THE DRY KILN --- LUMBER’S VALUE-ADDING TOOL FOR THE 90s

Thomas R. Hanneman, Assistant Chief
Lumber Inspector
Western Wood Products Association
Portland, OR

It was just two years ago that we were asked to come to Reno and share with
you our observations about kiln drying and its relationships to markets and
marketing. Two years is not a lot of time, so you might expect things today to be
pretty much as they were in 1990. To a degree, that is true. But let’s face the twin
realities that we are in a dynamic industry operating in a dynamic world where
change is a constant. In that light, a great deal can happen in a 24-month period.
And it has. Much of it can affect you and your profession. And much of it will
look to the dry kiln as a vital tool for adding value to lumber products right on into
the next century.

So here is what we’ll cover today. Many of you are here from mills where our
Association has the privilege of providing quality standards services. Please bear
with me while I take a short moment to explain to others what WWPA is and does.
Next we’ll review timber supply, lumber markets and environmental developments,
their impacts on our raw materials and products, and where the kiln-drying function
fits into the picture. Finally, we want to share with you once again some of the
market economics of kiln processed products. We ventured into that field the last
time out, and many of you told us it was especially interesting.

WWPA

The Western Wood Products Association is comprised of lumber manufac-
turers operating in the 12-state Western Woods Region. It supervises grading for
mills producing about 10 billion board feet of standard lumber products annually.
WWPA also conducts a broad range of marketing activities both in the United
States and abroad. That includes market development programs and a staff of
professional field representatives trained to service the product directly in the
marketplace.

These relationships with the marketplace are unique to WWPA among all
lumber quality control agencies in America, and provide experience with products
and their performance that are the basis for some of the observations we will be
sharing with you here. Also, WWPA happens to be the primary center for the
gathering of statistical information about the Western Lumber industry and its
products. In doing so, it also makes economic forecasts of lumber use.

TIMBER SUPPLY

Surely everyone in this room is aware of the pressures on timber supply
plaguing the forest products industry at this time. We won’t spend time here on
the cause, but the effect will be a consideration for you responsible for lumber
seasoning and quality control. Let me cite just one example that is occurring
because the resource mix is changing: Where once we had an appreciable volume of large trees in our raw material inventory, today we have an entirely different timber supply. That is NOT because the trees are not there, because they are. Rather, it is because great areas of perfectly harvestable forest have been withdrawn as timber-for-products and set aside permanently -- not all of them truly reasonable. So an important share of our raw material supply was once larger, old-growth type trees, today it is composed mostly of second growth trees averaging much smaller diameters.

That average tree is apt to get even smaller. One of the consequences is that a larger proportion of lumber to be manufactured from each of those more numerous smaller logs will be sawn from heart-center wood. This material tends to be less stable than lumber sawn from portions of the log farther from the log center. In seasoning, pith and heart center stock will tend to suffer a heavier incidence of degrade, posing real challenges to your kilning expertise. But, of course, minimizing degrade adds real value to the products your mill makes. And that is what it is all about.

MARKET ECONOMICS

As with timber supplies, there are changes afoot in the marketplace, too. Let's take housing as an example. In 1990, we reported the average lumber volume used per single family house built in the United States was 13,000 board feet. In 1992, that volume has increased to 14,350 board feet. Housing starts in this country, after hitting last year's lowest ebb since World War II, are expected to reach 1.2 million this year.

As big as this is for Western Lumber, the housing market is hardly bigger than the repair/remodel market. And there are strong implications for kiln dried products in that comparison. For one thing, professional remodelers must do their work right in front of homeowners, who are very picky about what they perceive as the quality of the lumber being installed in their homes. Kiln-dried material almost always looks better to consumers. So remodeling contractors prefer to use it. The remodeling process often requires adding new lumber side-by-side with old lumber. The older stock is already seasoned, whether through formal drying procedures or while standing in place over time. For the integrity of the new construction, the new lumber must also be seasoned. Another bit of value added by the dry kiln. Another example: do-it-yourselfers pick their own lumber at the retail yard, and they choose only the best. Retailers will tell you that kiln dried stock simply "yards" better, which means fewer "cats and dogs" in the lumber bins at the end of the day. Once again, the kiln adds value to lumber products.

In international markets, new kiln-drying challenges are on the horizon. Already you know that seasoned lumber stays brighter longer when exported to overseas markets. Kiln drying can help keep stain problems under control. But here is something new: kiln drying techniques are the basis for a newly-developed pasteurizing heat treatment intended to keep Western U.S. lumber markets open in Europe. The treatment should eliminate any possibilities of exporting the North American pinewood nematode to member countries of the European Community.

