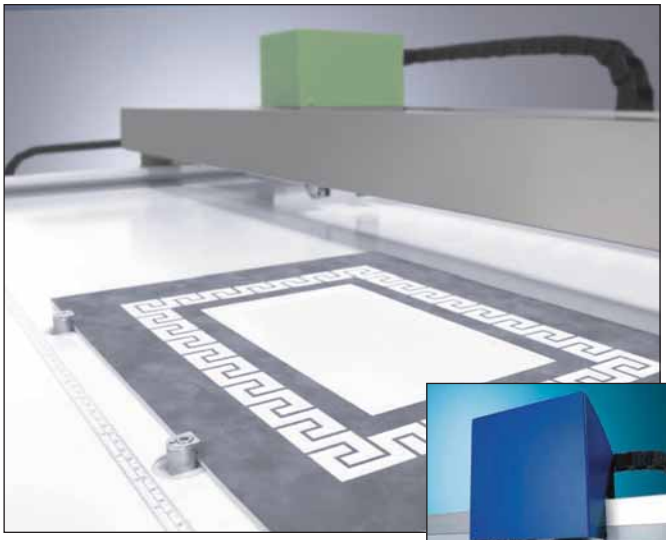
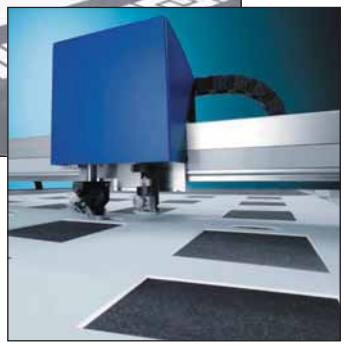
Choosing a CMC

BY PATRICK SARVER

THERE ARE SEVERAL COMPUTERIZED MAT CUTTERS THAT CAN MAKE YOUR PRODUCTION OPERATION MORE EFFICIENT. WHICH ONE MAKES THE MOST SENSE FOR YOU?

The Zund 1600 is a high-end machine featuring a vacuum table that can make bevels, straight cuts, and French lines with one cutting head.





Above: The Gunnar 601 has two cutting heads with 45 and 90 degree angles and is designed for constant use and large volume jobs. Right: A close-up of a Gunnar 3001 head cutting a multiple-opening mat. The 3001 has a vacuum table divided into two fields so one side can be loaded while the other is cutting.

"What I often find is that OEMs will buy a name brand CMC but at some point find that they bought the wrong piece of equipment for the job," says Jim Parrie, president of Millennial Technologies and a leading production framing consultant. "They blame the equipment even though there's nothing wrong with it; they just bought a CMC better suited to a different type of production framing."

The two ends of the mat production spectrum are ready-mades (large runs using the same cutting specifications) and custom mats (one-of's). Both ends of the spectrum have different needs. Facilities producing a high volume of one-of's typically use a machine that places more emphasis on design. Facilities producing large runs with the same cutting specifications, such as ready-made mats, generally use a vacuum table system to minimize waste. In between are numerous production combinations.

Therefore, when researching a CMC you should consider certain production factors before making an investment decision, including the number of units cut per day, the types of mats being cut, run size, and type of distribution channel.

The number of units per day is a key factor because it is necessary to calculate the return on your investment for a CMC. Take into account how many man-hours are expended for cutting mats under your current system and what will be the labor savings when a new CMC is deployed.

Another factor to consider is the type of mats being cut. Common sense dictates that it takes longer to cut a 25-opening double mat than it does a single layer 8"x10" mat with one opening. The mat type helps dictate what cutting speed is necessary. The type of production run is tied closely with mat type because larger runs of standard products require higher cutting speeds.

Finally, the type of distribution system is criti-

cal because that often determines the method by which orders enter the system and how data is transferred from the customer transaction to the CMC. For instance, the data path of an order for an OEM selling via the Web is different than a retailer using a hub-and-spoke fulfillment system.

While machine speed is the feature most often discussed by manufacturers and buyers, all these factors (volume, mat type, run size, and channel of distribution) must all be considered when analyzing the features available on today's CMCs.

