If you think you'll be working more in the upper grades and heavier thicknesses, you'd need to cut this in half – or double the size of the kiln. Likewise if your kiln operates at less than conventional temperatures.)

How much lumber can a kiln hold? You have to be sure you're talking the right language. Dry kiln schedules are based on the lumber's actual thickness, not its nominal thickness. A kiln's capacity will be dependent on the lumber thickness too. Given uniform sticker thickness of 3/4", the amount of kiln volume occupied by lumber will increase as lumber thickness increases. In drying 4/4 lumber, 3/4" stickers occupy about 43% of the total potential lumber charge volume ( $3/4 + 4/4 = 7/4$ ; 3 divided by 7 = 43%). With 6/4 lumber, the stickers occupy 1/3 of the volume ( $3/4 + 6/4 = 9/4$ ; 3 divided by 9 = 33%). With 8/4 lumber, the stickers occupy 27% of the volume ( $3/4 + 8/4 = 11/4$ ; 3 divided by 11 = 27%).

**Kiln Sizing.** For drying a variety of lumber lengths from 8 to 16 feet, a kiln chamber 24 feet long is a good choice. It would accommodate (3) 8-ft packs, (1) 8-ft pack plus (1) 16-ft pack, (2) 12-ft packs, or (1) 10-ft pack plus (1) 14-ft pack. Of course, you would want to make the chamber a bit longer to account for over-length or (heaven forbid) a crooked or uneven stack. Therefore I would recommend at least 25' but not more than 26' (again, assuming lengths from 8' to 16').

Lumber packs are often made 40" to 48" high. In a package kiln, you must also account for the 4x4 blocking between the lower pack and the floor and between the lower pack and the upper pack. You will also need a little "wobble room", so that when loading the kiln with a forklift you don't bang into the fan deck. In reality, you would probably let the height between the floor and the fan deck determine your pack height, but I'm going to work it backwards and let the pack height determine that distance (as if you were building the chamber from scratch). So, if the pack height was 48" and the blocking is 4" and wobble room is 4", then the height between the floor and fan deck would be 9 feet (48"+48"+4"+4"+4"). With 24" fans and 6" (or less) above and below them (for mounting, support, shrouds, etc.), you'd be looking at a total ceiling height of about 12 feet.

Lumber packs are also commonly 40" to 48" wide, although you can make them any width you like; generally governed by the capacity of your forklift or length of the forks. If you stayed with a 48" width, you could build the kiln width to accommodate two or 3 packs wide (i.e., 8 to 12 feet). I think you would find 8 feet sufficient, but if you want to build in some expandability, you might consider 12 feet, realizing however that you may need to baffle some of that off if you're not using it all. Whatever width you settle on, you will probably want about 2 feet on each side that will act as a plenum and provide access to kiln samples. To accommodate two 48-inch wide packs side by side, you would build to an approximate inside dimension of 12 feet (2'+4'+4'+2'). To accommodate three 48-inch wide packs side by side, you would build to 16 feet. Unless the kiln has reversing fans, I would not recommend going over 12 feet in total lumber pack width.

**Kiln Capacity.** A solid pile of wood 8' high x 8' wide x 24' long would contain 18,432 board feet. (At 8x12x24 the capacity would be 27,648 bf). But that's solid wood, unstickered. Let's consider rough, green 4/4 shop lumber (and to keep things simple I'll just consider them to be 24' long). At 1 inch plus 1/8<sup>th</sup> inch (shrinkage and planing allowance) plus a 3/4-inch sticker, each course (layer) of lumber would take up 1.875 inches. If the total gross height of the packs is 8 feet (96 inches), then the total number of courses would be 96" divided by 1.875", or 51.2. (Call it 51.) In a pack 8 feet wide there would be (16) 6" wide boards. A 4/4x6"x24' board contains 12 bf. Therefore each course would contain 16x12, or 192 board feet. The total amount of lumber in the kiln would be 51 courses times 192 bf per course, or 9,792 bf. (If the width was 12 feet instead of 8 feet, the kiln charge volume would be 14,688 bf.)

With 6/4 lumber, each course would occupy 1 1/2 inches plus 1/8<sup>th</sup> inch (shrinkage and planing allowance) plus 3/4-inch sticker, or 2.375 inches. In 96 inches (height), there would be 96" divided by 2.375", or 40.4 courses. (Call it 40.) A 6/4 x 6" x 24' board contains 18 bf. At 16 boards per course, there would be 288 bf per course. And, in 40 courses there would be 11,520 bf. (17,280 bf if 12 feet wide instead of 8 feet wide.)

