

# STRUCTURAL BUILDING COMPONENTS MAGAZINE

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## Technology & the Structural Building Components Industry – a Manufacturer Perspective by Melinda Caldwell

In a recent publication of the National Association of Manufacturers (NAM), Ann Morris observed, "Technology has changed the world of manufacturing, and in turn, the world of manufacturing will change technology."<sup>1</sup> While her comments address the manufacturing sector in general, it is easy to apply her observation to the component manufacturing industry in particular, especially as one reflects on the past, takes stock of the present and considers the future of structural building components.

### THE PAST

The structural building components industry has only been around for approximately the past 50 years, but these five decades have seen more technological advances than in the rest of history combined—an exciting time to grow a new industry! As an example, consider the following results of a computer technology survey administered by WTCA's Engineering Review Committee and reported in the August 1989 issue of WOODWORDS:

- Truss manufacturers primarily use computers to compile lists, which machines do correctly 95 percent of the time.
- The second most popular use for computers is for quoting prices—62 percent of the manufacturers quote prices with their computers.
- Sixty percent of the manufacturers use their computers for deriving labor standards for the plant.
- Thirty percent of all trusses run have had a computer optimize their webbing by moving panel points.
- More than half of the manufacturers surveyed are using computers on layout, and all but one plan to do so in the future.
- Spreadsheets and word-processing programs are used by half the respondents; database software is used by one third.
- Layout, pressing and new configurations were cited as equally important computer application needs.

It seems strange to think that even though this was only a little over a decade ago and computer technology was making inroads into the component industry, these were still the days before the World Wide Web and Internet email became daily staples in the life of a business. But go back to the beginning of the component industry and one gets an even clearer picture of how far technology has taken things. Bob Becht, President of Chambers Truss in Fort Pierce, FL, remembers the early days and how computer technology has evolved since the 1960's:

"When I was first involved in the truss business in the 1960's we used trig tables, white out and luck to produce cutting lists. We did not have calculators. The first computer we had was an

Olivetti desktop; it was really an early calculator. We only designed half a truss and doubled the quantities. Hip, scissors and Dutch hips were a mystery. In the late 1960's Dan Hurwitz showed us a truss program that ran on time sharing and designed trusses and told us he was selling his truss plant and going into the truss program business. Dan called his business OnLine. . . . In 1978 the only computer Chambers Truss had was GE's computer in Ohio that we were connected to by Teletype and phone line that we used to run OnLine in timeshare mode. In the late 1970's and early 1980's truss designs came from books of standards—we rarely ran truss designs on a computer. We used OnLine to get cutting and pricing. In 1982, we asked OnLine for truss programs running on an in-house computer and where told it could never happen. In 1983 we wrote our own truss cut list program on a Z80 computer in Microsoft BASIC. The program worked well but did not design trusses.

“By the end of 1983 we realized that we needed on-site computer design. In those days most truss programs could do a limited number of trusses designs. We worked with two in-house programs—OnLine's TrusStar and an early Alpine program—and neither one did the job. In 1984 we got an HP computer from BeMax that did a good job of designing but was not good for cutting because the output on the thermal printer was unreadable in the shop. We did design on BeMax and used OnLine for cutting and pricing. The next big step was the BeMax program on a Radio Shack Tandy 2000. This program could design, cut and price—all in-house on a computer we could afford! It could cut any truss! The program could design a truss in an amazing minute and a half.

“Next we bought a Unix computer to run our homemade business programs. In 1986 we bought AutoCAD to draw layouts on a blazing fast 10mgz computer that cost only \$4500. In the late 1980's, I was one of the first customers to train on the ACES Layout program. The ACES Layout program is the prototype modern layout and is still used by MiTek. The next revolution was connecting those in-house computers to a computer-controlled saw and a laser that drew setups. When I started in the truss business we did everything by hand and did not have drawings to send to the shop. Now we have integrated computer systems that tie truss layout to cutting, setup and jiggling. Get the layout correct and everything else follows. When I first knew about the wood truss business we build common trusses only—hips were hand framed in the field. Today the truss program and high-speed, inexpensive computers allow us to design trusses our fathers and grandfathers could not have dreamed of. This has changed us from truss fabricators to the designers of impossible dreams. If our computers go down, Chambers Truss shuts down. What we do would be impossible without computers.”

## THE PRESENT

According to a recent NAM study, 84 percent of U.S. manufacturers in general use Computer Aided Design/Computer Assisted Manufacturing (CAD/CAM) technology and at least 60 percent use LAN technology in some part of their operations for multiple location communication.

NAM also reports that email is the number one business tool available to manufacturers in general. One main benefit of this development is that it helps salespeople service via email the 80 percent of customers who only provide 20 percent of their business, freeing them up to spend more quality time with the 20 percent of customers who provide 80 percent of their business. The use of the Internet, email and company web sites has grown a great deal among component

manufacturers as well, even in the last two years. In 2000, 44 percent of WTCA regular member locations had email addresses; in 2002 that has grown to 53 percent. Likewise, only 15 percent of WTCA regular member locations had a company web site in 2000, compared to the 35 percent that have one today. This kind of growth in such a short amount of time is indicative of just how much these technologies have influenced business practices.

"[Email] has replaced most all intercompany correspondence," stated Javan Yoder of Stark Truss Company in Canton, OH. "And [our web site] allows people to view our different operations and gives information about our company. It has also been used as a sales tool."

