As wire and cable customers of measuring and testing equipment continue to seek new ways to cut costs at all stages of the manufacturing process, equipment makers have been forced to redirect their focus, both within and outside of their companies. Companies are streamlining their operations and honing their focus on specific technologies to become more efficient and cut costs. Measuring and testing companies are leaner today, a trend that can be seen across the industry as a whole.

Because the market for measuring and testing products has become more competitive, not only do equipment suppliers want to give their customers the best product at the best possible price, they are also focused on finding new ways to cut costs. One way to do this is by reducing scrap – “a paperless office integrated with a paperless plant floor,” said one company official.

And while the question of whether or not laser technology has made measuring and testing systems a commodity, few in the industry like to consider the equipment they manufacture as such, therefore motivating them to develop the niche within which they can thrive.

In this feature, a number of equipment suppliers discuss their field and what they offer today. More detail on some of the products is presented on p. 96 and 97.

**Making adjustments**

In what have been trying times in the wire and cable industry, companies are being asked to do more for their customers. And, the companies that design, manufacture and distribute measuring and testing equipment are no exception.

Paul McDermott, director of sales and marketing at Clinton Instrument
Company, said the recent slowdown in the industry has motivated the company to spend time on product development for items which have a direct effect on the bottom line and product quality.

“We recently introduced a calibration test set which helps plant personnel to calibrate and troubleshoot our installed base quicker, easier and more efficiently,” McDermott said. “We spent a great deal of time making sure that prototypes were seen by as many of our customers as possible. Even though the cost of the equipment is nominal we have had to be cognizant of the return on investment value of the product.”

McDermott also noted the company’s increased attention to the details of specifications. “Manufacturing engineers are looking at all their options in an effort to reduce scrap, decrease costs and improve product quality.”

DCM Industries President Perry Chattler said cost reductions and time-to-market requirements have forced DCM to respond in two ways: the first is to offer its customers more for less; the second is to bring new product offerings to market more quickly than ever before.

“We are addressing cost concerns by scaling down the complexity of our products and introducing new products with a modular design,” Chattler said.

“Perhaps more than the innovation of product and process, this [Internet] is the playground where the future of our business will be set.”

-- Antonio Spizzamiglio, Aeroel

“Driving costs down and developing new products is also something Cleveland Motion Control’s Dan Burns said his company has been doing to keep its existing customers and gain new ones. “Our customers are looking for their vendors to reduce the cost to them. Our only choice in such a competitive market is to find ways to take cost out of our products in order to try to maintain margins.”

-- Dan Burns, Cleveland Motion Control

“We feel that there is a real pressing need to maximize production speeds while minimizing scrap generation.”

-- Ernest Henzi, Zumbach

“Reliable measurement allows manufacturers to ‘give away’ less product and, in some cases, ship product on the lower tolerance with confidence that the package will not be ‘too short.”

-- Jim Zampogna, MGS/HALL

DCM Industries’ ES-2G automatically tests cable to LAN cabling standards up to 1.8GHz. See p. 96 for more details.

DCM Industries’ Perry Chattler said that his company is cutting costs by incorporating simplicity in its products.

“For example, our new ES-2G is a high performance subset of an older and much larger test system. It can test the high frequency parameters of four pair cable at twice the frequency for half of the cost of the older system.

“In addition, several options can be added to the system to introduce additional test parameters that may be needed by some DCM customers but not necessarily all,” Chattler noted. “This gives our customers a menu of features to choose from to customize a test system to their technical requirements and budget.”

Chattler said time to market is being addressed by enhancing relationships with the company’s key customers. “Our sales and marketing team works closely with engineering and technical support to make sure that DCM is focused on the issues customers need to address most urgently,” he said. “Close coordination with standards bodies such as TIA/EIA, USB and IEEE also assures that our new equipment offerings will be on target.”

Driving costs down and developing new products is also something Cleveland Motion Control’s Dan Burns said his company has been doing to keep its existing customers and gain new ones. “Our customers are looking for their vendors to reduce the cost to them. Our only choice in such a competitive market is to find ways to take cost out of our products in order to try to maintain margins.”

“We feel that there is a real pressing need to maximize production speeds while minimizing scrap generation.”

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“Reliable measurement allows manufacturers to ‘give away’ less product and, in some cases, ship product on the lower tolerance with confidence that the package will not be ‘too short.”

-- Jim Zampogna, MGS/HALL

They said it

“Perhaps more than the innovation of product and process, this [Internet] is the playground where the future of our business will be set.”