With 8/4 lumber, each course would occupy 2 inches plus 1/8<sup>th</sup> inch (shrinkage and planing allowance) plus 3/4-inch sticker, or 2.875 inches. In 96 inches (height), there would be 96" divided by 2.875", or 33.4 courses. (Call it 33.) An 8/4 x 6" x 24' board contains 24 bf. At 16 boards per course, there would be 384 bf per course. And, in 33 courses there would be 12,672 bf. (19,008 bf if 12 feet wide instead of 8 feet wide.)

**Drying Systems.** The next thing to consider is what type of drying system you want to use. Generally, for small dry kilns, you have 3 choices: dehumidification, hot water with continuous (passive) venting or hot water with periodic controlled (active) venting. Certainly, a combination of these is also possible and perhaps feasible. [Note: Small vacuum dryers and radio frequency dryers are viable technologies but can generally only be justified in specialized in applications.] Ultimately, the choice is yours, but here are my thoughts.

**A. Dehumidification (DH) drying.** A lot of people promote DH as the best and most economical drying method in small applications. Compared to conventional steam-heated kilns, they may be right, but I haven't seen any comparisons of DH kilns versus hot water kilns. I see at least two potential problems with DH. The first is the cost of electricity. In areas where the cost of electricity is around \$0.06 to \$0.08 per kilowatt-hour, DH may very well be the way to go. If you are paying in the neighborhood of \$0.10 per kWh, the economics are going to be questionable (depends on the value of the dried products versus the cost of the green lumber input). And above \$0.10, I think you can pretty much forget about it, unless the KD vs. green premium is really high.

(Although I can't tell you what the relationship might be between BTUs and kilowatt-hours, I can give you some rough energy consumption figures. It takes approximately 1,000 BTUs (net) to remove 1 pound (about 1 pint) of water. But small dryers have relatively large heat losses per board foot because of the greater surface area of the kiln per unit of volume. Gross heat requirements will likely be at least double the net amount required. So, at 50 gallons of water per mbf (or 400 pints) the net energy required would be 400,000 BTUs per mbf. For a 10 MBF kiln charge, the gross amount would be at least 8,000,000 BTUs.)

DH is a valid method with which to dry lumber, but it has its limitations. It operates well within a fairly narrow range, but outside of that range, it needs assistance (in the form of supplemental heat) to make it work like it should. At the

beginning of the drying cycle when the wood is very wet or cold or frozen, a DH unit has to work very hard to warm or dry the lumber to the point where the DH unit becomes operationally efficient. Supplemental heat will help this situation. Once the lumber is warm and beginning to dry, DH generally works just fine, again, to a point. DH will dry lumber down to 10-12% MC pretty good but, beyond that, supplemental heat is a big help once again. If you are drying lumber to 6-8% moisture content (MC) you begin to run into trouble again. If you are drying a resinous species in which the pitch must be set (so you don't get bleed-through in the finish), you must hold the temperature of the wood at not less than 160°F for 24-36 hours (some experts recommend 180°). One hundred and sixty degrees is the upper limit for most DH kilns. Once again, supplemental heat would be a big help.

Another thing about dehumidification drying – DH dry kilns are essentially closed systems. They take hot moist air from within the kiln, pass it over cold condensing coils, condense the water out and then blow the warm dry air back into the kiln. If the condensing capacity of the coils is exceeded by the capacity of the lumber to give up its water, then the drying capacity of the kiln is governed by the condensing capacity of the coils, not the drying capacity of the lumber. In such cases, there could be problems with mold and mildew. In hardwoods this is generally not a problem, as most hardwoods do not dry quickly (although white birch is not one of these).

The last thing about DH is the disposal of the condensate. Technically, it is an industrial discharge. In an area where you can tie into an existing wastewater treatment system, this probably wouldn't be a problem. Anywhere else, you may have to obtain a permit from the State agency governing pollution control (DEC in our case). The other thing about condensate is how to get rid of it when the temperatures are below zero. This could pose a problem that I doubt many kiln manufacturers have stopped to consider. In drying spruce from 40% MC to 10% MC, you would generate about 50 gallons of water per MBF over the course of the drying cycle. With a 10 MBF kiln and a 5-day cycle, this would amount to approximately 100 gallons per day.

