

<p style="text-align: center;"><b>Bar Coding for Inventory Management: Softwood Lumber Manufacturers Gain A Competitive Edge</b></p>
--

**Working Paper # 14**

Richard Vlosky  
Assistant Professor  
Forest Products Marketing

Louisiana Forest Products Laboratory  
Louisiana State University  
Baton, Rouge, LA 70803

(504) 388-4527 (phone)  
(504) 388-4251 (fax)

April 4, 1996

**Introduction**

Bar codes are increasingly being used in the wood products industry at the unit or package level as either part of computer based inventory systems or to coordinate product flow to customers. Although there has been much written about retail home centers mandating UPC bar coding at the piece level for point-of-sale scanning, benefits of bar coding for inventory tracking and control exist for any company in any industry independent of piece labeling requirements.

There are two main uses of bar codes in inventory management. The first is in work-in-process inventories which can help wood products producers to calculate recoveries very accurately and in establishing real time finished and rough inventory tracking and control. Used in conjunction with electronic data interchange (EDI), the electronic transmission of business documents in standard formats, bar coding allows buyers and sellers to communicate efficiently regarding business transactions. The integration of EDI and bar coding for marketing channel efficiency improvement is often referred to as quick response or QR in the retail industry or

efficient consumer response (ECR) in the grocery industry. QR with suppliers, a corporate goal of many home center chains, will become a common practice in the future.

Although wood products suppliers are typically reactive to business competitive pressures to implement technology like bar coding, a number of companies are developing technologies and procedures that can dramatically improve their competitiveness and efficiency.

### **Bar Coding for Inventory Management & Control**

Bar code based data collection is an accurate and cost effective method of automating the identification and management of shipping units. Information contained on the unit level bar coded products may be used for internal inventory management or be communicated to customers as part of a joint inventory strategy. In inventory applications, bar codes are found on tags attached to units of lumber, plywood, and other wood products. This is an important distinction from a different bar code symbol, the Universal Product Code (UPC), which is used on individual boards, panels or other products destined for retail point-of-sale scanning customers.

The most prevalent bar code symbols used for unit level inventory management and in the wood products industry are the UCC 128, Interleaved 2 of 5 and Code 3 of 9. Bar codes generally do not contain information themselves, but rather are analogous to vehicle license plates in that they are unique and can be linked to unlimited information relating to products contained in the package or unit to which the bar code label is affixed. Information linked to wood product bar codes may include producer, manufacturing location, date of shipment, species, length, grade, moisture content, piece count, etc.

The information for every bar coded unit produced is maintained electronically and may be used to support a computer based internal inventory system, communicate inventory or shipping information to exchange partners in distribution channels, or both.

As inferred, electronically based internal inventory tracking and control systems may be developed independently from tracking product flows between exchange partners. There are two main uses of bar codes for internal inventory management. The first is in work-in-process inventories which can assist wood products producers with recovery rate calculations and the second is to establish "real time" finished and rough inventory tracking and control. Bar codes in conjunction with electronic communication technologies, such as electronic data interchange, electronic mail or data transfer are integral components of joint inventory management between channel partners.

### **The Study**

In Spring of 1995, the top 100 softwood lumber manufacturers (by 1994 production volume) in North America were surveyed with regard to their current and planned implementation of bar code based inventory management systems. Forty companies with 172 manufacturing locations across the United States and Canada responded to the survey (Figures 1 & 2). Figure 3, the distribution of production volume for the 36 companies that responded to this question, shows that over two-thirds of respondents had production in 1994 of 500 MMBF or less.

Over 75 percent of respondents either had bar code based inventory capabilities in 1995 or planned to in the next four years (Figure 4) and as seen in Figure 5, most companies began bar coding since 1994.

The primary reason for respondent companies to develop bar code based inventory systems is to manage internal finished goods inventory. Other reasons, in ranked order include communicating inventory information to customers for better product flow management, internal work-in-process inventory management and the desire to improve on-time shipment capabilities to promote better customer service (Figure 6).

The cost of a bar code inventory system can vary widely depending on the number of sites or mills to be linked. The level of integration with current business systems and functions can also impact the cost. Figure 7 shows the systems that are linked to the bar code inventory system for respondent companies. All respondents inventory systems were linked to shipping which, in turn, generated shipping documentation and tracked shipped orders. Nearly two-thirds of bar coding respondents had order-entry systems directly linked to inventory. This allows for immediate viewing of the inventory position and lets the sales person know exactly what is available to sell at any point in time. A number of other business functions are being facilitated by bar coding by respondents including production planning, traffic management, accounting and marketing analysis.

Figure 8 shows a post-installation audit of levels of satisfaction for different aspects of respondent bar code systems. On a 5-point scale of 1=very unsatisfied to 5=very satisfied, respondents are content with the management usefulness of having a bar code based system (3.7) and their software provider (3.5). Satisfaction with the remaining attributes are somewhat lower (3.3 or less). Surprisingly, although cost reduction is one of the touted benefits of a bar code based system, respondents were neutral in their satisfaction that a cost reduction was achieved.

## **Summary**

Bar coding for inventory management and control is but one of many competitive technologies that can facilitate business practices. Although implementation of bar code based systems in the softwood lumber industry is in the early stages, interest is increasing. The companies that develop a vision and a cohesive technology based business strategy will significantly strengthen their competitive position.