The best way to predict the future of bending is to invent it

Efficiency
The comprehensive solution for faster production

Ergonomics
Full control of the process operations with one finger

Ecology
Maximum CO2 and oil reduction

Economy
Maximum return on your investment

The E-volution in sheet metal working

November/December 2018
Volume 27 No. 6

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Suppliers of Fine Equipment
Xpert Pro Bending Cell

Bending centre for fully automatic sheet metal processing

- Ideal for the processing of small to large automation
- 7-axis robot with a high load capacity offers maximum flexibility and precision during the bending process.
- Depending on the set-up, the Bending Cell can offer bending lengths of up to 4 meters, robot load capacities up to 270 kilograms, ample material storage capacities and auto-tool changer with a generous tool magazine.
- Bystronic provides the press brake, the automation system, customer service, and a full turnkey package.
- Convenient offline programming of bending jobs.
NOVEMBER/DECEMBER 2018
Vol. 27 – No. 6

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In a world that changes faster than ever, SafanDarley takes a unique position.

We do not wait for what’s going to happen, but react actively to a challenging future full of innovations.

We embody the widest and most innovative range of press brakes in the world.

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MAXXMILL 400 Compact Milling Centre

5-axis performance for small workpieces

Is the ideal vertical milling centre for complex 5-axis machining of small workpieces in small or medium quantities.

MAXXMILL 400 can accurately and economically process workpieces on 5 sides in a single set-up.

MMV 2000 Travelling Column Machining Centre

High precision for heavy weights

Ideal for 3, 4 or 5 axis machining for small to medium lot sizes. Rapid travel up to 50 m/min with the utmost in precision.

The super-structure is highly rigid even for heavy work pieces weighing up to 2 200kg.

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www.elcomppptyltd.co.za
The Production Line is capable of processing sheet metal parts both in large series and on a small scale. The integrated laser and automation technologies adapt flexibly to changing order situations while also enabling customized expansion with modular options. The idea behind this manufacturing concept is to combine versatility and productivity. Both are important requirements for industrial sheet metal processing. This combination is possible thanks to the modular design of the integrated systems and the software that digitally networks all the process steps.

10 kilowatt fiber laser accelerates the workflow

The heart of the Production Line is the ByStar Fiber 3015 laser cutting system. Powered by a 10 kilowatt aggregate, this is where the speed of the entire production process originates. Inside the ByStar Fiber are patented fiber laser optics. A cutting head developed in-house by Bystronic that precisely adapts the focal point of the laser beam to match the sheet thickness and material. This enables the fiber laser cutting system to consistently achieve the optimal processing quality in spite of varying sheet metal thicknesses and materials. Within the Production Line, the ByStar Fiber processes steel, stainless steel, aluminum and non-ferrous metals such as copper and brass in sheet thicknesses from 0.8 to 25 millimeters.

Flexible automation directs the material flow

The ByTrans Cross loading and unloading automation is connected directly to the fiber laser. The automation unit’s purpose is to ensure that the supply and removal of materials keeps up with the fast fiber laser. To achieve this, the ByTrans Cross supplies the necessary raw metal sheets and removes the parts and residual sheets from the fiber laser’s shuttle table after the cutting process. For this purpose, the ByTrans Cross is connected to a material storage system. Here, all the raw metal sheets required for the cutting jobs are kept ready. The material storage system also handles the storage of finished cut parts and residual sheets.

In order to make the unloading of the laser cutting system even more flexible, Bystronic expands the unloading function of the ByTrans Cross with the BySort module. This makes it possible to deposit finished parts on additional unloading positions next to the laser cutting system. Among other things, this supports users with the processing of large series where the individual cut parts need to be sorted separately according to jobs outside of the storage system. BySort stacks the parts on material trolleys, pallets, conveyor belts, or even autonomous transport vehicles, depending on the requirements of the production landscape.

Showcase of new pre-processing solutions

Exclusively at EuroBLECH, Bystronic showcased solutions that in the near future will enable the Production Line to be expanded with value-adding processes for the pre-processing cut parts. ByFlex, an additional integrated system, drills and deburrs holes and cuts threads, if required even with countersinks, into sheet metal parts prior to the laser cutting process. The integration of this solution, even before the actual laser cutting process, allows users to make optimum use of secondary processing time within the Production Line.

Guidance system controls networked production

In view of ever-increasing networking and automation, sheet metal processing companies are faced with the question: How can complex production landscapes in which automated manufacturing solutions, such as the Production Line and individual machine systems are networked with each other be controlled and monitored? With the Shop Floor Control System, Bystronic showcased at EuroBLECH a newly developed software architecture for just this purpose.

Networked with sheet metal processing stations, the Shop Floor Control System assumes the centralized control function and helps users to always maintain an optimal production flow, in which scheduled production times and delivery periods are reliably upheld. Laser cutting systems, bending machines, automation solutions, integrated robotics and machines from third-party suppliers – all these must be coordinated in a networked production environment. In complex manufacturing landscapes, this is the only way to ensure that production orders progress smoothly through each process step.

Within the Shop Floor Control System, each integrated system provides real-time information on the current order status, on necessary maintenance measures and updates, or on any malfunctions. All this information can be visualized on a control station. Here the production managers can see on screens whether all integrated systems are running smoothly and whether there are any warnings, which can then be swiftly dealt with.
Manufacturing locally or sourcing internationally?