**B. Hot water/passive venting systems.** OK, so much for DH. Let's look at hot water/passive venting, a la' the Koetter Dry Kiln system. The difference between continuous venting and periodic/active venting (discussed below) is like the difference between leaving a window open a little bit all the time versus keeping it closed most of the time and opening it all the way once in a while. Koetter claims that continuous venting is less stressful for the lumber. I don't know about that but, even if it is true, I suspect it would be more applicable to slow-drying refractory hardwoods than to relatively fast-drying softwoods. However, the continuous venting system is certainly an easy system to operate and undoubtedly less expensive than an active venting system.

Continuous venting may not be without its problems however. Continuous venting is not unlike a DH unit with its *continuous dehumidifying*. But therein may lie the problem, at least for softwoods. In a manner similar to DH drying, if the venting capacity of the kiln is exceeded by the capacity of the lumber to give up its water, then the drying capacity of the kiln is governed by its venting capacity, not the drying capacity of the lumber. Again, there could be problems with mold and mildew. In hardwoods this is generally not a problem, as most hardwoods do not dry quickly (white birch notwithstanding). This situation may be relatively easy to correct however, by improvising on the venting (i.e., put in more than one vent and leave them open farther, for example, or incorporating an active vent).

**C. Hot water/active venting systems.** The system that “the big boys” use is active venting (although they use steam heat, not hot water) and, with today's technology, it's not out of reach for smaller applications, and the venting systems are limited only by your own inventiveness. The demonstration kiln in Sitka is a hot water, active venting system. There are two main system controls:

1. **The thermostat.** The dry bulb (DB) controller receives a signal from a temperature sensor, called a *resistance temperature detector* or *RTD*, inside the kiln. When the temperature inside the kiln is less than the set point that the kiln operator has programmed into the controller, the controller opens an electrical circuit to the water circulation pump on the boiler. Hot water is then circulated through the 2” fin tube pipe in the kiln until the RTD tells the controller to shut the pump off (i.e., the temperature inside the kiln matches or exceeds the set point on the controller). In this regard, the DB controller is just a glorified thermostat, like the one controlling a household furnace.
2. **The humidistat.** The wet bulb (WB) controller controls the opening and closing of the vents. It is identical to the dry bulb controller, with the exception that the RTD has a small cloth sock over it (similar to a thick shoelace) and that sock is suspended in a small water reservoir that keeps it wet. When the wet bulb temperature (as detected by the RTD) meets the WB controller set point that the kiln operator has programmed, the controller sends a signal to a pneumatic valve (solenoid operated?) which then permits the actuation of the pneumatic cylinders that open the vents. (The Sitka kiln has 4 vents approximately 12” high by 16” wide, located two on each side of the kiln.) When the wet bulb temperature falls below the set point (due to the fact that the vents have been open), the WB controller sends a signal to the pneumatic valve to close the vents. [The compressed air with which to actuate the

pneumatic valves is provided by a small air compressor in the kiln's control room.] Just as the DB controller can be compared to a thermostat, the WB controller can be compared to a humidistat. Both the DB and WB controllers are made by Omron, Model E5CS, costing around \$200 - \$250 each.

**D. Hybrid systems/options.** Just as kiln operators have learned that DH kilns operate better over a wider range of operating conditions with supplemental heat, some operators of hot water kilns have improved their energy efficiency by putting a dehumidifier (or two) inside the kiln. Once the wood is dried below the fiber saturation point (generally around 30% MC) and all the free water is gone, more energy is required to remove the "bound water". Dehumidification could save some energy, since you could reclaim some of the heat and keep the system closed. Since dehumidification would be continuous, the vents would only open if/when the DH unit couldn't keep pace with the lumber. Something else to consider with a vented kiln would be preheating the make-up air going into the kiln (perhaps if that air could be captured off the flue stack from a boiler, for example).