"Email is central to owning a business and to my participation in WTCA," commented Becht. "We receive plans and bid requests by email. We email truss design information to engineers of record for review and in-incorporation in building design. We use interoffice email to distribute memos."

"Email is our main form of internal communication," agreed Michael Colcombe, Regional Manager for Wickes Components in Castle Rock, CO. "The goal [of our web site] is communication for employees, customers and vendors. Being a public company, we want to present the company in the most favorable light, and our web site assists in this goal."

Furthermore, the use of the Internet to facilitate telecommuting and the transfer of data has allowed the world to grow smaller, making more work possible over greater distances and at greater speeds. "Many employees log on to our LAN and work from their homes or remote offices," remarked Yoder. Dan Holland, President of Clearspan Components in Meridian, MS, pointed out that they, like many component manufacturers, have grown to rely on the Internet to transmit data to their plate companies for truss design preparation. In addition, Electronic Data Exchange (EDI) is allowing a multitude of companies to save time and money by paying bills, providing specifications and processing orders over the Internet.

It's certainly not news to anyone that technology has not only made its mark in the offices of component manufacturers around the world, but has caused a revolution in efficiency and productivity in the manufacturing plant as well. In particular, the vast majority of respondents to a recent questionnaire cited automated saws as "a definite payback in labor savings" with regard to technology in the component plant. Those who had recently purchased a new automated saw did so for a variety of reasons including the "need for additional capacity for multiple set-ups with short runs."

Becht stated that Chambers Truss has been using automated saws for more than ten years. "The effect of automated saws has been revolutionary," he said. "Sawyer training takes days, not months. We used to have our best people on the saws; now they have moved into supervisory jobs. Human error has been eliminated in cutting. Trusses get built faster because the boards are correct."

Indeed, because of the increasing complexity of truss designs and the continued shortage of quality labor, perpetual innovation in component manufacturing automation will be necessary for the sustained success of this industry. With that said, let's consider the needs of component

manufacturers moving forward.

## THE FUTURE

When asked what was needed from suppliers to help facilitate the continued growth and success of the structural building components industry, there were two main areas that component manufacturers cited. The first area, material handling, is one that has seen a lot of improvement in the last few years, but remains an area in need of constant improvement. As Colcombe pointed out, more than 50 percent of a component manufacturer's labor costs are tied to material handling. Therefore, automation in this area along with process control software to better communicate the sequence of jobs and flow of work throughout the plant will greatly help to solve some of the labor problems that component manufacturers are experiencing today and into the future, especially as the labor market gets tighter.

The second area mentioned by component manufacturers was the development of a "building component industry data exchange standard." Holland and Becht offered for consideration the concept of a standardized industry data format for the storage and transfer of all of the data required to fully describe a building component. Holland explained that such a standard would improve the ability of component manufacturers to compete against others for several reasons:

- The standard would help control the costs of suppliers to the industry. Suppliers would not have to write numerous translation or interface programs to support the connection between design software and shop equipment and would not have to maintain such programs every time the design software version changes. Elimination of such maintenance would lower cost. The cost saving would benefit everyone in the industry as passed through the system to the buyer of the building components due to competitive forces.
- Advances in efficiency would be much more possible if such a standard were in place. A manufacturer could use multiple vendors for machinery, design software, accounting software, management software, or any other useful tool not yet imagined. All of these tools would share data without being affected by changes by one vendor. This would surely make component manufacturing more efficient and more competitive with field framing.
- Becht noted that there will be increasing importance placed on the layout and design programs that are being developed. The complexity of building design and the increased pressure on the labor supply will require that these programs become increasingly sophisticated. Suppliers and component manufacturers will need to continue to work very closely together to ensure that all the design bugs in this process are worked out quickly and accurately prior to additional bells and whistles being added, given the importance of these programs. This will continue to be a significant industry investment for years to come.

It is important that such a standard be public and that changes to the standard are made public well in advance of implementation. It is also important that the plans to form such a standard are promoted well in advance so that the right persons are involved in the process and that everyone comes to understand that the ultimate benefit to the entire industry far outweighs the perception of a loss of proprietary competitive advantage any suppliers may believe they now have. We will all win if building with components becomes a more efficient, cost-effective and collaborative construction solution.

## CONCLUSION

What else is necessary to make this possible, especially where the manufacturer/supplier relationship is concerned? According to component manufacturers, working together and speaking with one voice is the answer.

“In order for us both to succeed,” Colcombe explained, “we need to work together to provide the end user with a higher level of service—sometimes it will not be a product that you sell to me and I sell to the end user, but rather an integrated solution to the bigger picture.”

Colcombe's comments speak to the fact that cooperation and mutual understanding are the keys to moving forward in this industry. At a recent meeting of veterans of the component industry, Don Hershey of Imperial Group, Inc. made a statement that epitomizes the truth of the matter: “I don't think the suppliers to our industry are any different than we are [as component manufacturers]. We're trying to listen to our customers by asking ‘What do you need that we can supply?’ Suppliers who will survive in this industry are the ones who will listen to what we need and who will meet those needs. . . . The companies that are getting bigger are the ones who are listening.”

While this holds true in all aspects of business today, it is especially important to reflect on as manufacturers and suppliers consider the power of technology to transform an industry. The past fifty years have seen great innovation that has propelled the structural building components industry forward. In order to continue the momentum, the future must hold productive collaboration between suppliers and manufacturers that will result in the solutions of tomorrow.

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1 Morris, Ann. “Technology’s Reach Extends to Manufacturing,” Strategic Moves, 2001-2002, p. 12.

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