For nematode control, studies show that holding core wood temperatures to about 56° C for 30 minutes will kill these damaging organisms in that wood. Over the years, that particular market has wanted unseasoned stock from U.S. manufacturers. Air-dry seasoning techniques have been used by many European
importers to assure the highest possible recovery from stock purchased from U.S. sources at unseasoned prices. E.C. law now requires all North American lumber imports to be kiln dried to below 20 percent moisture content, assuming that process would deliver the right heat for the right length of time. Until the end of this year, however, certified bark-and-grub-hole-free green lumber still is being admitted into the E.C. as an interim alternative while the practical substitute for kiln drying is being developed. The E.C. is expected to announce official approval of the new pasteurization procedure next month.

Although regular steam kilns can be used for most of the pasteurization, special facilities or steam-chamber modifications of existing dry kilns may be needed. Superior dry kiln professional skill will be necessary to assure the highest possible levels of lumber quality control in the process. That will allow pasteurized green lumber --- stock that otherwise would be banned throughout Western Europe --- to land in all major European markets.

Despite this pasteurization development, there is a growing trend in Europe and export markets worldwide for kiln dried products. In fact, during this past year our Association introduced a "Certificate of Kiln Drying", issued under a program officially approved by the Animal and Plant Health Inspection Service of the U.S. Department of Agriculture. It certifies the products covered have been kiln dried, specifically. And that all parts of the wood have reached a temperature of at least 71°C --- that is 160°F --- and the moisture content is less than 20 percent. So it is evident that as time goes on, either for full-seasoning or pasteurization, the dry kiln will be adding more value than ever to more of the basic lumber export product.

At WWPA, the quality control responsibility is to the standard grading rules we publish in this book (the grading rules). These are definitive and comprehensive. Normally, they are referenced in lumber sales agreements and become a binding part of sales contracts covering billions of board feet of lumber traded each year. When our inspectors check grades at each mill, we also sample seasoned stock that is ready for shipment. We must confirm that material is within moisture levels specified on the grade stamp it carries. We use our own metering equipment, and with all other inspection data gathered for each mill, document the results for the records at the Portland headquarters.

For anyone here not familiar with the system, let me take a quick moment for review. In dimension lumber, an S-Dry designation means the material was 19 percent or less in moisture content at the time of surfacing. On Selects, Factory and Shop and Decking grades, the "MC-15" on a grade stamp--- or, more likely, on an official inspection certificate --- that warrants a moisture content of 15-percent or less at the time of surfacing.

On rare occasions during mill inspections --- and it does happen --- we find gradestamped stock that exceeds the moisture level specified on the stamp. Usually, before it can be shipped, stock at the mill stamped as dry but found instead to be wet, must be restamped as "green", with the net size indicated. Or it can be shipped with no stamp on it simply by obliterating the original stamp. But the costs and inconveniences that can result from all of this make it wise to follow the correct process, from beginning to end, according to "the book."

Sometimes an official grading agency reinspection in the marketplace is triggered by a moisture content challenge. This is a formal procedure whereby an inspector's examination determines a contested moisture status. Usually this is conducted at the customer's location, which today might be anywhere in the world. If the mill is at fault, a reinspection can prove costly. Just a couple of decades ago,
it was common to see literally hundreds of re-inspections called every year by your mill customers. But since the early 1970s, all of that has changed due to a growing understanding and sophistication in quality standards both at the mill and in the marketplace. In fact, this past year, WWPA inspectors were asked to conduct only 52 re-inspections of all kinds. Mills won 22 of these. By the way, of these, nine were called due to moisture content questions. The mills lost every one.

Keeping your mill out of such re-inspections is the other side of adding value... it is value preservation. And that leads to other realities of seasoning economics: WWPA does not list seasoning per se among its responsibilities. You guys are the real experts here. But sometimes we are asked to analyze mill procedures to identify critical areas of impact upon return and profitability. Over the course of many of these, we see lumber kinked and warped due to such careless drying practices as mis-aligned kiln carts, stickers and pile bottoms. It doesn’t take much of this to start costing a lot of money. One missing sticker can affect not only the course of boards immediately above it, but maybe a half dozen more courses above that. Bad cart stringers or bunks can warp bottom courses of entire lumber packages. Bad placement on pile bottoms visibly eats into the mill’s bottom line.

Ever wonder how much these problems cost? Well, in March this year, the average price of 8-inch No. 2 Common 4/4 Ponderosa Pine was $463 per thousand board feet. Had those several courses of boards dropped one grade to No. 3 Common, they would have been worth only $285 per thousand. That would have incurred a loss of $178 per thousand. But, unfortunately, some physical mishandling like that generates fall-down across not just one, but two grades. And since No. 4 Common Ponderosa Pine was only $203 in March, that would result in a disastrous loss of $260 per thousand board feet.

Excessively high temperatures can inflict other damage... seasoning checks, honeycombing, case-hardening and end splits. Overdrying to bring the moisture content average down can result in unnecessary knot fall-out, bow, twist, cup, warp and discoloration. It can cause excessive shrinkage in the stock, and that can result in skip in surfacing. Any one of these can affect the quality of pieces throughout the charge. Enough so to warrant dropping it at least to the next lower grade.

