

MACHINE TOOLS

WORLD

Monthly Magazine on Machine Tools & Allied Industry

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INDUSTRY FOCUS

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TWO COMPANIES. ONE WORLD OF STANDARD PARTS

AN INTERFACE WITH:
MR. RAM GROVER
MANAGING DIRECTOR
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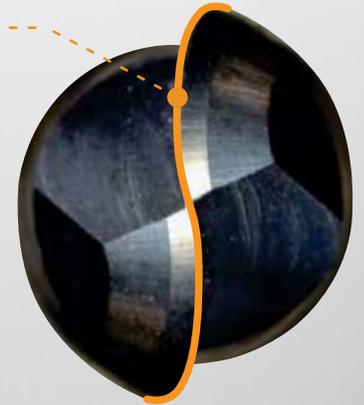
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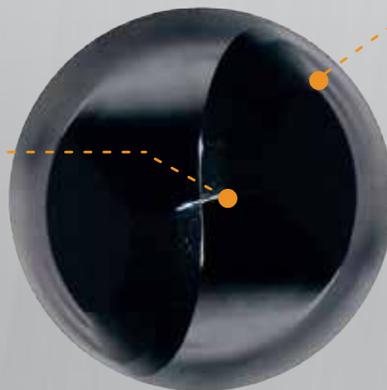


New Negative Cutting Edge Shape
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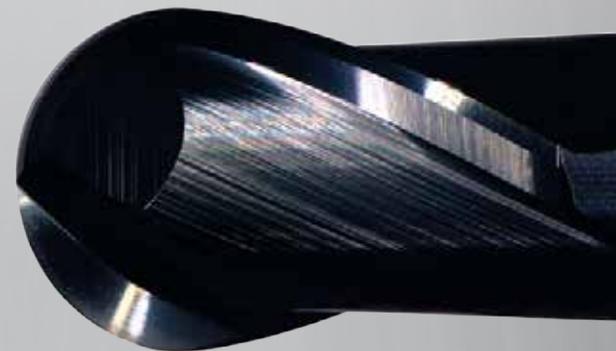
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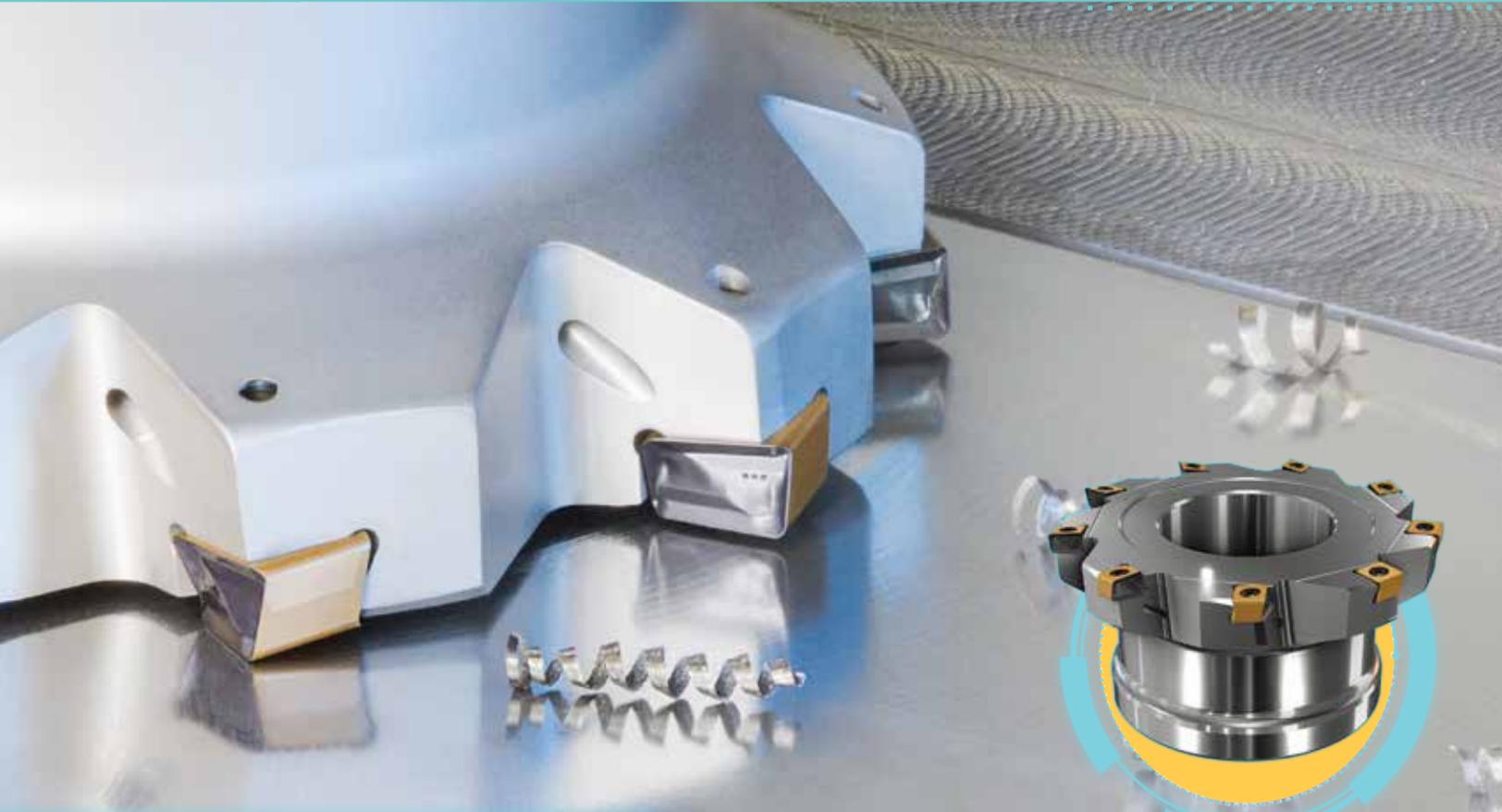


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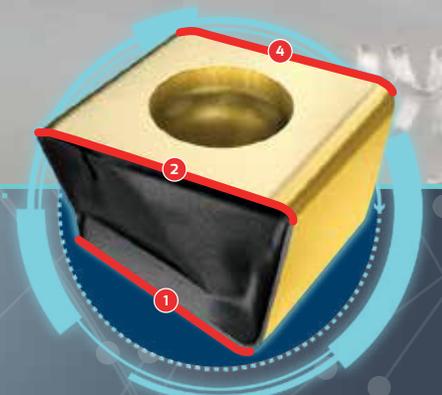
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CEO CORNER



Budget 2020 : Sighting the light at end of tunnel

It is seemingly clear that the government is upbeat on consolidating its existing financial measures. While tax structuring gets reshuffled with an intention to increase cash in common people's hands prima facie, employment generation remains elusive in the Budget. Even though there are certain takeaways for industries in general, Budget 2020 is short of evoking a comprehensive nod by industries.

The automotive industry has been demanding a slash in GST rate and waving of customs duty on lithium batteries for EVs to promote EV manufacturing in the country. Currently, battery costs almost 40-45% of the cost of EVs due to increased imports duty.

The Big Infrastructure Push in the union budget 2020 is a big step towards boosting the economy and the sector. Government announced a huge spend over 102 trillion rupees (\$1.44 trillion) on roads, ports, airports, irrigation and other infrastructure over the next five years. This is definitely a demand revival step and will create an environment for sustainable growth in the sector.

The government, however, has other plans regarding EVs. While it has budged from slashing imports on batteries, it has increased import duty on Completely Built Units (CBUs) in both EV and conventional vehicle categories to promote manufacturing in the country. While increased import duty on CBUs will curb imports, retention of exiting duty on EV batteries will continue to keep EV prices higher at a time government is planning to make mass adoption of EVs.

The budget seeks to strike the right note with the themes of aspiration, economic development, and caring society. The outlay on infrastructure projects worth INR 100 lac crore and schemes for revitalizing the manufacturing of new world items, should help revive investment. The government has recognized the contribution of start-ups to the economy via incentives such as tax breaks on ESOPs for 5 years, tax rationalization for start-ups with INR 100 Cr turnover and digital platform for start-up IPR. Measures for improving the ease of doing business such as the NIVRIK scheme, removal of Dividend Distribution Tax and simplification of the GST regime will bring back investor confidence. MSMEs are the mainstay of a vibrant economy and it is good to see the budget improving credit access and increasing cash in hand for these businesses.

Budget 2020 is actually targeted at boosting incomes and enhancing purchasing power with the reduced tax burden. Besides, the dividend distribution tax has been removed in the new tax regime which would encourage small investors. With the better cash flow and improved purchasing power of the common people, manufacturing including the automotive segment may witness better sales realization.

CEO

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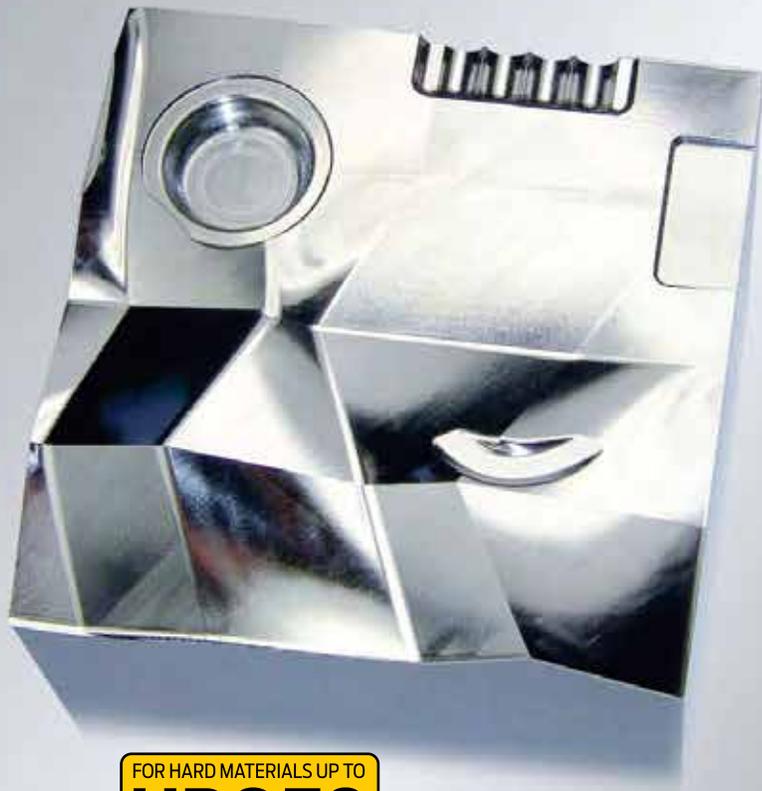
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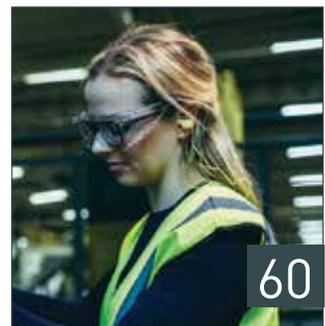


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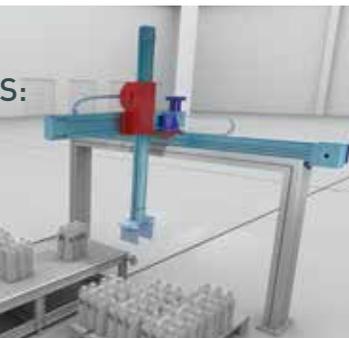
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Raising a toast to 10 successful years in business in India

Nicolas Correa S.A. is one of the leading CNC Milling Machine Manufacturing companies in Europe. The company supplies machines to Railway, Aerospace, Machine Tools, Energy, Defence sectors among others celebrated 10th Anniversary of their Pune Branch.

The event saw The Group President Mr. Jose Nicolas



Correa in the attendance along with Company's customers, dealers and other dignitaries. Mr. Parag

Alekar, CEO of India branch elaborated about the 10 years journey and achievements of company in India. During the function President Mr. Correa was felicitated in a traditional Puneri way by being given the Puneri Pagdi, Shawl and Shriphal.

correa

Intech Additive Solutions launches new 'Made in India' range of Metal 3D Printers

Intech Additive Solutions Pvt. Ltd., industry experts in metal additive manufacturing in India, announced that they have designed, developed and delivered for the Indian manufacturing Industry a true 'Made in India' technological solution, with the launch of their new range of Metal 3D Printers.

The newly launched iFusion series of Metal 3D Printers- the iFusion SF1 and the iFusion LFMulti were showcased at the 'IMTEX FORMING 2020' exhibition held in Bangalore from 23rd to 28th January, 2020.

The iFusion SF1 is a smaller format machine dedicated to R&D laboratories, universities, institutions and academies. The iFusion LFMulti is a large-format multi-laser machine with extensive features designed for the Indus-

trial use of metal additive manufacturing.

"The iFusion series of metal 3D printers, based on the selective laser melting technology and the first of its kind in India, are designed for high precision, stability, reliability and to deliver unmatched performance with higher build rates," said Sridhar Balam, MD & CEO of Intech Additive Solutions. "These cost-effective machines are part of Intech's 3D ecosystem with software bundled in for machine parameter optimization and build process being sold as a package. The overall target of Intech is to reduce the cost of acquisition, cost of operations and first time right with a quick go to market."

"These machines are



The Intech team that designed, developed and delivered to the Indian manufacturing industry the truly 'Made in India' iFusion series of innovative, cutting edge technology Metal 3D Printers

a culmination of more than 30,000 man hours of research, development and innovation spread over the past 36 months. We have 3D printed more than 800 parts for variety of industries in different materials. Along with our in-house developed Software AMOptoMet and the upcoming AMBuilder we aim to create a full-fledged ecosystem for

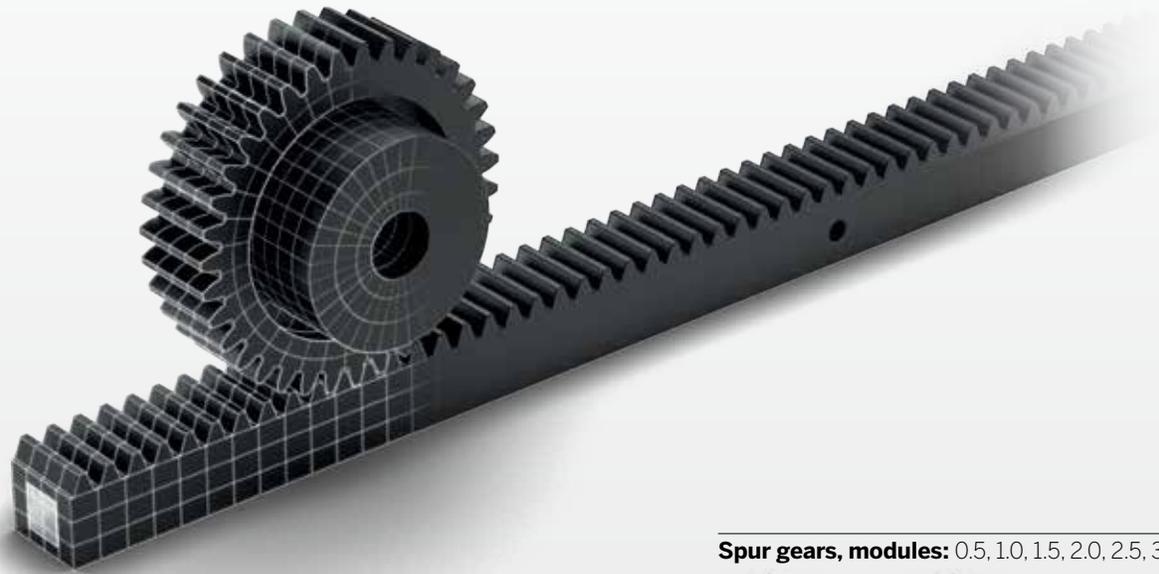
Additive Manufacturing fueling the industrialization of AM in India," added Sridhar Balam.

Intech Additive Solutions is a Bangalore based company at the forefront of additive manufacturing with business offices in the US and Europe.

For more information, Website: www.intech-dmls.in

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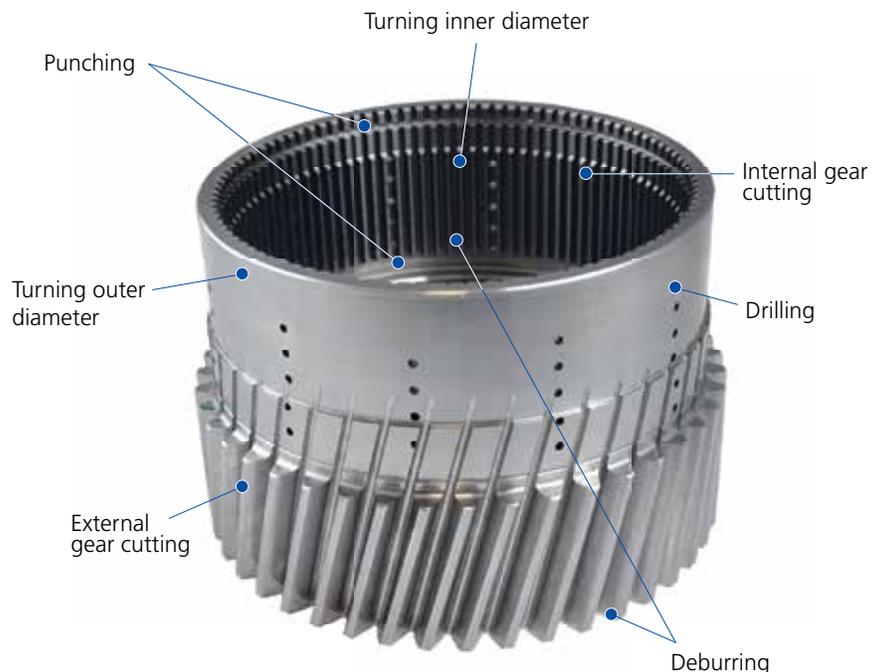


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ELGi's NABL accredited metrology department key to ensuring enhanced product reliability and performance consistency for customers across the globe

The Elgi Equipments (BSE: 522074 NSE: ELGIEQUIP), NABL (National Accreditation Board for Testing and Calibration Laboratories) accredited Metrology Department plays a crucial role in ensuring enhanced reliability and performance consistency across ELGi's product portfolio of 400+ compressed air systems. This, in line with ELGi's focus on high quality, customer centric compressed air solutions. ELGi's proprietary Metrology Department, located at ELGi's state-of-the-art manufacturing unit, in India, has been accredited by NABL in the field of mechanical – dimension, pressure and torque.

Addressing the team at the Metrology Department, Dr. Jairam Varadaraj, Managing Director of Elgi Equipments said, "At ELGi, we are never satisfied with the status quo, we believe in pushing the boundaries, every day, in our quest to be "Always Better". Across the world, we know our customers deserve the best and appreciate, high reliability, unmatched performance consistency and zero downtime."

The ELGi Metrology Department was set up to ensure every product undergoes the right measurement through the usage of accurate and pre-



Dr. Jairam Varadaraj, Managing Director- Elgi Equipments

cise measuring equipment, resulting in a reduction in variation in accordance with the ISO/IEC 17025-2017 norms. Over the years, the laboratory facilities have been upgraded with computerised master equipment and data acquisition systems. The calibration results from the ELGi Metrology lab have been authenticated through Inter laboratory comparisons specified by NABL.

To ensure instruments, gauges & testing Equipment (IMTE) adhere to national and international standards, the team at the ELGi Metrology Department focus on -

- Selection of appropriate measurement methods for IMTE
- Periodical verification of the measurement method
- Periodical verification of IMTE
- Variation reductions in

- measurement systems
- Ensuring the validity of the results

ELGi Equipments recently won the Deming Award for Total Quality Management and became the first global air-compressor manufacturer, to have won the prestigious award in the last 60 years. A pioneer in cutting edge compressed air technology with a presence across over a 100 countries, ELGi offers customers across the world a complete range of compressed air solutions from oil-lubricated and oil-free rotary screw compressors, oil-lubricated and oil-free reciprocating compressors and centrifugal compressors to dryers, filters and downstream accessories. With state of the art manufacturing units and a product portfolio of 400+ compressed air systems, ELGi redefines

reliability, efficiency and cost-effectiveness across 2+ million installations globally.

About ELGi:

Elgi Equipments Limited is a global air compressor manufacturer with a broad line of innovative and technologically superior compressed air systems. ELGi has consistently worked towards ensuring that its customers achieve their productivity goals while keeping the cost of ownership low. ELGi offers a complete range of compressed air solutions from oil-lubricated and oil-free rotary screw compressors, oil-lubricated and oil-free reciprocating compressors and centrifugal compressors, to dryers, filters and downstream accessories. The company's portfolio of over 400 products has found wide application across industries.

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Dormer Pramet introduces new addition in its hole-making range

The global cutting tool manufacturer has extended its range of Hydra replaceable head drills, launched a solid carbide drill for aluminum and added a new spotting drill.

Providing a highly cost-effective option for large diameter drilling, the Hydra program supports structural and general engineering applications. Its range of solid carbide heads – for steel, stainless steel and cast iron – are married together with a hardened steel body.

Existing body options – 3xD, 5xD and 8xD – have been expanded with a 12xD for deep hole applications and a 1.5xD option for improved rigidity in shallow hole and plate drilling.

Providing consistently high performance, even after numerous head changes, the range of bodies incorporates coolant holes to improve cutting efficiency and swarf evacuation. The exact fit between head and body maximizes tool rigidity for superior hole accuracy and precise tolerances.

Also, one body can fit multiple solid carbide head sizes, reducing inventory requirements. In addition, heads can be easily changed without removing the body from the spindle, minimizing



Force N is a solid carbide drill for all types of aluminum, from soft to abrasive grades.

machine downtime.

Meanwhile, Dormer Pramet has extended its Force hole-making assortment, with a solid carbide drill for all types of aluminum, from soft to abrasive grades. The flute and cutting geometry of the new Force N range features a 32° helix angle. This helps to break swarf into small manageable chips and reduce exit burr, which can occur when drilling soft materials.

Offering high metal removal rates and reduced thrust forces to improve hole quality and productivity, Force N is available in 5xD and 8xD lengths with

through coolant.

