

FIREWOOD PALLETS

Pallets can reduce handling in a firewood operation, which speeds production and makes the work easier. Pallets can fit into both small- and large-scale operations.

Here in Vermont we note the many times heating with firewood warms you: when you harvest the trees, when you cut the logs to firewood length, when you split the chunks, when you stack the pieces, when you carry firewood to the stove, and lastly, when you burn it! Heating with firewood is a labor-intensive activity.

There are a variety of ways to make firewood, from a hand saw and a splitting maul, to a chain saw and hydraulic splitter, to a processor where logs go in one end and split firewood comes out the other. Once the split firewood is produced, reducing the number of times each piece needs to be handled can speed the operation and make the work easier.

THE ADVANTAGE OF PALLETS

The advantage to placing firewood on pallets is that a large amount of split wood can be handled at once by a machine, rather than having

single handling. Full pallets were then transported to the storage shed for drying using forks on the resort's skid steer loader. Whenever firewood was needed at a building, the skid steer loader was used to deliver a full pallet and pick up the empty pallet.

On a far smaller scale, I use pallets for handling the firewood I use to heat my home. The firewood is stacked directly onto the pallets from the wood splitter. A two person operation works great: One person operates the splitter, and the other stacks the split pieces directly onto a pallet. When the pallet is full, I move it to a convenient place for drying and storage using forks on the front-end loader on my tractor. When I need firewood, I again use the tractor to move a pallet conveniently to my home.

PALLET DESIGN

Many different designs can be used for firewood pallets. Good ones have these characteristics:

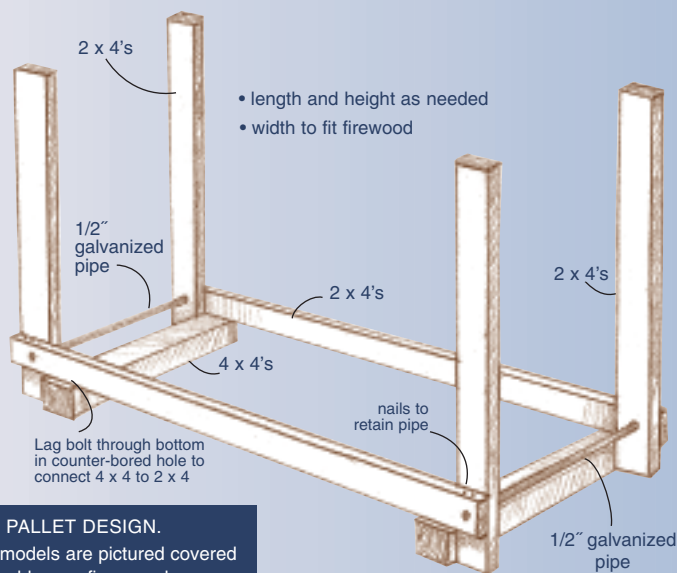
dimensions of 7 feet long, 4 feet high, and 1 1/2 feet wide, but I was concerned that such a pallet would be fairly tippy, and that I might lose some wood when I moved it. I therefore decided to make my pallets double wide, so they would hold two rows of 18-inch wood. Thus the pallet would be 3 feet wide and much more stable, and need a "face" of about 14 square feet. I settled on interior dimensions of 4-1/2 feet wide and 3 feet high.

PALLET COSTS

There are two costs that you need to consider: the materials and the labor to make the pallets.

The materials needed to make each of the pallets I made for my own firewood include 6 feet of 4-inch x 4-inch and 50 feet of 2-inch x 4-inch lumber, for a total of 41.3 board feet of lumber. I also used 6 feet of nominal 1/2-inch galvanized water pipe (actual outside diameter about 7/8 inch), 8 lag bolts 3/8-inch diameter by 5 inches long, and a few nails. Assuming retail values of \$0.70 per board foot for the lumber, \$1.40 per foot for the pipe, and \$0.33 per lag bolt, the retail value of the materials comes to about \$40 per pallet. My actual out-of-pocket cost was much less, as I milled my own wood and had some used water pipe available; my out-of-pocket cost was about \$10 per pallet.

I set up a mini assembly line to make my pallets. Once all the wood pieces were cut, I used templates to locate all the holes that needed to be drilled, which eliminated the need to measure each



FIREWOOD PALLET DESIGN.
Author's double-wide models are pictured covered by 0.060-inch thick rubber roofing membrane.

to handle the pieces individually by hand. If, for instance, the firewood is stacked on a pallet as it comes off a hydraulic splitter, it is handled just once in getting it stacked. The whole pallet load can then be moved to where the wood is needed.

