# EMAG Lasertec

## DEVELOPS HOLISTIC APPROACH TO COMMERCIAL VEHICLES

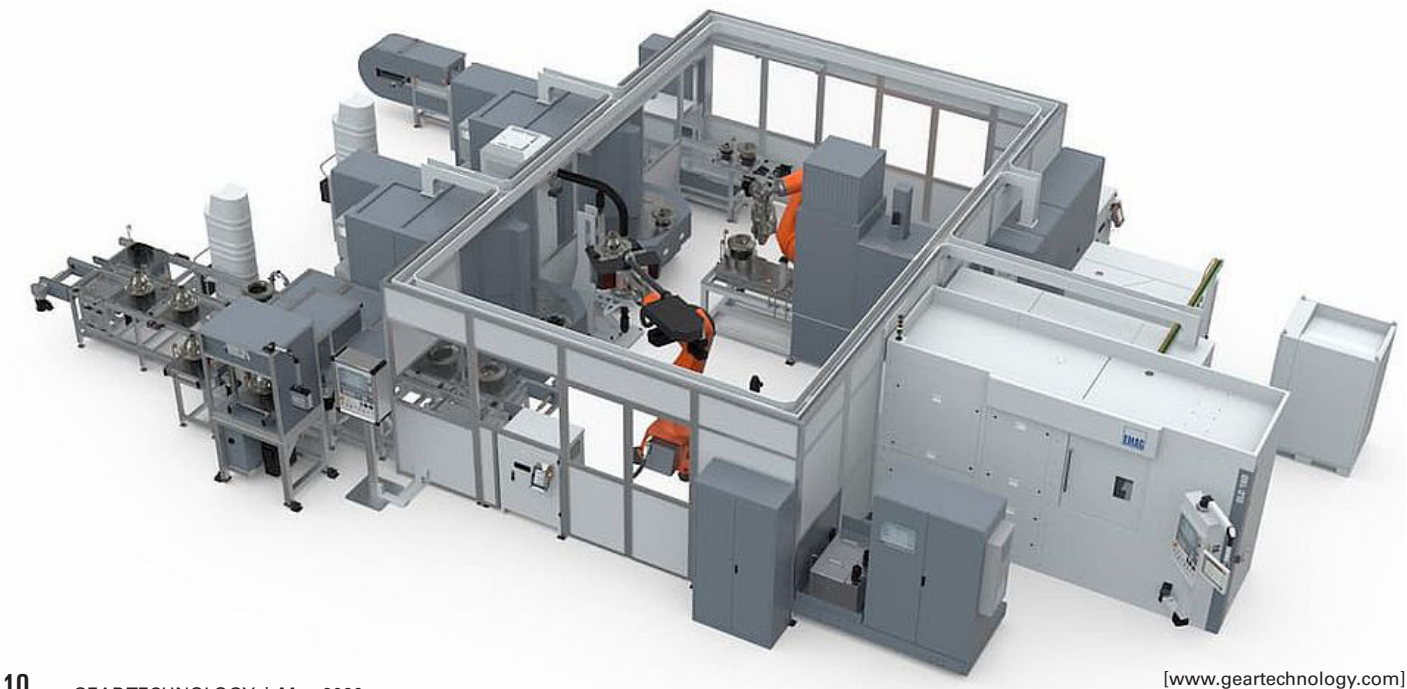
When the catch phrase "lightweight design" is used for the automobile production, it typically refers to passenger cars, rarely commercial vehicles. However, there is an enormous amount of potential for weight reduction and cost savings when considering the large, heavy parts needed for the drivetrain in trucks. Recently, a supplier in North America demonstrated the possibilities and benefits that a complete laser welding production system from EMAG LaserTec can provide. The commercial vehicle specialist currently uses an EMAG production system that welds three different parts together to manufacture a large truck differential — eliminating approximately 40 costly screwed connections. What type of processes take place in this production line?

