



By Eberhard Reyer

# CRITICAL ISSUES

## Ligna+ 2005

New technology developments in wood and panel processing — Part One

Contributing to this report were Lignum Consulting engineers: Michael Brockmann, Georg Frey, Bernard Henneken, Jen Hoppe, and Boris Volland

Weber Sander



**A** team of Lignum Consulting engineers, in cooperation with *Wood Digest*, scanned the Ligna+ Machinery Fair (May 2-6, 2005) in Hannover, Germany for new processing trends and processing technology.

Ligna+ in Hannover was definitely another trend-setting fair for the global woodworking industry. After five action-packed days, this premier international trade fair for the forestry and woodworking industry closed its gates on a very positive note.

According to the fair organizers, more than 100,000 visitors came for a firsthand look at the latest processing developments and innovations.

The visitor turnout from abroad climbed to 43,600. Mainly, the growth in visitor numbers was attributed to increased participation from the United States and Asia.

Visitors from the United States rose by 19 percent to 5,700 (4,800 U.S. visitors in 2003) and Asian attendance shot up by 50 percent to a total of 4,800 visitors from this region.

The following is a sample of the innovations presented at Ligna+ 2005:

### Sanding

**Company:** Weber  
**Machine:** CBF Sanding Aggregate

The CBF system was created to reduce/eliminate oscillating marks on surfaces. To accomplish this, Weber uses an internal lamella belt with narrow, ribbed strips diagonally arranged. The constant changing sanding belt areas come into contact with the workpiece, thus interrupting the wavy marks that typically are the result from individual sand grains. This technology will be very helpful for the manufacturers of conference tables, wall paneling, frames / cross elements, larger surfaces and flooring.

#### Benefits include:

- Avoidance of oscillating marks
- Consistent sanding pattern
- Increased sanding belt operating life
- Reduced sanding belt heat generation
- Great cost advantage compared to the chevron widebelt

### Drilling

With an overall trend for flexibility, drilling machines have become more versatile at increasingly affordable prices. This year **SCM** introduced its flexible feed-through boring machine, **UNIX**, with a compact design that

allows for easy integration in applications like a cabinet assembly line or as a flexible working cell run by one operator with return conveyor. The machine can be equipped with drilling heads from the top and bottom, as well as hardware insertion units. In addition, the work piece can be processed from all sides in one pass and depending on the drilling patterns, an output of six to eight parts per minute can be realized.

**Weeke** presented its first proto-



type of a similar machine called **ABX**. Following the same approach, a part will be processed in one pass. In the near future the industry will see more drilling machines like this.

Weeke also presented their new feed-through drilling machine, **BST750**. This machine is designed for batch production with up to 25 cycles per minute and reduced setup times. For a change of drilling patterns, drilling supports move automatically into a setup position, where the operator changes the drilling blocks or single drill bits. When opening the program, the supports move into position automatically and the pattern is set at CNC precision and ready for production. No fine adjustment necessary.

**IMA** presented a completely new approach for edge drilling — a drilling unit that can be installed on a formatting or edge banding line. The unit keeps up with feed speeds of up to 40 meters per minute and drills in a 32mm grid without having to stop the part.

### Glueless case assembly with ultrasonic energy

**Company:** Titusonic/  
**Ligmatech**  
**Machines:** Ligmatech  
**Drawer Clamp**  
**MPK 300**

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seconds, by means of ultrasonic technology and special plastic components, wood and wood materials can be permanently fastened together or welded, respectively.

This so-called "wood welding technology" forms the basis of the new Titusonic-Ligmatech procedure for the assembly of case components and drawers. The method was developed in close cooperation between Wood-Welding-Technologie S.A., the owner of the patent, and Titus International PLC, the renowned English fittings manufacturer.

The core of this procedure is a specially formed thermoplastic dowel made of synthetics, which is liquefied on its surface on exactly defined areas by ultrasonic energy. This dowel material penetrates into the porous material of the components and bonds them firmly in a matter of seconds.

This procedure can now be converted into practical applications by carcass clamps as manufactured by Ligmatech.

For this purpose, the ultrasonic generator and the sonotrodes were specifically positioned directly at the pressure units.