### **NATIONAL FOREST MATERIALS PURCHASERS LOAN PROGRAM**

The Alaska National Interest Lands Conservation Act (ANILCA) was passed in 1980 (Public Law 96 – 487). Provisions of that law [Sec. 705(b)] state:

*(1) The Secretary (of Agriculture) is authorized and directed to establish a special program of insured or guaranteed loans to purchasers of national forest materials in Alaska to assist such purchasers in the acquisition of equipment and the implementation of new technologies which lead to the utilization of wood products which might otherwise not be utilized. The Secretary is authorized to promulgate such regulations as he deems appropriate to define eligibility requirements for the participation in the loan program and the terms and conditions applicable to loans made under the program. Except as otherwise provided in this section or regulations promulgated specifically for this loan program, such program shall be carried out in a manner which is consistent with other authorities available to the Secretary.*

*(2) To carry out the special loan program established by this section, there are hereby authorized beginning after the fiscal year 1980 to be appropriated \$5,000,000 from National Forest Fund receipts, to be deposited in a special fund in the Treasury of the United States to remain available until expended. Repayments of principal and interest and other recoveries on loans authorized by this section shall be credited to this fund and shall remain available until expended in order to carry out the purposes of this section.*

The National Forest Materials Purchasers Loan Program was never established, regulations were never promulgated and funds were never appropriated to implement the program. The question of "why" may never be answered and, at this late date, it may be immaterial. More importantly are the following:

- Do today's National Forest materials purchasers in Alaska need or desire such a program of loans and/or loan guarantees?
- If the answer to the above question is "yes", then is \$5,000,000 sufficient to fund such a program (20 years after it was supposed to be established)?
- What would make such a loan program most user-friendly and/or attractive?

Several people are interested in determining the level of demand for a National Forest Materials Purchasers Loan Program, as specified in ANILCA. Comments may be submitted to any of the following people, and written comments are preferred. A target date for submitting comments is April 27, 2001.

Contact	Agency	Phone	Fax	E-mail
Keith Perkins	USDA Rural Development	747-4322	747-4325	<a href="mailto:kperkins@rdasun2.rurdev.usda.gov">kperkins@rdasun2.rurdev.usda.gov</a>
Paul McIntosh	The Denali Commission	271-1640	271-1415	<a href="mailto:pmcintosh@denali.gov">pmcintosh@denali.gov</a>
Dan Parrent	Wood Products Dev. Svc.	747-5688	747-4331	<a href="mailto:dparrent@ptialaska.net">dparrent@ptialaska.net</a>

## NEWS FROM THE USDAFS WOOD UTILIZATION CENTER

The Wood Utilization Center is involved in a number of research projects that have been identified as *important* to Alaska's forest products industry:

- **Lumber strength testing of Alaska softwoods** -- A 3-year program of strength testing and evaluation, designed to help establish new lumber grades for Alaska species. Consistent information regarding the design values of Alaska species could enhance their use in engineered wood products and other value-added applications
- **Preservative treatment of wood by double-diffusion method** -- Alaska softwoods are well-suited to a preservative treatment process called *double-diffusion*, in which freshly sawn wood is treated in a series of two liquid baths. Wood treated by this process has shown to be highly resistant to decay when used outdoors for applications such as railroad ties, fence posts and patio decks. Efforts are currently underway to identify opportunities for increased used of double-diffusion treated wood for railroad ties and other markets
- **Alaska Softwood Lumber Drying** -- Kiln drying of lumber represents a significant value-added opportunity for Alaska wood products. This project will assist in developing appropriate techniques and methods for efficient drying of Alaska softwood species to meet current industry needs.
- **Value-added opportunities for Alaska's sawmill industry** -- More than 100 sawmills in Alaska are currently producing lumber on at least a part-time basis. Many of these facilities do not process lumber beyond the initial rough-cut sawing operation. This project will identify opportunities having strong potential for producers to include value-added processing steps to their sawmills
- **Economic evaluations of Alaska wood products** -- 1) A cooperative agreement with the Center for International Trade in Forest Products (CINTRAFOR, University of Washington) has been established to identify niche market opportunities and recommend strategies for increasing the competitiveness of Alaskan forest products in Japanese markets. 2) A joint venture agreement with the Institute for Social and Economic Research (ISER, University of Alaska, Anchorage) has been established to create an Alaska Timber Industry Database.
- **Silvicultural futuring** -- Second-growth stands will become a significant forest resource in Southeast Alaska, but market opportunities are unclear due to the long timeframes before harvesting begins to occur (perhaps as much as 50 years). Silvicultural futuring studies currently underway are designed to determine the product attributes expected from current management practices
- **Special forest products** -- Special forest products (SPFs) include, primarily, non-timber forest products having herbal, medicinal, floral, decorative and other values. In the Pacific Northwest their production has developed into a multi-million dollar industry. Projects underway are designed to facilitate opportunities for Native communities to benefit from the commercial sale of these products.
- **Retail Market Potential of Alaska Birch Lumber -- An Evaluation** Much of the hardwood lumber sold in Alaska's retail outlets and home care centers is purchased from sources in the continental United States. Researchers at the Wood Utilization Center are evaluating the retail market potential for selling locally produced Alaska birch lumber into local markets, including home centers and building supply outlets. The study is designed to evaluate the potential of hardwood lumber produced in Alaska for a variety of end uses. Although the focus of the study is on random width and random length paper birch lumber for retail sale, the market for secondary manufacturers, including cabinetmakers and other craft facilities, will also be considered. In recent years several hardwood sawmills have purchased dry kilns and have started lumber drying programs. There appears to be strong potential for selling paper birch in local retail markets if the lumber can be kiln-dried to consistent quality standards. The geographic focus of the study covers the major paper birch regions of Alaska, including the Anchorage bowl, the Mat-Su Valley region near Anchorage, the Kenai Peninsula region, and the Fairbanks region. For more information about this study, please contact Dave Nicholls at (907) 747-4312 or e-mail [dlnicholls@fs.fed.us](mailto:dlnicholls@fs.fed.us).