Contrast this with an operation where the firewood is thrown into a truck or trailer as it comes off the splitter, driven to where the wood will be stacked, and then unloaded from the vehicle and stacked. This will involve two or more handlings of each piece (both loading and unloading the vehicle, and some of the wood may need to be handled twice to get it off the truck or trailer—once to move it to the back, and again to move it to the stack). Also note the greater effort it takes to throw the pieces onto the vehicle compared to setting them on a pallet. There is also the likelihood that many pieces will need to be carried several steps to where they will be stacked.

Clearly, eliminating the extra handling, the need to toss pieces of wood onto the truck or trailer, and extra steps speeds up the work and makes it physically easier.

PALLET SYSTEMS

My first experience with pallets for firewood came when I needed to design a firewood handling system for a resort. This resort used about 100 cords per year in fireplaces in a bunch of different buildings. The firewood needed to be dried, and then the dry wood needed to be distributed to the buildings. A system where incoming wood is stacked to dry, then loaded onto a trailer, and driven to the various locations, and then restacked at those locations would be very labor intensive: three handlings would be needed, and the resort would be paying the staff each time. There had to be a better way.

Pallets for the firewood proved to be a tremendous labor saver. The pallets were brought to the firewood where it was dumped by the delivery truck, saving steps. The wood was stacked directly onto the pallets, which entailed a

- They are sturdy.
- They securely hold the firewood, so it won't fall off when the pallet is moved.
- Loading and unloading is easy.
- They are sized for the equipment that will move them.

The design concept I settled on for the resort is shown in the drawing above. In addition to the characteristics noted above, I designed these pallets so that the sides fold down for storage. The design was easy for the resort's staff to construct on rainy days when other work was slow. The pallets are very easy for two people to move, as the steel pipe makes for a convenient handle on each end. When folded, a stack of pallets can be efficiently moved with forks.

“ Eliminating the extra handling, the need to toss pieces of wood onto the truck or trailer, and extra steps speeds up the work and makes it physically easier. ”

Weight is an important consideration when sizing pallets. Firewood, especially green firewood, is heavy, and it is important to size the pallet so that the available equipment can safely move it. A full cord (128 cubic feet of wood, bark and air) weighs 4,500 to 5,500 pounds when green, depending on the wood's species and how densely it is stacked. By knowing the lifting capacity of the machine that will move the pallets, you are able to calculate how many cubic feet of firewood to design the pallet to hold.

For instance, the loader on my tractor is capable of handling 2,000 pounds. I decided to design my firewood pallets to hold about one-third of a cord, so that I would have a good load each trip (1,500 to 1,850 pounds when green) and yet be comfortably within the capabilities of my tractor. One-third of a cord would take up a volume of about 42 cubic feet. My woodstove burns 18-inch (1 1/2 foot)- long wood, so the pallet would need a "face" area of 28 square feet (42 cubic feet divided by 1 1/2 feet). I considered a pallet with internal

hole location. I predrilled most of the holes with a drill press. I used a heavy duty 1/2-inch electric drill to turn the lag bolts (an air wrench would have worked just as well). All told, it took just over half an hour to build each pallet.

I should note that it is possible to make much lower cost firewood pallets. For instance, used shipping pallets are often available for free. Using three such pallets (one for the bottom and one for each end), some 1 x 4 strapping and nails, one could quickly make a serviceable firewood pallet for very little cost.

Are firewood pallets worth the time and cost to make? The answer depends on the value one puts on time. If handling firewood is seen as recreation and exercise,

the answer is clearly no: You'd be decreasing a desired activity!

If you look at time spent handling firewood as time away from other activities, the answer depends on how much time would be saved and the value of that time. In my case, I estimate that each pallet saves me an hour of handling time each year. If I value firewood handling time at \$20 per hour and paid retail value for the materials in each pallet (\$40), then my investment is roughly \$50 per pallet. My payback period would be about 2 1/2 years (\$50 divided by \$20/year saved), which I consider very good. Since I milled my own lumber and scrounged the pipe, my payback period was much shorter.

Do firewood pallets make sense for you? The answer depends on how much time they could save, the needed investment in pallets, how you value your time, and how much you like handling firewood.

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