A Shell Commercial Vehicle Study predicts that the number of commercial vehicles on the road will continue to rise, very quickly, until 2040. The study claims that the number of new registrations in Germany each year will increase from the current 290,000, all the way up to 344,000, and that the rolling stock of vehicles will reach nearly 3.5 million in 2040 (currently 2.9 million). We will also continue to see the same push for energy efficiency in an effort to achieve climate goals, as well as political pressure on manufacturers to develop vehicles that are more economical. Based on this, a system that will allow manufacturers to achieve a lightweight design in the commercial vehicle sector will be a game changer. Many truck manufacturers have naturally been focusing on well-established light weighting systems from the passenger vehicle sector, that have allowed for massive cost savings with enormous decreases in weight — and that's precisely where laser welding comes into play.

For years, laser welding has been essential in the development of drive train workpieces for passenger vehicles. Welded joints now replace screwed connections in many places. Even if a workpiece cannot be made lighter, it can be produced more cost-effectively by eliminating expensive screwed connections. For instance, some modern double-clutch transmissions have no less than 16 laser weld seams—on the various transmission wheels, the double clutch and the differential. With that in mind, it is not surprising that a North American supplier to commercial vehicle manufacturers called EMAG LaserTec. The experts, headquartered in Heubach, Germany, specialize in the development of complete laser welding systems.

"The customer knew us, since they already use a variety EMAG machines in other application areas. Their goal is to produce a considerably lighter and more cost-effective large-sized truck differential. This is an ideal task for us, even though we are implementing it for the first time in the truck sector," explains Dr. Andreas Mootz, managing director of EMAG LaserTec. "Having a high level of expertise as a system provider was an absolutely crucial factor for the customer. We develop complete process chains revolving around laser welding, which in principle simplifies planning at the customer end and simultaneously guarantees safe and effective processes."

A perfectly timed sequence becomes apparent for truck differentials, it consists of three individual parts before



production starts: two housing parts and the ring gear. These each weigh up to 130 kilos (287 lbs) and have a diameter of up to 600 millimeters (24 in). The detailed sequence is as follows:

After being fed by two separate loading stations, the two housing parts and the ring gear run through an EMAG laser cleaning system—a new in-house development that already looks and feels like a standard machine. The process is extremely fast and removes all residues, such as coolants or preservatives, using a focused laser beam.

Robots then remove the parts from the laser cleaning machines. The ring gear is first preheated with induction heating and is then transported to the joining station (preheating is performed using a low-frequency generator by EMAG eldec). The two halves of the housing are directly fed into the joining station and press-fitted together with the ring gear. The process is performed under force/path monitoring.