For more information about any of these projects, contact the Alaska Wood Utilization R&D Center at (907) 747-4309.

## **TRADING POST**

*To place an ad in The Trading Post, mail, e-mail or fax the information to me in Sitka. Please do not attempt to submit ads over the telephone. Only items of interest to the wood products community will be published. Please include your name, mailing address and telephone number. E-mail addresses are optional. Ads will be run for one issue of AWPB per submission.*

*The Juneau Economic Development Council is not responsible for the accuracy of advertisements appearing in the Alaska Wood Products Bulletin. Such ads do not imply any endorsement of any products, item, service, individual or company.*

**Lumber Grading Services:** Thanks to a special arrangement between the Alaska Science and Technology Foundation (ASTF) and the Western Wood Products Association (WWPA), Alaska has its very own resident lumber inspector, Mike McGuigan. If you join WWPA, Mike will visit your mill once a month to provide lumber grading training to you or your lumber grader(s), and will work with you to help you earn grade-stamping privileges. If your production levels don't justify membership in WWPA, Mike is available on a per diem basis to provide lumber grading instruction or to grade lumber for special needs or projects on an as-needs basis. Mike lives in Eagle River, but serves the entire state. He can be reached at 694-3544.

**Lumber Drying / Kiln Operators Workshop.** We would like to offer a second LD/KO Workshop, patterned after the very successful and instructional workshop held in December 1998. Anyone interested in attending this workshop should contact Dan Parrent at 747-5688 or [dparrent@ptialaska.net](mailto:dparrent@ptialaska.net).

**Wood and fish waste composting workshops** A forest products workshop designed to explore a value-added opportunity for the wood and fish waste industries of Alaska is scheduled for April 2001. The session will feature researchers, local business owners, and other professionals in the fields of wood composting and fish wastes. Presentation topics are composting methods, marketing opportunities for local producers, and new and emerging composting technologies. The workshop, Wood & Fish Composting: Small Industry Waste Management in Alaska, is scheduled for Ketchikan, April 9 and Anchorage April 11. Sponsors include the Cooperative Extension Service, University of Alaska Fairbanks; Cooperative State Research Education and Extension Service, USDA; and the Alaska Wood Utilization Research and Development Center, Pacific Northwest Research Station, USDA Forest Service. To learn more about this workshop, call (907) 747-4309 or log on at <http://www.fs.fed.us/pnw>

**Interior Alaska Forest Products Conference** A conference focusing on Interior Alaska Forest Products has been scheduled in Fairbanks on May 7-9, 2001, at the Chena River Convention Center. Planned topic areas for the conference include Alaska resources and markets, wood manufacturing and processing technologies, and log harvesting. Decision-making in sawmilling, lumber drying and marketing will also be addressed. For more information about the conference please contact Dr. Bob Wheeler or Amy Simpson at (907) 474-6356 or 474-6363.

**For Sale: Dry Kiln(s) and 4-sided planer.** Contact Bernie Brown at Alaska Spruce Products in Anchor Point at 252-6742 for more information.

**The 16<sup>th</sup> Annual WMI Workshop on Design, Operation, and Maintenance of Circular and Band Saws** will be held March 12-13 in Portland, OR. This workshop is sponsored by the Wood Machining Institute. For more information, contact Dr. R. Szymani at 925-943-5240, or by e-mail ([szymani@woodmachining.com](mailto:szymani@woodmachining.com)).