Finally, Dormer Pramet has launched a new solid carbide drill for fast and accurate spotting. The R125 has a 150° self-centering point geometry, making it ideal for use with high performance drills with point angles around 140°. Providing consistent performance and repeatability in all materials, a multi-layer TiAlN coating ensures longer tool life, improved cutting-edge stability and wear protection.

*For more information,
www.dormerpramet.com*



The exact fit between Hydra head and body maximizes tool rigidity for superior hole accuracy and precise tolerances.



The Hydra range now includes a 12xD for deep hole applications and a 1.5xD option for improved rigidity in shallow hole and plate drilling.



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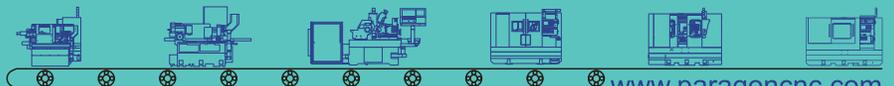


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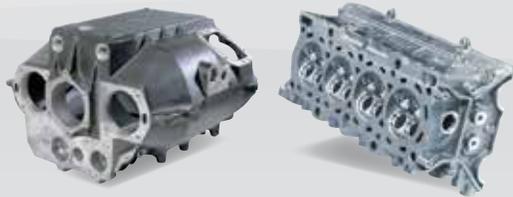
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		Minimum	Maximum
Machine(s)		1	15
Number of pallets	1 level	6	240
	2 levels	12	240
	3 levels	18	240
Loading station(s)		1	8
Loading robot		1	1

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IMTEX FORMING 2020 & ToolTech 2020 receive an overwhelming response

IMTEX FORMING 2020 & ToolTech 2020, organized by Indian Machine Tool Manufacturers' Association (IMTMA), held between 23 - 28 January 2020 at the Bangalore International Exhibition Centre (BIEC) received an overwhelming response.

Spanning over an exhibition space of 33,000 square meters with 602 exhibitors from 26 countries, IMTEX FORMING 2020 & ToolTech 2020, brought stakeholders from the entire global manufacturing fraternity on a common platform for knowledge sharing and business transactions.

Technologies in metal forming such as high-speed laser cutting machines, sheet metalworking, welding and joining, presses, metrology, and CAD / CAM were exhibited live by machine tool manufacturers to help user industries make informed decisions. The focus was on additive manufacturing and

Industry 4.0.

The exhibition also featured parallel events such as:

- i2 Academia Pavilion (With participation from more than 50 institutions, including IITs)
- International Buyer-Seller Meet (Participation from 19 overseas buyers from 9 countries: Egypt, France, Guatemala, Iran, Kenya, Russia, Sri Lanka, UAE, and Uzbekistan)
- Eco Design Awards to encourage green stalls (Participation from 63 companies)
- Manufacturing Quiz Contest (An inter-college quiz on manufacturing technology)
- Jagruti

The welcome address at the inauguration was addressed by Jamshyd N Godrej, Chairman Exhibitions – IMTMA. He said, “This is our largest IMTEX FORMING event ever, despite a challenging



economic scenario in the country. The current reduction in sales of automobiles, I believe is a global phenomenon and we need to understand that.”

In his address at IMTEX FORMING 2020 & Tooltech 2020 inauguration, Indradev Babu, President, IMTMA said, “We are at the cusp of a new decade and seeing undercurrent of positive vibes with some initiatives from the Government of India for strengthening manufacturing sector. Few like the allocation of Rs. 102 lakh crores for developing infrastructure, reduction in base corporate tax for companies and related policies to enhance ease of doing business can spur growth.”

Ram Venkataramani, Immediate Past President, ACMA, delivering his address said, “It is heartening to see the developments in the machine tool industry

and as users, we are happy with it. Automobile and auto component sectors continue to be the primary drivers of the machine tool industry.”

Kamal Bali, President and Managing Director, Volvo Group, delivering his address on automobile industry at the inauguration said, “Metal forming will have a major role in battery enclosures and development with the entry of EVs in a big way, IMTEX FORMING exhibitions will act as a catalyst.”

The IMTMA publications, ‘Comprehensive Report on Indian Metal Forming Machinery’ highlighting the current demand trends in metal forming and the Exhibition Catalogue were released. The IMTMA – Premier Outstanding Entrepreneur Award in memory of Vinod Doshi was conferred to C.S. Shiva Shankaraiah, Managing Director, Trishul Machine Tools. **MTW**



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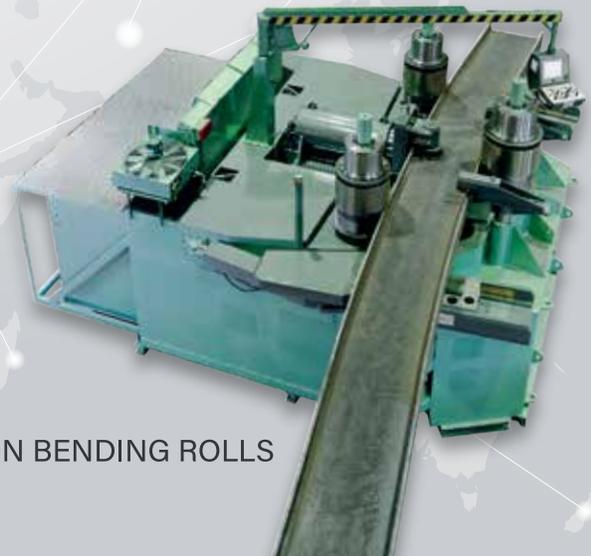


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CNC Software, Inc., the developer of the world's leading CAD/CAM software, has announced that Owner and Executive Vice President Brian Summers is transitioning to a new role. Summers will retain ownership responsibilities but is stepping away from executive duties to embark on a new journey as an ambassador for the manufacturing community.

Working with his brothers, Summers was pivotal in starting CNC Software in the early 1980s, from a home office, and growing the business to what it is today. Over the decades, they evolved Mastercam from a few toolpaths,

Mastercam Pioneer Becomes Ambassador for Manufacturing Community

to a name brand provider of CAD/CAM to the global manufacturing community. The business they started, still operating as a privately held family operation, now employs hundreds and is connected to the world market with a world-class Reseller network, providing sales, training, educational services, and technical support to clients around the globe.

CNC Software President and CEO Meghan West shared, "Brian's involvement in the manufacturing industry, as a leader of our company for the last 30+ years, has been the reason for many of the positive interactions with the product and support that our customers experience today. I'm so excited for Brian as he moves on in his new role, continuing to build and

strengthen relationships with our Resellers and Partners that are the cornerstone of our business."

Summers has developed an extensive group of contacts over the years working for his family business. In his role as ambassador, he will spend time traveling to meet up with clients and other prominent players to share stories of innovation and accomplishment in the manufacturing industry. These are people and organizations working in the public and private sectors that are leaving a positive mark on the world in which we live. According to Summers, "It has been a lot of hard work and an incredible privilege to have been a part of the development of a world-renowned brand in the field of manu-

facturing. I'm so thankful for the community of talent that I have been a part of for more than 30 years.

What people are capable of doing with Mastercam has always impressed me, from medical solutions to space exploration to automotive innovation. As I transition from Executive Vice President to Mastercam Brand Ambassador, I look forward to traveling around to meet with the people and organizations using our software, in addition to the talented community of Resellers and Partners supporting ongoing software development. As an ambassador for manufacturing and the Mastercam brand, I am excited to share their stories."

*For more information,
Web: www.Mastercam.com.*

LANXESS joins World Business Council for sustainable development

LANXESS has enhanced its commitment to sustainability. The specialty chemicals company joined the World Business Council for Sustainable Development on January 1, 2020.

LANXESS CEO Matthias Zachert said, "Sustainability bolsters our business objectives in many different ways – whether by ensuring greater resource efficiency,

good relationships with our stakeholders, greater risk awareness or long-time beneficial cost structures. I am delighted to have joined the World Business Council for Sustainable Development where, together with other member companies, we will be able to make a business case for sustainability."

Peter Bakker, President and CEO of the WBCSD

said, "WBCSD is pleased to welcome LANXESS as our newest member. We are dedicated to working towards a transformation of the key systems across society, and LANXESS – as a provider of sustainable solutions for a wide range of areas – will strengthen the collaboration we aim for and help accelerate the transition to a sustainable world."



In the last few months, LANXESS has focused its business activities even more on sustainability. The specialty chemicals company announced in November 2019 that it will become climate neutral by 2040. In December, LANXESS linked the interest rate terms of its main revolving credit facility to sustainability criteria. 

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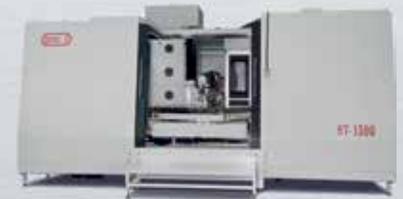
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J.C. Bose University inks MoU with DesignTech Systems Pvt. Ltd.

J.C. Bose University of Science and Technology, YMCA, Faridabad, the leading technical University of Haryana, has signed an MoU with DesignTech Systems Private Limited, engineering services company in India, to develop a Centre of Excellence on Internet-of-Things (IoT) and Augmented Reality (AR) technology based solutions to enable the students to work with an academic supervisor and industry experts on advanced areas like Artificial Intelligence (AI), Machine Learning, Augmented Reality and Internet-of-Things (IoT).

This is first of its kind collaboration of University with an industry to work on IoT and AR based Projects. The MoU was signed by Prof. Dinesh Kumar, Vice Chancellor of J.C. Bose University and Vikas Khanvelkar, Managing



Director of DesignTech Systems Private Limited in the presence of senior officials from both the organizations.

The new centre is being developed under the Department of Electronics Engineering in supervision of Dr. Shaameem Ahmad, former Vice Chancellor of Jamia Hamdard University, who is serving the University as Adjunct Faculty, and Dr. S.K. Aggarwal.

Dr. Ahmad apprised that the purpose of this collaboration is to develop a Centre of Excellence to provide industrial experience and facilities

to students to make them enable to provide solutions of real-time industry problems using Artificial Intelligence, Machine Learning, Augmented Reality and Internet-Of-Things. Initially, two state-of-the-art IoT and AR Lab are being set up under this centre.

Speaking on this occasion, Vice Chancellor Prof. Dinesh Kumar said that Augmented Reality is emerging technologies with tremendous career opportunities as it will play a significant role in improving productivity, efficiency, and

DesignTech

Technology for designing the future

safety, especially in manufacturing sector.

Managing Director of DesignTech Systems Vikas Khanvelkar said, "It is a great initiative of J.C. Bose University to create the set up for training students in emerging technologies like IoT and Augmented Reality. This will help industry to get trained manpower in these areas which at present is difficult to find. DesignTech is proud and happy to be associated with this unique initiative by J.C. Bose University. We have over 21 years of experience in helping industries and educational institutions adopt the benefits of latest technologies. We are committed to support J.C. Bose University to make this initiative successful."

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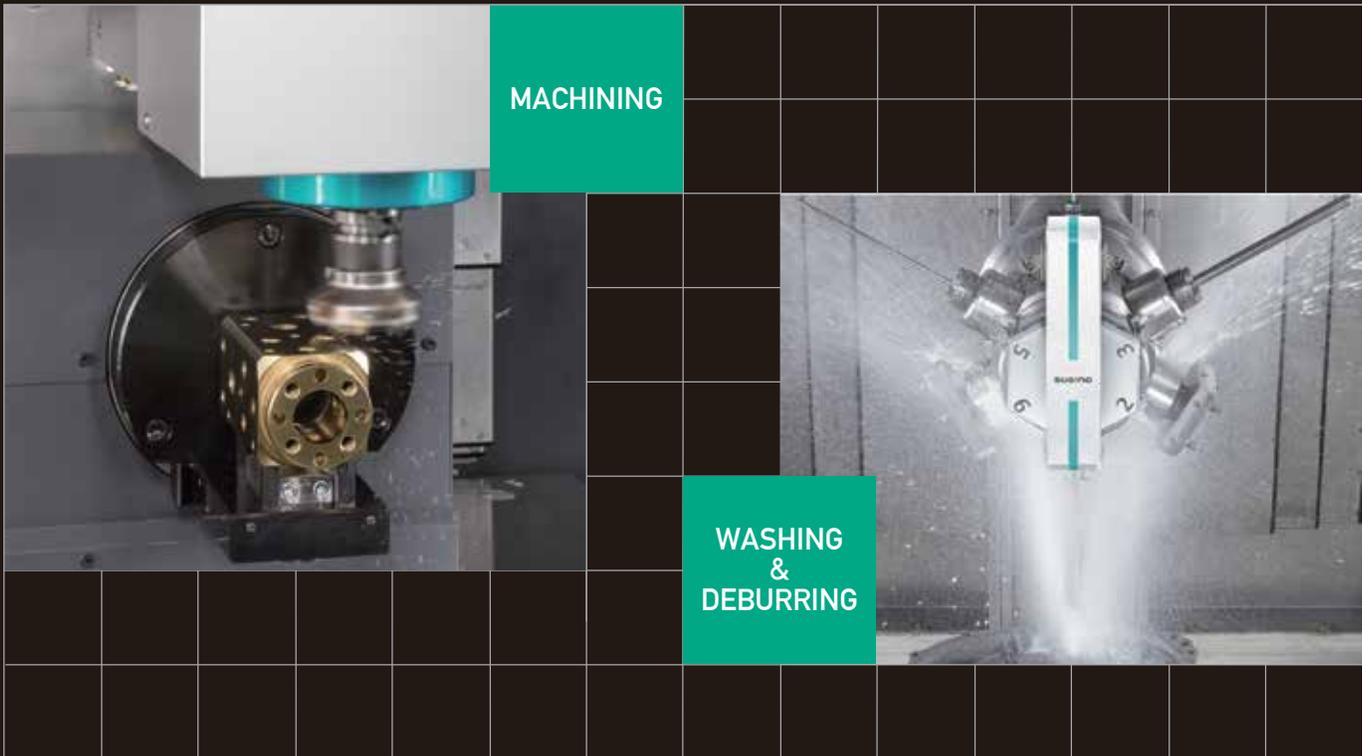
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Q. Please brief us about company's Indian & global reach?

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Elesa and Ganter India: Headquartered at Noida (U.P.) and powered with a dedicated team of qualified sales engineers spread across regions and along with our pan India network of authorized channel partners ensure our presence across length and breadth of our country. We continuously strive to increase our presence across regions by adding more channel partners and sales representatives.



Q. Please also highlight the latest initiatives in machine tools industry domain?

The country is set to become a key player in the global machine tools industry and is poised to see substantial high-end machine tool manufacturing. With Government's thrust on 'Make in India', we are in the global spotlight and our future capabilities and success as a leading manufacturing hub relies very much on the growth of our machine tools industry.

We cater to almost all the industrial sectors with our extensive range of 60,000 Standard machine elements simultaneously poised with our core strength in constantly developing new products and varieties, we have already carved a niche. We are looking at getting into high-end manufacturing sectors like railways, defence and aerospace thereby creating extensive scope for our products.

Q. What are the market opportunities for your company's products in India?

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Mr. Ram Grover
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Q. What is your vision for your company?

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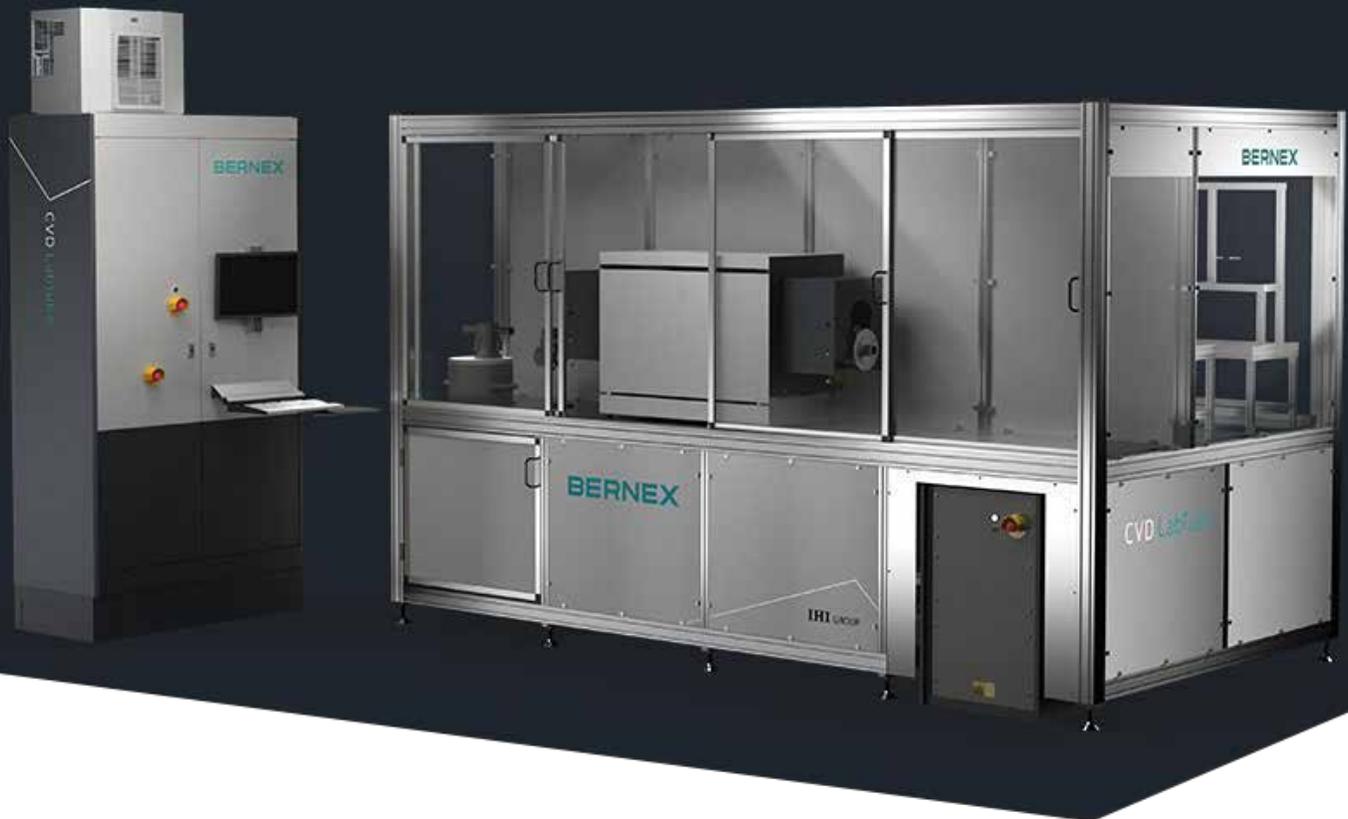
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The small size of the Bernex CVD LabTube unit, along with its low consumables, contributes to high costs savings during coating development.

Available modules:

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- NH_3 module
- BCl_3 module
- Up to four liquid modules with dedicated controlled evaporators, using carrier/purging gas supply
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- Solid precursor sublimator
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TECHNICAL DATA CVD LABTUBE EQUIPMENT

The equipment consists of a ceramic tube reactor with a three- zone-furnace surrounding it. Both ends of the tube reactor are equipped with water-cooled vacuum flanges to ensure tightness at the gas inlets and outlets. The unit is installed into a vented housing, equipped with gas detection systems for any hazardous or combustible medium used. An emergency stop button and function is also integrated, allowing immediate system shut-down for safety reasons.

The exhaust line of the equipment is equipped with a high-capacity condensator, which is able to settle any

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Gas channels	There are permanent multiple gas flow channels like; H ₂ , Ar, N ₂ , NH ₃ , CH ₄ , CO, CO ₂ , H ₂ S, HCl, BCl ₃ , Hydrocarbons. The whole gas supply is split within several particular gas manifolds.
Vacuum generation	Corrosion-protected dry vacuum pump
Pumping/exhaust line	The exhaust line is equipped with a pneumatically actuated shut-off valve in the exhaust line. A cooling trap is installed in-line between the reactor outlet & the pump.
By-product condensation	High capacity cooling trap using liquid N ₂ , installed between reactor outlet & vacuum pump
Compressed air	6 ± 0.2 bar (rel.) dry, no lube required for valve actuators. Consumption < 1 kg per batch
Cooling water	One cooling water circuit at 15 °C ± 5 °C

Millenia Technologies

311, Options Primo, Plot No. X-21, CTS-31, Near Passport Office, Kondivita, MIDC, Andheri (E),
Mumbai - 400093, Maharashtra, India. | Tel: +91-22-28316101 / 28320401
Email: sales@millenia-technologies.com | URL: www.millenia-technologies.com

Hexagon Production Software : Committed to provide end-to-end solutions for manufacturing sector



(From L to R) Amol Arun Mane, General Manager – Technical & Marketing (India & South East Asia), Sandeep Srivastava, Director- India & South East Asia

Hexagon Production Software is a product portfolio of Hexagon Manufacturing Intelligence division of Hexagon AB. Hexagon Production Software develops and distributes CAD CAM software for aiding the design and manufacturing processes, providing solutions for the tooling, production engineering, sheet metal, metal fabrication, stone and woodworking industries.

Despite the diversity of industry, our CAD CAM applications all address the rising challenges of achieving manufacturing efficiencies and bring huge value to the operations where they are deployed.

Hexagon Production Software has

been on a growth spree in the Indian market, despite the country's manufacturing grappling with sharp economic downturn. In an interview, Sandeep Srivastava, Director- India & South East Asia and Amol Arun Mane, General Manager – Technical & Marketing (India & South East Asia) tell us about the company's strategy, USP and its vision for 2020.

Q. How was the year 2019 for you?

Year 2019 had been a challenging year for most of the manufacturing sector in India especially the automotive sector. However, we could register a double digit growth for the Indian market when compared to year 2018.

Q. What was the market share you could attain in 2019?

We have increased our market share though there was slowdown in the Indian manufacturing sector.

Q. Which was your block buster product?

We have been always focused on providing end to end solutions to the manufacturing industry in order to address their critical business issues. However, when it comes to a specific products, VISI and WORKNC products focusing on die and mould design and manufacturing respectively; and EDGECAM, which is our CAM product offering for production machining, have shown a significant sales growth in year 2019.

Q. What was ur USP?

Focusing on customers' critical business issues (CBIs) and providing them with end to end solutions mapping their CBIs using our various products, has been our key strength. We have robust technical processes and systems, along with well experienced and knowledgeable team members. We work with our customers as solution partners helping them to improve their productivity.