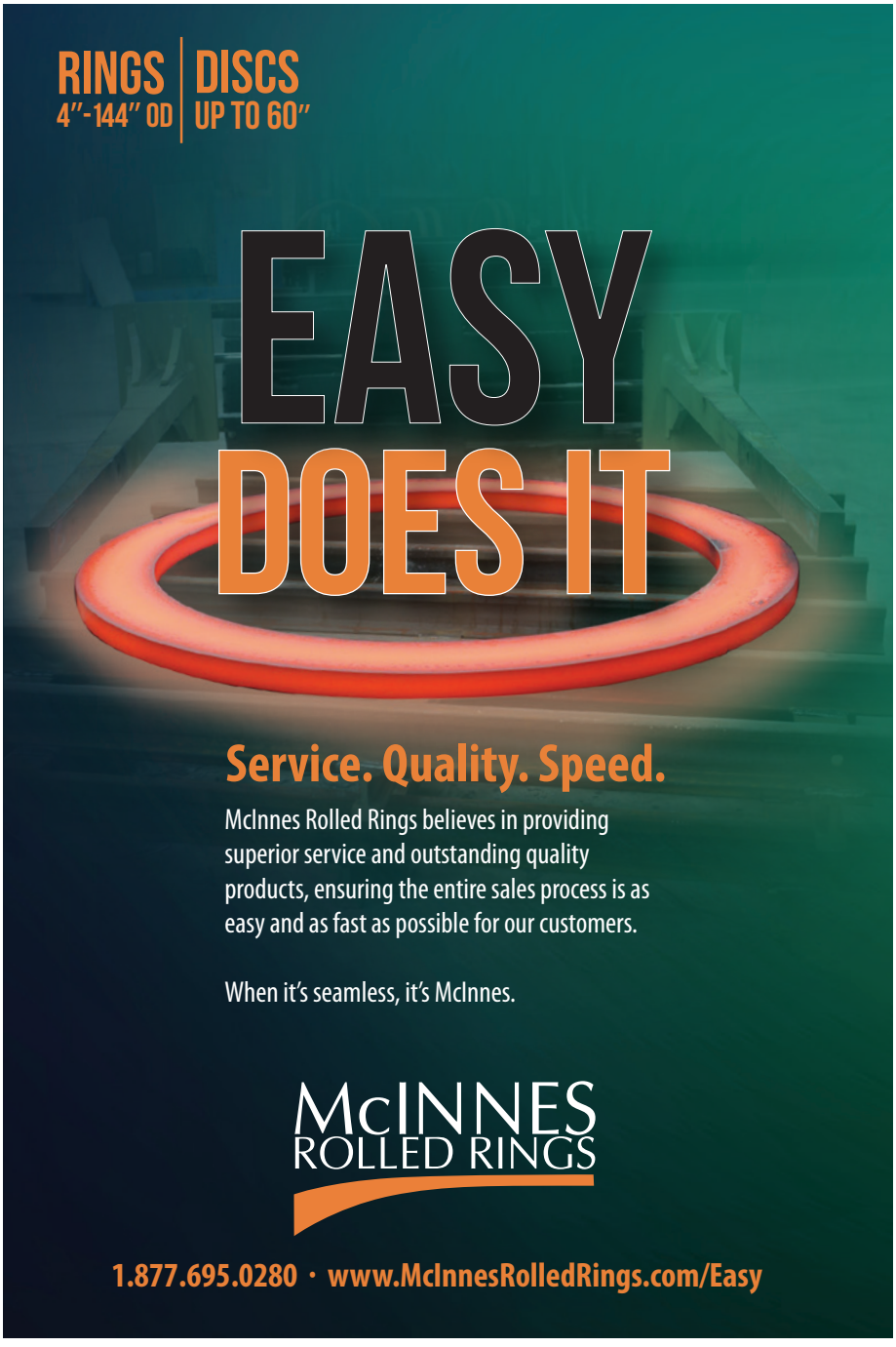
The subassembly is now ready for welding—a robot loads it into the EMAG ELC 600. After axial clamping, the housing is closed, and the ring gear is joined with the housing using two welds.

An EMAG ultrasonic testing system automatically checks the quality of the welded joint —a key step in the process that is just as important to specialists as is the machining of the workpiece.

Within 12 months, the development of this process was completed! The specialists at EMAG LaserTec had to overcome a number of process-related challenges during this time—after all, the weld seams are cast steel/case-hardened steel connections with great depth, which are welded with an 8 kW (11 hp) solid-state laser and with welding additives. Aside from that, the dimensions of the manufacturing system are impressive: The whole system consists of two laser cleaning stations, a heating station, a joining station, the ELC 600, and the ultrasonic testing station, which are interlinked with complex feeding technology and two industrial robots.