-- Antonio Spizzamiglio, Aeroel

“‘Our customers must make certain that they operate efficiently with every product they manufacture. Scrap reduction and in-process material usage are key factors to profitability. From a management perspective, this is the no-brainer.”

-- Jeff Swinchatt, Sikora

“We are addressing cost concerns by scaling down the complexity of our products and introducing new products with a modular design.”

-- Perry Chattler, DCM Industries

“It is no longer enough to calculate the proper tension value for a wire as one half its yield ratio in a static condition.”

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“Our customers are looking for their vendors to reduce the cost to them. Our only choice in such a competitive market is to find ways to take cost out of our products in order to try to maintain margins.”

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“Reliable measurement allows manufacturers to ‘give away’ less product and, in some cases, ship product on the lower tolerance with confidence that the package will not be ‘too short.”

-- Jim Zampogna, MGS/HALL
provide more accurate and detailed information at often lower prices observed Donald Bugden, the company’s vice president of marketing.

“Cost savings for the customer come from scrap reduction, elimination of down time and efficient integration of automatic inspection and data concerning product quality into the production process,” Bugden said.

Antonio Spizzamiglio, president and sales manager of Aeroel Srl observed that growing competition from Asian companies is forcing the European steel wire testing industry to enhance efficiency, reduce costs and improve quality in order to survive. Companies in Asian countries, he noted, can rely on a cheaper workforce and are not impaired by strict safety and environmental regulations.

“It is necessary to identify new products and applications, innovative methods and technologies and also to conceive and implement brave and creative marketing strategies and techniques,” Spizzamiglio said. “Our customers are increasingly asking for on-line diameter control instruments that can operate on any machinery in a reliable and efficient way, for a small price or anyway for a price adapted to the actual economical advantages they offer.”

Consistent, accurate length measurement can reduce costs, explained James Zampogna, vice president of sales and marketing for MGS/Hall, who agreed that reducing costs has quickly become a top priority.

While most wire and cable applications use four basic types of length counters (single wheel, dual wheel, caterpillar and laser), Zampogna noted that some manufacturers still use a simple manual counter, which measures by using a single rubber coated wheel that sits on the product as it moves through a process. This method may still be cost effective, but only when product is sold by the pound or rewound to accurate lengths.

“Reliable measurement allows manufacturers to ‘give away’ less product and, in some cases, ship product on the lower tolerance with confidence that the package will not be ‘too short,’” he said. “Also, with accurate measurement and creativity, a packaging system can be programmed to help make decisions to reduce scrap when defects are found.”

For example, Zampogna noted that length tolerance specifications and alternate package lengths can be programmed into the line PLC, and when defects are found, the optimum use of good product is quickly decided and produced.

Sikora International USA President Jeff Swinchatt observed that recent market forces have impacted his company’s customers in a variety of ways. “Cost reduction programs are balanced with development initiatives to deliver new or enhanced products at attractive price levels,” Swinchatt said.

The shrinking market, combined with overcapacity in some segments of the wire and cable industry, have led to fiercer competition, consolidation and streamlining of operation, noted Ernest Henzi, Zumbach Electronics Corporation’s senior vice president of marketing.

“The need for uniform quality, cost reduction through shorter start-up times, raw material savings and scrap reduction is even more pronounced at this time, translating into a more acute need for accurate and dependable online measuring and control instrumentation,” Henzi said. “We feel that there is a real pressing need to maximize production speeds while minimizing scrap generation. Zumbach has been offering the tools to achieve this all along, except today customers seem to be more inclined to really invest time (and money, where still available) to get a tighter grip on productivity, production costs and quality.”

Henzi also noted a greater need for customer support.

“Some customers downsized and lost highly qualified people while the requirements (production speeds, production specifications, etc.) increased,” he noted. “More has to be achieved with fewer people, and some customers are more inclined to make use of our service specialists to help them to optimize their measurement and control systems.”

Jeff Kohler, vice president of TLA, Inc., noted that there is “constant pressure” to improve and document quality while lowering costs.

“Information management has become a key part of the manufacturing process,” Kohler said. “Companies are pushing to download machine setup information to the plant floor, computerize data collection and archiving for on demand reporting. A paperless office integrated with a paperless plant floor means efficiency, streamlined operations and ultimately cost savings.”