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EFFICIENT COMPLETE MACHINING OF LONG WORKPIECES

DMG MORI extends its portfolio of universal turning centres adding the CLX 450 with a longer turning length and sets a focus on automation solutions from a single source.

With the huge investments at FAMOT, DMG MORI on the one hand promotes increased capacities, on the other hand the machine tool manufacturer concentrates on further developing its universal machine portfolio made in Poland. The latest example is the CLX 450 with its larger turning length of 800mm. Automation solutions ex-work from a single supplier are another focus at FAMOT. The portfolio includes the flexible robot Robo2Go for CLX turning centres, the WH CELL, a robot solution for CMX V and CMX U machines, and the PH 150 pallet handling, also for the CMX machining centres.

DMG MORI extends its portfolio of universal turning centres adding the new CLX 450 with its longer turning length. The turning centre will be presented in a version with an 800mm turning length and counter-spindle for 6-sided machining. It has a turning diameter with Y-axis – which has a travel range of around 120mm – of ø 315mm. Without the Y-axis its spacious work area can accommodate components up to ø 400mm. Bar machining up to a diameter of ø 80mm is possible and ø 210mm, ø 250mm and ø 315mm chucks are available. With its counter spindle the CLX 450 enables 6-sided complete machining of complex parts. The main spindle impresses with a high torque of up to 426 Nm. Direct travel measuring systems from MAGNESCALE in the X- and Y-axis ensure high precision, optionally also in the Z-axis. On the control-side, DMG MORI offers both SIEMENS and FANUC.

This strong total package requires a mere footprint of 6.7m², which means that all CLX universal turning machines from DMG MORI are available in all technological levels, starting from turning operation up to sub-spindle operations, and with numerous technology cycles as well as hard and software options – and can be configured individually in accordance with the application-specific requirements of our customers. The new CLX 450 will be produced in the Polish factory FAMOT as well as in the Italian factory GRAZIANO that has a long-lasting FANUC experience.

Automation ex works from a single source

Automation solutions are one of the most important key topics for DMG MORI, so that FAMOT has also expanded its range in this field. Customers receive a wide range of productive standard automations here ex-works from a single source. All CLX lathes can be automated by means of the new Robo2Go 2nd Generation. The robot is optionally available with 10 kg, 20 kg or 35 kg load capacity and moves workpieces up to ø 170mm. Its dialog-guided control is easy to operate even without previous robot programming skills. Additionally, the CLX series can be equipped with the gantry-loading system GX6 that can be individually customized to the customers’ needs.

A robot solution for the milling machines of the CMX V and CMX U series is the WH CELL. The modular automation system is designed for many different workpieces and is available with single or double gripper – including customized gripper jaws. The CMX V and CMX U series can also be automated by means of the PH 150 pallet handling. The load capacity is 150 kg or optionally 250 kg, while two pallet sizes are possible: ten pallets with 320 × 320mm each or six pallets with 400 × 400 mm each.
ROBO2GO

THE NEW ROBO2GO 2\textsuperscript{nd} GENERATION
FLEXIBLE WORKPIECE HANDLING, SIMPLE TO PROGRAM

NEW FUNCTIONS

+ \textbf{NEW}: Open programming with drag & drop for maximum flexibility - \textit{Simple robot teaching} in < 15 min.
+ \textbf{NEW}: Handling of shafts $\varnothing$ 25 - 170 mm
+ \textbf{NEW}: Modular gripper system, external and internal gripping as standard.
+ \textbf{NEW}: 20\% higher capacity of the workpiece tray
  - Robot loaded capacity 10 / 20 / 35 kg
  - \textit{Simple relocation} to a different turning machine in < 30 min.
  - Simultaneous use with bar feeder possible
+ \textbf{NEW}: Stacking of workpieces

USER-FRIENDLY
MACHINE AND AUTOMATION INTEGRATED IN ONE CONTROL

PRODUCTIVITY | RELIABILITY | QUALITY
HG-ATC press brakes can be equipped with AMADA SF75 sheet followers. These handy devices, which fit to the front of the machine, make it easier to handle large, heavy parts, which perhaps would have previously required two operators. As a result, labour costs can be immediately halved.

Of course, most people associate automation with robotics, and here AMADA’s latest offering is the HG-ARs. This robotized bending cell, which is equipped with the AC-300 automatic pallet changer and ATC, perfectly illustrates all the productivity and flexibility gains that can be achieved using the latest automation technology. Material load/unload and bending functions are performed by a seven-axis articulated robot, which is capable of a complete range of motions.

A seven-axis robot also features in AMADA’s HG-Rm press brake system for bending large-scale parts featuring complex rib and panel shapes. Here, special grippers dedicated to rib parts are used to process complex shapes in short cycle times. The automatic re-gripping device, which does not require any manual set-up, is equipped with two motorized arms and automatic scissor supports.

From a software perspective, AMADA offers its advanced VPSS 3i suite for the provision of streamlined workflow from initial 3D CAD model to finished product, taking in processes such as cutting, punching, bending and welding. The key to the success of the VPSS 3i system is the constant data link between the separate software modules (such as Blank CAM, Bend CAM and Weld CAM), the machines and the central database. This database stores all parts, machines, tools, materials and technology-related information in a consistent way, distributing the data quickly and reliably. All of AMADA’s automation solutions incorporate the latest digital technologies in line with smart factory concepts.

HG-ATC can load even the most complex tool layout within just 3 minutes.