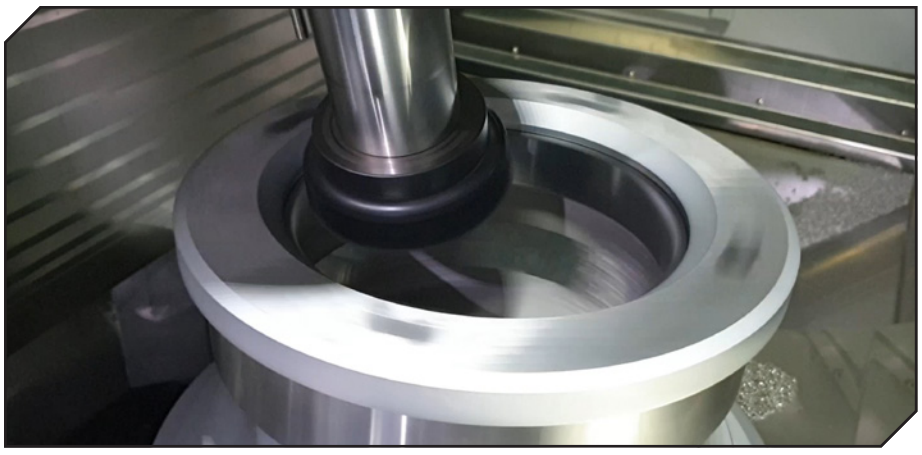
"This development project perfectly illustrates how we work," says Mootz about the holistic laser production system. "We always start out with the workpiece and its constituents to develop the matching process with optimal timing and control. This results in customized solutions that stand for productivity and process reliability."

**For more information:**
EMAG LLC USA
Phone: (248) 477-7440
*www.emag.com*

# Helios

## ANNOUNCES NEO POWER SKIVING MACHINE



Helios Gear Products announces a new line of machine tools from YG Tech that serves gear manufacturers seeking a power skiving solution. This line, called "NEO Power Skiving" or "NEOPS," is the latest affordable innovation brought to the North American market by Helios. "Gear manufacturers for powertrain systems will welcome this new competitor in the marketplace for its affordable price, high technology, productivity, quick delivery, and domestic support," said Adam Gimpert, president of Helios.

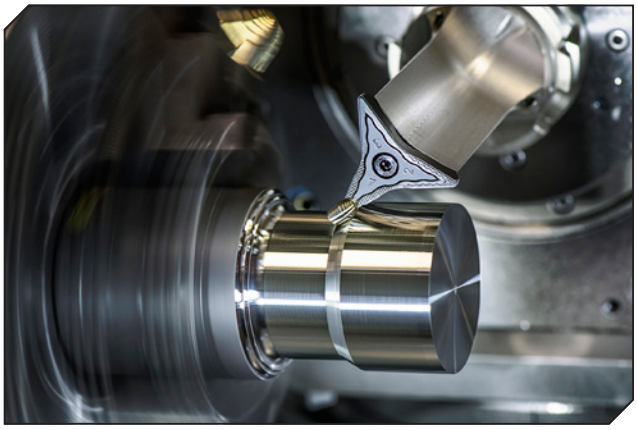
Internal or external spur or helical gears are candidates for power skiving—in particular, those that may traditionally require shaping due to clearance requirements. Compared to shaping, power skiving offers a gear tooth generating operation that is a fraction of the time. Consequently, NEO Power Skiving allows manufacturing gears with a game-changing level of productivity and profitability. This is achieved with a continuous process where the cutting tool is constantly producing small cuts, whereas traditional shaping has unavoidable idle backstrokes that reduce productivity.

The NEO Power Skiving line includes the model 200 and model 400 with capacities for parts up to 420 mm (16.535") diameter and a pitch rating of 4 module (6.35 DP). The machines use high quality components such as direct-drive torque motors for the work and cutter spindles, FANUC 0i MF CNC, and precision linear scales. Key optional features include automatic tool changer, deburring, cutting tool resharpening, and automatic loading/unloading. The NEOPS 200 and NEOPS 400 offer manufacturers a leading combination of technology and productivity at an affordable price with domestic support.