Let me put that into dollar-and-sense language for you. In March, the average price of Standard-and-Better Douglas Fir 2x4 was $307 per thousand board feet. That portion of your kiln charge that is knocked down just one grade, to Utility, suffers a price drop to $202. That is a loss of $105 per thousand. Another example: in March, 2 & Btr Hem-Fir 2x10 averaged $368 per thousand. If your drying process were to knock a portion down to No. 3, its value decreases accordingly to $204 per thousand... a decline of $164. Here is an example in Shop. The March average for bright 5/4 Sugar Pine No. 2 Shop was $861. Stock dropped by a single grade into No. 3 Shop was valued at $713. That is a $148 loss. But if the degrade instead had resulted in Stained Shop, priced in March at $677, the loss differential would have been $184 per thousand. All of that confirms what I suspect most of you already know... that in our business, lumber drying management is an important form of money management.

There are underlying, flagging questions about the price-return benefits kiln drying provides mills. Do kiln-dried products earn their way in the marketplace? Do they give the mill the returns on its investment needed to make going the extra seasoning mile all that worthwhile? The answers: a definite yes on some products, but not so definite on others. It depends upon species, and upon each mill’s operating costs, including its ability to meet energy requirements economically.
And it depends upon whether or not the mill has already invested in kiln-dry facilities. For instance, even in the 1990s, green Douglas-fir dimension continues to have a strong market following. But significant dry lumber volumes in that species are also sought. That does not make drying Douglas-fir as attractive as it could be otherwise. For example, based upon 1991 prices for Douglas-fir, kiln dried stock returned and an average of about $30 per thousand more than did green Douglas-fir lumber. But studies show mill kiln-drying costs were about $5 higher, not including additional costs incurred from degrade and trim. So, at this time in history, on a dollar basis, drying Douglas-fir probably remains no better than a break-even operation. But don't expect that to stay that way.

Hem-Fir is another story. There is not a broad-based market for green Hem-Fir. But the dry product has a great following, including in such sophisticated and demanding offshore markets as Japan. Last year dry Hem-Fir averaged $50 higher price than green Hem-Fir. Subtracting actual kiln drying costs (except trim and degrade) reveals a net benefit of more than $15 per thousand board feet. The expectations from producing kiln dried lumber will vary from mill to mill depending upon each mill's historical investment timing in kiln facilities. Mills with mature equipment investments would need consider only actual kiln operating costs. Mills requiring the purchase of new kiln capacity would have to factor in the extra costs of that additional investment.

In 1990, well over half of all Western Lumber was shipped from the mill in a seasoned state, by far the bulk of it kiln-dried. Only one-fourth of the sawmill production in the Pacific Northwest coastal producing region is being kiln-dried. Lumber economists, however, are looking for that to change at an accelerating pace through the rest of this century. In the Inland West, including all of California, unseasoned stock is an endangered species. Almost 85 percent is seasoned.

In the West as a whole in 1990, almost 12 billion board feet of production was shipped seasoned, most of it kiln-dried. That green-to-dry ratio is expected to tilt ever more heavily to the dry as we march into the next century. That is because of the growing worldwide preference for both the real and perceived qualities inherent in the seasoned lumber product. And, also, because of the recognition both in your mills and in the marketplace that your dry kilns are, indeed, lumber's value-adding tools for the 90s.

One last comment. These are troubling times for people like ourselves who work in this great industry that happens to depend upon using the forest in its business. Everywhere, there are those both outside our communities and in who would challenge us personally for our roles in the making of products from trees that must be cut down. These attacks can be vicious. And they can be persistent enough that we may develop self-doubts about the moral validity of the very jobs we hold.

Well, we can clear that up right now. At this particular time in history, there surely is nothing wrong with society taking a close look at the environmental impacts of civilization. And certainly most all of us would agree that the Western Forest is a critical component in the make-up of our environment. In that light, please take note of these facts:

The environmental extremist would prefer the world would believe otherwise, but the trees that comprise the raw materials for our products come from forests clearly on track to generate sustained yield endlessly into the future.
Just here in the West alone, each year more than 400 million trees are planted manually in our commercial forests. That will be 100 trees for every baby born in America this year.

Even though only half of our great Western forest is allowed to produce for the critical needs of people, it still is big enough to grow all the wood needed to house more than a 1-1/2 million new families each year, year after year, endlessly into the future.

Lumber is the only major building product in the world that comes from a renewable resource.

Wood is unique among building products in that it can simultaneously be both durable and biodegradable.

Among all the world's building products, lumber --- by far --- has the lowest energy requirements in its manufacture.

Indeed, our lumber products are the only ones among the major building materials on this planet that come from a natural resource which can be perpetuated both for products and the environment. In short, you can take great pride in this environmental age that you are working in one of the most environmentally positive industries available to serve modern civilization. When it comes to adding value in the 1990s, our role in balancing human needs with the environment may be the best value of them all.