Q. Which were your key acquisitions?

Hexagon had acquired Spring Technologies towards the end of year 2018. We had launched NCSIMUL products in India in May 2019 during our India Customer Meet 2019 event at Pune. Using NCSIMUL products, we can create a digital twin of a machine tool, verify and optimize the tool path generated by CAM software. We are actively working with various prospects from the aero-

space and automotive sectors in India for NCSIMUL products.

Q. What will be your focus for 2020 – Product wise?

As mentioned earlier, we will be more focused on end to end solutions using our various products. Now, Hexagon Production Software along with Smart Factory and Q-DAS divisions will work together to provide end to end solutions to our customers mapping their CBIs.

Q. Are you expecting any product launch in 2020?

We plan to launch FASYS in India in year 2020. FASYS is a Tooling / Shop Floor Management solution, which includes the following capabilities :

- 2D/3D tool & resource management based on industry standards.
- Central data management with interfaces to major CAD/CAM systems &

leading PLM/ERP systems.

- Integration of tool storage, pre-setting and assembly data.
- DNC solution for all conventional CNC control units and pre-setting devices.
- Inventory management with integrated ordering and connection to storage systems or dispensers.

Q. What do you feel about the industry trend?

Most of the manufacturing industries are looking for productivity improvement to stay ahead in this competitive market scenario, and increase profitability. They are either in the process implementing Smart Manufacturing / Industry 4.0, or thinking / planning for its implementation in the near future. **MTW**



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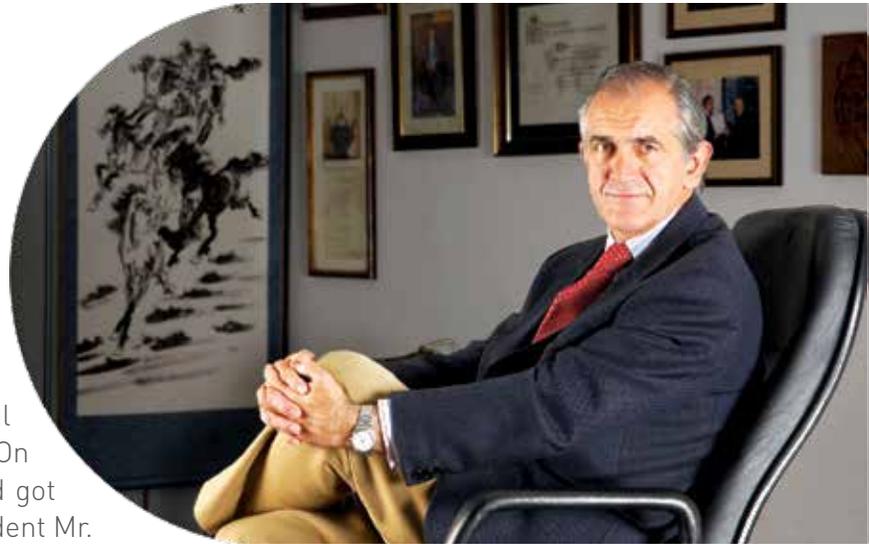
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BOLDITALIC/BL/SEW

Nicolas Correa: Investing in India with a long-term vision

Nicolas Correa S.A. is one of the leading suppliers of machines to the railway, aerospace, machine tools, energy and defence sectors. The company recently celebrated its 10 successful years of business in India at its Pune branch. On the side-lines of the event, Machine Tools World got the opportunity to interact with the group's president Mr. Nicolas Correa, who talks about the company's journey in India in the last decade, evolving demands of Indian customers and future plans. Excerpts:



Mr. Jose Nicolas Correa,
President, Nicolas Correa Group

Q. In over last 10 years of your existence in India, have you noticed any changes in the expectations and demands of your customers in India.

Yes, definitely. Indian customers have increased their level of requirements particularly in the areas of quality and after service. They are getting more and more quality conscious.

We, at Nicolas Correa, are committed to meet the quality requirements for our customers globally. We give complete application support to our customers as we consider that our job does not end just by delivering the machine. Our aim is to support our customers with applications to ensure that they can get the optimum and desired result through their use of the machine.

Q. Which sectors are you catering in India? Are you noticing demand emerging from any new industry or segment?

We are catering to very different areas in the country. We are selling to the railway and energy sector, job shops, capital equipment companies and many more.

In terms of emerging sectors, the situation in Indian market is comparable to the rest of the world. Key areas like renewable energy is gaining a lot of traction. The motor car industry is in a kind of revolution, which is attracting major investment. Some other sectors like wind energy are booming in various parts of the world and it will soon come to India.

Q. How important is India market for your company? What is your future growth plan?

When I first visited India, it had a population of 600 million people. Since then, India has not only doubled its population but has developed immensely. We see huge opportunities in this growing country and are investing with a long-term vision.

Our future plan is to be stable and to continue to work professionally and ensure customer satisfaction. Over the years, we have grown step-by-step in the country. Looking ahead, we intend to continue to be stable and grow steadily, while keeping customer satisfaction at the core. We hope to be here for many

years and contribute in a small way to the evolution of this great country.

Q. Has the slowdown affected your business? What are your strategies for 2020?

It is true that the market conditions are challenging as compared to last year. Yes, there is a slow down as compared to the number of enquiries earlier. However, now it seems new enquires are coming.

Our main philosophy is to keep close to our customers. Their satisfaction is the basis of our relationship. We never sell the machine and forget our customers; we make solid partnership with them. Our after-sale services and application support are the key differentiator for our customers, which helps them maximize their investment. For instance, we noted that repairing the heads of milling-machines is a big issue for our customers. Hence, to ensure proper repair in assured time, we have recently started a head repair center in the country.

*For more information,
Website: www.nicolascorrea.com*

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V	Q	J	K	F	K	S	P	O	T	Y	B	J	I	Y
K	O	L	T	I	H	T	A	V	Z	I	G	K	L	H
V	V	V	P	R	O	B	L	E	M	N	M	L	H	O
I	E	H	H	E	T	H	D	R	Y	J	A	W	O	T
H	R	T	G	U	S	H	U	T	D	O	W	N	W	S
G	H	A	Z	A	P	S	H	E	A	Y	L	O	S	P
E	E	K	L	D	S	U	A	A	K	P	H	F	B	O
H	A	L	N	U	T	L	D	T	D	Q	D	I	W	T
T	T	U	K	Q	U	A	E	I	A	S	U	S	G	D
F	I	S	F	A	V	M	L	A	D	B	N	Q	C	F
Y	N	T	H	C	I	H	N	G	K	N	V	Z	Q	Y
G	G	M	O	T	O	O	F	A	I	L	U	R	E	O
F	Q	E	I	N	S	U	L	A	T	I	O	N	X	Q



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Dynaspede Thrives on Mechatronics

Dynaspede Integrated Systems (P) Ltd. headquartered in Hosur, specialises in the design and manufacture of electro-mechanical components and sub-systems for a wide spectrum of industries in the Mechatronics business sector. It has extended service offerings in Engineering design, Product development, Prototyping and Testing. Dynaspede also offers contract manufacturing facilities and distribution services for its partners through its network.

Sprawling Infrastructure

The company's facilities in Hosur, Tamil Nadu occupy over 100,000 sq. ft. area, employing over 260 people. Its manufacturing facilities are distributed across multiple locations supported by a mature and effective vendor network. Its manufacturing capabilities include Sheet metal fabrication and finishing, Tooling and Machining, Electronic assembly and Precision engineering.

Dynaspede has eight branch offices across India managing its sales and

service network and extending effective pre-sales and after-sales services to its customers. The strength of Dynaspede lies in its ability to synchronise skills in various disciplines of engineering and offer reliable solutions both in Design and Manufacture for its partners and customers.

Ever-expanding Product Range

Dynaspede was started in the year 1978 with Mechatronics as its core competence. A wide variety of electro-mechanical components and sub-systems including electronic drives, clutches, brakes, gear transmissions, electronic sensors, and digital motion control products have been developed and manufactured. Its Electro-mechanical system engineering capabilities have grown over the years



Lalit Dhody, Business Head - Sales & Marketing, Dynaspede Integrated Systems Pvt. Ltd.

to include customized solutions in Machine assembly, Robotics and Plant engineering.

Dynaspede is also manufacturing and distributing various Power Electronics products namely Aluminum foil wound Transformers, Stabilizers and UPS at affordable costs. The aluminum foil wound transformers are very cost-effective products having extensive applications in Power electronics products..

Dynaspede is funded by some of India's largest private equity funds, Kotak Mahindra and SIDBI. Technology development is sourced through a combination of affiliations with specialised institutions of higher learning and investments in boutique research and development outfits. The company is managed by a team of experienced senior management



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staff headed by Mr. Mohan Ram, Whole-time Director and CFO presently encompasses a complete range of capabilities for designing and manufacturing complex machines and integrated systems from concept to installation.

Facilities Galore

The in-house facilities like R & D, Machining, Gear Shop, Metrology, Electronics Assembly, Fabrication and Heat Treatment, form the backbone of the organization.

The Design & Development Team consists of experts in machine design & control technology, academicians, application specialists, software and hardware engineers working in an institutional environment, supported by modern CAE facilities. From the simple design of a base plate to the complexities of automatic controls, every piece of equipment from Dynaspede reflects a commitment to excellence. The in-house metrology and calibration facilities provide for mechanical and electronic measurements with an accuracy traceable to international test standards.



Machine Building Shop

In a Class Apart

Dynaspede's Repertoire includes superior engineering and development capabilities, robust manufacturing setup, Small enough to scale up and large enough to be agile, Focus on value creation and lasting relationships, and Strong global clientele spanning automotive, aerospace / aviation, defence, and other industrial sectors.

What sets Dynaspede apart is the collaborative approach of its dedicated professionals who do not hesitate to say: "We enjoy spending long hours to match customer expectations with our

own. Within the family of Dynaspede, we keep driving a point or two... no hard selling in pre-sales matters, no matter what... and no soft pedaling in after-sales matters," all dictum geared towards maintaining our Business Ethics ...to conduct our business with honesty, integrity and dependability."

Dynaspede

- P.K. Balasubramanian



Dynaspede Engineers at the Assembly line

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- RN parallel shaft gearboxes: 180 to 3300 Nm. Two and three stages.
- RO-RV bevel/helical gearboxes: 180 to 3300 Nm. Three stages.
- RG precision planetary gearboxes: 10 to 230 Nm.
One and two stages.
- VR dry friction speed variators: IEC63 to IEC90
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The Bettinelli advantage



Rupesh Paparaju,
Director, Bettinelli Automation
Components, India

Over the years, Bettinelli Group and CDS Indexers have become synonymous with high quality automation products and technologies.

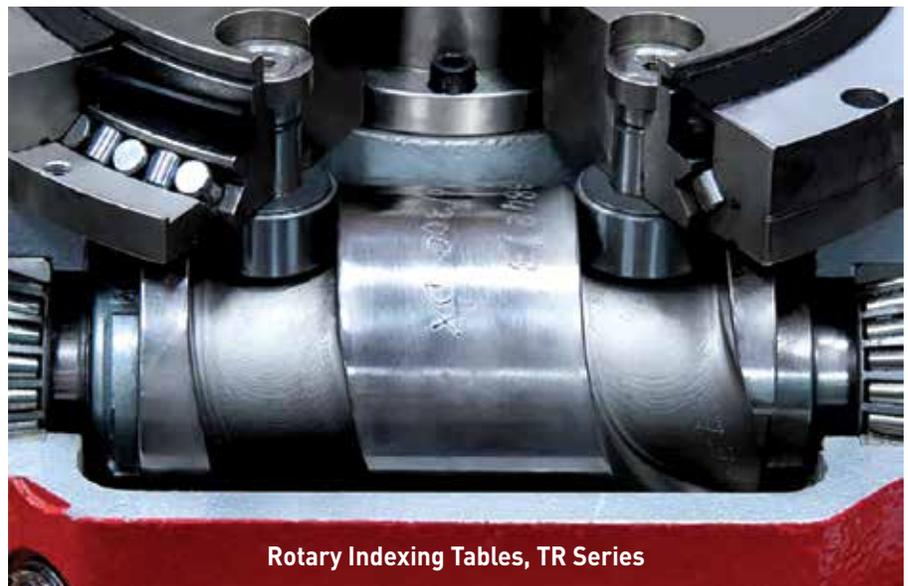
Bettinelli S.p.A, established in 1953, specializes in the development and manufacturing of precision motion control components and systems. In 1996 a separate division named CDS Cam Driven Systems was created for engineering solutions in automation and motion technology.

CDS produces the widest range of mechanical Cam Driven Units, commonly known as rotary / indexing tables for precision motion control applications, requiring rotary or linear transfer, positioning and handling. The products range includes, cam indexing and servo-driven tables, ring positioning drives, intermittent and oscillating drives with parallel or right angle configuration, rotary & linear part handlers, precision link transfer systems, and epicycloidal servo reducers.

Wide ranging products

The broad product spectrum covers IP parallel shaft indexers, IT roller dial indexing tables, TR roller dial indexing

tables, HP roller dial indexing tables, IG/IGA roller gear indexer, TL precision link conveyors, MHP/LHP part handlers, FT-HT open center ring tables and packages



Rotary Indexing Tables, TR Series



Parallel Shaft Indexer

of rotary indexing tables. Bettinelli has a wide range of standard products. These are delivered in 3 weeks. When it comes to customized products, these are designed, manufactured and shipped in 6-8 weeks.

The manufacturing takes place centrally in Italy. The regimen starts with design & engineering, CNC induction hardening, CNC milling, grinding, quality check and then assembly, painting and shipment. In order to ensure quality, all components are machined internally, including the cam hardening by a proprietary CNC controlled induction hardening equipment. For better finish, the products are also subjected to chemical nickel plating, blasting and painting. The manufacturing process is constantly controlled to conform to international standards. The company's quality systems are ISO-9001-2008 certified.

Strategic advantages

Over the years, Bettinelli Group and CDS Indexers have become synonymous with high quality automation products and technologies. "Our design and manufacturing systems have furnished competitive and strategic advantages to numerous industries in pharmaceutical, automobile, manufacturing, packaging and a plethora of other sectors. And for automation functions, our solutions are invariably preferred by companies," says

Rupesh Paparaju, Director, Bettinelli Automation Components, India.

The Indian subsidiary, headquartered in Pune, serves its customers in India by providing installation, commissioning, and after-sales support. It also offers technical consultation. In the pharmaceutical industry cam driven systems are used in filling, blister pack, tablet making and packaging machines. In automobile industry, they are used in pallet transfer tables, assembly machines, painting applications and test rigs, just to mention a few. In machining industry, they are used with advantage in deburring, lapping and pressing machines and in transfer lines. In SPM & robotics, they find applications in transfer lines, station loading, sequential operations and so on. In welding, these indexers are inevitable in positioners, synchronous welding, robotic welding and component transfer.

Packaging too is a major application area. Cam systems are used in box filling machines, wrapping machines, cartoning and capping machines. Indexers are also used in casting, printing and cosmetics industries.

Closer to the customer

The Indian arm of Bettinelli, based in Pune, Bettinelli Automation Components Pvt. Ltd., is highly customer-centric. "Our presence in India means quite something in

Our design and manufacturing systems have furnished competitive and strategic advantages to numerous industries in pharmaceutical, automobile, manufacturing, packaging and a plethora of other sectors. And for automation functions, our solutions are invariably preferred by companies,"

**Rupesh Paparaju, Director,
Bettinelli Automation
Components, India.**

fostering a symbiotic relationship with our customers. It helps us to match our world-class products with our eminent customer support," underlines Paparaju, Director, who has built up a team to improve Bettinelli's response time. "CDS are high-tech products which lend themselves to enhance the operational efficiency and productivity at the customer's end. We stay close to the customer to understand his needs and offer customized solutions within the shortest possible time to ensure peak uptime of his equipment and operations", he adds.

- P.K. Balasubramanian

How viable is additive manufacturing?

In 1984, Charles Hull invented the first 3D printer, which used stereolithography to build up a plastic product layer by layer. Over 35 years later, additive manufacturing (AM) is drastically altering a range of industries, from manufacturing to the medical sector. But what are the limitations of the technology? John Young, APAC Director, EU Automation, shares some insights

In some applications, component manufacturing is shifting away from traditional subtractive machining methods and towards additive manufacturing techniques. The broadening of the applications of AM is causing manufacturers to assess the viability of using it in their own facilities. To do this, there are a few considerations to make before turning to 3D technology.

Quality not quantity

When moving from one manufacturing method to another, quality is a huge factor, particularly in highly regulated industries like aerospace and medical devices. In fact, quality has been one of the major hurdles to the widespread adoption of AM. One critical consideration is that quality and consistency must be the same machine to machine, regardless of location.

Powder bed fusion is one of the most frequently used additive manufacturing methods and there is a possibility that it may introduce defects. However, if the process has a constant thermal gradient, it can prevent warping of the product, avoiding the introduction of defects due to incorrect temperatures. Another concern is that unsintered powder will degrade as a result of heat exposure and that this could impact quality, although regular changing of the powder can prevent this from becoming an issue.

When investing in an AM system, manufacturers can overcome quality concerns by working with an experienced partner, who provides



training and support on best practice. Those looking to invest in AM parts produced elsewhere should be mindful of their supplier's approach to quality, to ensure that what they are purchasing meets specifications.

The perfect material

Polymers, ceramics and metals can all be 3D printed, although plastic 3D printing remains the most popular. While it is feasible to print many materials, some are more suited to the process than others — choosing the wrong material will also impact quality. If you are manufacturing a product from a material unsuited to AM, you may have to rethink your options, either to change the material or opt for a subtractive process.

Ultimately, it won't usually make good economic sense to switch to AM from conventional manufacturing,

unless AM offers significant benefits to the application, for example by making it lightweight. However, if your design is extremely complex and will require expensive custom tooling, AM may be a better option.

Additive manufacturing is a fantastic technology that has brought great design freedom to many applications. However, it is not a one-size-fits-all approach. Companies should think carefully about whether a component really needs to be produced by AM, considering the cost, productivity and practicality of incorporating AM into their process. In many situations, producing and sourcing parts the old-fashioned way — ordering them from a reliable supplier — is the best approach.

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AEROSPACE IN FOCUS

The aerospace industry is not only one of the largest consumers of cutting tools but also one of the most important driving factors for cutting tool development. The aerospace industry features continuous efforts aimed at improving aircraft component manufacturing efficiency, increasing flight safety, and reducing potential environmental damage.

To achieve these goals, the aerospace industry must constantly improve the design of aircraft engines and airframe structural elements, to increase the protection of the aircraft from the damaging action of such dangerous factors as lightning and icing. This in turn has resulted in a series of industry demands, including the introduction of engineering materials that require new production technologies, developing appropriate machinery and cutting tools. The aircraft manufacturer has to deal with complex parts, which are produced from various materials with the use of different machining strategies. This is why the aerospace industry is considered as a powerful and leading force for progress in cutting tool development.

Many materials used for manufacturing aircraft components have poor machinability. Titanium with its impressive strength-to-weight ratio, high temperature superalloys (HTSA) that do not lose their strength under high thermal load, and composites are difficult-to-cut materials. In order to increase output rate and improve productivity, aerospace component manufacturers must use machine tools capable of implementing advanced machining operations. In such conditions, the role of cutting tools is significantly increased; however cutting tools can represent the weakest link in the whole manufacturing system due to their low durability as a system element

, which can decrease productivity. Customers from the aerospace sector expect higher levels of performance and reliability from cutting tools and tool manufacturers have been both challenged and inspired, in terms of developing and integrating sometimes unconventional solutions into their products, to meet these expectations.

Basic materials

Most cutting tools continue to be manufactured from cemented carbide. Over recent years, ISCAR has introduced several carbide grades designed specifically for aerospace materials, including

IC 5820. The grade combines the advantages of a new submicron substrate, a progressive hard CVD coating, and a post-coating treatment to substantially increase impact strength and heat resistance. The inserts from this grade are intended mostly for milling titanium. Pinpointed wet cooling and especially high-pressure coolant (HPC) significantly improve grade performance.

Ceramics, another tool material, possess considerably higher hot hardness and chemical inertness than cemented carbides. This means that ceramics ensure much greater cutting speeds and eliminate diffusion wear. One of the last ISCAR's developments, a family of solid ceramic endmills, is intended for machining HTSA. These endmills are made from SiAlON - a type of silicon-nitride-based ceramic comprising silicon (Si), aluminum (Al), oxygen (O) and nitrogen (N). When compared with solid carbide tools, the endmills enable an increase in cutting speed of up to 50 times, which can drastically save machining hours.

For turning applications, the company expanded its line of indexable SiAlON inserts for machining HTSA materials. The new products (Fig. 1) have already

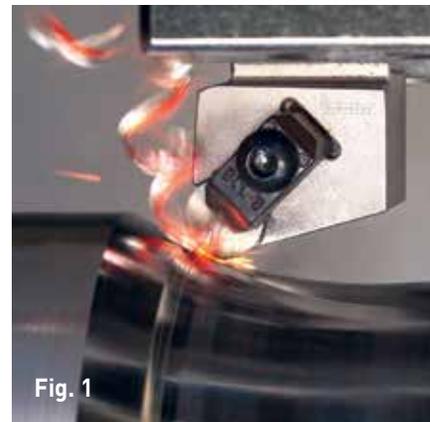


Fig. 1

proved their effectiveness in turning aero engine parts from super alloys such as Waspaloy and different Inconel and Rene grades. In contrast to other silicon nitride ceramics, SiAlON possesses higher oxidation resistance but less toughness. Therefore, a key of a SiAlON insert reliability is additional edge preparation. ISCAR's new "TE" edge geometry has been developed to increase tool life in heavy load conditions during rough operations and interrupted cuts.

Advanced geometry

Improving a cutting geometry is an important direction in the development of cutting tools. Cutting geometry is a subject of theoretical and experimental researches, and advances in science and technology have brought a new powerful instrument to aid in tool design: 3D computer modeling of chip formation. ISCAR's R&D team actively uses modeling to find optimal cutting geometries and form the rake face of indexable inserts and exchangeable heads.

The F3S chipformer for the most popular ISO inserts, such as CNMG, WNMG and SNMG, was designed specifically for finish turning high temperature nickel-based alloys and exotic materials (Fig. 2). It ensures a smooth and easy cut with notable chip breaking results. The remarkable working capability of the designed cutting geometry is a direct result of chip flow modeling.