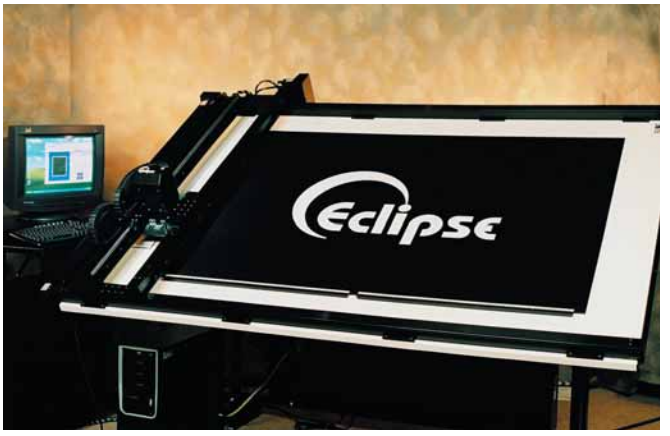
MACHINE SPEED

Users frequently focus on the fact that a particular CMC can cut at 20" per second or 40" per second. But that's not the whole story. You should also look at the complete cut cycle time. This is the amount of time it takes a user to initiate the software, load the mat, cut the mat, remove it, and discard the fall-out.

Even though a CMC may be able to cut at 40" per second, it will not achieve that speed when cutting a 5"x7" mat or a mat with customized names or other specialized cuts because of the time it takes for a motor to attain full speed. Therefore, when examining CMCs, ask for a demonstration of cutting the same mats you cut in your facility. That will give you a more meaningful comparison of time among the CMCs you are examining.

"It's advisable to discuss the complete cycle time of cutting the mat with the manufacturer," says Parrie. "This includes starting from the time you load a CMC until the time you take the finished mat off and clean up the fall-outs."

The Future GTO 150, made by Valiani and distributed by Fletcher-Terry has two workstation operation and can cut multi-layer mats with V-grooves.



Eclipse features an air clamp system and has almost 100 standard templates and hundreds of CutArt shapes and designs.

Parrie suggests asking the following questions, since the answers all affect cycle time:

- How much time does it take to remove the fall-out(s)?
- Is it hard to get a mat under the clamps?
- Do you have to clamp it manually or does it clamp itself?
- How many steps do you have to go through on the software before you cut, especially if it's integrated with POS software?
- How often do you have to change the blades?
- How long does it take to change a blade?
- If it uses a blade cartridge system, can you have cartridges pre-loaded?
- How often do you have to change the slip-sheet?

Some CMCs require that the head initialize or reset for each cutting cycle, and this takes time. If it takes an extra 10 seconds and you conduct this process 200 times a day, that's a total of 10,000 seconds or 2.77 hours a week. At, say, $12 an hour, that equates to $33.33 per week or $1,666 per year in potential idle time for an operator. This cost must be compared to the potential idle time of the other CMCs you're looking at.

"The linear cutting speed is 15 inches per second for the Wizard CMC 8500," says Brian Wolf, director of standards and training at Wizard International, which today sells Wizard, Eclipse, and Zünd CMCs. "However, there is no extra initialization or homing time, so the actual time it takes to cut a mat—from the moment you press start until cutting is finished—compares favorably with other machines. It also cuts flat or on an angle, depending on how the user has the machine mounted."

"The Fletcher/Valiani Future Plus will cut an 11"x14" window in a 16"x20" mat in less than 10 seconds; the GTO is even faster," says Brian Simard, CMC product line specialist for Fletcher-Terry. "The real time savings for the machines come when you do production work with multi-layer mats. It will cut a pre-assembled triple mat with a V-groove, all from the face of the mat, in under a minute. The ability to handle each mat fewer times makes these machines more efficient than comparable CMCs. The linear cut speed for the Future Plus is more than 31" per second. The cutting speed on the Future GTO is 46" per second. Positioning speed, where the cutting head moves from the home position and from opening to opening is even faster on both machines."

"The speed at which Gunnar CMCs cut window mats varies with the size being cut," says Blair Card of Gunnar. "For example, our production models will cut 8"x10" mats with 4"x6" openings at 7 seconds per mat or 514 mats per hour for the 601-XL and 655 mats per hour for the 3001-XL. The 3001 will cut at a maximum speed of 40" per second. The COE (cut other end) system standard on the Gunnar models provides two cutting stations, left and right, increasing productivity by 100 percent."