AUTOMATION SOLUTIONS FOR AMADA PRESS BRAKES

While many assume press brakes to be mature technology, AMADA continues to push the boundaries of what can be achieved with this core metal-forming process. As a result the company offers a number of important automation advancements that are designed to deskill and reduce costs for fabrication shops everywhere.

A piece of integral technology able to advance productivity is AMADA’s innovative ATC (automatic tool changer). The HG-ATC is the company’s flagship press brake and is unique in the marketplace. ATC technology facilitates the automatic locating and precise loading of punch and die profiles using an independent four-axis tool manipulator, delivering dramatic time gains. In fact, using a clever algorithm to guarantee the best set-up time means the
The Amada Product Portfolio includes:
- CNC TURRET PUNCH PRESSES,
- CNC LASER CUTTERS, CNC PRESS BRAKES,
- NC HYDRAULIC/MECHANICAL SHEARS, SOFTWARE,
- BANDSAWS, BANDSAW BLADES,
- SALES & SERVICE.

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- Lower operating costs
- Expanded capabilities
- Lower maintenance
- Proven performance
- System integration
- Energy efficient
- Elimination of harmful emissions

**HG 1003 ATC Servo/Hydraulic Press Brake with Automatic Tool Changer**
- Introduce rush jobs seamlessly
- Triple or quadruple the amount of set-ups performed each day
- Lower operating costs
- Expanded capabilities
- Lower maintenance
- Proven performance
- System integration
- Energy efficient
- Elimination of harmful emissions

**EM Z 3612 MII Next Generation Servo Electric Punch Machine**
- Set-up time reduction
- Process integration
**ABB TO BUILD THE WORLD’S MOST ADVANCED ROBOTICS FACTORY IN SHANGHAI**

Pioneering digital technology company ABB recently announced a major, new US$150 million investment in Shanghai, China to build the world’s most advanced, automated and flexible robotics factory – a cutting-edge center where robots make robots. The new Kangqiao manufacturing center, near ABB’s expansive China robotics campus, will combine the company’s connected digital technologies, including ABB Ability™ solutions, state-of-the-art collaborative robotics and innovative artificial intelligence research to create the most sophisticated and environmentally sustainable factory of the future. It is expected to begin operating by the end of 2020.

The announcement marks a significant milestone for ABB as China’s #1 robotics manufacturer as well as a critical global growth investment for the company in the world’s largest robotics market. In 2017, one of every three robots sold in the world went to China, which purchased nearly 138,000 units. Today, ABB employs approximately 5,000 people in Shanghai and the company’s robotics businesses in China employ more than 2,000 engineers, technology experts and operational leaders in 20 locations across the country. ABB has invested more than US$2.4 billion in China since 1992, with over 18,000 employees in total.

The new Shanghai factory will feature a number of machine learning, digital and collaborative solutions to make it the most advanced, automated and flexible factory in the robotics industry, and an onsite R&D center will help accelerate innovations in artificial intelligence. Using a new, global design approach that ABB announced earlier this year, the factory will be able to dramatically increase both the breadth (type of robots) and depth (variants of each type) of robots that can be made onsite, allowing greater and faster customization to meet the needs of customers.

The entire Shanghai factory will be modelled as a digital twin, which will provide intuitively tailored dashboards for management, engineers, operators and maintenance experts to make the best decisions. This includes gathering and analyzing intelligence through ABB Ability™ Connected Services on the health and performance of ABB robots in the factory to ensure early identification of potential anomalies. In addition to avoiding costly downtime, ABB Ability™ offers advanced digital solutions that can improve performance, reliability and energy usage, as well as providing access to the world’s best platforms, such as the Microsoft Azure enterprise cloud, which is the first international public cloud service operated in China.

The new factory will have an innovative, flexible floor plan based on interlinked islands of automation rather than fixed assembly lines. ABB logistics automation solutions will be used throughout the plant, including automatic guided vehicles that can autonomously follow robots as they move through production, supplying them with parts from localized stations. This will allow production to adapt and scale efficiently to changes in China’s robot market without additional capacity expansions.

To aid the move to mass customization in manufacturing and to ensure the highest levels of productivity and flexibility, the new Shanghai factory will make extensive use of ABB’s SafeMove2 software, which allows people and robots to work safely in close proximity. In addition, ABB’s YuMi robots will allow close collaboration on many of the small parts assembly tasks needed to manufacture an ABB robot.

**DAIMLER INVESTMENT IN NEW TECH CENTER CHINA**

Daimler recently announced plans to build a Research and Development Tech Center China with a total investment of over 1.1 billion RMB (approximately 145 million EUR). This marks the further expansion of the company’s footprint in its single largest market and will be its second major R&D site in Beijing, following the Mercedes-Benz R&D Center established in 2014.

Located on the premises of the local production hub Beijing Benz Automotive Co. Ltd. (BBAC), the R&D Tech Center will allow Daimler to accelerate the localization of new Mercedes-Benz products in China. Scheduled to start operations in 2020, the R&D Tech Center’s proximity to the production hub will enable the integrated campus concept of local production with R&D, through the existing pilot plant, test track and test benches at BBAC, together and new test labs and workshops at the R&D Tech Center for testing in new energy vehicle technology, powertrain and chassis, emissions and in-vehicle air quality.