**The 29<sup>th</sup> Annual Wood Technology Clinic and Show** is scheduled for March 14-16, 2001 at the Oregon Convention Center in Portland. The show features over 30 educational sessions presented by leading industry experts and the largest exposition of state of the art sawmilling equipment on the West Coast. For more information call 800-789.2223 or log on to [www.woodwideweb.com](http://www.woodwideweb.com).

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**Export Publications Online**—The Forest and Fishery Products Division of the USDA Foreign Agriculture Service (FAS) publishes quarterly circulars that offer a comprehensive overview of the world supply and demand situation for wood products. These circulars include extensive data tables of U.S. exports of logs, lumber, plywood, veneer, and a variety of other solid wood products, as well as species data for some products, articles, and trade highlights. The *Third Quarter Trade Edition* is now available online at [www.fas.usda.gov/ffpd/forestcirculars.htm](http://www.fas.usda.gov/ffpd/forestcirculars.htm). Also available at this address is the *Trade Policy Edition*, which is published every 2 years and features tariff information and recent policy developments for the top 10 U.S. markets. In addition, FAS publishes a monthly magazine, *AgExporter*, which is posted at [www.fas.usda.gov/info/agexporter/agexport.html](http://www.fas.usda.gov/info/agexporter/agexport.html). The January issue is dedicated to U.S. wood products. To obtain a hard copy of *AgExporter*, send an e-mail message containing your name and complete mailing address to Rachel Hodgetts at [hodgettsr@fas.usda.gov](mailto:hodgettsr@fas.usda.gov). [Source: Susan Odell, Cooperative Forestry Staff, Washington, DC]

**Interested in High-Value Uses for Small-Diameter Timber?** The Center for Resourceful Building Technology web site ([www.crbt.org/](http://www.crbt.org/)) has several publications available on using small-diameter timber as a building material including:

- *Small-Diameter Timber and Western Montana Sawmills*—A report on personal interviews with operators of western Montana timber and wood products companies about their capacity to handle small-diameter timber and their interest in increasing the utilization of small-diameter timber in building products manufacture.
- *Building Products From Small-Diameter Timber*—A report on research and demonstration of building products and systems using small-diameter timber, with hotlinks to sources of further information worldwide.
- *Technologies for Effective Use of Small-Diameter Timber*—A report on a variety of log-processing equipment specifically designed for small-diameter timber, with hotlinks to manufacturer web sites.
- *Additional Resources Relating to Small-Diameter Timber*—A PDF document with hotlinks to organizations and documents on sustainable forest management, small-diameter timber use, product demonstration, and wood products market studies.

CRBT is a project of the National Center for Appropriate Technology, a nonprofit organization with programs in sustainable agriculture, rural development, renewable energy, and low-income housing. CRBT promotes resource efficiency in building design, materials selection, and construction practices through research, education, and demonstration. Along with research on small-diameter timbers (a project funded by a Rural Community Assistance grant from the USDA Forest Service), CRBT's web site has resources dealing with construction and demolition waste, bio-based building materials, and post-consumer glass in construction.

**The Small-Diameter Round Timber Demonstration Structure Techline** describes the construction of a covered picnic shelter at the Forest Products Laboratory (FPL) in Madison, WI. The average diameter of the round timbers is approximately 8 in., but the structure can be designed to use material as small as 4 in. in diameter. The structure showcases various engineering approaches that could be used in a roundwood structure, such as different connection and roof systems. The structure is for demonstration; no building in actual use would incorporate all the engineering design elements being evaluated. A limited number of copies of this Techline are available from FPL's Information Services: Tel: 608-231-9200, Fax: 608-231-9592, or e-mail: [mailroom\\_forest\\_products\\_laboratory@fs.fed.us](mailto:mailroom_forest_products_laboratory@fs.fed.us). A copy is also available via the FPL web site ([www.fpl.fs.fed.us/documnts/techline/VI-17.pdf](http://www.fpl.fs.fed.us/documnts/techline/VI-17.pdf)). For more information on small-diameter and underutilized species, contact Sue LeVan-Green, Program Manager, Technology Marketing Unit, by phone (608-231-9518), fax (608-231-9592), or e-mail ([slevan@fs.fed.us](mailto:slevan@fs.fed.us)).



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