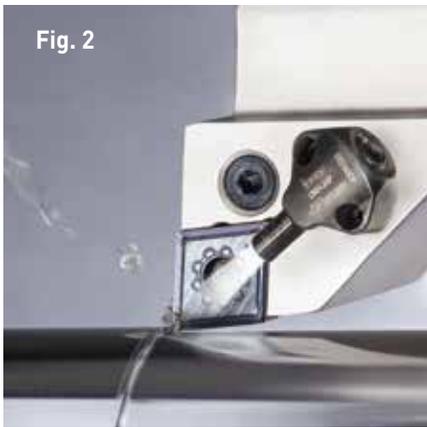


Fig. 2



Fig. 3



Fig. 4

In hole making, applying modeling to the design process significantly contributed to creating a chip splitting geometry of SUMOCHAM exchangeable carbide heads for drilling holes with depth up to 12-hole diameters in hard-to-cut austenitic and duplex stainless steel.

Flexible Customization

Aerospace products can vary immensely in material, dimensions, shape, complexity, and more. To make such a diverse range of products, the product manufacturer needs dozens of machine tools and technological processes. Not every standard cutting tool is optimal for performing certain machining operations with maximum productivity and, consequently, the aerospace industry is a leading consumer of customized tools.

A customer producing titanium parts might be interested in solutions comprising indexable shell mills and arbors from the standard line; while another customer producing similar parts might prefer special milling cutters with an integral body, for direct mounting in a machine spindle.

ISCAR developed the MULTI-MASTER and SUMOCHAM families of rotating tools with exchangeable heads and different body configurations to ensure various tool assembly options that simplify customization and decrease the need for costly tailor-made products.

A further example of simplified cus-

tomization can be found in ISCAR's recently-launched modular drills for multi-spindle and Swiss-type machines. The drills combine the SUMOCHAM design with a FLEXFIT threaded connection (Fig. 3). Multi-spindle and Swiss-type machines typically have a limited space for tooling, which means that the tools in operation need to be as short as possible to avoid collisions and facilitate easy set up. A wide range of FLEXFIT threaded adaptors and flatted shanks has been designed precisely to fit the drills and maximally shorten an overhang.

Responding to demands from the aerospace sector, the company also expanded the MULTI-MASTER family by introducing a new thread connection to increase the diameter range for the exchangeable endmill heads to 32 mm (1.25").

Aluminum machining

Although machining aluminum might appear to be an extremely simple process, effective cutting of aluminum actually represents a whole field of technology with its own laws and challenges.

The need to increase productivity and boost metal removal rates for milling aluminum workpieces, especially large parts of aerospace structural components, has led machine tool builders to develop milling machines with a powerful main drive - up to 150 kW - with high spindle speeds of up to 33000 rpm. To meet this demand, ISCAR has ex-

panded its family of 90° indexable milling cutters by introducing new tools carrying large-size inserts that enable up to 22 mm (.870") depth of cut (Fig. 4). The tools have been designed to eliminate insert radial displacement, which might occur due to high centrifugal forces during very high rotational speed. This concept facilitates reliable milling in a rotational speed range of up to 31000 rpm.

In hole making, the company developed new inserts for drilling aluminum with indexable drills from the DR-TWIST drilling tool range. The inserts are peripherally ground and feature sharp cutting edges and polished rake face for light cut, preventing adhesion.

ISCAR's cutting tool program for the aerospace sector is based on several principles: the complex needs of this industry, taking into consideration trends in metalworking, and the drive to strengthen partnerships with tool consumers. ISCAR believes that such a tri-pronged approach ensures the successful realization of innovative ideas for efficient machining of the difficult-to-cut materials that characterize this challenging and dynamic field.



For more information,
Website: www.iscar.com

Indian Economy Limpes through 2019 - PART I

The Sino-US trade war, an indecisive Brexit and abject mismanagement have spelt doom for the Indian economy in the ongoing year. Despite fudging data, suppressing reports and wholesale denial things continue to spiral downwards. The government has, so far, come up with knee-jerk reactions and ad hoc measures which have made matters worse. In this two-part article we look at the first two quarters of FY2019-20. Article by Arijit Nag



This year has not been a favourable one for the Indian economy. It has still not recovered either from the rude jolt of demonetisation unleashed in November 2016 or the chaotic implementation of the Goods and Services Tax (GST). On top of that the Sino-US trade war and the uncertain Brexit have not really helped India's cause though India assumed that they would.

For the last four years, India has battled the suspicion that its new and 'improved' GDP series is a rose-tinted view of reality. Earlier this used to be the case with China but of late, it has also become a sad truth of India. Now that Narendra Modi is Prime Minister for a second term, he must see that battle for what it is: a lost cause. A top for-

mer government adviser, Arvind Subramanian, provided a statistical estimate which points out that the numbers put forward by the government are cooked up.

Unlike harmless advertising puffery around a toothpaste that kills 99.9 per cent of germs, the narrative of seven per cent growth has not done the national reputation any good.

Against a grim backdrop, including intensified US-China trade and technology conflict as well as the prolonged uncer-

tainty around Brexit, momentum in global financial activity remained slow in the first half of 2019. Although there were positive signs of growth in advanced economies, weaker-than-expected activity in emerging market and developing economies were more than evident.

Growth was better than expected in the United States and Japan, and one-off factors that had hurt growth in the euro geography in 2018 (notably, adjustments to new auto emissions standards) appeared to recede as anticipated.

However, among emerging market and developing economies, first quarter GDP in China was stronger than forecast, but second quarter indicators suggest a weakening of activity. Elsewhere in emerging Asia, as well as in Latin America, growth has been disappointing.

- Global growth has continued to remain subdued. After the release of the World Economic Outlook (WEO) report in April, the United States further increased tariffs on certain Chinese imports and China retaliated by raising tariffs on a subset of US imports. However, additional escalation was averted following the G20 summit in June.

- Keeping this in view, global GDP growth is forecast at 3.2 per cent in 2019, picking up to 3.5 per cent in 2020 (0.1 percentage point lower than in the April WEO projections for both years). GDP reports so far this year, together with generally softening inflation, point to weaker-than-anticipated global activity. Investment and demand for consumer durables have been subdued across advanced and emerging market economies as firms and households continue to hold back on long-range spending. Accordingly, global trade, which is intensive in machinery and consumer durables, demand remains sluggish. The projected growth pickup in 2020 is precarious, presuming stabilisation in currently



Indian Economy Data	2013	2014	2015	2016	2017
Population (million)	1,250	1,266	1,283	1,300	1,317
GDP per capita (USD)	1,488	1,614	1,633	1,763	2,017
GDP (USD bn)	1,859	2,044	2,096	2,291	2,657
Economic Growth (GDP, annual variation in %)	6.4	7.4	8.0	8.2	7.2
Consumption (annual variation in %)	7.3	6.4	7.9	8.2	7.4
Investment (annual variation in %)	1.6	2.6	6.5	8.3	9.3
Industrial Production (annual variation in %)	3.3	4.1	3.3	4.6	4.4
Public Debt (% of GDP)	68.5	67.8	69.9	69.0	69.8
Money (annual variation in %)	12.3	10.7	11.5	6.7	21.8
Inflation Rate (CPI, annual variation in %, eop)	8.2	5.3	4.8	3.9	4.3
Inflation Rate (CPI, annual variation in %)	10.0	6.0	4.9	4.5	3.6
Inflation (PPI, annual variation in %)	5.2	1.3	-3.6	1.8	2.9
Policy Interest Rate (%)	8.00	7.50	6.75	6.25	6.00
Stock Market (annual variation in %)	18.9	24.9	-9.4	16.9	11.3
Exchange Rate (vs USD)	60.02	62.29	66.25	64.86	65.11
Exchange Rate (vs USD, aop)	60.42	61.14	65.42	67.04	64.46
Current Account (% of GDP)	-1.8	-1.4	-1.1	-0.7	-1.8
Current Account Balance (USD bn)	-32.8	-27.6	-22.1	-15.2	-48.7
Trade Balance (USD billion)	-136.7	-137.5	-117.3	-108.9	-158.6
Exports (USD billion)	314	311	262	275	305
Imports (USD billion)	451	448	379	384	463
Exports (annual variation in %)	4.6	-1.2	-15.6	5.1	10.6
Imports (annual variation in %)	-8.0	-0.7	-15.3	1.3	20.5
International Reserves (USD)	304	341	356	373	421
External Debt (% of GDP)	24.0	23.2	23.1	20.6	19.9

Source: Focus Economics

Dimensional Measurement Systems For Manufacturing Quality Control



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stressed emerging market and developing economies and progress toward resolving trade policy differences.

- Risks to the forecast are mainly to the downside. They include further trade and technology tensions that dent sentiment and slow investment; a protracted increase in risk aversion that exposes the financial vulnerabilities continuing to accumulate after years of low interest rates; and mounting disinflationary pressures that increase debt service difficulties, constrain monetary policy space to counter downturns, and make adverse shocks more persistent than normal.

In Q2 FY 2019, i.e. from July to September, the Indian economy grew by 4.6 per cent compared to the same period a year ago, down from Q1's five per cent expansion and a whisker below market analysts' expectations of 4.7 per cent growth. It was also the sixth consecutive decline in economic growth and the weakest reading since Q4 FY 2012.

Fixed investment growth sunk to one per cent in Q2 (Q1: +4.0%), marking the weakest growth since Q3 FY 2014. Ex-

perts attributed this slowdown to weaker bank lending growth, which moderated to a nearly three-year low, despite five consecutive interest cuts by the Reserve Bank of India. In contrast, private consumption growth accelerated to 5.1 per cent (Q1: +3.1%), despite falling consumer confidence, while government consumption growth surged to 15.6 per cent (Q1: +8.9%).

However, there is a lot of contradiction in the claim that private consumption grew during the first half of the current financial year. The Minister of State for Statistics, Programme Implementation and Planning Rao Inderjeet Singh tried to defend the government claim that there has been no decline in consumption by putting forth specious arguments like free education and Ayushman Bharat scheme. While various experts and institutions have pointed out that private consumption has declined the most in the last 48 years the government refused to accept the CSO report.

The GDP data released recently confirmed distress stories emanating from different sectors. The private final consumption expenditure (PFCE), which re-

flects demand in the economy, grew 3.14 per cent in the first quarter (Q1) of 2019-20 (FY20) - a 17-quarter low.

The PFCE grew by 7.2 per cent in the previous quarter (January to March or Q4 of 2018-19 or FY19). In the year-ago period, PFCE growth was 7.31 per cent.

“Collapse of private consumption demand growth from 10.6 per cent in Q4FY18 to 3.1 per cent in Q1FY20 is the real cause of concern,” said Devendra Pant, chief economist at India Ratings.

In August of the current year a Ficci survey pegged India's GDP growth rate at 6.9 per cent for the entire year which seems rosy when looked at in the month of December. The same is the case with the central Bank. The RBI had forecast seven per cent growth in June but brought it down to five per cent by November-end. However, the Union Finance Minister has continued to come up with weird explanations to defend her government.

Arijit Nag is a freelance journalist who writes on various aspects of the economy and current affairs.





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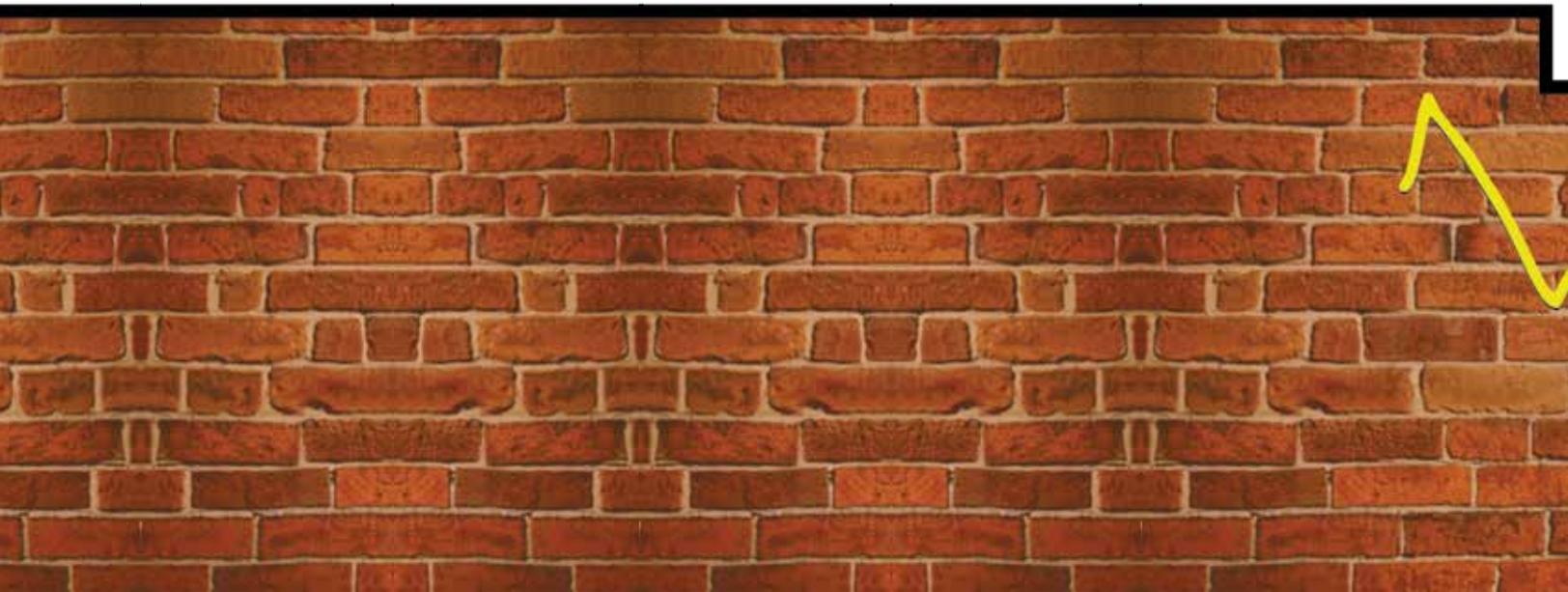
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Pro-government economists have been making a lot of optimistic noise regarding the revival of the flagging economy. They are expecting that economy will start recovering from the first quarter of the next financial year. However, they have not yet come up with any solid reason why any sort of recovery will begin any time soon. Despite the slight easing of the trade conflict between the US and China and the decisive British election, the Indian economy has not benefitted much. Neither have the government initiatives to revive the economy have had any impact so far. As the economy spirals further down towards the nadir, the government is busy with turning discriminatory Bills into weird Acts while the whole country burns. Article by Arijit Nag

Union Finance Minister Nirmala Sitharaman made a fantastic claim while replying to a question in the Rajya Sabha on November 27. She said, “If you are looking at the economy with a discerning view, you see that growth may have come down but it is not a recession yet, it will not be a recession ever.”

In a recent interview to Huffington Post, the India chief of IMF Ranil Salgado admitted that the institution has been wrong in its assessment. He also accepted that the slowdown wasn't cyclical but structural. Although he seemed impressed by certain government measures to revive the economy he said it couldn't happen

without significant investments in education and health. In case people have forgotten let me remind them that the government recently decided to clip Rs 3,000 crore from the education budget. Although improved financial transmission and a possible quick resolution of global trade tensions maybe some possible upsides to growth projections but a delay in the revival of domestic demand, a further slowdown in global economic activity and geopolitical tensions can also prove downside risks.

The GST Council has decided not to tamper with the tax rates. While there is an advantage of this move, there are also negatives to it. The government

has been falling short of its targeted collections and a hike in the rates would have helped in this regard but, on the other hand, animosity between the Centre and some states has been intensifying due to delay in payouts to the states. Tax cuts usually put the saved money directly into the hands of consumers, which they can spend on other goods and services. From a macroeconomic point of view, this is a time to cut both personal income taxes and indirect taxes. That would be the quickest way to push demand and correct the cyclical downturn in demand. This what the experts say but this downturn isn't cyclical, it is a structural anomaly. NITI Aayog Vice-



Indian economy limps through 2019

– PART II

President Rajiv Kumar seems optimistic about the state of the economy. He feels despite all odds the economy will grow by six per cent or maybe more. But how, he doesn't know.

Despite general expectations, the RBI kept key policy rates unchanged keeping in view the rising inflationary trends. Disappointingly, real GDP growth for FY20 is revised downwards from 6.1 per cent in the October policy to five per cent for FY20

According to a PTI report, the previous low was recorded at 4.3 per cent in the January-March period of 2012-13. The GDP growth was at seven per cent in the corresponding quarter of 2018-19.

The gross value added (GVA), a measure of the value of goods and services produced in an area, industry or sector of an economy plunged to a near ten-year low. A lot of so-called experts have been citing the rising stock exchange indices as a sign of a healthy economy. But that is a very poor way of looking at the economy.

Stock exchanges do nothing for the health of an economy. The slowdown is visible across other sectors as well. Construction sector GVA grew 3.3 per cent in July-September 2019 compared to 5.7 per cent in the previous quarter and 6.8 per cent in the second quarter of the previous fiscal year. The GDP growth in 1H-FY20 has averaged at 4.75 per cent.

Right from the days of demonetisation Indian real estate has been devoid of any appreciable forward momentum and it has continued in the same vein 2019. Dwindling consumption, lacklustre investment and the global slowdown overshadowed all possibilities for growth.

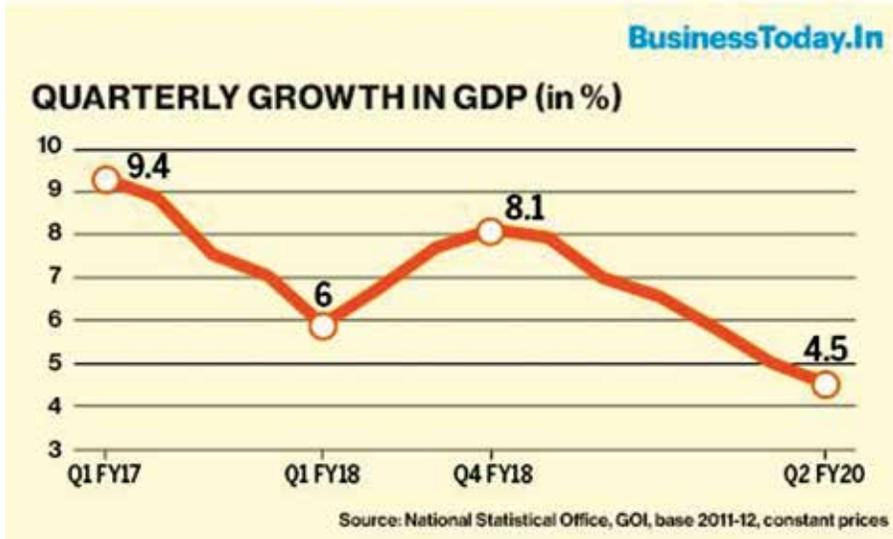
The real estate sector's performance - a reliable barometer of India's overall economic health - painfully reflected the macro-economic state of affairs. The liquidity crisis did not relent and dented any 'real' growth during the year.

As Johnny-come-lately, the apex bank in its fifth bi-monthly policy review sharply lowered GDP growth projection

for the entire fiscal to five per cent from 6.1 per cent. RBI also revised its headline retail inflation projection upwards to 5.1-4.7 per cent for the second half of 2019-20. Putting pressure on household expenses, retail inflation is likely to remain "very high" in the upcoming three-four months before a possible dip in the first half of 2020-21.

However, there are chances that it may take longer as inflation is influenced by a number of factors. While RBI could ask banks for faster transmission of lending rates, it needs to team up with the government and cater to the needs of stressed sectors like banking, manufacturing, construction, automobile and real estate. Banks have only transmitted 0.6 per cent of 2.25 per cent repo cut by RBI, choking up the economy

There's really nothing to cheer for RBI repo rate cut though it means everything and yet results in nothing. Because the economy is choked up as India's public and private sector commercial banks have collectively choked up the



domestic economy by refusing to pass on the repo rate cuts to the consumers and the industry for the past five years. Consistently high interest rates have dissuaded the industry from borrowing to invest in greenfield projects and plant expansions. India's private investment is at a 14 year low, according to CMIE.

The National Statistical Office (NSO) released the GDP estimates for the Q2 of FY20 showing a sixth straight fall in the quarterly GDP growth - from 8.1 per cent in Q4 of FY18 to 4.5 per cent for Q2 FY20. Manufacturing, which contributes 77.6 per cent to the IIP, was growing at a much higher rate earlier - at a simple annual average of 10 per cent between FY05 and FY11 (base 2004-05) - but had fallen to just four per cent of simple annual average growth rate between FY12 and FY19 (base 2011-12). Simple data can confuse and confound. For example, the latest monthly data of the CMIE shows an unemployment rate of 7.48 per cent in November - down from 8.45 per cent in October 2019. But the labour force participation rate (LFPR) - which reflects how many of the labour force (those either working or looking for work) are employed - fell to a new low of just 42.37 per cent.

There is broad unanimity among the various experts about uplift in 2020.

Private sector consensus prediction is that GDP will grow above six per cent in 2020-21, the next financial year. The RBI expects an early comeback — an average 6.1 per cent in April-September 2020. And the International Monetary Fund's October World Economic Outlook forecast India's GDP growth accelerating to seven per cent in 2020, up from 6.1 per cent in 2019. Incidentally, these are the two institutions, the RBI and IMF, which were the last to revise their earlier projections. This optimism is presumed upon an uptick in spending and production from monetary and fiscal policy support, namely, enhanced pass-through of cumulative monetary easing in 2019, lower business taxes, partially eased labour regulations, further counter-cyclical stimulus expected in the forthcoming budget, and other sector-specific relief measures. An improved rabi crop outlook owing to robust monsoons adds to this optimism. Progressive improvement in liquidity and financing conditions of the stressed non-bank sector is also anticipated.

However, most segments are fundamentally weak or strained. A quick health check shows businesses and consumers are less than fit. Many large firms are still to deleverage, regain balance sheet strength to contemplate

investing afresh.

The protracted slowdown has slowed this process. It has also tipped newer firms into this pool, adding fresh bad loans to the existing stockpile of non-performing assets and aggravating overall stress. Consumers or households, also increased their liabilities in the last two years in which income growth slowed, not an ideal situation for borrowing or spending more. The weakened capacities could therefore mute the magnitude of aggregate demand response, or private investment and consumption.