Customers appreciate the fact that measuring and testing companies continue to look for ways to cut costs, while at the same time improve their product offerings, said Brian Osmondson, TSI, Inc., marketing manager.

“I believe that customers are smart and recognize they need to produce high-quality products and improve productivi-
ty of their plants,” Osmondson said. “Measurement equipment plays an important role in achieving these goals.”

**Focus on technology**

Measuring and testing companies are redirecting and honing their focus to specific technologies in order to remain successful in what continues to be an extremely competitive environment.

Antonio Spizzamiglio noted that for a small company like Aeroel, which manufactures a single product, namely laser gauges for diameter control, it is essential to focus on few and fairly defined industrial sectors to guarantee its own competitiveness and vitality.

“High specialization, product quality and great care for each single customer are the key to success,” he said. “With a view to specialization, our firm has principally focused on the drawn wire industry for a number of reasons.”

For example, Spizzamiglio noted that other sectors, such as the electrical cable and conductor industry, are “led by qualified competitors that are firmly settled and fight for the market. It is apparently quite hard, if not impossible, to take a share in the market here and snatch it off from such competitors who can rely on huge resources and their big size and are therefore able to offer a wider range of products (not only laser gauges) and services,” he said.

Over the last decade, Spizzamiglio noted that Aeroel has gained a specialized and in-depth experience in the drawn wire industry, especially in the ferrous wire sector.

“Thanks to our know-how in thousands of different applications, we can now offer a totally reliable and efficient solution to on-line continuous monitoring of wire diameter, especially under difficult environmental conditions, for instance in dry drawing benches,” he observed. “Our growth prospects look reasonably interesting and promising considering the size of our business and the existing great number of machinery that can be equipped with instruments for diameter continuous control.”

Cleveland Motion Control, said Dan Burns, is focusing on its end users, selling them parts and retrofitting existing equipment for better performance. “We are finding only a few user customers investing in new equipment.” he noted.

Clinton Instrument’s Paul McDermott said his company is focusing on the product enhancements that customers have been asking for over the years.

(continued)
“The cost of adding additional features will be minimal and the time spent here will enhance our brand,” Cleveland Motion Control’s Dan Burns said. “Unfortunately in the next year or two, our growth will be outside of our core market in the wire and cable industry. We will be introducing our technology to other market segments and product types not so heavily affected by the economic slowdown.”

When it comes to product innovation, DCM’s Perry Chattler believes the customer must be King. “We firmly believe that the best input for our new product developments comes from the companies that will buy them,” he said. “In response to input from our customers we are focusing on cost reduction, additional features and performance enhancements. Cost reduction is being achieved by scaling down the size and complexity of our offerings.”

Chattler refers to these new offerings as ‘bench top’ units, which are different than older systems that require their own chassis, and so forth. “Additional features are being added constantly to the main bench top unit,” Chattler noted. “For example, the ES-2G can test most needed high frequency parameters. Separate options can be added for low frequency parameters or items such as LCL and transfer impedance testing. New options are always under consideration and development. As for performance enhancements, the ES-2G capability speaks for itself. With an upper frequency test limit of 1.8GHz it far surpasses any competitive system on the market today. In addition, new calibration routines have been introduced to the system to also make it the most accurate.”

Renzo Zanni, general manager of Engineering Future Automazione Flessibile Srl (EFAF), said his company has focused on making modifications to its length measuring system in order to make it more reliable and efficient for all types of cable at various speeds.

“In the packaging cycle there are much violent accelerations and decelerations, and in order to avoid sliding of the cable on the pulleys we have reduced the inertia of the pulleys at the minimum possible,” said Zanni, who added that the company was able to do this by creating a fusion of very light alloy aluminum, on which an application of Vulkollan has been applied to increase the adherence and the wear endurance. The upper pulleys are assembled on a support linked to a pneumatic cylinder with pressure variables which allow the regulation of the force of the pulleys on the cable avoiding sliding,” he observed.

EFAF’s Renzo Zanni said length measuring systems are made more efficient and reliable by avoiding the sliding of the cable on the pulleys.

Magnetic Analysis Corporation’s Donald Bugden believes that technical improvements will concentrate on developing and combining techniques in the future to allow detection of unacceptable product variances that cannot be accomplished with the present state of the art.

“The overall requirement is to find and, if possible, measure and identify these variances by type,” he said. “This must be done while reducing the incidence of mistakenly identifying acceptable product as non-conforming.”