Compared to the conventional process (glue application on ends and bottoms, dowel insertion, pressing, removal of glue residues and fastening of the back panels), the Titusonic-Ligmatech procedure is considerably faster. Glue application is no longer required, pressing by means of ultrasonics leads to shorter cycle times. The connection is firmer many times over compared to a dowel-based glued connection. As a result, the component part can be processed further right away. The insertion of the back panel outside the car case clamp allows the pressing of the following component part and thus increases the throughput capacity.

Here are the advantages

of the Titusonic-Ligmantech procedure at a glance:

- Lower production costs as a result of a more consistent throughput and the elimination of the gluing and cleaning processes
- Cleaner — no glue required, no mess, no cleaning
- No glue application process

- No drying time
- Quicker — two-second bonding time, approximately five-second press time (up to six times, 80 percent faster than traditional wood dowel connection)
- Four to six press processes per minute
- Stronger — about 30 percent stron-

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ger than traditional connections (back panel can be installed after/outside of clamp)

- Repeatable process, recordable, traceable (quality assurance benefit)
- Just 5 percent of the traditional 3 to 4 tons of pressure needed

- Component part can be removed from press in retangular shape- without the risk of getting warped.

According to the agreement between Titus and the Homag-Group, both companies will sell and market



this new technology. The procedure has already been introduced to some of the major furniture manufacturers in Germany, England and in the United States, who have accepted it enthusiastically as a groundbreaking novelty.

## Lightweight panels support edge technology

Another trend at Ligna+, as well as interzum, was lightweight material with honeycomb core. Several manufacturers presented their way for machining, i.e., honeycomb boards. **IMA** presented an innovative machining line for edgbanding frameless honeycomb material. Up until now, the inconvenience of honeycomb material was the lack of flexibility due to the support frame, which had to be laid out together with the inlay when pressing the boards. Another method applies a 3mm thick support edge, which will be applied prior the decorative edge, and both edges were applied in one line. Their innovation is, that the line can be used for the length as well as the cross edge without a visible support edge from the side.

The rebated supporting edge can be used like a postforming profile for suitable surfaces. A special foaming technology provides a stable basis for the supporting and décor edges — even if the topcoats are extremely thin (HPL or Alum-coat).

## Panel saws

In order to keep up with flexibility needs, machine manufacturers are working on designing machines that are able to cut difficult cutting patterns fast.

We have seen **Giben's "Moving Gripper"** innovation in 2000 (won IWF challengers award), **Holzma's double speed angular systems**. This year we have seen new innovations in automation and optimization software.

For example, the new off-cut management system by **Schelling**, identifies offcut, allocates identification and stores information in database. If pos-

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sible, the operator will be informed to use offcut instead of full-size board.

This impacts yield when using a beam saw in a flexible manifesting environment such as batch-size one production or C-Cell.

**HBV380 robotic** by **HOLZMA** and **Bargstedt**. A combination of beam saw and a portal frame robot.

By feeding sheets from predefined raw material stack with the aid of the newly developed feeder, the cell can work without any operators. The same feeder also stacks the cut-to-size pieces on a designated stacking position. This man-less cutting cell is not a new machine invention but an innovation of combined systems.

**Large batch production**

While most manufacturers are looking for flexible machinery, there is a small percentage of manufacturers with different needs. For those producing with large batches that require high productivity machinery, **Giben** introduced its **"Tetramatic" quadruple-bladed saw** for cutting books of 220mm or up to 310mm upon request. Instead of one large and thick saw blade from the bottom, this machine is designed to cut with two smaller and thinner saw blades — one from the bottom, the other from the top — each with a scoring blade and high capacity

Giben points out that smaller and thinner blades offer a better cutting quality, less vibration and cost less due to smaller motors and longer lasting blades.

**Remote Thickness Setting Gauge**

**Company: Butfering**  
**Item: ME 3000**

**Remote Thickness Setting**

**Process:** The measured thickness value will be transmitted wirelessly to the sanding

machine.