**For more information:**
Helios Gear Products
Phone: (847) 931-4121
*www.heliosgearproducts.com*

# Ceratizit

## OFFERS SINGLE POINT TURNING SOLUTION



High Dynamic Turning (HDT) from Ceratizit combined with the company's dynamic FreeTurn tooling allows customers to carry out all traditional turning operations such as roughing, finishing, contour turning, face turning and longitudinal turning with just one tool. HDT with FreeTurn represents a completely new method of turning.

For 100 years, new cutting materials, new chip breakers and a few new tooling systems have been invented to optimize turning. However, the actual basic turning process has remained essentially unchanged. Even today, a contour is created with an indexable insert at a fixed angle to the workpiece. This method has not changed, even with the addition of controllable axes in modern turning-milling centers, machines which are intended to serve one purpose, namely, to manufacture a component as completely as possible within a single machine work envelope.

Ceratizit has taken advantage of the features on these turning-milling centers and developed the High Dynamic Turning (HDT) System. The simple idea behind HDT: the tool approach and point of contact in the machine can be varied as opposed to conventional turning with a fixed tool.

Instead of the classic, static position of the insert in the holder, the milling spindle is now used to produce the corresponding approach angle to the workpiece. The use of the spindle drive, in conjunction with the slim, axial tool design of the FreeTurn tools by Ceratizit, creates a degree of freedom of 360° without the risk of collision, thus providing unprecedented flexibility. Due to the rotation around its own tool axis, the change can be done without interrupting the cutting process.

Additionally, the angle of approach is freely variable at any time and can even be changed while cutting. This not only enables flexible machining of almost every workpiece contour, but also optimum chip breaking, higher feed rates and an increase in tool life. Depending on the machine capabilities, the technology can be used functionally in all areas of turning operations. The approach of the milling spindle on the Y/Z axis on turning-milling centers is widespread.

**For more information:**
Ceratizit USA, Inc.
Phone: (800) 783-2280
*www.ceratizit.com*



# Mahr

## ADDS DEPTH GAGES TO WIRELESS LINE OFFERINGS

Mahr Inc. has announced an expanded line of digital depth gages. The pocket-sized 30 EWRi is easy to take along for fast depth measurements and the new universal depth gage 30 EWR-U/40 EWRi-U includes interchangeable anvils.

The 30 EWRi is a compact depth gage with a 0.06 inch (1.5 mm) contact and 1 inch (25 mm) gaging range with integrated wireless data transmission. It is ideal for mobile use in manufacturing and inspection at the point of manufacture.

"Taking measurements on the shop floor and transmitting them wirelessly speeds up the quality assurance process," said George Schuetz, director of precision gages at Mahr Inc. "It also adds portability, flexibility and a measure of safety by eliminating troublesome cables. This speeds setup and provides more efficient data processing, especially for quality control in production or incoming goods inspection."

Mahr's new 30 EWR-U universal depth gage includes MarConnect output for wired USB RS-232 or Digimatic while the 30 EWRi-U with integrated wireless data transmission brings new application versatility to depth gage measurements. Both gages incorporate interchangeable anvils to multiply the measurement capabilities of the gage. The gage also comes with a 30 Ud twin hook anvil standard for measuring basic widths and distances.

Five anvil choices are also optionally available to increase the gages' measurement capabilities. Now, measuring depths and recesses with various configurations of ball or chisel style anvils becomes a lot easier and cost effective rather than trying to find a costly special alternative. Both the 30 EWR-U and 40 EWRi-U come in measuring ranges of 0–12 inches (300 mm) or 0–20 inches (500 mm) and each has resolution of 0.0005 inches (0.01 mm).

All MarCal depth gage products offer IP67 resistance to dust, coolants and lubricants, and are easy to use with high contrast digital display, locking screw, zero reset function, and reference system for retaining zero immediate measurement readout. Built to provide years of quality service, the units include steel measuring surfaces; hardened steel slide and beam construction; raised and lapped guideways for the protection of the scale; and even include dirt wipers integrated in the slide.