The greatest growth, he added, “will come from the ability to tailor systems for each customer that can obtain and assimilate measurements of a product’s quality throughout the production process, so as to improve process control as well as quality control. As an example, further development of electromagnetic acoustic transducer (EMAT) techniques may facilitate adding the unique capabilities of ultrasonic inspection to the mix without the inconvenience of having to provide a coupling agent between the transducer and test specimen.”

TLA, Jeff Kohler noted, has two areas of technical focus: gauging and data processing. “In the area of gauging, our clients continue to expect higher accuracy to meet ever-tightening product specifications on wire, cable, optical fiber and faster measurement rates to support production efficiency (i.e. higher line speeds),” he said.

“In the area of data processing, clients are demanding operator ease of use, access to data and configuration over networks, and integration with other applications – horizontally, such as SPC and HMI/MMI software; vertically with applications such as ERP software.”

Flexibility is engineered into the components to provide Magnetic Analysis Corporation’s equipment in a form that can be combined in a unique system according to a customer’s needs.
Sikora’s Jeff Swinchatt said today’s customer spends a fraction of what they once did for a gauge, but that they get much more information and capability. “This is how we ensure that our customers can justify the investment in technology,” he said. “The challenge for the measurement company is technological, building the products we supply to the industry at a lower cost basis.”

Commodity or specialty?

While it may be argued that laser technology has made testing and measuring equipment a commodity, companies are exploring new avenues to differentiate their product from their competitors.

“At a basic level, eddy current, ultrasonic and flux leakage flaw detection have become commodities in that knowledge of the technologies is widespread and creating apparatus based upon the techniques has a relatively low entry cost,” said Magnetic Analysis Corp.’s Donald Bugden. “However, adapting the techniques to specific requirements that are studied and understood by the equipment supplier differentiates the NDT packages from one another.”

Bugden explained that the unique requirements of the production process being monitored create the criteria against which the NDT system should be engineered into the components so as to satisfy a broad range of applications at competitive prices.

Zumbach’s Ernest Henzi believes there is no doubt that laser-based diameter measuring heads have become more of a hi-tech commodity than ever before, but that all brands are not created equally. “Comparing the product to a laser printer, for instance, shows that there is more to such ‘commodities’ than price and delivery,” he said. “Considerable differences exist between the various products, from the opto/mechanical design to signal processing, net-

“Cost savings for the customer come from scrap reduction, elimination of down time and efficient integration . . .”

—Donald Bugden, Magnetic Analysis Corporation
working and beyond. “Like in the case of the laser printer example,” Henzi said. “The end user is often not in a good position to make an informed decision, relying on brand names rather than technical facts.”

Sikora’s Jeff Swinchatt noted that he is often asked the question of whether or not laser technology has become a commodity.

“The wire and cable industry has accepted the perspective that this technology is useful and people find it valuable especially the operators you talk with,” he said. “From the viewpoint that a commodity is something that is no longer a specialty item, one can argue both sides of this answer.”

More cable makers accept that diameter gauges are part of their process today, Swinchatt said, and added a cable maker would rarely run a production line without measurements and controls. “Ten years ago, this was not the case. Our customers today understand the cost savings and quality control impact this technology contributes.”

And just as there are different cables being made, there are different manners in which the diameter gauges can be applied, Swinchatt noted.

“Each process must be examined for the correct manner which to examine the cable product and control the application,” he said. “When this type of expertise is required to apply this technology, it would appear to me that we remain in a specialty market.”

Aeroel’s Antonio Spizzamiglio believes the laser gauge is “gradually becoming a commodity or at least an element that is starting to be considered as a standard component of the drawing bench, provided that cost and performance conditions are met,” he said.

This is even more evident, he said, when the application of laser gauges to online monitoring is considered, which helps to avoid the cost of manual checks, cuts scrap enormously and in the long run widens plant automation, he explained.

Depending on how it is used, TLA’s Jeff Kohler said equipment certainly might be considered a commodity.

“For many applications, there are a handful of choices of laser scan micrometers that would suffice,” he said. “In those cases, one could say that the gauging is a commodity.

“What tends to differentiate in these cases is data processing capabilities, operator interface and non-technical issues such as support and cost,” he added. “Our systems run on the PC platform, utilizing our TLASer400 Micrometer Interface card. Each card supports up to four micrometers, and up to four cards may be run in one PC. Support for up to 16 micrometers on a single platform offers substantial cost savings, without sacrificing performance.