**Benefits include:**

- No typing mistakes (manual setup)
- The sand-off value can be set in the remote and will be deducted automatically when transferred to the machine

- Trouble-free transmitting within the range of 100 meters
- Multiple parts can be manufactured in advanced and saved in order
- No measuring errors with oversized and difficult-to-handle parts, like on regular measuring systems on the machine

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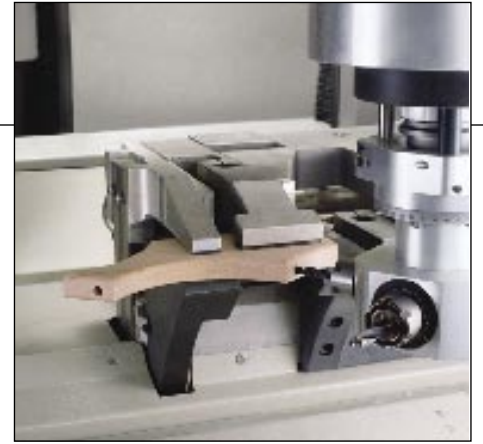
The patented PowerGrip system can handle even the most small and delicate workpieces precisely and without damage. Courtesy of Weinig Group.

- Time saving: the machine adjusts itself right after scanning the part (i.e., while the employee is on the way back to the machine with the part or stack)

**Weinig Conturex Workcenter**  
Weinig showed a new manufactur-

ing technology for complete processing of solid wood components with zero change over time. The **Conturex**, cuts, shapes, drills, profiles solid wood parts on all six sides using a throughfeed principle.

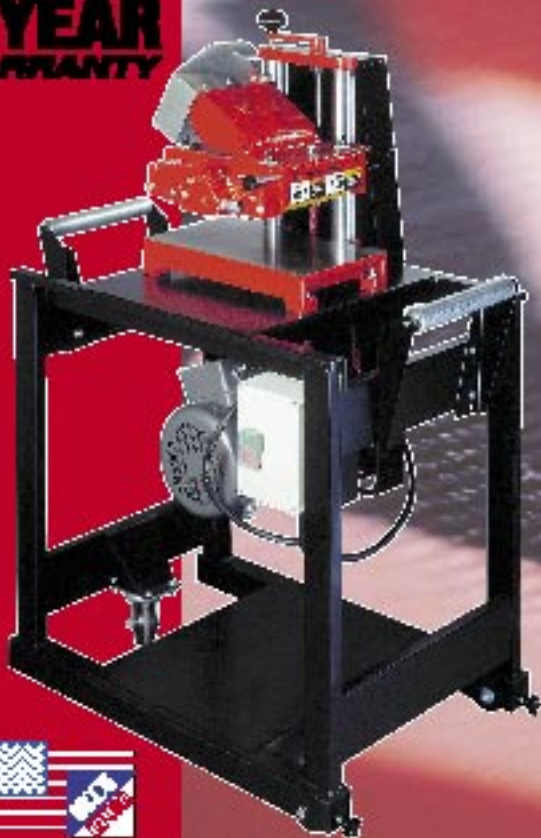
The patented **Weinig PowerGrip** clamping system is a workpiece with



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zero changeover downtime

The PowerGrip clamping system mimics the function of the human hand. Even during the workpiece handover, the PowerGrip ensures precision handling throughout by means of precise yet damage-free clamping of the work piece at the correct point. It yields amazing processing benefits like reliable working on two tables and two processing units — without jigs — yet offers absolute positioning accuracy and therefore maximum quality, even for small parts.

The machine has two processing units and two tool changers. This is valuable because after passing through a first station, a workpiece can be further processed by the second. Meanwhile, Station 1 changes the tool with no loss of processing time.

The Conturex offers major benefits in terms of flexibility and new market segments:

- Complete processing, even of complex workpieces, with two processing units
- Precision workpiece holding with Weinig PowerGrip clamping system
- Processing of small and thin dimensions with zero changeover time
- Simple data transfer
- Just-in-time production
- Highest dimensional accuracy
- Optimum ergonomics and user-friendliness
- Processing in the center of machine feeding and off-loading zone on either side
- Extreme part variations and complex shapes in solid wood
- Workpiece handover from one clamping table to another
- Two processing units work simultaneously in tandem
- Special aggregates process workpieces from below **WD**

More Ligna+ coverage on page 78...

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