"The M-series Zünd can cut up to 40" per second," says Matthew Morman, customer support technician at Wizard. "It uses dynamic DC servo motors, and the software allows the user to automatically lay out multiples of a job on a single piece of matboard to increase efficiency and reduce waste. When cutting in dual zones, the software also optimizes tool change (straight edge to bevel, etc.)."

COMPUTER HARDWARE REQUIREMENTS

◆ Zünd: P4 2 Ghz processor, 256 MB RAM, 10 GB disk space, standard serial port, floppy drive, DVD/CD combo drive, 10/100 MBPS network interface.
◆ Gunnar: PCs require a processor with a minimum of 300 MHz, a COM port (9 pin serial) or USB, 128 MB of main memory, minimum 2 GB hard drive, and a 4X minimum CD ROM.
◆ Fletcher: A new PC is supplied with every machine. The minimum requirements are: Windows 95/98, Me, 2000, NT, or XP; Pentium III, 266Mhz CPU or higher; 64 Mb RAM (128+Mb recommended); 20 Mb available hard disk space; CD-ROM drive.
◆ Wizard: All CMCs come with a computer. It is a Pentium with at least 256 MB RAM, 40 Ghz hard drive, CD-ROM, 3.5" floppy, and modem.
◆ Eclipse: Pentium3 550, 64 Mb RAM, Windows 98 or better.

COMPUTER SOFTWARE

◆ Eclipse comes with Eclipse 3.5 software, which runs the machine and designs the mats.
◆ The Wizard 8500 comes with its own computer and software. Customers can purchase an extra copy of the software so designs can be created on one system while another computer is running the CMC to cut.
◆ Fletcher's Future Plus comes with a "Multi-Mat Array" feature, which automatically lays out the greatest number of mats possible from a full sheet so that minimum waste is created.
◆ Gunnar SPT32 includes full design and production mode tools designed to maximize productivity and material yield.
◆ Wizard Mat Designer for Zünd with enhanced tiling is included in the package.

LABOR SAVINGS

One of the primary justifications of a CMC is that it can produce more mats for fewer labor hours. CMCs also require operators with fewer skills than do manual mat cutters. "One of the big advantages of a CMC is that it can reduce hourly labor rates because a CMC requires a lower skill level than cutting mats by hand," says Wolf.

Labor savings figure prominently in return on investment calculations. While a less skilled person is required when using a CMC, the exact skill level also depends on the type of mat being cut. A system that relies on repetitive tasks and produces large runs of the same mat will be able to use workers with fewer skills than does a system that produces the same volume of mats that are all one-of's.

Cutting one-of's generally requires more user interaction with the data, especially in making decisions about cutting order or in measuring errors and making adjustments to meet order specifications. So, an operator's skill level needed for a CMC in a one-of environment will typically be higher than that of an operator producing large standard runs. The skill levels in both cases will still be lower than cutting the same mats by hand.

NESTING CMCS

Nesting two or three CMCs in a single production cell and using one operator to run all the machines in that cell can achieve additional labor savings. "At one place I designed, they were cutting mats with 30 openings," says Parrie. "One operator was using 12 machines because it took so long to cycle through those openings. For another company that cuts a customer's name into each mat, one operator can run three machines.

To know how many machines an operator can manage, calculate machine time, machine idle time, and how many units your operator is cutting. "If it will take three minutes to cut a mat, that operator can load two other machines in that time period," says Parrie. "On the other hand, if you're cutting custom 5"x7" or 8"x10" mats, the CMC will cycle so fast that an operator can just feed that one machine. If the cycle time is greater than the load and unload time, while that machine is cycling the operator can load another mat."

Simard concurs. "Customers use multiples of these machines, with each running different mat design jobs simultaneously, while others use just one machine in an assembly-line, batch-type environment." While one machine is in the cut cycle the operator can load another machine, possibly even more. It all depends on the cycle time for that mat. This multi-tasking of the operator reduces idle labor costs for a factory. Again, the simpler the job, the faster the cycle time and the less likely an operator will be able to handle much else.

