

by DR SUN J CHANG

# Faster Delivery and Flexible Manufacturing

In this issue, The Business Mind looks at the importance of flexible production and the potential benefits that manufacturers can gain.

So far, I have discussed the importance of having a better product at a lower cost. This column will deal with the third element of what a manufacturer is supposed to do – faster delivery. I will focus on reducing the machine setup time to achieve flexible manufacturing.

## Diversity and speed in manufacturing

I once visited a printing and writing paper mill in the United States. Like most American paper mills, this mill produces American-sized paper. In this case it is 8.5" x 11" letter size paper, 6 mm wider and 18 mm shorter than the A4 size paper.

Thinking that the mill would benefit from a more diversified customer base, I asked my host if they would be interested in producing A4 size paper. The host responded that they would love to but the order must be large enough for them to stop the production and spend one full day to set up the equipment to cut A4 size paper.

Alternatively, the client must wait while they accumulate a sizable backlog to justify production stoppage and machine set-up time. Since the oversea importers are not interested in placing a huge order at least initially, it means that they will have to wait a long time before taking delivery of what they order.

The mill, unable to deliver quickly, never received the order. A similar problem, the long delay

in fulfilling a particular furniture order, plagued the American furniture industry. Over the last decade, the industry got hammered by their Chinese counter part, resulting in hundreds of mill closures and tens of thousands of employees losing their jobs.

## Flexible manufacturing

In order to achieve faster delivery, a producer must pursue flexible manufacturing. To accomplish this, a producer must master

the art and science of reducing the machine setup time. As Shigeo Shingo, the guru of machine setup time reduction, mentioned in his book, *Single Minute Exchange of Die*,

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that with his help, Toyota reduced the setup time for a 1000-ton stamping press from four hours to less than 90 seconds.

Imagine what a producer can accomplish with flexible manufacturing if a producer can reduce the machine changeover time down to less than a minute. The paper producer in the US would have been able to take the small trial order and deliver quickly.



The American furniture industry would be able to deliver on the furniture ordered in weeks instead of months as I mentioned in my second column on what a producer is supposed to do.

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### A case study

Moreover, I must emphasise that reducing the machine setup time starts with a concept, involves changes in operations, and requires little or no capital investment in many cases. Let me demonstrate with an example. Years ago, when I was a student intern at a

furniture mill, I was frustrated by the amount of time it took to set up an automatic feed turning lathe. Every time we had a new parts order, the machine was stopped for at least a full day to install a new set of blades and adjust them, test produce a few pieces of turning, readjust the blades, measure the new test pieces again, until the turning matches the specifications exactly.

After studying *Single Minute Exchange of Die*, I realised that we failed to make a distinction between internal setups and external setups and wasted our time adjusting the blades on the machine (internal setups) that could have been done externally. We could have bought another shaft, built a simple support frame to hold the model turning and the shaft while adjusting the blades externally without ever stopping the production lathe at all. At the time of change-up, one simply removes the current shaft from the turning lathe and replaces it with the new one. Restart the turning lathe. New turnings with exactly the desired profile will be made because all the adjustments have already been made externally (off line).

Note that the cost involved would have been minimal. The benefits, on the other hand, would have been dramatic. The entire process is all mental, starting with a closer look at the current practices and ending with the realisation that internal setups can be converted into external setups. Once procedures are developed to convert the former into the latter, machine setup times could be dramatically reduced, literally from hours to minutes.

For hardboard, OSB, and particle board producers, if you have a 12' x 24' hard press, you are already way ahead in the game. With such a press, you can produce both 3x6 and 4x8 panels with mini-



mal wastes for both the Japanese and US, markets. Even then, your ability to quickly changeover the saw setup from cutting one to the other remains imperative.

In this hard economic time, every producer is pursuing flexible manufacturing to produce more varieties in small batches. While the strategy is important, it is the basic drills of actual implementation that truly matters. Quick machine changeover represents the basis of flexible manufacturing, which in turn leads to faster delivery. It all starts with converting internal setups into external setups. **PFA**



*Dr. Sun J Chang (picture) is a professor of forest economics and management at the School of Renewable Natural Resources, Louisiana State University Agricultural Center. His interest is in working with primary and secondary manufacturers in the forest products industry in Asia to further strengthen their competitive advantages.*