Integrated wireless data transmission simplifies the recording and documenting process, especially in the networked factory of Industry 4.0. With the touch of a button on the instrument, keyboard, timer, remote control, or foot switch, acquired data is sent from the gage to an i-Stick radio receiver plugged into the USB port of the computer.

*MarCom 5.2* software enables fast and easy setup of measuring stations with wireless (or wired) data transfer to the PC. The *MarCom* cell control is highly flexible. Measured values from connected devices can be automatically transferred into separate Excel columns, tables, or files ensuring the reliability of measurement data documentation. At the same time, the *MarCom* software ensures that readings can be passed on through an integrated virtual interface box to an SPC/CAQ software such as *Q-DAS* or *Babtec*.

**For more information:**
Mahr Inc.
Phone: (401) 784-3100
*www.mahr.com*

# Mitutoyo America

## INTRODUCES PROCESSOR PACKAGE WITH PH-3515 PROFILE PROJECTOR

Mitutoyo America Corporation recently announced the release of the new M2 2D Processor as part of a new package with the PH-3515 Profile Projector. The M2 2D processor updates the PH-3515 Profile Projector with a new touch screen tablet and easier 2D processing for measuring dimensions.

M2 2D Processor Features:

- Easy-to-use high-tech touch screen M2 geometric measurement display
- Graphics-based "part view" constructions: generate distances and tangent lines from within the graphical part view
- Geometric Tolerancing: measure features, set nominals, apply tolerances and view deviation results with only a few quick clicks
- Report Flexibility: Customize report data and format, including header, footer and graphics
- M2 Geometric 2D Measurement Software
- Optional Edge Detection

PH-3515 Profile Projector Features:

- ø14" screen horizontal projector
- Horizontal projector is equipped with accurate linear glass scales
- Profile and Fiber Optic Surface Illumination
- 10" × 6" Travel T Slot table for accessories
- Digital built-in angle counter

**For more information:**
Mitutoyo America Corporation
Phone: (630) 820-9666
*www.mitutoyo.com*

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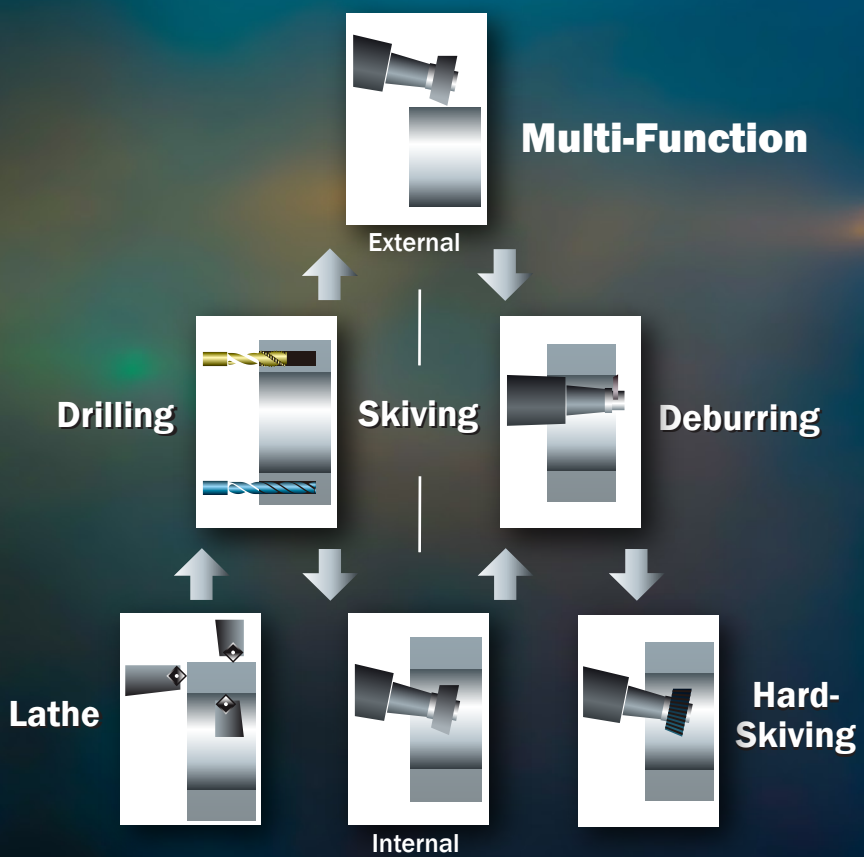