Higher-end CMCs help to reduce idle labor by containing double cutting bays in one machine. Of the production CMCs, two brands offer double bays or heads:

Brian Wolf makes final adjustments for cutting a mat design displayed on the computer monitor for the Wizard 8500.

Zünd and Gunnar. These allow an operator to cut on one side while loading on the other, so there's no idle time. It is, in effect, like having one operator running two machines.

The caveat for a double bay system is that if the whole machine goes down, 100 percent of your capacity is lost. By comparison, a factory that uses multiple machines in a cell loses a much smaller percentage of its capacity when one of those machines goes down. A cell that contains three machines will see only a 33 percent loss in capacity if one machine is out of service as opposed to 100 percent if an entire double bay machine is down.

VACUUM TABLES

OEMs often struggle with whether to purchase a CMC with material hold-down clamps or a vacuum table. The type of system depends largely on the type of mat being cut and the size of the runs. Hold-down clamps (sometimes called buttons or rails) are less expensive to manufacture than a vacuum system. When exploring your options start by determining whether a vacuum system can be justified.

The return on the additional investment in the vacuum system should be justified by the faster cycle times and reduced waste. Waste is reduced with a vacuum system because the CMC can cut to the edge of the mat board, thereby increasing the yield. A clamping system prevents the cutting head from going to the edge of the raw board, which reduces the material yield. Determine what your average waste would be with clamp and vacuum systems on a daily and then a yearly basis. That resulting figure should be part of your ROI calculations.

"If you're doing all ready-mades," Parrie adds, "then you should look at using a more expensive machine with a vacuum table so you can maximize your yield. On the other hand, if you are looking at having one operator run two to four machines, then you should consider less expensive machines and use more of them. You will need to determine which savings is greater—the increased material yield or the labor. Odds are, it will be labor."

"Machines designed for cutting large quantities of matboard are large, open flatbed cutters for easy loading and unloading of material," says Morman. "The material is held down with a vacuum system for optimum use of material. The high cutting speed is well suited for high production framing, whether for a single work cell or in-line production."

When considering a vacuum system, determine the increase in productivity, the decrease in labor costs, the yield increase, and the reduced idle labor cost with a vacuum system. Compare that to the same figures with a production cell containing less expensive machines. The cost justification should become fairly evident.

TABLE ANGLE

A closely related issue is table angle. The angle of the work surface must be considered for productivity and ergonomic issues. A flat work surface is great because the

PARTS & SERVICE

◆ Zünd parts are available in the U.S. and are shipped directly from Zünd America in Wisconsin. As a rule, 90 percent of maintenance is cleaning, some of which can be performed by the operator. A more in-depth annual maintenance must be done by an authorized technician.

◆ Gunnar's modular design allows for easy maintenance. Parts are stocked and can be shipped via next day courier if needed to minimize down time. Service contract arrangements are provided on a requirement basis. Generally, if service is requested, a Gunnar technician will notify other customers in the area and arrange visits as needed. Service includes additional training, software updates, preventive maintenance, and technical aid.

◆ Fletcher: As Valiani machines are manufactured in Italy, parts are stocked for the North American market at the Fletcher facility in Connecticut. Parts can be overnighted when a repair is time-critical. Customers may contact Fletcher-Terry directly for detailed information on extended warranty and service contract options.

◆ Wizard and Eclipse models are manufactured in Washington. Technical support will diagnose parts that need to be replaced via toll-free phone and send them out by expedited shipping to keep customers' systems up and running. Wizard also offers free technical support and expedited delivery of parts when needed. Wizard's modular design makes troubleshooting and repair simple. Eclipse parts are also readily available upon request. There is a 90 day labor warranty offered with the Eclipse. Eclipse service is usually done on request at the expense of the customer.

fall-outs do not drop into the cutting area. But shorter workers or those with shorter arms may not be able to reach across to clear the fall-outs. Flat surfaces use more space. An angled work surface can make it easier for all staff members to reach across the entire work surface. However, when cutting a mat with a lot of openings, fall-outs may drop into the path of the cutting head.