The public or government sector is increasingly strained. This is a large segment with significant economic influence through taxation and expenditure policies. To elaborate, higher government spending alone contributed 1.9 percentage points to last quarter's GDP growth of 4.5 per cent. But now, the government is cash-strapped. On the revenue side, it is affected by declining economic activities that reduce tax collections as well as recent tax cuts; committed expenses strain the expenditure side. The resource constraint is posing a difficult choice, whether to axe spending or raise taxes. Either will result in further demand compression. It is to be hoped such a vicious spiral does not set in.



Arijit Nag is a freelance journalist who writes on various aspects of the economy and current affairs.



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Change the way you think about TOOL MANUFACTURING

While you will be able to make use of existing CNC machines, it will require you to embrace some new technology. To work effectively with other machines and maximize the benefits of a smart factory each CNC grinding machine will need to be connected to a communication network

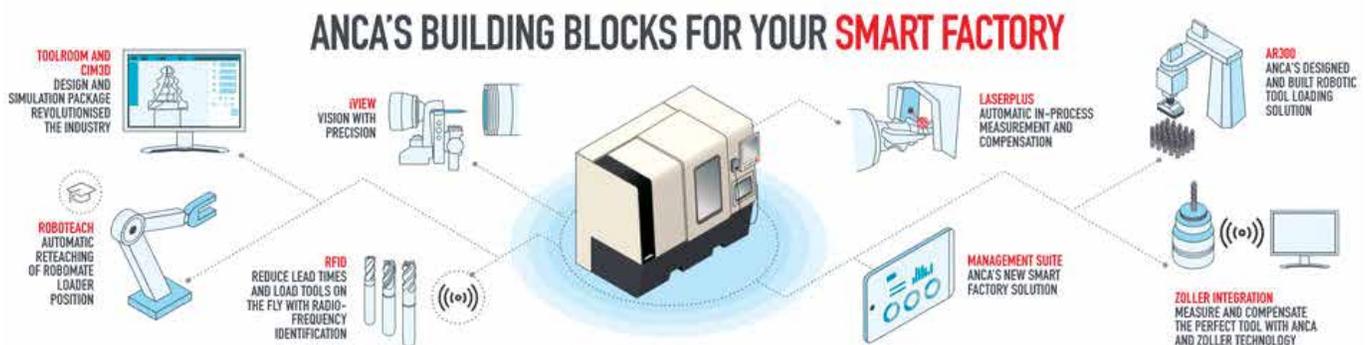
In the factory of the future, running a factory won't require you to be as hands on with what you produce anymore. Instead of a manual production line, you will have an integrated network of machines that is more efficient in manufacturing processes, intellectual property generation, tool design, customer responsiveness, cycle time,

profitability – and the list goes on. Across your business, automated machines will take care of more of the laborious tasks before work begins.

Don't let the enormity of what you can achieve with a smart factory cause you to stick to what you have always done because it is easier. With a bit of investment to upgrade your existing technology and facilities, you can reap

the benefits of automation – dare I say, its easy.

It is about working with a CNC grinding machine that is smarter. Of course, this will need some investment, but it is also about understanding how the new infrastructure will work. The benefit for your team is that instead of needing to manufacture products with manual intervention, your team will





be able to program machines ahead of time, so that they are able to do what needs to be done throughout the day. And not only will your CNC machines manage the production, but they'll also collect and analyze data and make automatic adjustments to production in real time to improve the way you're running.

All your CNC grinding machine needs is to be connected

While you will be able to make use of existing CNC machines, it will require you to embrace some new technology. To work effectively with other machines and maximize the benefits of a smart factory each CNC grinding machine will need to be connected to a communication network.

Having a machine connected to a network may seem daunting, but the benefits are unparalleled. Your CNC machine becomes part of a smart, connected set of tools working together

to make your work easier.

Depending on the age of your machine, you can connect machines using either WIFI (the best option to avoid messy cabling) or a cabled LAN connection. While newer machines come Wi-Fi enabled, older machines can be retrofitted with a Wi-Fi adaptor and software drivers. Check with your vendor first to make sure the driver software is supported.

Exploit your niche, finesse your offering and charge accordingly

As a small company, you're able to offer a personalized service bigger business can't. You understand your customers' needs. You sell the precise product they need to keep their operation running. They need you as much as you need them.

So being small can be your greatest selling point. You can adapt to the market as it changes and respond to demand. Where potential customers

may be frustrated by businesses with long lead times, you have the ability to turn things around quickly and with more flexibility. Customers wanting something you don't manufacture yet can even be an advantage. With the tools and flexibility to make it happen, you can easily expand your offerings and show them how well you understand your niche.

This kind of specialization is hugely valuable to a business. You're not only providing labour and materials but access to years of knowledge and refinement. It's been shown that customers will pay more for specialized products that offer this level of added value.

Embrace automation

Most CNC machines, including those that we produce, already come equipped with comprehensive, advanced software that allows flexibility in everything from configuring setup to adaptive processes like product gauging and automatic compensations, freeing your team to work on more valuable tasks.

By creating automated systems and processes, you'll immediately have access to more information than ever before – and this is a huge benefit for you and your customers. Your machines will be able to alert you when you're running low on materials. They will predict maintenance that's required to keep them operating, so you avoid lengthy and expensive disruptions.

Better still, they can become part of a wider network of machines. Integrating with other factories will reinvent your supply chain process. Suddenly, your factory can integrate with your customers and your machines can speak to one another. Is your customer running out of a product you manufacture? The machine at your end can find out and start the production

process without any intervention from you.

Move forward one step at a time

Don't worry – you don't need to do all of this at once and there are easy ways to add automation functionality:

- **Add after-market software or hardware accessories**, such as lasers to measure tools in production and make sure they're meeting required design and tolerances.
- **Retrofit with automation**, robotic loaders mean lower costs and greater volumes. You can have a new robotic loader at a reasonable price installed into your machine to achieve the benefits of lights out or unattended machine production.
- **Enable machine connectivity on older machines** through Wi-Fi adaptor and software drivers to connect machines to each other and the wider factory.
- **Store tool files centrally with tools and wheel servers**. Maintaining a database of each tool file that a machine can use for setup and are a great place to start with software. Your factory can store a whole range of files centrally, so each machine can access what it needs to get the process going.



Planning ahead for future success

This might be brand new for your factory, and there are tricks you will need to learn. For example, did you know that if you're moving jobs between machines, you will need to have the same version of software on each? And again this is an investment but the efficiencies will weigh out the costs in a few months – it is about knowing what will be required to make your factory smart.

If scaled manufacturing is not your background, you might need more information before you scope out your strategy. We can help you understand your specific requirements and help

you understand how to incorporate them into your supply chain.

Whatever approach you take, you will need to invest in some degree of technology to keep your machines up to date and your operation functioning effectively. Without this, other companies will move ahead of you as they can produce more complex tools more efficiently.

There are many ways to bring your CNC grinding machines up to speed for your smart factory. The most important thing is that you start.

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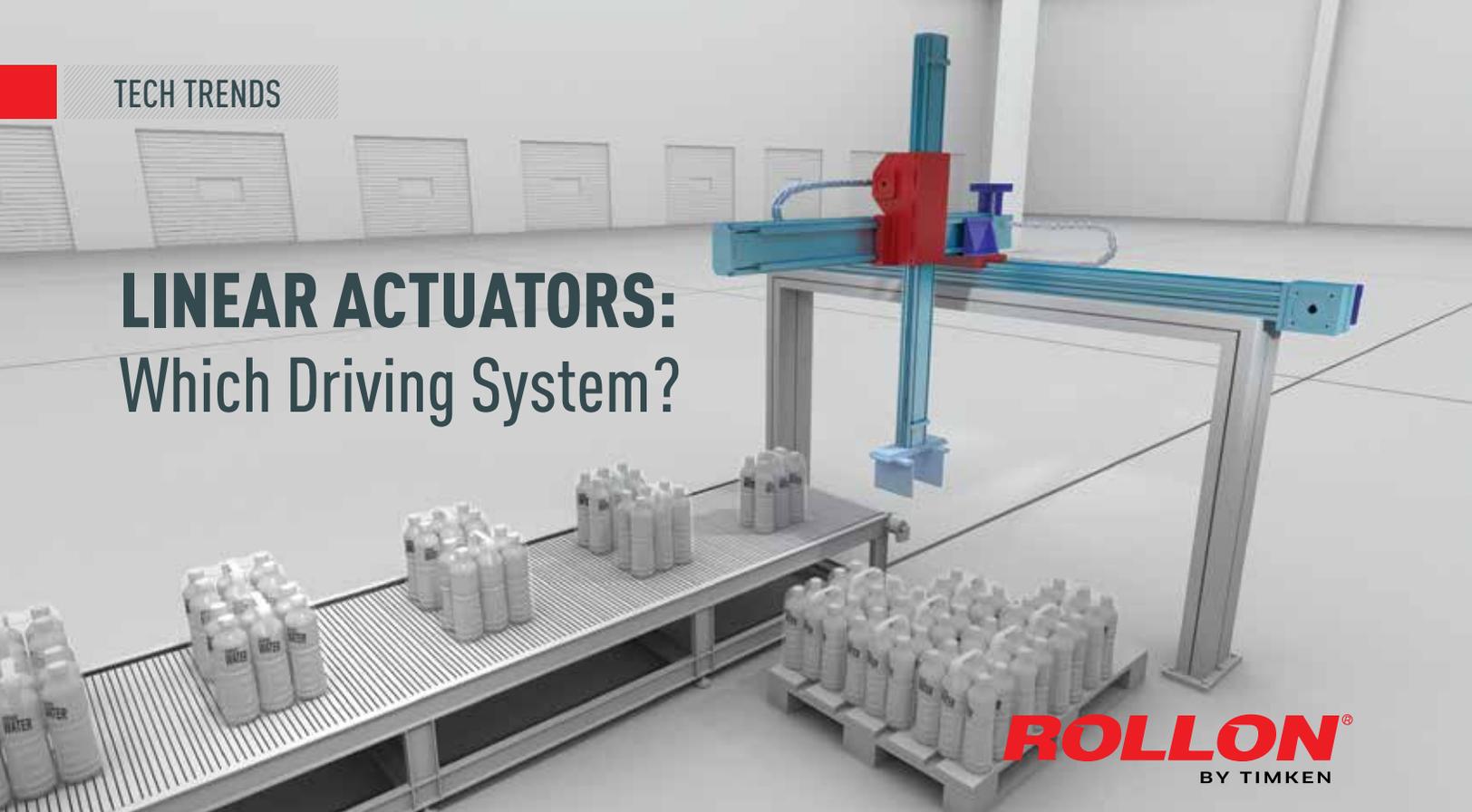


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LINEAR ACTUATORS: Which Driving System?



An actuator's driving system is directly related to its performance. But how can someone find the most appropriate? To explain it, we chose 3 different application scenarios.

When choosing a linear actuator, the first question to ask is: "What type of drive do I need?". Linear actuators are mainly driven by belt, rack and pinion, or ball screw. Each of these systems has features that make them suitable for specific applications.

Rollon has a broad and extremely varied range of actuators, which include different models for each of the drives mentioned above. Let's look more closely at three different cases and define the different needs and assess the correct choices for each application. The correct actuator defined by the peculiarities of the application allows us to maximize results and reduce costs.

CASE 1 - HIGH PERFORMANCE PACKAGING SYSTEMS

Productivity, performance and safety: in the packaging sector, speed is fundamental and reducing cycle times translates directly into an economic advantage,

while component reliability translates into reduced maintenance costs and increased productivity. To obtain high performance and production rates on discreetly long strokes, choosing one of the belt solutions would be spot on.

Belt solutions allow high speed accelerations on distances as long as 10-12 m strokes. At the same time, load capacities are high: an X-Y-Z portal built with a belt driven solution can manage loads in the range of 150/200 kg. The absence of lubrication on the belt, unlike the other two solutions, involves less maintenance and avoids costly "machine downtime". The choice of a different type of actuator would not guarantee the same results: for example, a screw system would be too slow and would not be able to handle such long strokes.

For packaging applications, Rollon created Plus System, a high performance product family of extremely robust linear actuators in extruded aluminum with a high level of protection of sliding and

drive systems; and the Smart System linear actuator product family, which features simplified construction that successfully combines performance and competitiveness. Both product families are driven with toothed belt systems. They use linear rails with recirculating balls, and they reach accelerations of up to 50 m/s² and maximum sliding speeds of 5 m/s. Both of these product families also offer dedicated solutions for vertical applications on the Z axis.

CASE 2 - PICK & PLACE SYSTEMS WITH LONG STROKES

The second case involves large portals for pick and place systems, such as those that move metal sheets for the appliance industry or various types of production lines. Load capacities are crucial aspects of these systems, along with the rigidity of the system and the possibility of moving several vertical axes independently along Y axes and strokes possibly longer than 30 m.

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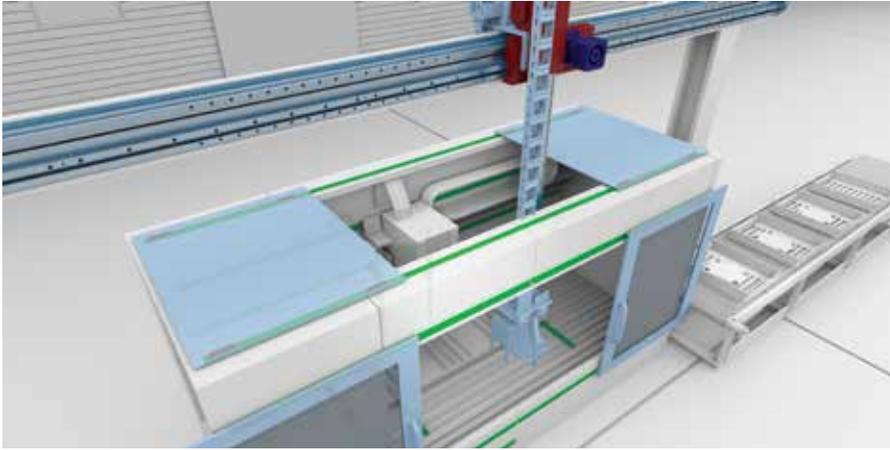
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Rollon is a global provider of **linear motion solutions** for several industrial sectors, such as: **industrial machines**, **railway**, automation, packaging and logistics, aerospace.



A belt solution would be limited in this case. Since belts are made of polyurethane, when we assess applications, we must consider elastic deformation rates with the resulting loss of rigidity in the system, and the reduction in precision as the stroke becomes longer.

A belt system also usually has a single motor that uses a motor head to drive the belt and move the different carriages and their respective vertical axes in perfect synchronization.

A Y axis moved with a rack and pinion drive would, instead, maintain its rigidity along potentially infinite strokes and offer the option of moving each carriage independently. For these reasons, a rack and pinion drive would be the best choice for these large portals, especially on the Y axis.

The series of actuators in the Tecline

family by Rollon mounts induction hardened steel racks with inclined teeth, and rails with recirculating ball bearings or prismatic rails with bearings depending on the application. They also have extruded aluminum profiles with different sized sections, up to 360 mm. Able to handle loads up to 1000 kg, these systems can easily be configured with actuators from the Modline family (these are belt driven) to create portals.

CASE 3 - ASSEMBLY SYSTEMS FOR SEMI-CONDUCTORS

Precision is undoubtedly the main feature for a system used to assemble small parts, such as in the semi-conductor industry. Precision is necessary in terms of positioning and repeatability, to allow the assembly system to be efficient and produce high quality over time.



ROLLON: A Capillary Organization on a Global Scale

Rollon is close to its customers, both locally and internationally. Rollon's industrial and distribution organization has been developed to reach the customer on a global basis through a widespread network. The Company can count on production sites, assembly logistics and a wide distribution network all over the world. The company is also present in India with its branch in Bangalore.

Moreover, when speaking of precision in the semi-conductor industry, the level must be extreme (two-place decimal tolerance). The ideal choice for this solution would be the an axis with a screw drive unit.

The Precision System product family by Rollon includes several models of linear tables for translating with great precision. These systems are built with anodized extruded aluminum profiles and rails with recirculating ball bearings, and they are driven with screw units with recirculating ball bearings, which can achieve a level of precision of 10μ with regard to positioning and $\pm 5 \mu$ with regard to repeatability. All mounting and reference surfaces of higher performance models are finished.

Needless to say, this level of precision is impossible to reach with any belt or rack and pinion drive system.

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Why should we consider a CNC plate roll?

CNC plate rolling machines accommodate lines with varying degrees of automation, but even a fully automated line requires some operator intervention because actual material characteristics often are different from those specified.

Written by: Javier Lanfranchi – Senior Sales Area Manager

Workforce, consistency, productivity needs point to CNC

There are many reasons to upgrade to a CNC plate bending roll. They provide consistent leading and trailing edges and accuracy, facilitate varying degrees of automation, and allow simple development of irregular shapes. But the most important reason is to augment the skills of your new workforce.

Why should we consider a CNC plate roll? Workforce, consistency, productivity needs point to CNC

There are many reasons to upgrade to a CNC plate bending roll. They provide consistent leading and trailing edges and accuracy, facilitate varying degrees of automation, and allow simple

development of irregular shapes. But the most important reason is to augment the skills of your new workforce.

Say that you have an older plate rolling machine. The machine components may be worn and the hydraulics are inefficient, possibly causing loss of pressure. But because your lead fabricator responsible for rolling has an intimate knowledge of the machine's weaknesses, he can work his magic with the old machine and achieve acceptable results if time restraints are not critical.

The question is, what happens to your capabilities if this guy decides to leave for whatever reason? Finding a replacement with the required skill set would be very difficult, and training an

existing employee could take months.

You may not have considered bringing plate rolling in-house because of the skill level needed to produce parts consistently, accurately, and quickly. As a result, you continue to outsource all your plate rolling work at a cost.

There are many reasons to consider investing in a CNC plate bending roll other than a skills shortage:

- Consistent leading and trailing edges
- Consistent accuracy
- Consistent shape production
- Simple development of irregular shapes
- Reliability for both low and high volumes
- Automation in varying degrees

Simple Programming, Consistency

CNC facilitates simple programming and consistency with varying degrees of automation.

On fully automated lines, the plate is loaded automatically onto the feeding table. Motorized alignment ensures that the plate is parallel to roll input, the material is prebent, rolled, and supported. Then it is auto ejected and transferred to the welding station.

On an automated line, plate rolling is not necessarily the only operation. It is part of upstream and downstream processes, such as welding. The CNC has to be powerful enough to control all the different axes, not only those of the roll bender, but also of all the other accessories such as the feeding table, plate centering, lateral and top supports, and clamping devices. The entire process has to be flexible



The rolling of a polycentric shape, such as for a fuel tank truck, can be simplified on a CNC roll bending machine, with enormous time savings.

enough to synchronize with the other operations on the line.

Automated lines can incorporate some manual operations. For example, they can have manual feed, automated rolling, and manual part removal.

It's important to recognize that CNC is not going to completely replace the operator!

All the parameters can be entered into the CNC, but in reality, material thickness and yield strength can vary, and every difference from the programmed parameters can result in a variation, from design to workpiece.

An operator has to be involved to adjust the parameters as needed. However, this operator does not have to be a rolling expert. Once he has adjusted the program, the plate roll operation can be run in automated mode.

with old technology. Young workers have different expectations, and this involves machines with user-friendly interfaces that are intuitive. CNC plate rolling machines promote simpler operation and faster learning to meet today's workforce challenges.

Manufacturing companies face huge challenges; intensified pressure; and the need to reduce production time, improve flexibility, and increase quality while reducing energy consumption. Trading up to CNC technology can help fabricators meet those challenges. Features such as systems diagnosis, teleservice, management control, drawing imports, and ling and production lot statistics are helping the manufacturers of today face the challenges of tomorrow.



Today's new workforce does not come with the skills and years of experience to rely on. The user-friendly interface of a CNC augments their capabilities.

Roll Bending for the Next-Gen Workforce

It's happening in the U.S. It's happening in Europe. It's happening all over the world. It's very difficult to find young talent willing to work



For more information,
Website: www.faccin.com

Simplicity in Expanding Mandrels a key to effective solution in Work Holding



The continuing advancement in production methods in the Metalworking Industry has created a need for precision workholding devices capable of automatic clamping in component bores. In addition, the equipment must transmit the high accuracy of the latest machine tools and develop sufficient holding power to resist the cutting forces imposed on the workpiece.

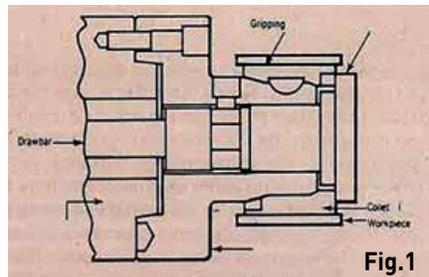
Such capabilities are possible by using a BIRLA PRECISION TECHNOLOGIES (BPT) Expanding mandrel system.

The BIRLA PRECISION TECHNOLOGIES (BPT) Expanding Mandrels, double angle principle for precision expansion, have been proved over a number of years as the most versatile and trouble free Mandrels for jobs requiring internal chucking where accuracy positive grip are necessary.

Considering the problem of large-diameter workpiece with a small ID mounted on the solid mandrel. The torque generated when cutting on the relatively large OD creates a slippage problem. Likewise, a short-length ID creates a problem of holding the workpiece square / perpendicular to the centerline. The use of end drivers / End Locators. or other assists to gain either holding capability or to insure part accuracy may create a problem of machining end surfaces. In addition, serrated or tooth-type end drivers could leave marks on the ends of work pieces. Simply stated, the answers are found in a wide range of mandrel designs and applications that have been developed to meet virtually every need. However, these items are not always known to those who face a new problem.