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# CAS DataLoggers

## INTRODUCE MONITORING SOLUTIONS FOR HEAT TREATERS

CAS DataLoggers provided the temperature data logging solution for a factory with multiple lines of (fixed) heat treating ovens. The factory's existing procedures required employees to periodically read temperatures from controller displays and record all these temperatures on a piece of paper. However, this manual method proved to be inaccurate and time-consuming, so the customer wanted to eliminate these recording/transposing errors and extra labor. Since the goal was to increase data precision and quantity and provide high-accuracy reporting to their own customers, data collection needed to be simple and unobtrusive. Management decided that it needed a compact yet rugged solution offering a large number of inputs along with convenient data downloading capability.

The factory installed 2 dataTaker DT85 Intelligent Data Loggers to automate their data recording process. The data logger inputs consisted of a combination of new thermocouple sensors and repeated signals (4–20 mA, 0–5 VDC) from the existing controllers/display units. In case the temperature monitoring scope suddenly needed to expand, the dataTaker inputs could be increased up to 300 channels or 900 single-ended inputs using dataTaker channel expansion modules.

Each stand-alone DT85 data logger could connect to a wide range of sensors and data measurement devices using its 16–48 universal analog sensor channels. The systems' rugged construction withstood the factory's extreme heat ensuring years of durability and dependable operation. Current temperature readings of the heat treating ovens were shown on each logger's built-in display, and each data logger could store up to 10 million data points allowing independent control of schedule size and mode so that users could log only as long as necessary. All curing data was now recorded to non-volatile memory without any human intervention needed.

Additionally, whenever power interruptions occurred, the dataTakers generated a record of the temperatures, allowing engineers to determine exactly how much of the heat treating cycle had been completed. This reduced scrap product, lowered the building's wasted energy and helped increase product quality. The dataTakers also archived data on alarm event, sending data an Ethernet network without needing polling or specific host software.

Temperature data was also available via the network and the DT85's built-in web server for ad hoc monitoring of the oven temperatures throughout the plant. The free software provided for configuration, setup, and displayed temperature measurements in real-time, allowing the factory's quality engineer to remotely access the logger's web server from home for effective remote monitoring.

Ethernet connection to LAN was present at each data logger so that the temperature data could be automatically pushed via FTP to a local server for historical archive. The DT85's sophisticated communications array also included RS232/485 as well as support for Modbus for connection with SCADA systems. Calculations and diagnostic information were easily accessible in the browser style interface, and users also viewed the data as mimics, charts, and tables.

The factory's heat treatment monitoring needs were fully met by the intelligent dataTaker DT85 data loggers, which entirely replaced the previous reliance on fault-prone manual measurements and freed up time for more important tasks. The data loggers automatically monitored the oven temperatures with precise accuracy while also handling data transmission and enabling remote access. Users relied on the intuitive dataTaker software to view the real-time temperature data in any network-accessible location using the loggers' many advanced logging and communications features. Additionally, the dataTakers kept on taking measurements even during occasional power interruptions, allowing operators to effectively track the heat treating cycle and save on energy costs.

**For more information:**
CAS DataLoggers
Phone: (800) 956-4437
*www.dataloggerinc.com*

# Seco/Warwick

## VECTOR FURNACE ACCOMMODATES WIDE RANGE OF THERMAL PROCESSES

Vector from Seco/Warwick is a single chamber HPGQ model loaded with capabilities, and highly flexible to accommodate a wide range of thermal processes including hardening, tempering, annealing, solution heat treating, brazing and sintering applications. It is characterized by high speed cycles, low consumption of energy and low process gas emissions, and is available with curved graphite elements or an all-metal hot zone.