Covering a gross floor area of 55,000 m², the Daimler R&D Tech Center China will consist of a test building and an office building. The office building with a canteen and social areas will be capable of accommodating up to 600 employees, while the two-story test building will include a warehouse and parking area for 250 test vehicles. It will house a wide-array of cutting-edge test facilities for overall vehicle and component testing, ranging from electric drive and charging, powertrain, chassis, in-vehicle air quality, emission to noise, vibration and harshness (NVH), as well as a consolidated workshop for all functions including overall vehicle and endurance testing. New test labs will have the capacity to carry out a wide-range of basic to complex tests, such as system calibration, durability and thermodynamics. The facilities will incorporate road simulators and climate simulation, making testing as accurate and as optimized as possible.
5 Axis Machining Centre

GENOS M460V-5AX

MACHINE SPECIFICATIONS

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<td>Z-axis (spindle up/down)</td>
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CHINA WILL NEED MORE THAN 7,400 NEW AIRCRAFT

China will need over 7,400 new passenger aircraft and freighters from 2018 to 2037, with a total market value of US $1,060 billion, according to Airbus’ latest China Market Forecast. It represents more than 19 percent of the world total demand for over 37,400 new aircraft in the next 20 years.

In the Small segment, typically covering the space where most of today’s single-aisle aircraft compete, there is a requirement for 6,180 new aircraft; in the Medium segment, for missions requiring additional capacity and range flexibility, represented by smaller widebodies and longer-range single-aisle aircraft, Airbus forecasts demand for 870 passenger and freight aircraft. For additional capacity and range flexibility, in the Large segment where most A350s are present today, there is a need for 240 aircraft. In the Extra-Large segment, typically reflecting high capacity and long range missions by the largest aircraft types including the A350-1000 and the A380, Airbus forecasts demand for 130 aircraft.

By 2037, the propensity for the Chinese population to fly will more than triple from 0.4 trips per capita today to 1.4. Private consumption from a growing middle class (550 million people today to 1.15 billion by 2037) is expected to be the main driver of future air traffic growth. Today this private consumption accounts for 37 percent of the Chinese economy, a share that should rise to 43 percent by 2037.

With these strong growth drivers, China will become the lead country for passenger air traffic, for both domestic and international markets as passenger traffic for routes connecting China are forecast to grow well above the world average, at 6.3 percent over the next 20 years. Domestic China traffic has grown fourfold over the last 10 years with double digit growth rates and is expected to become the largest traffic flow in the next 10 years. International traffic from/to China has almost doubled over the last 10 years.

With aviation continuing to prove an extremely efficient way to move people and goods around the country, domestic air traffic in China will become the world’s number one traffic flow, tripling from today’s already impressive levels. Flows between China and the USA, Europe and Asia-Pacific are expected to be amongst the fastest growing globally, with average annual growth rates of 5.7 percent, 4.9 percent and 5.9 percent respectively. Between 2018 and 2037, the average annual growth rate for all international traffic from/to mainland China is forecast to be 6.3 percent.

FIRST A330-800 SUCCESSFULLY COMPLETES MAIDEN FLIGHT

The first A330-800 development aircraft to fly, MSN1888, landed at Toulouse-Blagnac, France after successfully completing its first flight which lasted four hours and four minutes. The aircraft, the second member of the A330neo Family, is powered by the latest technology Rolls-Royce Trent 7000 turbofans.

The A330-800’s development programme will include around 300 flight-test hours, paving the way for certification in 2019. Its sibling, the larger A330-900 family member, recently completed its development testing and certification programme which validated the A330neo Family’s common engines, systems, cabin and flight & ground operations.

“China is one of the most powerful growth engines of global air transport. It will become the world’s number one aviation market in the very near future,” said Christian Scherer, Airbus Chief Commercial Officer. “Airbus’ share of the China mainland in-service fleet has steadily increased and now exceeds incumbent and competing aircraft types and keeps growing thanks to our cost-effective new generation products. In parallel, the total value of our industrial cooperation with Chinese aviation industry is growing to $1 billion USD by 2020.”

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The A330neo comprises two versions: the A330-800 and A330-900. Both of these widebody aircraft incorporate new Rolls-Royce Trent 7000 engines, nacelle, titanium pylon, new wings and offer an exclusive ‘Airspace by Airbus’ passenger experience. The larger A330-900 will accommodate up to 287 seats in a typical three-class layout, while the A330-800 typically will seat 257 passengers in three classes.
HARP ACCURL CNC HYDRAULIC PRESS BRAKE
Size range from 40Ton to 450Ton

HARP WAYTRAIN HORIZONTAL BANDSAW

HARP SMTCL DOUBLE COLUMN HORIZONTAL BANDSAW
DBS280 / DBS350 / DBS280NC / DBS350NC

KINGRICH BED TYPE MILL KR-B4V

HARP ACCURL CNC HYDRAULIC GUILLOTINE
Size range from 4mm to 20mm

“We would like to wish our customers a Merry Christmas and a Healthy & Prosperous New Year”.

BAOJI CENTRE LATHE
Size range from 1000mm to 3000mm

KINGRICH TURRET MILL

HARP SMTCL RADIAL DRILL
Z3032x10/1 / Z3050x16/1 / Z3063x20/1 / Z3080x25

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We would like to wish our customers a Merry Christmas and a Healthy & Prosperous New Year.\n
Harp Quality never lets you down
**BOEING FORECASTS AIR CARGO TRAFFIC WILL DOUBLE**

Boeing projects air cargo operators will need more than 2,600 freighters over the next two decades to keep up with increasing global freight traffic, which is expected to double with 4.2 percent growth annually.