With the very simple plug-type solid

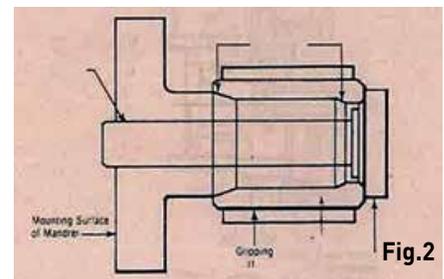
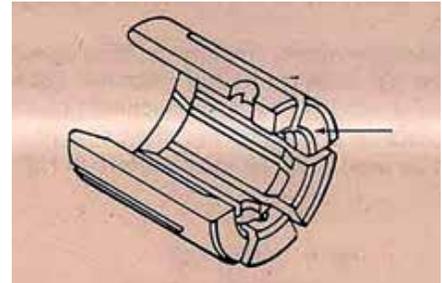
mandrel, which can be very effective when used with certain types of work pieces. Its strength lies in its very simplicity. It is nothing more a plug of suitable length with a threaded end upon 'which is slipped a work piece which is then bolted into place with some kind of an end clamp. Its weaknesses are twofold. The first is the inability to accommodate work pieces with any variation of inside diameters. For example, if the plain plug mandrel is 25mm in diameter & customer components location bore size is 25.50mm i.e. over size by 0.5 mm... work piece can not be clamped. It obviously, would locate off center due to its own weight, and concentricity between the ID and OD would be lost. Secondly, any kind of an end clamp either covers part of the work piece end, which may be a machining area, or end drivers may leave unacceptable indentations on the work piece. Most machines are equipped with the standard mounting shown in Figure 1.



The spindle nose has a 7 1/2-degree taper and holds the mandrel plate to the nose with bolts. BPT's mandrels are suitable for ISO Std Spindle Nose A2-5"/A2-6"/A2-8". Through BPT Standard Adaptor plates.

As stated, the simple plug-type solid mandrel cannot cope with any variation of workpiece ID. So the most prevalent approach is the use of an expanding

-sleeve mandrel as shown in Figure 2.



Although most applications do involve lathes, there are plenty of examples whereby round work pieces are held on machining-center and milling-machine tables. The drawbar principle can be applied to non rotating work as well it is variation for use in a non rotating application. These are often powered by shop air and they can develop several tons of drawbar pressure. There are two things to keep in mind about the drawbar and expanding sleeve or segments. First, a preload pressure is always maintained. Even when the drawbar is released, it never moves forward so far that the slope of the sleeve loses contact with the slope of the mandrel body. Secondly, while expansion is achieved with air or hydraulic pressure, the return is achieved with springs built between the mounting and mandrel plates.

For more information

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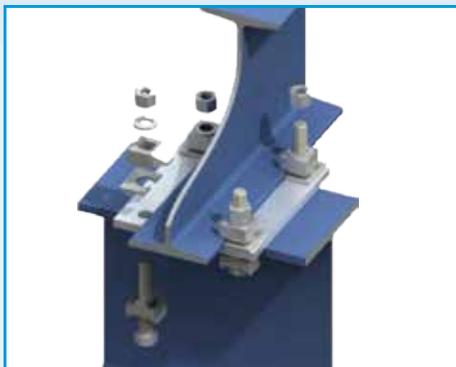
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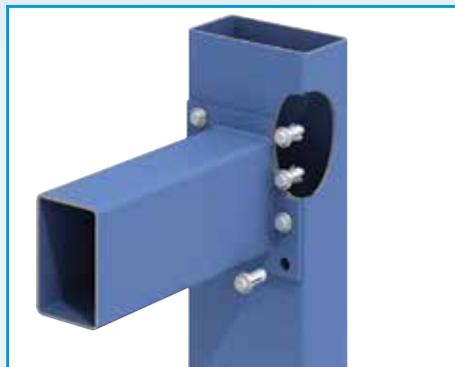
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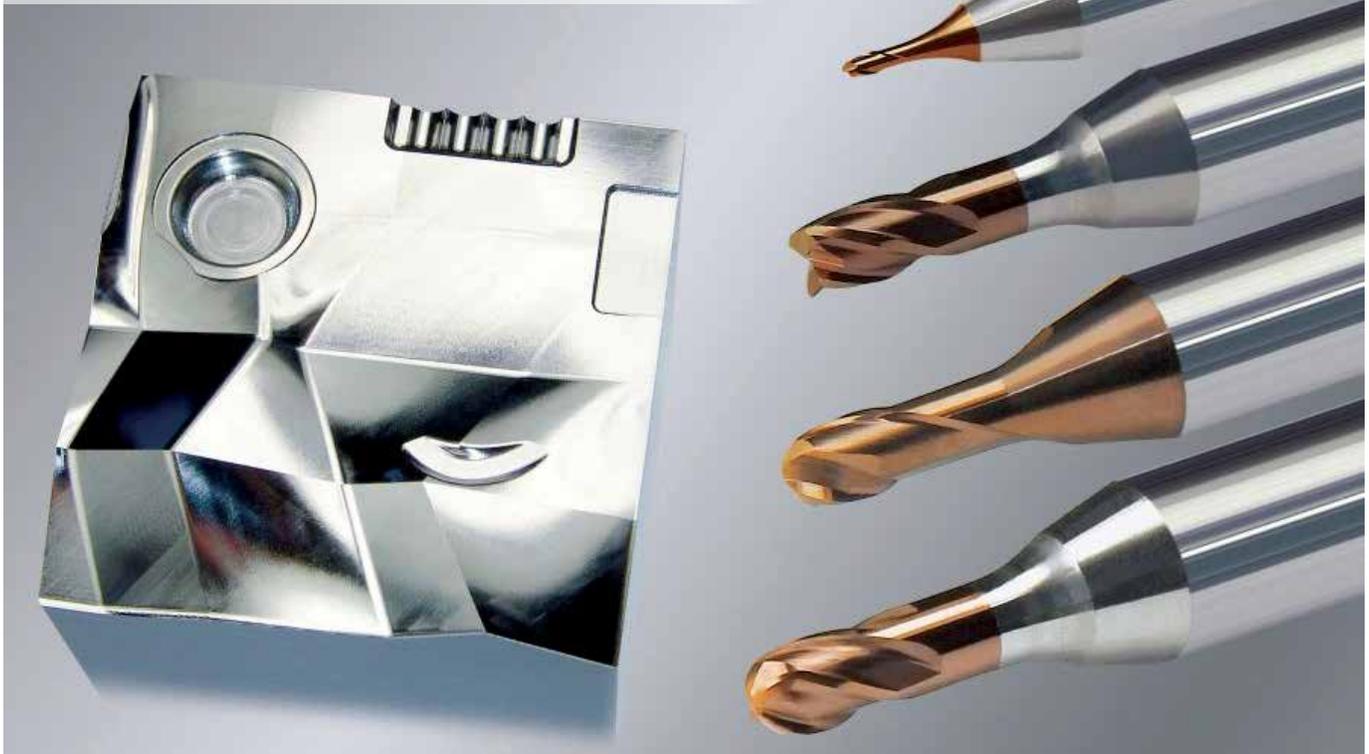
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Impressive results even under the hardest conditions.

Homogenous surface quality even after hours of use and this at the highest performance levels - anything demonstrating these features in the hard milling environment is already playing in the champion's league of processing. The PEACOCK mill cutters from ZECHA just keep on going even at 67HRC.

Homogenous surface quality even after hours of use and this at the highest performance levels.



Optimised tool design for materials up to 67 HRC

Other rules apply when it comes to hard machining in comparison with the processing of “normal” materials: Interventions in steels up to 67 HRC generate wear and friction above the norm and call for tools of uncompromising quality.

“But never fear, we have the right answer even for such demanding applications: The PEACOCK series provides the tool and mould maker

with a high-tech mill cutter that can create even complicated structures in the hardest of materials without constant tool changeover or flagging machining quality impairing economic efficiency!”, stresses Martin Ruck, Head of Research and Development at ZECHA Hartmetall-Werkzeugfabrikation GmbH in Königsbach-Stein.

Dazzling name - cool(ing) design

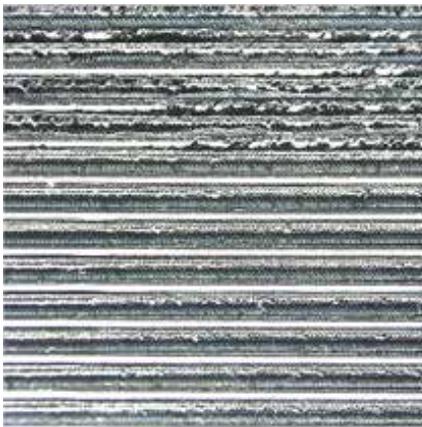
The two-flute ball and torus mill cutters in the PEACOCK series demonstrate

unrivalled eagerness to tackle hard and powder metallurgical steels, always confident of having the better arguments in the encounter. “And some of them can be found on the cutting edge,” adds Mangesh Awate, Sales Manager, Zecha Precision Tools Limited, India. “From the substrate to point and micro geometry, the PEACOCK mill cutters have been configured for the highest level of resilience.

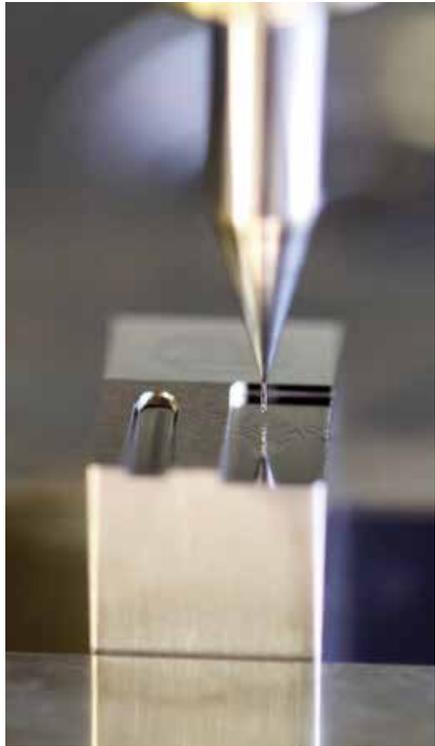
Our engineers’ attention to detail in producing the series means nothing



has been left to chance and our customer requirements have thus been implemented in full.” These include the diameter coordination relevant in manufacturing. On the PEACOCK ball mill cutters in the 581P series they range from 0.2 – 12.0 mm and the PEACOCK torus mill cutters in the 583P series are available from 0.2 - 6.0 mm. Common to all is the new point geometry, which ensures faster removal of the hot chips from the treatment zone - a vital measure for hard mill cutters. The groove design stabilises the entire geometry, which in turn is supported by



left-hand processed with conventional milling cutter (100-x magnification) and on the right-hand side processed with PEACOCK (100-x magnification)



The smallest 3D contours are milled into high-alloy steels with up to 70 HRC.

the soft radius transitions in the shaft.

Smooth coating for long tool life

The mill cutter design is rounded off by the latest coating technology. It is characterised by minimised friction, very smooth and homogeneous coating surfaces in combination with great stability and strength including excellent coating adherence.

“In comparison with conventional solutions our WAD coating helps to more than double tool life. And the user will notice this in the longer tool changeover intervals and resulting shorter transition times,” says Mangesh Awate. This means that as far as efficiency is concerned, the mill cutters have it in them to come top of the class in high speed machining for tool and mould making. Just to top it off, the PEACOCK mill cutters are exceedingly flexible in their deployment. Even highly alloyed, somewhat soft materials can be roughened with cooling

lubricant, semi-finished and even finely finished with the highest degree of component precision.

Reproducible quality creates safety

“Life is not becoming easier for tool, mould and machine makers: price pressure, extreme quality demands and also unforgiving materials as the measure of all things, set a very high bar. Yet with our PEACOCK hard mill cutters, we have provided a good balance of performance, highest reproducibility and safety in application. This is why the series is really a feather in our cap!” summarises Martin Ruck.

*For more details please contact
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 Mr. Mangesh Awate
 DGM- Business Development
 Email: mangesh.awate@zecha.in
 WEB: www.zecha.in*



Drake External Thread Grinders

G grind a full range of threads, worms, ball screws, gauges, and other parts up to 4 meters long on Drake's GS:TE External Thread Grinders. All GS:TE models are fully programmed and delivered with a grinding process optimized to run customers' parts. Equipped with a power helix and Drake PartSmart™ menu-driven screens, these machines are easy to operate and deliver repeatable, accurate results. Drake grinders are built using premium materials, ensuring dependability and longevity regardless of your production schedule.

Drake machines are designed for accuracy, consistency, and reliability. These external thread grinders are built on high mass, cast polymer bases for vibration damping and thermal stability. The use of linear motors and linear roller ways allows for maximum acceleration and contouring. Dressing software is available for contour dressing of ISO, 60°, Whitworth, Acme, Buttress, Worm (ZA, ZN, ZK, ZI), full radius, Gothic arch, and other thread forms. Other standard features of Drake external grinders include a high precision workhead and motorized wheel spindle. Additional upgrades, including automation, are also available.

After assembly and verification is completed, Drake offers hands-on training. Working with the Drake team ensures that all your thread grinding requirements are met.



Drake's line of precision machines also includes:

- **Internal Thread Grinders:** grind internal threads up to 220mm
- **Dual Spindle Grinders:** grind multiple operations in one fixture setup
- **Crown Grinders:** grind drums for tapered roller bearings
- **Vertical Thread Mills:** rough mill parts for finish grinding
- **Rack Mills:** high speed rack milling

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**New accessories for capacitive sensors:
The CCg cable enables cable lengths of up to 8 metres**

Capacitive sensors are known as highly precise measurement technology for clean environments such as clean rooms. However, capacitive displacement sensors can also be successfully applied in the industrial environment

The method of capacitive displacement measurement is based on the principle of the ideal plate-type capacitor. The distance displacement of the plates (sensor and measurement object) leads to a change in the total capacity. If an alternating current of constant frequency and constant amplitude flows through the sensor capacitor, the amplitude of the alternating voltage on the sensor is proportional to the distance to the target (ground electrode). The distance change between the measurement object

and the sensor is detected, processed and output as measurement value by the controller via different outputs. However, a continuous dielectric constant between sensor and target is required for a stable measurement, as the system does not only depend on the distance between the electrodes but also reacts to dielectric changes in the measuring gap.

In order to achieve the highest possible measurement precision e.g. in the nanometre range, the environment should be clean and

dry. As an electromagnetic process, a capacitive measuring system measures on electrically conductive objects with constant sensitivity and linearity as standard. The system evaluates the reactance of the plate capacitor which changes in proportion to the distance. Capacitive sensors can also measure insulating material under certain conditions, in which the sensor grounding acts as ground electrode and the insulating material as coupling medium. An almost linear output signal for insulators is also achieved by

using an electronic circuit. Capacitive sensors are considered one of the most precise measurement systems, achieving resolutions well below one nanometre.

As thermally induced conductivity changes of the measuring object have no influence on measurements, the principle is also reliable even with fluctuations in temperature. Maximum stability: Whether close to the absolute zero or with glowing brake discs - the capacitive measuring principle is resistant to temperature fluctuations. The capacitive measurement systems are also suitable for the detection of fast moving objects and processes (max. bandwidth 8.5 kHz), enabling fast, reliable measurement of motion sequences during operation.

Applications

Capacitive sensors can be applied in a very broad range of applications. For instance, in the semi-conductor industry, they measure for example the thickness of wafers. The sensors are likewise applied in objectives for highly precise position measurement of lenses in the subnanometre range. They can be universally applied in test laboratories where different distance measurements are fulfilled using changing sensors. In medical engineering, capacitive sensors measure the uniformity of gelatine layers applied on pills. In another place, a capacitive measurement system is used as absolute wear-free switch in operating microscopes. This is a modern and user-friendly controller technology via web interface.

The capaNCDDT controllers from Micro-Epsilon are considered as the most modern electronics for signal processing. In particular, their ease of use and compatibility of the product range distinguish these controllers from others. capaNCDDT components

are completely interchangeable, without requiring complex calibration. Complex settings via jumper or rotary controller are unnecessary. The exchange of sensors, cable or controller is carried out within a matter of seconds. As all components are mutually compatible, even sensors with different measuring ranges can be connected to the controller quickly and easily. Set up and configuration of the controller are carried out via a user interface on a web browser. The controller is connected to a PC via an Ethernet interface and a predefined IP address. Without any complex software to install, a clear user interface is carried out using a web browser, which enables the user to configure and set up parameters, data processing and the display. Set ups can be saved, loaded and transferred to further controllers.

Eight metre-length cable for capacitive displacement sensors

The range of accessories for capacitive displacement sensors from Micro-Epsilon has been extended with a



Whether close to the absolute zero or with glowing brake discs - the capacitive measuring principle is resistant to temperature fluctuations.

new long length CCg cable. The new triaxial cable enables cable lengths of up to eight metres and is designed for industrial environments where long cable lengths are required. Due to the measuring principle, capacitive sensors have a limited cable length. Now Micro-Epsilon has developed a solution for significantly increasing these cable lengths. The new CCg sensor cable for capaNCDDT systems from Micro-Epsilon is a world first in the market. Using a triaxial cable, it is now possible for the first time to reach eight metres of cable length without a preamplifier, which at the same time provides full exchangeability.

While the previous outgas-optimised and oxygen-free miniature triaxial cable is suitable for different applications and modern EUV lithography in semiconductor production, the new CCg cable has been specifically designed for industrial environments, where long cable lengths are required. Compared to its predecessor, the new CCg model allows for double the cable length. The CCg cables can be applied both with standard catalogue products and custom modified ones. They are compatible with all existing capaNCDDT systems from Micro-Epsilon. Dimensions and plugs are identical to the previous CCx cable.



Author:

Dipl.-Ing. Stefan Stelzl

Product manager sensor technology

MICRO-EPSILON MESSTECHNIK

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Website: www.micro-epsilon.com

Effective pneumatic clamping

Pneumatic toggle clamps fix workpieces in place, position mechanisms and hold molds together. In this way, they not only simplify handling, they also enable fully automated processes. Elesa+Ganter offers a number of flexible solutions for this purpose

Toggle clamps of the series GN 860 and GN 862 feature an important unique property: After passing through a dead point during closing, the retaining force is maintained even after loss of pressure at the cylinder. The low-wear design as well as the option to detect the position of the clamping element by means of magnetic sensors offer additional dependability.

The retaining force itself is transmitted to the clamping point by a clamping arm or piston rod. A hybrid toggle clamp employs a hand lever to combine manual closing with pneumatic opening – an important feature for clamping applications requiring individual clamping but simultaneous, fast and automated releasing.

The compact power clamps of series GN 864 and higher are also designed to remain in the clamped position after a pressure loss. The sophisticated kinematics ensures that the setting action is fast while the actual clamping movement takes place slowly, making pneumatic end stop dampening unnecessary. The available types differ in terms of their clamping motions and are each sold in four sizes with astonishingly high retaining forces of up to 13,300 newtons. These clamps feature high stability, long lifespan and low compressed air consumption. The offering is rounded out by various mounting options and a large range of accessories from adjustment plates and blanks for individual jaw shapes to directly attachable proximity switches.

The swing clamps of the series GN



875 / GN 876 perform two motions: The clamping arm first rotates by 90 degrees from its resting position, then travels in a linear motion down onto the workpiece in the actual clamping stroke. Thanks to the rotary movement, either to the left or the right, the workpiece remains accessible from above, allowing it to be positioned and removed directly.

The freely selectable mounting brackets as well as the various clamping arm designs allow the clamps to be adapted to the specific situation. There is even a completely customizable adapter flange. The swivel clamps are available in block design with T-groove mounts for end

stop sensors or in a compact design with male thread which can be easily mounted in a height-adjustable fashion using a threaded adapter flange.



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Use of TIP-TIG Technology in Process Equipment Plants

by Rakesh Choudhary,
Head WAPS, Ador Welding Ltd.
(with inputs from Plasch, TiP-TiG, Austria)

TIP-TIG welding is a new advanced innovation of the common GTAW Process. This process uses new, patent-pending technology (TiPTiG), that delivers the highest possible weld energy with the lowest possible weld heat, all while still being user-friendly.

What is TIP-TIG welding?

TiPTiG new welding with a hot wire process can be used in every industry. It is very simple to learn, use and simple to teach. This process is so unique that higher travel speed, lower heat input, reduced cycle time, and an overall better-quality welding advantage can easily be achieved.

The Process

The TIG weld receptivity for higher weld deposition rates is done by decreasing the speeds for the weld solidification process and increasing the fluid weld area. This allows for a 100%-400% increase in TIG wire feed rates, increasing the overall weld deposits. All these attributes like faster speeds and higher than normal weld energy, increase the resulting TIG weld quality and overall process productivity.

The process is also slag-free and uses

the lowest possible heat input of any welding process, producing a Heat Affected Zone (HAZ), all of which help to reduce distortion and weld stress. It produces some of the highest quality products with the best metallurgical and mechanical properties on all alloys, but also increases production up to four times the normal speed. There is also no inter-pass cleaning, creating availability for an increased Arc on time and weld quality.

The TIP TIG process is available in manual and automated capability to attain weld and clad quality levels way beyond the conventional TIG – Hot – Cold Wire TIG – Pulsed MIG and the Flux-Cored process.



Fig.3

How it Works

A TIP TIG welding system uses a wire fed GTAW system just like a typical TIG system, but it's distinctive for the vibratory effect on wire at weld pool which is achieved by a linear forward and backward mechanical motion created by the customised wire feeder system. The forward and backward motion of the filler wire creates an oscillation that is then transferred to the weld, agitating the molten weld pool and ultimately disrupting the surface tension. In addition to this



Fig.1



Fig.2

vibratory effect on the wire, a hotwire current (powered by a secondary power source) is also applied to the filler metal, prior to entering the weld puddle. The two pictures (fig. 1 & 2) describe the weld finish with Manual GTAW & Manual TIP-TIG process.

ChampTig 400P Power source from Ador Welding with the TipTig wire feeder.

Benefits of the TIG-TIP process

- Increased fluidity of the weld pool
- Greater tolerance to joint fit-up
- Significantly reduced joint sensitivity
- Greater ability to accept more wire into the weld pool, results in a higher deposition
- 4-6 times increased travel times
- Reduced cycle time and heat input
- Cleaner welds with agitated weld pool
- Reduced weld stress with the reduced heat input

Approved Alloys

TiPTiG welding can work on a wide range of alloys such as carbon steel, stainless steel, duplex and super duplex stainless steels, inconel, titanium, aluminium, copper, nickel, and many other critical materials like P-91, which are used in process plant production.