"Our Vector offers customers real value which they can use to improve performance of in-house heat treatment departments or custom heat treat service providers alike. Four Vector furnaces sold in just two months is confirmation that we have both a product and a support team that are attractive to our customers," said Piotr Zawistowski at Seco/Vacuum Technologies.

In addition to Vector, Seco/Vacuum offers several other thermal technologies, from single chamber configurations to multi-chamber systems with gas or oil quench, to single-piece flow inline heat treating and quenching systems. Multiple specialized vacuum heat treat technologies can create opportunities for OEMs and commercial heat treaters to improve throughput, quality and performance.

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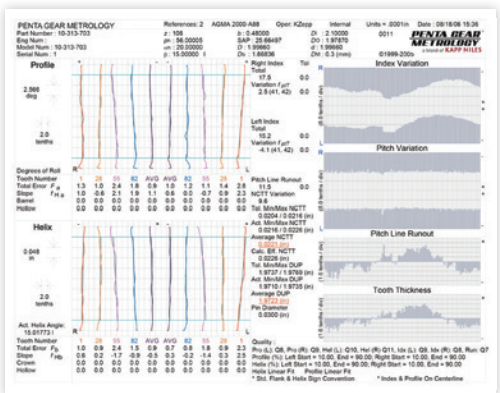

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# Kyocera Corporation

## DEVELOPS NEW GENERATION OF HIGH-PERFORMANCE MILLING CUTTERS

Kyocera Corporation announced its new MEV series of efficient, multi-functional milling cutters for metal machining applications. The new product series, which includes six inserts and 25 holders, are now available worldwide.

A milling cutter typically has cutting edges on its outer holder body and bottom and is used to cut grooves and forms out of the surface of a metal workpiece. The process requires continuous improvement in cutting precision and efficiency to support the growing range of materials and applications demanded within many industries, including automotive and aerospace manufacturing.

While a conventional milling cutter can deliver high rigidity and high-precision machining through increased web thickness, this often results in higher cutting forces that decreased efficiency. Alternatively, if efficiency is prioritized instead, the tool can become prone to vibration shock, which diminishes cutting accuracy. To overcome this longstanding challenge, Kyocera developed a unique "vertical triangle" insert design that delivers both high rigidity and lower cutting forces.

In addition, Kyocera achieved longer product life and greater versatility by adjusting the angle of the cutting edges, increasing the rigidity of the holder body, and optimizing the insert shape to improve chip control.

The web thickness of the MEV Series holder body has been increased to approximately 120 percent compared to conventional milling cutters by changing the insert orientation to a tangential mounting style for the first time among Kyocera's indexable end mills. In addition, the use of a triangular-shaped insert with low cutting resistance ensures both higher rigidity and lower cutting forces for greater machining precision and efficiency.

The innovative design features larger cutting edges for increased strength. In addition, all three usable cutting edges feature Kyocera's proprietary MEGACOAT NANO coating technology (CVD coating will also be available) with wear and adhesion resistance for increased tool life. Increasing holder rigidity and creating wider area of contact with the inserts leads to high durability.

By optimizing the design of the chipbreakers, the MEV maintains exceptional chip evacuation. The MEV can also achieve stable machining in more difficult applications where chip recutting and high cutting force can be challenges such as slotting and ramping at a depth of cut (DOC) up to 6 mm.

**For more information:**
Kyocera Corporation
Phone: (800) 823-7284
*global.kyocera.com*

# Send Us Your News!

**Do you have product news that would be of interest to the gear industry? If so, send it to Senior Editor Matthew Jaster for our consideration. We'll post appropriate announcements online and in print. Submit news to *jaster@agma.org*.**

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