The 980 new medium and large freighters and 1,670 converted freighters will go toward replacing older airplanes and growing the global fleet to meet demand, according to the new World Air Cargo Forecast, released by Boeing recently at The International Air Cargo Association’s Air Cargo Forum and Exhibition.

“The air cargo market continues to be a major element of commercial aviation’s growth story,” said Darren Hulst, managing director of Market Analysis & Sales Support at Boeing Commercial Airplanes. “Our new forecast indicates strong long-term air cargo trends, which coincide with the market recovery that we have seen over the last few years across Europe, North America, and Asia.”

Some of the factors driving the growth in air cargo include a growing express market in China and the global rise of e-commerce, which is forecast to increase 20 percent annually to nearly $5 trillion in 2021 according to Boeing’s analysis.

To meet growing market needs, Boeing also forecasts that the world freighter fleet will expand by more than 70 percent, from the current total of 1,670 to 3,260 airplanes with new production freighter deliveries valued at $280 billion. Demand for regional express services in fast-developing economies will boost the standard-body share of the freighter fleet from 37 percent to 39 percent. 1,170 standard body and 500 medium wide-body passenger airplanes will be converted into freighters over the next two decades.

Dedicated freighters, which provide unique capability that passenger belly-cargo cannot match, will continue to carry more than 50 percent of the world’s air cargo demand. The majority will be in the large widebody freighter category, such as the 747-8 Freighter and 777 Freighters. “With 90 percent share of the freighter market, Boeing is well positioned to capture this growth,” said Hulst. “We have invested in our freighter family to help express cargo and general freight operators carry out their missions around the world. Whether it’s our 777 Freighter or our 737-800BCF program, Boeing offers the most capable family of freighters with the best combination of payload, range and fuel efficiency.”

Since January 2017, Boeing has sold 128 freighters, including 80 production and 48 converted freighters.

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**NISSAN SIGNS MOU WITH GHANA**

Adding to its track record of investing in Africa, Nissan has committed to working with the government of Ghana to establish an automotive manufacturing industry in the country. The company will also make Ghana its hub for sales and marketing in West Africa.

Nissan Group of Africa, Managing Director, Mike Whitfield (left) shakes hands with Government of Ghana Minister for Trade and Industry, Alan Kyerematen (right) after signing a memorandum of understanding.

The announcements were made recently in Accra, where Alan Kyerematen, Ghana’s minister of trade and industry and Mike Whitfield, managing director of Nissan Group of Africa, signed a memorandum of understanding.

Nissan aims to be the first carmaker to assemble vehicles in Ghana, building on its market leadership in the country. Nissan models accounted for 32.8% of vehicle sales in Ghana last year. The company’s cars, pickups and SUVs are sold through a national network of six sales and service outlets.

The memorandum seeks to unlock economic potential, promote development of the automotive sector and promote investor-friendly regulatory frameworks that encourage sustainable car manufacturing. The aim is to promote infrastructure development, job creation and skills development in Ghana.

Industry wide vehicle sales in Ghana have been growing steadily at an annual rate of about 10% and now stand at about 9,150 vehicles a year.

Working closely with the government of Ghana and with other members of the African Association of Automotive Manufacturers, Nissan will provide its global expertise to establish a sustainable auto manufacturing industry in the country.
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CONTINENTAL’S AUGMENTED REALITY HEAD-UP DISPLAY

The technology company Continental reveals an industry-first full-color demonstrator of an automotive-specific Head-up Display (HUD) based on waveguide technology. This demonstrator is the result of the joint development with DigiLens Inc., one of the leading experts in projection technology enabled by switchable holographic gratings.

“Head-up Displays, particularly those with large-area augmentation, provide optimum driver support. Thanks to our early investment into waveguide technology, we are now taking a big step forward towards ultra-compact AR-HUDs. We have successfully overcome the most challenging hurdle which is the instrument size. As a result, industrializing the AR-HUD in the vehicle is now within reach,” said Dr. Frank Rabe, Head of the Continental business unit Instrumentation & Driver HMI.

HUDs with graphic augmentations in a real-world view offer intuitive driver support. Embedding the augmentations in the real world makes the driver immediately understand where their attention is required and why. For instance, virtual turn-by-turn navigation signs on the road make driving safer and easier. During automated driving, an AR-HUD can make the vehicle’s sensing and planning transparent. As an AR-HUD requires the option to embed augmentations in the complete forward field of view of the driver, the use of mirrors inside the instrument, which is state-of-the-art today, leads to AR-HUD instrument volumes of around 30 liters – too much for most dashboards.

The new Continental AR-HUD with waveguide technology significantly reduces the packaging size. With this new, innovative technology, Continental achieves an augmentation area of 15° x 5° (= 2.60 meters x 0.87 meters at a projection distance of 10 meters) while bringing down device size to a mere 10 liters magnitude. At that level, device integration becomes possible in many vehicles.

Flat waveguides replace mirror technology

Up until very recently, AR-HUD development was still generally based on mirror technology, like in the windshield HUD. However, what works well in the HUD is not an option for the AR-HUD, because the display area of a conventional HUD is small by comparison. While a conventional windshield HUD has a volume of 3 to 4 liters, mirror technology inevitably leads to spatial AR-HUD capacities that can be around 90 liters, which is almost ten times as much.

“Most vehicles simply do not offer this amount of space. That was clear from day one, and that is why we wanted a different solution in order to be able to offer the AR-HUD benefits to as many drivers as possible,” said Dr. Pablo Richter, Principal Expert Optical Technologies at Continental.