Heat Exchangers

Heat Exchangers are commonly constructed from low Carbon Steel, Copper, Copper-Nickel, Stainless Steel,



Hastelloy, Inconel, or Titanium. There are certainly some unique applications and challenges associated with the welding of heat exchangers, such as the position and access for the popular circumferential welding of Tube to sheet welds or the half tube shell welding.

A trained TIP-TIG welder can typically weld a 50mm tube in 30 seconds... or less with the highest quality and lowest heat input. Our typical travel speed for fillet welds will be between 300 to 500 mm/min on most applications. Compared with 80 to 150 mm/min with conventional GTAW.

TiPTiG manual system is a low cost semi-automatic solution to tackle any job by selecting a wide variety of torches for different applications, with modified 180 deg torch it allows a complete tube sheet welds without repositioning the wire or stopping, allowing for defect free welds.

The typical customers in the manufacturing and repair of various sized heat exchangers are in power plants, chemical plants, petrochemical plants, petroleum refineries, natural gas processing, and sewage treatment.

INCONEL CLADDING

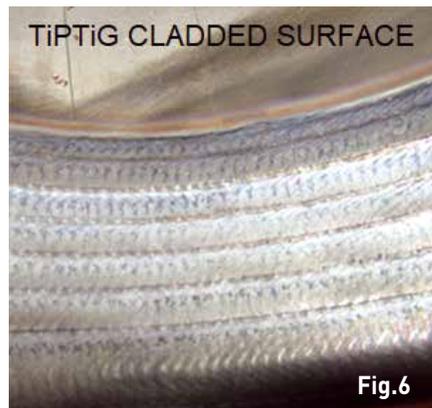
Normally, when you manually clad the end of a pipe ID with Inconel using Pulsed MIG as shown in the picture and result is often not so good. However when we use TIP-TIG, the results are visible as shown on the mentioned pictures.

In the picture TIP-TIG cladded Job, TIP -TIG Inconel 800 pipe was welded with Inconel 82 wire on 10 inch pipe 3/4 Wall. The TIP TIG weld cycle time for the Inconel pipe was 40 – 50 minutes, whereas the customer used to take around 4 hrs with regular TIG. When your weld process can weld a complex incoloy* pipe and make the welds look



simple, that's a process that should be given consideration. With TIP-TIG, no brushing, no grinding, no spatter, no weld rework, no feeding of wire, no foot control, less skills. Note weld smoke prep machining lubricants.

(*Incoloy refers to a range of superalloys produced by the Special Metals Corporation group of companies. They are mostly nickel-based, and designed for excellent corrosion resistance as well as strength at high temperatures; there are specific alloys for resistance to chemical attacks)



Duplex Steel Welding Applications

Application

The picture (fig.5) is of a very thin Gage Duplex Boiler. Traditional automated TIG process with cold wire may result in sluggish duplex welds.

The customer typically attained a maximum Hot Wire TIG weld travel speeds from 12 – 15 inch/min.

Then the customer switched over from Hot Wire TIG to the TIP-TIG process. The TIP TIG weld parameters and speeds were achieved using an 0.035 (1mm) 2205 Duplex wire, with TIP-TIG travel speed of 35 inch/min was achieved providing 200% increase in weld travel. The welds had a superior, less sluggish weld bead appearance and the parts had a dramatic reduction in weld distortion, (note the much smaller HAZ). Also the TIP-TIG process was much more stable and consistent.

TIP-TIG produces the cleanest welds from lowest possible oxidation. The welds will have the lowest possible weld pores and inclusions and the smallest possible weld HAZ.

Welding of P-91 Material

Welding of Grade 91 (9Cr-1Mo-V) chromium-molybdenum steel has presented numerous challenges since its introduction in the 1970s. The gas tungsten-arc (GTAW) process can produce welds of high quality; however, manual welding can be

expensive and labour intensive, requiring skilled welders with extreme hand-eye coordination and dexterity. Grade 91 productivity can be increased in either shop or field fabrication by introducing a semiautomatic high deposition metal transfer (HDMT) GTAW welding process that combines controlled excitation of wire with a hot wire addition. This technique is cost-effective and can be used for the entire weld from root to cap while producing high quality welds that industry expects from the GTAW process.

With TiP-TiG weld study, it indicates that semiautomatic HDMT GTAW welding process is capable of producing toughness values comparable to or exceeding manual GTAW and that the process provides an attractive alternative for welding P91 root and hot passes or the entire weld from root to cap. Results of this study indicates that semiautomatic HDMT GTAW welding process is capable of producing impact values comparable to or exceeding manual GTAW. The process also provides an attractive alternative for welding P91 root and hot passes or the entire weld from root to cap. The semiautomatic HDMT GTAW welding process permits an increase in energy (heat input), larger weld puddle and increased deposition rate while still providing tempering of the previously deposited weld beads or layers.

TIP-TIG HDMT (HIGH DYNAMIC METAL TRANSFER) FOCUS

TIP-TIG HDMT FOCUS is a unique TIP-TIG welding process. Its precision and reliability make the TIP-TIG HDMT FOCUS welding process particularly suitable for automated applications in combination with linear axes, robots and other guiding systems. Nearly all steels, non-ferrous metals or galvanized sheets can be welded in one layer with filler material; e.g. CrNi-steels with a material thickness of up to 10 to 12 mm can be welded in single pass without any joint preparation. Some of the welded examples are listed below.

It has resulted in elimination of backing gas in austenitic stainless steel welds using high deposition metal transfer gas tungsten-arc welding (HDMT GTAW)

TIP-TIG HDMT FOCUS PROCESS

Example

- Material: CrNi 8+8mm
- Weld current: 500A
- Weld speed: 46 cm/min
- Wire feed speed: 2,0m/min

Details of Welded Samples

- Material: CrNi 10+10mm
- Weld current: 500A
- Weld speed: 32 cm/min
- Wire feed speed: 1,8m/min

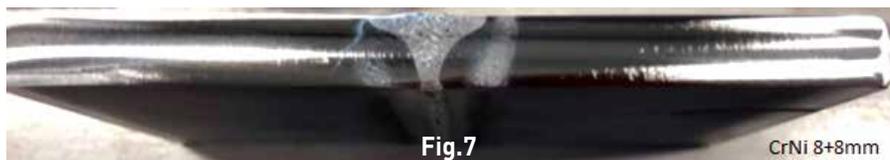
TIP-TIG REDUCED COSTS BY OVER 60%, WHEN COMPARED WITH CONVENTIONAL TIG PROCESS

TIP-TIG Cost Comparison

The following comparison shows the actual savings calculated on a real stainless-steel welding application comparing conventional TIG and TIP-TIG on a pipe application (2" Sch 80 Stainless) in the 5G position.

Conclusion

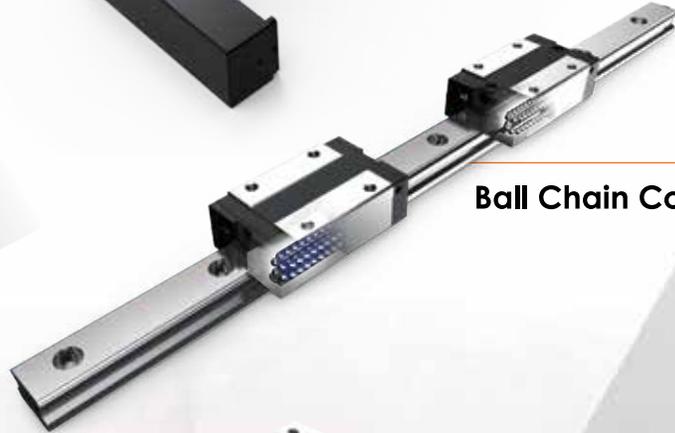
TIP-TIG is an innovative TIG process and good alternative to standard



Ballscrews
Linear
Guideway
Actuator
Cross
Roller Bearing



**Actuator
Motor Turn Type**



**Ball Chain Compact Type
SMB Series**



**External Ball
Circulation Series**



**Metallic End Cap
Linear Guideway ME**



High Lead Series



**Enhanced Dust
Proof Guideway HD**



**Low Noise Type
S Series**

Headquarter



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Variable / Results	Units	Conventional TIG	TIP TIG Process
Welding process		GTAW	GTAW
Wire type		ER308L	ER308L
Wire size	mm	2.4	0.9
Wire deposition speed	mm/min	100	1900
Melt off rate	g/h	200	580(3 times)
Deposition efficiency	%	100.00%	100.00%
Deposition rate	g/h	200	580(3 times)
Duty cycle	%	100.00%	100.00%
Final deposition rate	g/h	200	580(3 times)
Gas type		Argon	Argon
Flow rate	cfh	30	30
Gas/Wire ratio	cf/g	63.05	23.62(60% Reduction in gas per gm of wire)

The above data shows, the deposition rates approx. 3 times to standard TIG process which reduces the production costs by 60%.

gas tungsten-arc (GTAW) process. Its versatility and simplicity makes the manual welder to give higher output. The Automated High Deposition Metal Transfer (HDMT) GTAW welding process that combines controlled excitation of wire with a hot wire addition and gives very promising results to challenging applications. Plant equipment manufacturing, wherever GTAW is

applicable, is possible to be replaced by TIG-TIG process which gives very high output without compromising on quality. The success in P91 welding with TIP-TIG, also increases the application possibility in that area.

References:

1. Paper on 'ACHIEVING TOUGH-

NESS IN P91 WELDS FROM ROOT TO CAP USING SEMIAUTOMATIC HIGH DEPOSITION METAL TRANSFER (HDMT) GTAW WELDING PROCESS' by Charles W. "Pat" Patrick

- Information from TiPTiG USA
- Information from TiPTiG International AG . 

Flex shafts in automotive interiors: Keeping up with expectations to reduce cabin noise

Utilizing the wrong type of flexible shaft can create unwelcome in-cabin noise. Flocked flexible shaft designs offer a solution to engineers seeking quieter operation of accessories

By Michael Boehm, Sales Manager at S.S. White Technologies, Inc.

The focus of today's car interior design is to provide ergonomics and convenience with a high level of comfort. More and more gadgets delight our driving experience, and many of them move, open, or adjust with the push of a button rather than manually. As the cabin includes an increasing number of moving parts, engineers benefit from flexible shafts that grant a freedom of design, to separate the actuator motor from the driven component. However, utilizing the wrong type of flexible shaft can create unwelcome noise. Flocked flexible shaft designs offer a solution to engineers seeking quieter operation of accessories.

Expectations for reduced in-cabin noise increased drastically over the last decade. Hybrids and electric vehicles became the benchmark in regards to vehicle noise. Conventional gas-powered cars followed, and better noise insulation and active noise canceling make the car interior quieter than ever. So, noise sources from within the cab—actuators for power seats, power adjustable pedals, power steering column adjustments, etc.—have to get quieter as well. Noise is not just a matter of decibels, but also of noise quality. Sounds that were acceptable a couple years ago are perceived today as too loud and obnoxious.

Flex shafts do not create noise per se, but they do transmit vibrations from the actuator motor. By dampening these harmonics, a noise quality can be achieved that is not as disruptive or unpleasant. This noise dampening occurs when a layer of flock yarn—a felt-like material—is applied as the top layer of a flex shaft,



S.S. White flocked flexible shafts can limit noise in automotive interiors.

giving it a pipe-cleaner-like appearance. In addition to dampening vibrations, flock yarn also eliminates the need to use grease or any other lubricant. Instead, S.S. White flocked flexible shafts operate dry inside the plastic tube that encases them.

Now, the automotive interior continues to evolve further. Even in conventional cars, cabins will become more flexible, adjustable and configurable in the future. Seats will be able to swivel to the outside for easy access. They will be even more adjustable, with sensors allowing the seats to adapt themselves to the physical characteristics of the driver or passenger who sits in them. A person's preferred seating position might be stored in an app, so when he or she rents a car it already is adjusted to him or her. Access to the rear seats in a coupe will happen with power easy-entry functions, and so will the fold and tumble of all seat rows in SUVs and minivans. Center consoles

will slide back and forth by the push of a button. When considering the interiors of future self-driving vehicles, possibilities become almost endless.

For all these challenges automotive interior engineers face, flexible shafts are an ideal component. They allow the motor to be detached from the driven part, allowing for freedom of design otherwise not possible. They also compensate misalignments, simplify component installation, and can overcome relative movement from one component to the other.

S.S. White is preparing for the future. The next generation of flocked flexible shafts are in development and under testing. These shafts will be lighter, rotate faster, offer less resistance, cost slightly less, and remain ecologically sustainable. Equipped with these new flocked flexible shafts, engineers will tackle new challenges to enable quiet, reliable and efficient operation of motor-driven interior elements. [MTW](#)

Enhancing the longevity of critical machinery with high-performance vibration isolation

ITT Enidine Wire Rope Isolators provide unsurpassed multi-axis vibration isolation to prevent equipment failure

Minimizing the amount of vibration your machines experience is critical to their long-term performance. Vibration fatigue can cause premature equipment failure and expensive machine downtime. But finding a way to reliably and cost-effectively counteract it has always been a challenge.

Enter ITT Enidine Wire Rope Isolators. Engineered with a rugged, all-metal design comprised of stainless steel cable and aluminum retaining bars, the wire rope isolators provide unsurpassed multi-axis vibration isolation. They require almost no maintenance. They're environmentally stable and highly resistant to extreme temperatures, oil, ozone, abrasives and chemicals.

The wire rope isolators also come complete with a patented crimping pattern. Along with an array of versatile mounting options and sizes, this design makes products ideal for a broad range of



applications in the Commercial, Industrial and Defense industries. All of ITT Enidine's wire rope isolators meet the industry standards of DEF-STND 0755, MIL-STD-810, BV43-44, MIL-STD-167, STANAG-042, MIL-S-901 and MIL-E-5400.

The best part? Even if your application parameters fall outside our standard product line, ITT Enidine has the engineering capabilities to design, test and recommend a custom solution to suit your specific needs. For more than 50 years, the company has partnered with its customers to provide value that extends beyond products — leveraging its extensive knowledge to address their most challenging applications.

About Shavo Technologies Pvt. Ltd.

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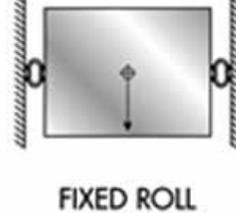
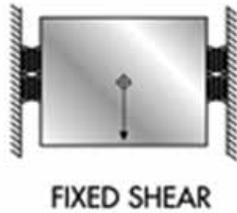
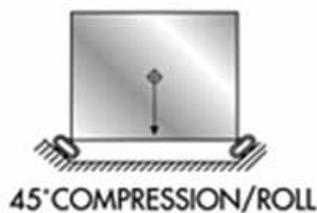
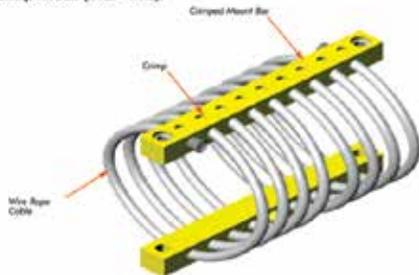
and reliability, Shavo Technologies is your source for premier high-tech solutions in Gas Management, Shock and Vibration, Static & Dust controls, Lubrication and Air Moving Products. Shavo is a full service organization with design, assembly, sales support, service, installation, and commissioning functions

Building on our heritage of innovation and high technology we have partnered with world leader ITT Enidine to deliver enduring solutions to key industries in the area of Shock and Vibration solutions



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Renishaw & RLS help to drive a robot revolution



COMPANY
TQ-RoboDrive

INDUSTRY
Shaft Servo Motors

PROBLEM / CHALLENGE
Torque overload condition

SOLUTIONS
AksIM encoders

END RESULT
Expand its product offering to include servomotors with the highest torque densities

RLS, in conjunction with Renishaw, has designed a new variant of its AksIM™ magnetic encoder with a custom miniature ring size to meet the new challenging form factors and performance requirements of TQ-RoboDrive as they work together to make advanced cobots a reality

A revolution in collaborative robots (cobots) promises to change how assistive care is delivered to the elderly, how people interact with their work environment and even how surgeons perform heart surgery.

RLS d.o.o., a Renishaw associate company, has over many years cultivated a value-added partnership with the German company, TQ-RoboDrive, part of the TQ-Group.

TQ-RoboDrive manufactures a range of frameless hollow shaft stator-rotor kits (ILM series) for cobots, with payloads of up to 20 kg. It also manufactures a range of framed hollow shaft and solid shaft servomotors that combine the powerful motor design of TQ-RoboDrive's frameless servo kits with a space-optimised housing.

RLS supplies TQ-RoboDrive with Ak-

sIM™ magnetic absolute off-axis (hollow shaft) encoders, as well as OnAxis™ encoders. In conjunction with Renishaw, it has adapted the AksIM™ encoder to meet the new challenging form factors and performance requirements of TQ-RoboDrive as they work to make advanced cobots a reality.

Challenge

Modern cobot designs tend to be built on a human scale and require compact, lightweight motorised joints with high motor torque densities. When a robot that is already holding a load is then required to lift the load to a higher level, the current drawn by the motor will spike considerably. Such operational tasks can lead to a torque overload condition (over-torque).

Heavy motors (over 500 g) can absorb



RENISHAW
apply innovation™

the excess heat produced during an overload without difficulty, but lighter motors risk burning out. TQ-RoboDrive motors are designed to withstand thirty seconds of 3x rated overload, which is an industry benchmark.

TQ-RoboDrive motors offer high torque at a low weight, which is important for applications with exoskeletons and cobots.

This combination of high torque and low weight (high torque density) is what differentiates TQ-RoboDrive motor systems from those of other motor manufacturers. For its ultra-low weight frameless motors designed for robotics applications, TQ-RoboDrive sought a precision magnetic encoder solution. This demanded a new miniature absolute encoder that wasn't available on the market.

Ulrich Kerber, Head of Industrial Drives at TQ-RoboDrive, explains, "We were thinking about what might happen in robotics in the near future, and one of our conclusions is that the robots have to become smaller and smaller. We

already had the small motor sizes available (ILM25 and ILM38), but the search for the right accessory components, such as encoders, was proving difficult. Having found nothing that suited our needs, we contacted RLS and Renishaw and told them that we needed an encoder with an outer diameter of no more than 28 mm and a remaining hollow shaft of up to 5 mm."

Solution

TQ-RoboDrive approached RLS and Renishaw to help with finding a solution. RLS already supplies its AksIM encoders to TQ-RoboDrive for other larger diameter motors and offered to design and manufacture a new variant of this encoder with the required ring diameter.

"RLS and Renishaw acknowledged that it would be challenging — but they were also very keen to take up the challenge", recalls Kerber.

Improvements in existing AksIM technology were implemented to meet the challenging requirements of the electric motor such as extended temperature range, higher immunity against stray magnetic fields and ease of set-up.

TQ-RoboDrive motors consist of several main components: the stator and rotor, a safety brake, and an encoder — all mounted in a compact motor housing. The encoder sits at the rear of the motor and each component has a different diameter. The sequence of assembly is im-



portant as there is a stray magnetic field emanating from the safety brake, which requires that the encoder be positioned behind the brake to shield the encoder ring.

"In the end, they were able to design a sensor that fits our ILM 25 and ILM38 sizes perfectly, giving us a complete drive solution for both the hollow shaft framed motors and the frameless servo kits. They did a fantastic job", concludes Mr Kerber.

Results

The partnership with RLS and Renishaw has allowed TQ-RoboDrive to expand its product offering to include servomotors with the highest torque densities available for the robotics market. Customers benefit from improved communication between TQ-RoboDrive and its suppliers as this results in faster problem resolution, better technical support and better customer service.

Ulrich Kerber expands on the importance of collaboration and industrial partnerships in robotics, "The world of collaborative robotics in particular is still relatively small, but it is growing dynamically with every year. Within this community, I see the need for constant dialogue amongst suppliers and customers to ensure that we're all working to fuel the newest trends and solve the biggest challenges. It is very important to have a reliable encoder partner. The variety on the market is huge and we needed the best technology that would fit into our motors. One of the benefits of a partnership with RLS and Renishaw is that they are key players on the market with products that everybody knows. Trouble shooting is also much easier as TQ-RoboDrive can call on RLS and Renishaw for technical support if needed."

*For more information,
Website: www.renishaw.com*

Mill-turn machine programs save time & cost for oil industry seismic instrument maker

The end bell being machined on the Citizen Miyano ABX51-TH3.

COMPANY
GeoSpace Technologies

INDUSTRY
Seismic data acquisition

PROBLEM / CHALLENGE
Ensuring complete use of the machine's three turrets was complicated

SOLUTION BY YOU
Espirit CNC Program

END RESULT
Reduced the cycle time for producing the part

Despite having new and advanced machinery, GeoSpace Technologies was facing challenges in taking full advantage of the machine's capabilities due to inefficient CAM software. By selecting ESPRIT software from DP Technology, the company has been able to improve its manufacturing efficiencies while significantly saving cost

Since 1980, GeoSpace Technologies (Houston, TX) has been developing innovative products for the petroleum industry, including geophones, printheads, and land-to-deep sea systems for seismic data acquisition. Seismic data acquisition, in particular, has become one of the most commonly used technologies in the petroleum industry to search for subsurface oil and gas. Designing and manufacturing innovative scientific instrumentation and equipment are at the heart of every GeoSpace project.

With GeoSpace's seismic equipment, sound data is collected to create maps of the earth's subsurface, which allows oil and gas companies to search for potential or existing oil- and gas-bearing formations. For the oil industry, efficiently finding and developing hydrocarbon

resources is essential. As the search for oil and gas deposits continues, perfecting the art of seismic data collection and subsurface mapping has become one of the most commonly used technologies in the petroleum industry. And the need for accurate and cost-effective technology continues to grow.

That's where GeoSpace Technologies comes in. Geoscientists have come to rely on their instruments and equipment to keep that data flowing – and to do so in newer and better ways. Efficiency and reliability are the keys to success, both for GeoSpace Technologies and for the petroleum companies that rely on them. Tight delivery schedules are another key factor for this industry. For example, it might cost up to \$300 thousand per day for a company to charter a large ship for a geological survey. Forcing the ship to sit

at the dock waiting for equipment to be delivered is not acceptable.

For GeoSpace Technologies, these constraints mean they could not rely on external manufacturing suppliers—especially overseas suppliers—that have their own priorities and can't always be relied on for on-time deliveries. GeoSpace Technologies overcomes this challenge by producing a majority of its products and their components under its own roof. The company employs over 200 manufacturing employees who build molds, perform injection molding, build printed circuit boards, make machined metal and plastic components, and perform many other manufacturing operations.