Some CMCs have a table that can be adjusted to different angles, which gives you the best of both worlds. This does come at a sacrifice in cutting speed. A rule of thumb is, the faster the machine is, the flatter the angle should be. When operating a high speed CMC, it is better to allow gravity to hold the fall-outs in place. This keeps from ruining excessive amounts of matboard, and it is safer for the operator. When cutting all one-of's, such as custom mats for a retail chain, then you may want to consider a machine that rests at an angle for better ergonomics and space savings.

BEVELS

Machines that cut a 90-degree outside edge tend to be more expensive due to the engineering involved. The converse is also true. Machines with fixed heads that can cut only beveled edges on the outside of a matboard tend to be less expensive. The bevel can be an issue for companies that produce cut mats as the final stand-alone product. Mats with outside beveled edges that are shrink-wrapped can cut through thin shrink-wrap. The final product can then become soiled and damaged. Consumers may also cut themselves on the protruding beveled edges, which might not cost a manufacturer money but will surely add to headaches. Manufacturers of shrink-wrapped or standalone mats should consider a machine that cuts a 90-degree outside edge. These tend to be higher end, but this type of finished mat product also dictates the use of a vacuum system. The ROI of a 90-degree head does not need to be justified solely on the removal of the bevel. "Look for a CMC that has both a 45 and 90 degree cutting head, allowing an inside bevel or straight cut and outside straight cuts to be made in one operation," says Card of Gunnar.

REAL WORLD CMC COST

There are other expenses that need to be considered in operating a CMC, such as servicing, parts, downtime, and normally replaceable items like blades. These include:

- A variety of heads and cutting tools for use with multiple materials as well as different blade options.
- The maintenance contract.
- Consumable items, such as blades and slip-sheets, constitute the bulk of ongoing costs. Consider using entire sheets of flaw board as slip sheets. Blades are designed to provide 50 to 100 cut openings, depending on design, size, and type of board.
- Wear items, such as bearings and springs require periodic replacement. A commonly replaced part is the mat foot.

SOFTWARE

A detailed comparison of all CMC software could fill several articles, but here are some of the major issues involved.

The transfer of information from the consumer to the CMC differs with the channel of distribution. For example, a consumer ordering a custom framed poster via the Web will have the order transmitted and filled differently than a consumer buying a piece of pre-framed art at Bed, Bath and Beyond. There are numerous other ways for consumers to purchase items, which generally fall into two main categories: hub-and-spoke and fulfillment center. In a hub-and-spoke operation, a retail chain has numerous stores and feeds orders—typically based on geography—to a centralized production facility. A fulfillment center would be used by a Web-based company or an OEM selling at High Point that gathers orders from all over and sends them to one location.

Hub-and-spoke operations tend to produce more custom products, are normally in retail, and are closer to the customer. Therefore, the designs can be more diffi-

MAINTENANCE AND OPERATIONAL TIPS

◆ Simple maintenance should be done weekly, including wiping debris off the roll-on bearing channels with a lightly greased cloth. The cutting head cover should be removed to clean dust and debris off the gears. The shaft in the cutting head should be lubricated periodically. Check accuracy on a weekly basis for consistent precision.

◆ Change blades regularly to make sure they are sharp and keep the blade depth set correctly.

◆ Make sure the air supply is dry and the recommended PSI.

◆ Keep sharp things out of the clamping areas.

◆ Blade heads on the Eclipse need to be sent to the manufacturer once a year for inspection and adjustment to keep warranty intact.

◆ Get the software well in advance of the arrival of the machine and allow all users to become familiar with it. Design the mats most common to your system. When the installer arrives, the users' experience with the software gives them a higher level of comfort.

◆ Managing, training, and retaining employees who can keep a machine operating at the highest percentage of the time will translate into higher profit margins.

◆ Space is an issue. Make sure you have enough room for the machine you buy.

◆ Consider using blade change cartridges. You can have extra cartridges pre-loaded so blade changes can be really quick and easy. You'll also know you've got it right every time.

cult but, more importantly, orders are generally one-of's. CMC software must be deployed in all the stores where training and ease of use are of primary concern. An additional issue is how well the CMC software interfaces with POS systems. As an example, Wolf says, "For a hub-and-spoke operation, Wizard CMC software integrates with POS software and allows for a direct transfer of cut files to a centralized production facility, reducing data entry time and errors. It lets a designer order exactly what is needed for the job. Wizard developers will also work with third-party developers who have their own POS software."