That is also why Continental entered into a strategic partnership with the waveguide HUD expert DigiLens, located in Silicon Valley, in 2016 and increased this participation in 2018. The joint development work has now produced the first full-color demonstrator, which uses three flat waveguides stacked over one another to create the RGB color space – and no mirrors.

With the waveguide technology, Continental brings down the device size to a mere 10 liters magnitude, while the conventional mirror technology leads to spatial capacities around 30 liters. © Continental AG

Flat waveguides replace mirror technology to bring graphic augmentations in a real-world view. © Continental AG

“The light rays from the projector enter the multi-layer waveguide from underneath. They get folded inside the waveguide and are finally projected upwards to create the virtual image through reflection on the windscreen,” Richter explained. “One of the many challenges was that while our development partner had produced solutions for the helmet visors of pilots or motorcycle drivers, the large-area application to a windshield takes the technology to a whole different dimension.”

Continental’s demonstrator enables augmentations within a field of 2,60 meters x 0.87 meters at a projection distance of 10 meters and solves the previous size issue of the AR-HUD. Over the course of ongoing development, further necessary requirements to the vehicle application will be met individually.
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Local steel major Allied Steelrode made history in 2015 with the purchase and commissioning of South Africa’s very first dedicated stretcher leveller. This machine was ordered from Red Bud Industries, the leading original equipment manufacturer (OEM) in the United States. The stretcher leveller, which has a length of 120 metres, is capable of processing material up to 12mm thick, 2 metres wide and up to 15 metres in length, fed from coils weighing up to 33 tons.

With this innovative machine in place at their stretcher leveller facility in Midvaal, Allied Steelrode was able to far more effectively produce stretched and flattened steel. Coil steel tends to retain various inherent stresses and latent memory as a result of the hot rolling manufacturing process. In this state, when subjected to subsequent processes such as laser cutting, water jetting, turret punching, welding and bending, these latent stresses cause the steel to distort and lift. This, in turn, raises the cost of fabrication as considerable re-work is involved to correct these variances.

“The speed and tight tolerances of modern fibre laser steel processors leave no allowance for metal lifting or distorting while it is being cut. De-stressed flat steel is therefore critically important in avoiding laser head crashes,” explains the Executive Director of Allied Steelrode, Warne Rippon.

While there have been other methods of de-stressing and flattening raw steel in use in South Africa, these are not as effective as Allied Steelrode’s stretcher leveller. “The effectiveness of our stretcher leveller process has been evidenced by the ever-increasing demand for our iconic trademarked brand, Allied Steelrode Stretcher Material (ASSM); which, since 2015, has been growing rapidly,” comments Rippon.

As ASSM has had the stresses eliminated and is perfectly flat, this allows fabricators and manufacturers – in a wide variety of industries – to produce superior products far more efficiently, at a lower cost. Part of this lowered cost includes a significantly reduced scrap rate. However, the stretcher levelling process does not change the mechanical properties of ASSM sheets, which comply with the standard of 0 to 1 International Units of Flatness.

“As the demand for our ASSM grew, we soon saw the need for a second, even more powerful stretcher leveller, which we also procured from Red Bud Industries. This became fully operational in July 2018,” explains Rippon’s partner in Allied Steelrode, CEO Arun Chadha.

The installation of the second stretcher leveller will allow for greater operational efficiencies, resulting in shorter lead times to delivery. This, in turn, allows our customers to improve their service offering and become more competitive emphasises Chadha.

The two stretcher levellers have varying capabilities which also represent a noteworthy value-add to customers. The first stretcher leveller is able to process steel gauges from 1.2mm to 12mm; while the second processes gauges from 3mm to 12mm. Having two operational stretcher levellers allows Allied Steelrode to be a more flexible supplier and also more responsive to the market, as the respective levellers can simultaneously be dedicated to processing different types of materials for more extended periods.

“What this means for us is that we have been able to drastically reduce the time lost in setting up when changing from one type of material to another,” explains Rippon.

For example, one stretcher leveller can be used to process steel which still has mill residue adhering to it; while the other processes stainless steel, which, in contrast, requires the line to be scrupulously clean.

“To physically stretch steel requires immense forces to be applied, which in turn requires a machine of some considerable scale,” comments Chadha. The new stretcher leveller weighs in at some 250 tons, and to accommodate this machine, the Midvaal facility needed to be expanded to a total of 15,000m² under roof.
FORD COMMENCES PRODUCTION OF ALL-NEW RANGER RAPTOR ENGINE

The Ford Struandale Engine Plant commenced production of the new-generation diesel engines that are set to power the new Ford Ranger Raptor and selected Ranger and Everest models that will be launched in the first half of 2019.

Assembled on an all-new high-tech assembly line, the start of production for the new engine programme marks an important milestone for the Port Elizabeth facility, which opened its doors in 1964 and has produced over 3.4-million engines to date.

"With the launch of the new diesel engines, the Struandale Engine Plant embarks on a historic new journey, as it almost doubles our combined installed capacity to 250 000 units for our two engine programmes," says John Cameron, Plant Manager of the Struandale Engine Plant.

As part of Ford’s 2017 investment of over R3-billion in its South African operations, the plant’s new assembly line has an installed capacity to produce up to 120 000 engines per year. The new engine programme starts off with low-volume production for the remainder of this year, then begins ramping up from early 2019.