The testing of electrical parameters of copper communication cable is hardly a commodity product, explained DCM’s Perry Chattler. “DCM differentiates its products in many ways, but the three most significant are system performance, flexibility and after sales support,” he said.

The company’s ES-2G’s range of frequencies and accuracy “clearly differentiate it from anything else on the market,” said Chattler. “Flexibility is addressed by modular product design. Rather than just producing one system and expecting customers to integrate our system into their test scheme, we provide them with a menu of options to choose from.”

TSI’s Brian Osmondson noted that traditional laser-based diameter gauges, which operated by reflecting a laser beam off of a spinning polygon mirror to create a laser scan, have been commercially available for at least three decades.

“Each laser scan is quite sensitive to the flatness and irregularities of the mirror surface,” he explained. “No matter how much grinding or polishing of the mirror is performed, each side of the polygon mirror is different from the other. As a result, multiple laser scans must be averaged together to compensate for the mirror surface irregularities in order to obtain a single diameter reading.

“In addition, traditional laser scanning diameter gauges are very sensitive to motor wobble due to bearing wear,” Osmondson said of the commodity item. “As bearings wear out, the motor begins to wobble and the mirror tilts off axis. A reflected laser scan generated from a tilted mirror causes the laser scan to tilt by twice as much as mirror tilt. The result produces erroneous measurements and requires the gauge be repaired.”

TSI Holix gauges employ patented Holoptics technology to create fast and accurate diameter gauges with flaw detection capabilities.

Making changes

Aside from the demands of the customer, there are plenty of other factors, from changing standards to government intervention, that may influence and affect the way companies do busi-
ness and develop new products.

With the advent of stringent QS and ISO requirements, Tensitron President and General Manager Stan Saxl said understanding static versus dynamic wire tension characteristics has become essential.

“It is no longer enough to calculate the proper tension value for a wire as one half its yield ratio in a static condition,” Saxl said. “Other engineering specifics such as the speed of the wire, the maximum and minimum tension values, and in some cases the length of the part run, must be taken into consideration to ensure and document process consistency.”

The ever increasing transmission capability of copper data wire, Zumbach’s Ernest Henzi noted, called for new standards for Category products which have made accurate online measurement and control indispensable, providing us with many opportunities to supply the company the necessary measuring and control systems.”

He added that the switch from standard PVC to a flame retardant version of PVC for LAN cable jackets, mandated for fire safety reasons, “increased the material cost per foot of this product considerably and made it more attractive to maintain the promised minimum wall thickness by monitoring its thickness in-line with ultrasonic measuring systems.”

TSI’s Brian Osmondson said advances in microelectronics have produced faster, more powerful chips enabling his company to develop smarter and lower cost gauges.

Take, for example, the company’s LaserSpeed gauges, which are used to measure both noncontact length and speed of wire and cable products. Ten years ago, Osmondson explained, a typical LaserSpeed gauge system required an optics sensor, a sensor cable and signal processor to make a length and/or speed measurement. Such systems, he noted, were rather expensive, making the entry point for wire, cable and optical fiber producers extremely difficult to justify replacing their contact wheels or belt devices to measure length and speed.

“Today, there is readily available
chip technology that has enabled TSI to embed the signal processing on a single chip, inside the gauge (optics sensor),” he said. The result is the TSI’s LaserSpeed gauge.

“In my opinion, the Internet is the main innovation that has been having and will continue to have a considerable impact on our work,” Aeroel’s Antonio Spizzamiglio said, touting the Internet as a fast, low-cost, universal and interactive form of communication.

“It [the Internet] allows us to establish a direct contact with our customers and partners, and so to by-pass costly and inefficient networks of agents, distributors and brokers,” Spizzamiglio said. “This is our way to meet the growing need for cost reduction. It is not a simplification or an impoverishment of the product, but a drastic cut to ‘renounce able’ costs, such as marketing.

“Perhaps more than the innovation of product and process, this is the playground where the future of our business will be set,” he added.

TLA’s Jeff Kohler echoed Spizzamiglio’s sentiment. “We think that the PC is critical to long-term operational success for companies,” he said. “The economies of scale, the availability of tools and application software, PC-based instrumentation, networking and a variety of other accessories means continued cost savings, faster development cycles, far more choice, flexibility and future adaptability.”

Meanwhile, Dan Burns noted that the challenge for Cleveland Motion Control is the need to have the company’s products certified for Europe and Canada, “as we expand into markets outside the USA in order to maintain volume and have a chance at growth.”

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