The skill level of the CMC operator at a hub-and-spoke facility will also be dependent on the amount of data correction that must be done for each order. When investigating CMC software, determine how many steps are needed for data correction, how many steps an operator must go through to get to the cut screen, and so on.

Some CMC manufacturers provide a series or a line of machines that allows you to purchase a smaller, less expensive machine and then move to larger capacity machines as your needs grow. However, make sure that the software platform is the same for each machine as you upgrade. Retraining in a chain environment can be costly. An operator should only have to learn a new raw material feed system and troubleshooting procedures. That is far easier than having to learn a whole new software platform or having to retrain all of the stores.

Template-based software as opposed to CAD-based software also makes sense for retail organizations. Template systems have a shorter learning curve and can provide for a quicker sales cycle. A CAD system does allow for greater creativity, which may be needed by an OEM.

The capacity for working with design files is also quite managable. "The files for these mats are quite small—between 1k and 10k," says Greg Hiatt, Eclipse customer support technician at Wizard. "There is no reason you couldn't have thousands of them, and they would last as long as a hard drive and a backup system last. Floppys or a flash drive work just fine for backup, as will CDs."

A centralized fulfillment system that would provide product for an OEM or a Web-based organization may want to use a system that allows for nesting orders. Nesting is a feature offered on some CMCs that allows for several orders to be cut out of one sheet of matboard while smaller mats are cut from the fall-out of a larger mat. Material utilization programs are available on some models that will queue orders in the machine based on the materials needed.

Centralized fulfillment systems generally rely on barcoded SKUs for order entry. These provide for a faster cycle time because an order is entered and retrieved faster through bar coding. This type of production system will rely on a CMC that interfaces with production software. In these type of systems, software that requires fewer steps to initiate the cutting cycle is generally preferable.

THE BOTTOM LINE

"The bottom line is, what's the return on your investment?" says Parrie. "A lot of that depends on the cycle time for the types of mats you're cutting. If you're cutting 500 custom mats a day, you're more likely to have an operator manage multiple machines. If you're cutting 5,000 readymade mats a day, then you'll probably get the most from a faster machine with a vacuum table, one that will keep one operator busy all by itself. All of these machines are good. You just need to find one that makes the most financial sense for you."

Every picture frame manufacturer has different needs, and all should do careful research when seeking a CMC. What is right for one manufacturer may not be right for another. Therefore, when comparing machines, do it based on your specific needs and not on someone else's. ■

WARRANTY AND LEASING

◆ Eclipse has a five-year parts and shipping warranty along with 90 days labor for the Eclipse Pro. Wizard offers third-party lease options. Actual lease rates depend on the model and credit approval.

◆ Wizard's CMC 8500 offers a one-year warranty on purchased systems. Rental systems carry a lifetime warranty. Wizard offers third party lease rates with a 60-month term and a $1 buy-out. Actual lease rates depend on credit approval. Wizard offer warranty extensions at any time. If you rent the 8500, all repairs are covered.

◆ Fletcher's warranty is for two years and covers parts and labor on the Valiani line, including electronics. The computer system is warranted by the PC manufacturer. The machines can be leased, and terms are largely up to the purchaser's fiscal requirements and credit situation. You can lease a machine with no money down and for up to 72 months. Normally, there is a $100 buy-out payment at the end of the lease term.

◆ Gunnar mat cutters are warranted for 12 months, which involves a full warranty for three months to a maximum limit of 200,000 cuts (601-XL) or 300,000 cuts (3001-M/XL), whichever comes first and another nine months to a maximum limit of 200,000 cuts (601-XL) or 800,000 cuts (3001-M/XL), whichever comes first. Many Gunnar customers acquire machines on a lease-to-own basis to take advantage of the tax benefits. Typically, a lease is based on $0 down with a $1 buy-out and amortized over five years.

◆ Zünd offers a one-year warranty with purchase. Annual service contracts (parts only) are available as an option. Wizard offers third-party lease options on the Zünd. Actual lease rates depend on the model and on credit approval.