The new assembly line will produce a total of eight derivatives of the new engines, including the advanced 157kW / 500Nm Bi-Turbo unit. All of these engines will be supplied to Ford’s Silverton Assembly Plant in Pretoria for installation in selected new Ford Ranger and Everest models and of course, the highly anticipated Ford Ranger Raptor. Ford’s local vehicle production supports domestic sales along with 148 export markets globally.

SA GOVERNMENT TO IMPROVE INVESTMENT CLIMATE

The South African government is pulling out all the stops to improve the country’s investment climate with the aim of attracting more investments to achieve the target of $100 billion worth of investments set by President Cyril Ramaphosa. This was said by the Minister of Trade and Industry, Dr Rob Davies. He was speaking at a roundtable discussion hosted by the Southern African – German Chamber of Commerce and Industry in Johannesburg.

The event was also attended by the President of Germany, Dr Frank-Walter Steinmeier.

“This event is happening in the early stages of what President Ramaphosa calls a new dawn. This new dawn is about setting our country up on a new trajectory where we are looking at raising the level of our investment by domestic and foreign companies by US$100 billion over five years. In order to achieve that it has been identified that we need to improve the investment environment of this country, hence the government is doing everything possible to improve the country’s investment climate and make it an attractive destination for investors," said Davies.

He listed a number of interventions that the government has already implemented in order to make the country attractive as an investment destination. These include providing certainty to the mining industry through the mining charter and changes to the visa regulations.

“We have also worked energetically to try and facilitate improved service for foreign and domestic investors through our entity called Invest South Africa. It provides services from an expression of interest to post-investment support to assist investors to find their way through all of the country’s regulatory issues. We have recently added onto their suites of services that they assist investors in finding an appropriate black economic empowerment deal that will add to the wellbeing of the country by supporting black entrepreneurs and assist in broadening the country’s economic base,” added Davies.
INDUSTRIAL PARKS CAN BE TURNED INTO SPECIAL ECONOMIC ZONES

The Director-General of the Department of Trade and Industry, Mr Lionel October says with proper infrastructure, utilities and management, the twenty-six approved Industrial Parks across South Africa can in future, become Special Economic Zones (SEZs) that can contribute immensely to the economy of the country and create jobs. October was speaking at the opening of the two-day Industrial Parks Symposium hosted in Midrand, Gauteng.

The purpose of the symposium was to serve as a platform for engagement with key stakeholders and experts on the acceleration of the industrial parks as catalysts for developing the Rural and Township Industrial Economy.

According to October, with the support of the dti and the Department of Co-operative Governance and Traditional Affairs’ Municipal Infrastructure Grant, all the challenges that have been faced by the parks in the former homelands areas can be sorted out and made more productive, and attract other businesses to operate in them.

DENEL APPOINTS WIM DE KLERK AS INTERIM GROUP CFO

Denel has parted ways with its Group Chief Financial Officer, Mr Odwa Mhlwana, following a disciplinary process that dealt with various allegations relating to mismanagement.

This signifies one of the key steps that the Board of Denel has taken to stabilize the business and ensure effective oversight over the company since its appointment in April.

An external candidate Mr Willem Abraham De Klerk, otherwise known as “Wim” has been appointed as an interim Group Chief Financial Officer (GCFO). His appointment is with immediate effect and critical in strengthening the executive management capacity of the company. De Klerk is a certified Chartered Accountant with post-graduate Executive Programmes from Darden and Harvard. He joins Denel having recently vacated a Chief Executive Officer position at Arcellor Mittal SA.

De Klerk’s interim appointment, is intended to help build and strengthen a sound internal control environment to enable Denel to restore its position as a strategic national asset and a credible industry leader to key stakeholders.

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The method of rough machining with significantly increased feed per tooth – known as fast feed (FF) milling or high feed milling (HFM) – found its industrial application in the 1990’s. Die and mold making was one of the first industries to adopt HFM into its production practices, following a massive increase in customer demands for reduced die and mold manufacturing time. HFM answered this need while providing an effective tool for boosting productivity. The HFM method is based primarily on two principles: the geometry of a milling cutter and the high-speed feed drive of a machine tool.

A typical fast feed tool features a small cutting edge angle, normally 9-17°. This design characteristic results in three important outcomes. The first is the possibility of considerably increasing feed per tooth due to a chip thinning effect. For example, in face milling low-alloy steel, 0.2mm/tooth (.008 ip) is a near maximum value feed, but high feed milling the same material with a 2mm/tooth (.08 ip) feed is normal. The second is a shallow depth of cut (DOC) that ensures this geometry for the tool. Milling with reduced DOC diminishes cutting force and power consumption. And the third point relates to minimizing the radial component of the cutting force combined with maximizing its axial component, which acts toward the axis of the machine tool spindle, i.e. the direction of the maximum machine tool rigidity. This improves machining stability.

Increasing feed per tooth means greater feed speed that requires the appropriate feed drive of the machine tool. In the above example of high feed milling low-alloy steel, the feed speed may be 7000-9000 mm/min (275-355 ipm) – the next-higher order versus conventional values.

Recognizing market needs, machine tool manufacturers developed a variety of machines intended specifically for high feed milling. These relatively low-power machines have triple high characteristics: high-torque, high-thrust spindle and high-speed feed drive. The machines feature advanced computer numerical control (CNC) hard- and software. Introducing HFM substantially changed the concept of rough milling. Instead of extensive material removal at large depths and width of cut by using high-power machines, the method proposed extremely productive milling at shallow depths by low-power machines fitted with a cutting tool that runs very fast.

The fast feed milling method has since undergone some interesting changes. Originally considered as an effective way for rough machining cavities and pockets that was typical for die and mold making, HFM soon proved advantageous in face milling (“fast feed facing” or “triple F”). The diameter range of the FF milling cutters was increased and the group of engineering materials suitable for cutting by the HFM method, expanded. Fast feed milling quickly penetrated to many industrial branches. It began to be more than an effective technique for the applicative niche of die and mold making, embracing all metal cutting areas as a generally recognized productive method. Steel and cast iron may be known as the main “consumers” of fast feed milling, but stainless steel, titanium and even high temperature superalloys can be successfully machined by the method as well. This in turn led tool manufacturers to introduce a variety of fast feed milling cutters in different forms. Indexable or solid in concept, they can have shank or arbor type design configurations, integral or modular body structures, and cutting geometry that varies according to the machined material group.

ISCAR’s line of high feed milling cutters illustrates this diversity with almost dozens of fast feed mill families; today it is unique in the field with an extensive range of options. Already in the late 90’s, the company introduced a family of indexable tools with one-sided inserts for fast feed milling and continued to expand their line by adding more indexable milling families with designs that provided added value to customers. In one case, the tools carried cost-beneficial double-sided inserts; in another, an advanced cutting geometry considerably improved ramp-down abilities for better performance in milling by helical interpolation. For applications requiring small-size cutters, the company developed FF solid carbide endmills and replaceable milling heads for the company’s “Multi-Master” products. Efficient use of HFM tools in face milling operations generated new demands, and the company not only introduced appropriate cutter families but suggested an original additional solution – the specially designed inserts. These inserts, intended for mounting in general-purpose cutters in the standard milling line, transform the latter to FF tools. The solution particularly won the recognition of small and medium manufacturers, as it allowed more effective usage of already purchased tools.

In its latest “LOGIQ” campaign, ISCAR introduced four new FF tool families and upgraded several existing lines. What was the motivation behind these developments? ISCAR is renowned for its commitment to innovations, driven by R&D advances and manufacturer needs.

The first noticeable feature of the new families is a substantial decrease in the size of indexable FF cutters. For example, the diameter range of FFT3-02 NAN3FEED endmills is 8-10mm (.315-.394”) – classical dimensions for solid carbide tools. The company is confident that the indexable concept represents a competitive solution. These endmills (Pic. 1) are characterized by the original clamping method of miniature carbide inserts. The inserts do not have a traditional central through-hole that weakens the insert structure. A screw head, which acts as a wedge, secures the insert allowing insert indexing to be quick and simple. As the insert is very small in size, it is placed in the pocket via a key with a magnetic boss on the key handle. The design ensures a multi-tooth tool configuration, such as 2 and 3 teeth for diameters 8 and 10mm (.315-.394”) with 3 indexable cutting edges of the insert for cost-effective operation using cemented carbide.

Pic. 1
Another example is TANG4FEED, a family of fast feed shell mills carrying tangentially clamped rhombic inserts (Pic. 2). The mills are designed mostly for rough machining medium- and large-size cavities and pockets. The tangential clamping principle, combined with a dovetail profile of matching surfaces for secure insert mounting, ensures a durable mill structure. The insert’s rhombic shape significantly improves mill performance in ramping-down and side-plunging operations. The TANG4FEED inserts are double-sided, resulting in 4 cutting edges.

The inserts of both mentioned families are provided in several cutting geometries for optimal milling of different engineering materials.

The variety of HFM tool family options inevitably raises the question how to choose the most suitable tool. In addition to ISCAR’s ITA (Iscar Tool Advisor) software, the company developed a quick tool selector guide, a compass for manufacturers to find the most effective solution for fast feed milling.

The case of ISCAR’s HFM line is good evidence that developing FF milling cutters is still far from its high point. The newly introduced tool families offer logical answers to real manufacturer demands. HFM, as a productive method of rough machining, has optimistic prospects and the metalworking industry will continue to require faster and faster milling cutters for high metal removal rates.

LOGIQ-5-GRIP PENTAGONAL ADAPTERS FOR TANG-GRIP (TAG) INSERTS

ISCAR is expanding its parting line by adding LOGIQ-5-GRIP pentagonal adapters with 5 pockets for TAG 2 and 3mm widths. A new family of tools and economical 5 pocket adapters for existing TANG-GRIP inserts in sizes of 2 and 3mm, the adapters allow parting applications of bar diameters up to Ø45.

LOGIQ-5-GRIP features include no setup time after pocket replacement. The back of the adapters is designed with V shape geometry (wedge effect) to ensure maximum clamping forces and tool stability and several adapters can be clamped on one holder. The tools and adapters are designed for JET-CUT cooling up to 340 bar.

For more information, please contact ISCAR South Africa – Tel: 011 997-2700.
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While A.P. Design provides press shop turnkey solutions and automation of presses and guillotines, the company also manufactures vibratory bowl feeders for small parts, servo drive roller feeders and eccentric presses. Our servo roll feeders come in any length required. While the units are controlled by a closed loop servo drive, models are available from 200mm to 1250mm wide. We have strip feeders available up to 400mm wide and 400mm feed length x 4mm thick. Smallest available 38mm wide and 50mm feed length x 1mm thick with feed accuracy ± 0,15 per 0,5m.

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