Challenge

GeoSpace has 33 CNC machine tools as well as many manual machines and auxiliary equipment. The company has recently invested in newer, more advanced machinery, including a Citizen Miyano Machinery ABX-51TH3, with an upper turret on the left side, one on the right side, and a lower turret capable of working on both sides.

The manufacturing engineers at GeoSpace Technologies initially programmed the machine with the CAM

software they had been using for years, but ran into difficulties while trying to take full advantage of the machine's capabilities. For example, ensuring complete use of the machine's three turrets was complicated by the fact that simply moving an operation from one turret to another often required starting the program from scratch.

Justin Henry, manufacturing manager for GeoSpace Technologies, was tasked with the challenge of improving the efficiency of the company's manufacturing options. His top priority was upgrading the company's CAM software. Boosting efficiency with multitasking machinings, like mill-turn and Swiss-type turning, was key. Henry says, "I looked at a few of the market leaders and selected ESPRIT from DP Technology because it provides the best support I have seen for advanced machines."

ESPRIT reseller, Victor Davila of Shape Design, was brought in to assist. Davila notes, "We helped GeoSpace by showing them what they could achieve with ESPRIT. When we met them, they had great machines and employees. One part was missing. They were held back by inefficient CAM software. Getting more efficient, newer machines made this bottleneck more visible. I told them they



Alejandro Perez, programmer, programming the end bell on ESPRIT.

could write code and take it to the machine and run good parts the first time."

After training on the new software, Henry focused on improving the program to produce a part called an end bell for the company's OBX product. While doing seismic mapping, this part protects electronic components from the deep-water pressure on the ocean floor with the use of six O-ring seals. Too complex to be injection molded, the end bells are machined from plastic at a rate of almost 50,000 per year.

The GeoSpace Technologies' programmer opened the Solidworks solid model of the part in ESPRIT and used the software's automatic feature recognition component to identify the machining operations required to produce it. In a few cases, Henry manually created features based on his own ideas on how the part should be produced. For example, he combined a bore and a counterbore into a single feature so that both could be produced with a single tool.

"We decided to flip the part around front to back in the machine because it is easier to deploy two spindles on the front side of the part, which also has most machining operations," Henry said. The programmer set about assigning machining operations to maximize turret utilization. For example, originally, two radial drilled and tapped holes were produced



Programmer Alejandro Perez (left) and manufacturing manager Justin Henry (right), working on the Citizen Miyano ABX-51TH3.

one after another by a single turret. With the new software system, they are now machined simultaneously on the front side of the machine by two synched turrets.

An axial through-hole with several steps was previously drilled and bored with four different tools. The programmer changed this so that after the hole is drilled, a single carbide insert tool is held in the positions to bore all the steps while the part rotates. The new approach saves considerable cycle time by reducing the number of tool changes.

The programmer also adjusted cutting speeds and feeds to take full advantage of the capabilities of the tooling. The new speeds and feeds were tested and tweaked on the machine, and the final parameters were transferred into the final CNC program.

Results

Overall, the new program reduced the cycle time for producing the part on the ABX machine from 22 minutes to 6.5 minutes, saving GeoSpace Technologies both time and money. Building on this success, the programmers used ESPRIT to reprogram an assortment of additional parts for the ABX machine and achieved even greater savings.

The time savings also came from the ability to do time studies within the software. The older software did not provide an accurate picture of run times until the



The final sensor. At the top is the plastic version for shallow water. At the bottom is the titanium version for deep ocean water.

part was test run on the machine. ESPRIT software, however, provides them with a report that shows how long the tool will be in the cut. Knowing that a tool actually takes 2 minutes to run instead of 10 allows for more accurate job planning and cost reporting.

In addition to more accurate job time estimates, ESPRIT allows GeoSpace engineers to accurately depict within the software how a program will run when creating or modifying a new tool. Avoiding collisions and syncing between turrets, for instance, can all be simulated in real time with a click of a button. With other systems, the syncs don't always match what you see in the machine. Instead, time and materials must be wasted while proving out the program on the machine tool.

"ESPRIT made it possible to move operations from turret to turret or setting sync points with a few clicks of the mouse," Henry said. Now, with more accurate syncs possible, even greater efficiencies could be found.

Control is everything when you're programming and process planning. ESPRIT software was the clear choice for GeoSpace Technologies. While there are several reasons GeoSpace chose ESPRIT for their machinery needs, one of the main reasons is "the power and control that ESPRIT gives you. With ESPRIT, you have control over the tool to do whatever you want to do." ESPRIT is completely customizable to meet the unique and changing needs of manufacturers and machine tool builders. "Most CAM software don't let you do that," says Davila.

"ESPRIT has given us the ability to quickly adapt and improve our CNC programs for multitasking machines," Henry concluded. "We have achieved substantial savings by combining processes into a leaner approach, dividing operations to more efficiently utilize all machine spindles and turrets, reduce the number of tool changes required, and make many other improvements."

For more information,
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Finished end bells with electronics.

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AMETEK Land helps reduce costs and increase efficiency for SAC Engine Components

SAC Engine Components Pvt Ltd, a manufacturer of valve train IC engine components, chose AMETEK Land's Cyclops Meltmaster high-precision portable non-contact thermometers to optimize the quality of their molten metal, whilst making significant savings on consumables every year



COMPANY

SAC Engine Components Pvt Ltd

INDUSTRY

Auto Parts

PROBLEM / CHALLENGE

Accuracy & consistency in measuring the temperature of liquid metal in its furnace and the ladle

SOLUTIONS

Cyclops 055L-2F Meltmasters with Bluetooth jumbo display

END RESULT

Accurate temperature reading of molten metal

Established in 1986 in Tamil Nadu, SAC Engine Components Pvt Ltd, formerly Southern Auto Casting, is a pioneer in the manufacturing of Camshaft, Balancer Shafts, Valve Tappets and Rocker Arms for diesel and gasoline engines in specialized chilled grey iron, chilled ductile iron, ductile iron, steel forging and steel bar. For over three decades, SAC Engine Components has maintained a unique position and strong brand name in the industry for its quality of manufacture.

SAC Engine Components required an effective solution to be able to accurately measure the temperature of liquid metal in its furnace and the ladle, with high accuracy and consistency, with the information clearly displayed on the shop floor for the production team to see.

Solution

AMETEK Land recommended that engineers utilize six Cyclops 055L-2F Meltmasters with Bluetooth jumbo display

installed at the factory in India near Chennai. The main advantage of the Cyclops 055L-2F is that it provides an accurate temperature reading of molten metal, which makes a fundamental difference to the quality of the casting.

The operator is positioned five to six metres away from the molten metal and points the Cyclops Meltmaster at the liquid. The trigger is then pulled when they wish to take a measurement, which is displayed in four simultaneous modes, including Continuous, Peak, Valley and Meltmaster to meet their specific requirements. The Cyclops 055L-2F Meltmaster provides accurate measurement of liquid metal temperatures in the range 1,000 to 2,000 °C (1,832 to 3,632 °F).

Accurate sighting is ensured by the clear, wide-angle field of view and small, clearly defined measurement area. All processed temperature values are shown continuously on the Bluetooth jumbo display when the trigger is pressed.

Results

The AMETEK Land Cyclops Meltmaster paid for itself at SAC Engine Components within 12 months. Every year, the company was spending 12,00,000 INR (\$17,143) on Dip type thermocouples, a cost it no longer needs to incur. The fact that the Cyclops Meltmaster uses no consumables is the main reason for the cost savings.

There are many other benefits of the Cyclops 055L-2F Meltmaster, in addition to return on investment. The instrument has a positive impact on health and safety because of its non-contact nature, making it much safer from an operational point of view. It is also very user-friendly and provides consistent and accurate readings.

The Cyclops 055L-2F Meltmaster offers high accuracy measurement of temperature, even while pouring, right up to the last mould. The instrument is renowned for its ability to measure the real liquid metal temperature, regardless of high-temperature sparks, low-temperature water vapour, dust and smoke that can cause errors in temperature measurement.

The Cyclops Meltmaster features four trigger operating modes for datalogging, which are available from logging a measurement for each trigger release to precisely execute pre-configured routes for consistent, long term readings. This in-

novative pyrometer can store up to 9,999 number readings.

Emissivity compensation is provided via the icon-based menu system. The operating waveband has been carefully chosen to minimise errors due to uncertainty in emissivity and the effects of atmospheric vapour components, such as steam or hot sparks. Its rugged instrument casing is designed to withstand harsh environments for extended periods. It also features a lens protector, which maintains the optics in good condition.

The equipment is designed for single-handed operation, with contact-free measurement for excellent ergonomics and better safety in hazardous environments. SAC Engine Components has been able to take advantage of the latest version of the Cyclops 055L-2F Meltmaster, which features a Bluetooth jumbo display. This offers greater convenience when accessing data. It also offers USB connectivity to download the data to a PC or mobile device. Consistency of measurement is assured as the Cyclops Meltmaster offers excellent repeatability.

AMETEK Land offers a NABL Calibration and technical service available locally in India, with facilities in both Bangalore and Jamshedpur. Each Cyclops Meltmaster made in India is calibrated to national standards, which gives the customer a guarantee of measurement

accuracy.

Mr. Kumar, Deputy General Manager of Foundry at SAC Engine Components, explains, "We are really pleased with how the AMETEK Land solution is working and how the Cyclops Meltmaster has provided a more effective method of temperature measurement. Our production team have welcomed the consistency, reliability and accuracy that the equipment provides and from a business point of view, there have been major savings already."

Prasath Venkatasamy, National Service and Business Development Manager for AMETEK Land in India, said, "In the past, SAC Engine Components used thermocouple tips, which are consumable and therefore an ongoing expense that builds up over the year. The company also had to check the calibration of the Dip thermocouple instrument every three months and minor issues that needed to be rectified required spare parts. This was expensive and time-consuming and meant that the accuracy of the process was not always consistent. With the Cyclops Meltmaster, the equipment is extremely easy to use and reliable and the Bluetooth display means that the readings are clear for the production staff to interpret. It is great to see that even though the equipment was only installed just over a year ago, it has already paid for itself."

Venkatasamy continues, "For any foundry in India, the Cyclops 055L-2F can provide major cost savings by reducing thermocouple tips, highly accurate and fast temperature measurements, reduction in quality defects, energy savings with immediate furnace control and operator safety improvements, plus its performance is proven throughout India with more than 250 new users in the last 5 years."

For more information,
Website: www.ametek-land.com





How manufacturer AB Tools is benefitting from ANCA's custom solution

COMPANY
AB Tools

INDUSTRY
Tool Manufacturing

PROBLEM / CHALLENGE
Custom design mechanical, electrical, software and process solutions

SOLUTIONS
ANCA MX7 with Robomate

END RESULT
Expansion of the capabilities and simplified process



ANCA supplied a solution based on an MX7 Linear for autoloading and grinding special inserts, which has simplified AB Tools' processes and reduced cycle time

AB Tools, Inc. – a US based specialist tool manufacturer, requested a solution to manufacture special carbide inserts. They were seeing a growing demand for this product and asked ANCA to supply a solution based on an MX7 Linear for autoloading and grinding special inserts as existing machinery and processes were not versatile enough for them to successfully meet their demands.

ANCA's Engineering team worked to find a solution as they can custom design mechanical, electrical, software and process solutions to enhance the standard product range and meet

unique customer requirements. Simon Richardson, ANCA Product Manager said, "Developing new technology that directly addresses customers' requirements, hopefully helping you get ahead of your competition benefits everyone. Our founders are often heard reflecting that some of our greatest product breakthroughs have originated from custom projects."

Alfred Lyon, AB Tools Shop Supervisor said, "Both Jon Baker, the President at AB Tools, and I were extremely impressed with the whole process. From our own testing to having Simon Richardson come out and scope

out our needs and what we wanted to accomplish. Followed by several emails, a discussion with Pat Boland himself and then flying to Melbourne to meet with the incredible Customer Solutions team who then took our requirements and ran with it.”

“Lastly, and probably the most amazing and important part, ANCA sending out engineers to iron out all last-minute details. Basically, our goals were not merely met but exceeded!”

The engineering team was requested to deliver a solution that was able to:

- Autoload and grind a range of AB Tools shear hog inserts.
- Perform grinding operations in one setup
- Meet cycle time requirements

The custom solutions engineering team delivered an enhancement to the ANCA MX7 with Robomate. New designs developed included:

- A modification to the loading system with custom pallets to suit the inserts. The custom pallets can hold up to 442 inserts, this capacity can easily be increased by ordering the four pallet upgrade option available on the MX7 Robomate.
- A modification to the robot gripper head allows the robot to pick up and handle the insert/nail combination. Robot loading software was developed to enable to the machine to pick up the insert and load and unload the nail via an interchange station.

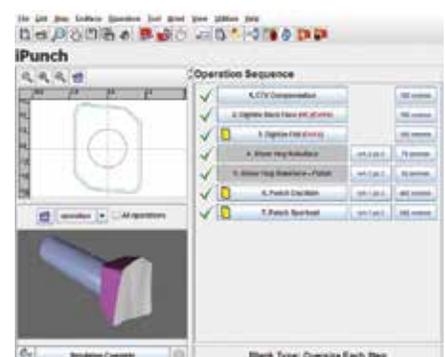
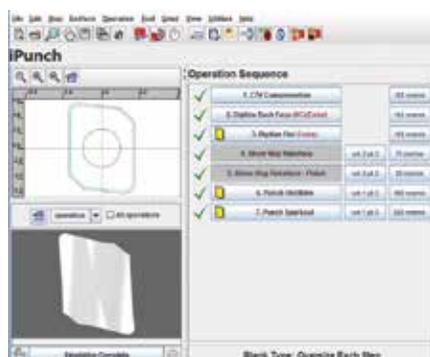
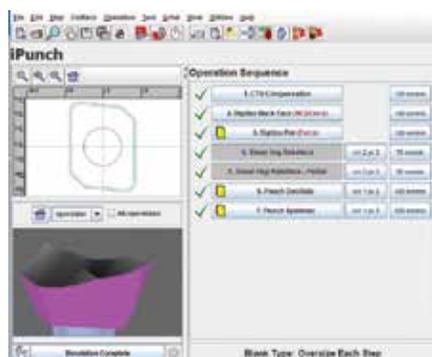
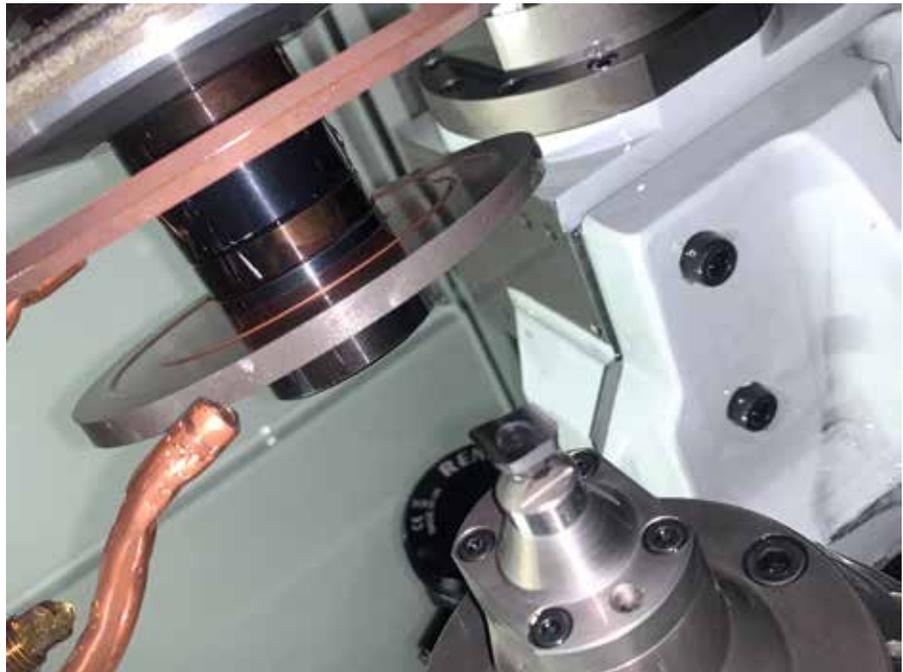
- Custom anvil nose work holding to clamp the inserts, with the added benefit of a variable force drawbar system. This drawbar allows flexibility to grind different sized inserts and to effectively clamp different sized tooling.
- A software interface to allow for the adjustment of specified insert parameters including – corner radius, periphery relief angle and rake face dimensions. Digitising software also verifies the insert orientation prior to grinding.

The grinding and loading process is running within the customers

parameters. Inserts can be ground in a cycle time of currently less than six minutes.

Alfred concluded, “ANCA impressed me from day one. Creating basically a whole new type of machine for AB Tools, Inc. is not merely impressive, it is extraordinary. We could have purchased another machine just like the one we were using but we asked ANCA for help because we wanted to expand our capabilities and simplify our process. This new machine has exceeded both desires.”

For more information, Website: www.anca.com



Wibu-Systems' Technology protects and licenses MVTec' machine vision applications



By integrating Wibu-Systems' CodeMeter licensing system into their complete range of machine vision software, MVTec is able to create and distribute time-limited student licenses in an easy way

Wibu-Systems, a security technology leader in the global software licensing market, has assisted MVTec, a vanguard developer of software for machine vision solutions used in a variety of industrial applications, extending the reach of its CodeMeter software protection and licensing platform into MVTec's product portfolio. The flexible CodeMeter licensing system also enables MVTec to facilitate licensing in the educational market, making the process for creating and distributing time-limited student licenses easier to control and manage via self-service web portals.

Image processing and machine vision technologies have become a crucial el-

ement in the automated environments of Industry 4.0. MVTec's HALCON and MERLIC software products enable users to build sophisticated machine vision solutions across multiple applications, ranging from PCB, semiconductor, and process testing to robot positioning and alignment, surface monitoring, quality assurance, print quality checks, ID screening, and much more.

Because of the diverse nature of these applications, any licensing solution used by MVTec requires support for a comprehensive range of architectures, operating systems, and industrial environments. In addition to versatility and agility, MVTec needed a technology that would protect their invaluable intellectual property.

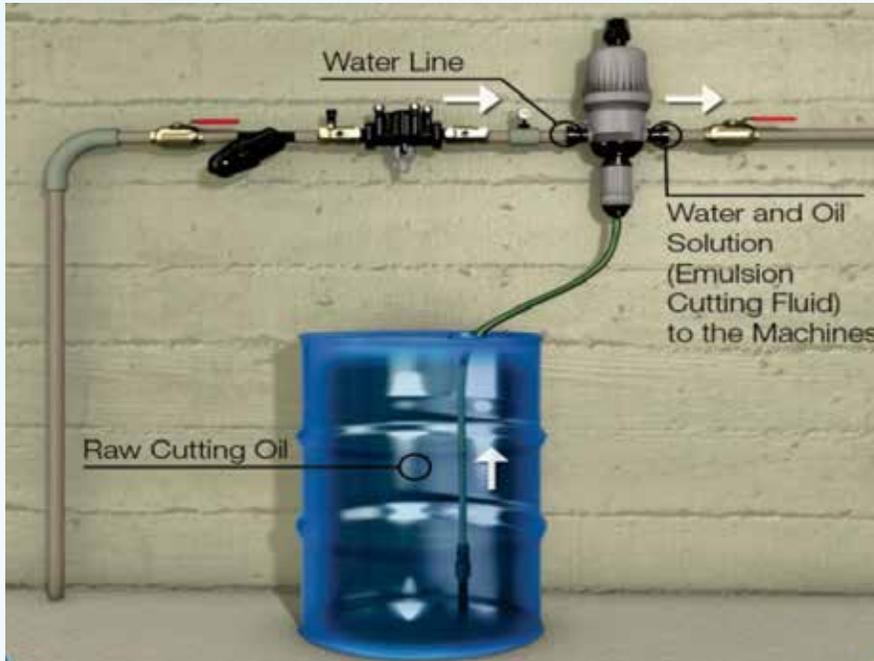
Protecting the digital assets

MVTec first integrated CodeMeter into MERLIC, an all-in-one software product that provides powerful tools to design and build complete machine vision applications without manual programming. With CodeMeter, MVTec employed customized and branded hardware secure elements (CmDongles) and software-based licenses

(CmActLicenses) to protect the know-how associated with their digital assets. The licenses for MERLIC are created, delivered, and managed via CodeMeter License Central. The end users then activate them via a web portal, WebDepot, and store them either in the physical CmDongle or the secure CmActLicense

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file bound to the fingerprint of their machine. Most recently, MVTec also chose to adopt the CodeMeter technology for HALCON, their standard software product for machine vision applications, combining software licenses with a dongle as a proof of identity.

With both products utilizing CodeMeter, MVTec now has a comprehensive licensing and IP protection solution that covers the entire HALCON and MERLIC product range with the flexibility and uniformity required to protect the software and to distribute and manage licenses across all their markets.

Christoph Zierl, Technical Director of MVTec, commented, “CodeMeter enabled us to respond to the many and complex needs of our users. MERLIC and HALCON are used in various shapes and forms, and so far, CodeMeter has mastered all requirements and challenges we have thrown at it. Choosing CodeM-

eter means choosing a mature ecosystem for protecting our company’s intellectual property. With Wibu-Systems, we found a partner who meets us on eye-level and offers us everything in one single technology, from our dongles to license management in the cloud.”

CodeMeter licensing dynamic approach also allowed MVTec to expedite user-friendly access to educational licenses. Batches of these licenses can be acquired by educational institutions and managed by designated administrators through the use of Wibu-Systems’ three educational portals: One for MVTec to manage the participating educational institutions and educators; one for the designated administrators to coordinate their student licenses; and a third portal for students to activate their licenses – putting cutting-edge technology in the hands of their future users without compromising security. This streamlined

process keeps MVTec in full control, while making the creation and distribution of time-limited student licenses far easier.

Ruediger Kuegler, VP Sales of Wibu-Systems, added, “It is gratifying to see how our technologies have evolved over the years and been reimagined to meet the challenges in the industrial sector. This goes particularly for MVTec, who is leading the way with advances in the most modern machine vision applications. With CodeMeter, they know their IP is safe, and they have the licensing versatility that will enable them to tap into new markets.”



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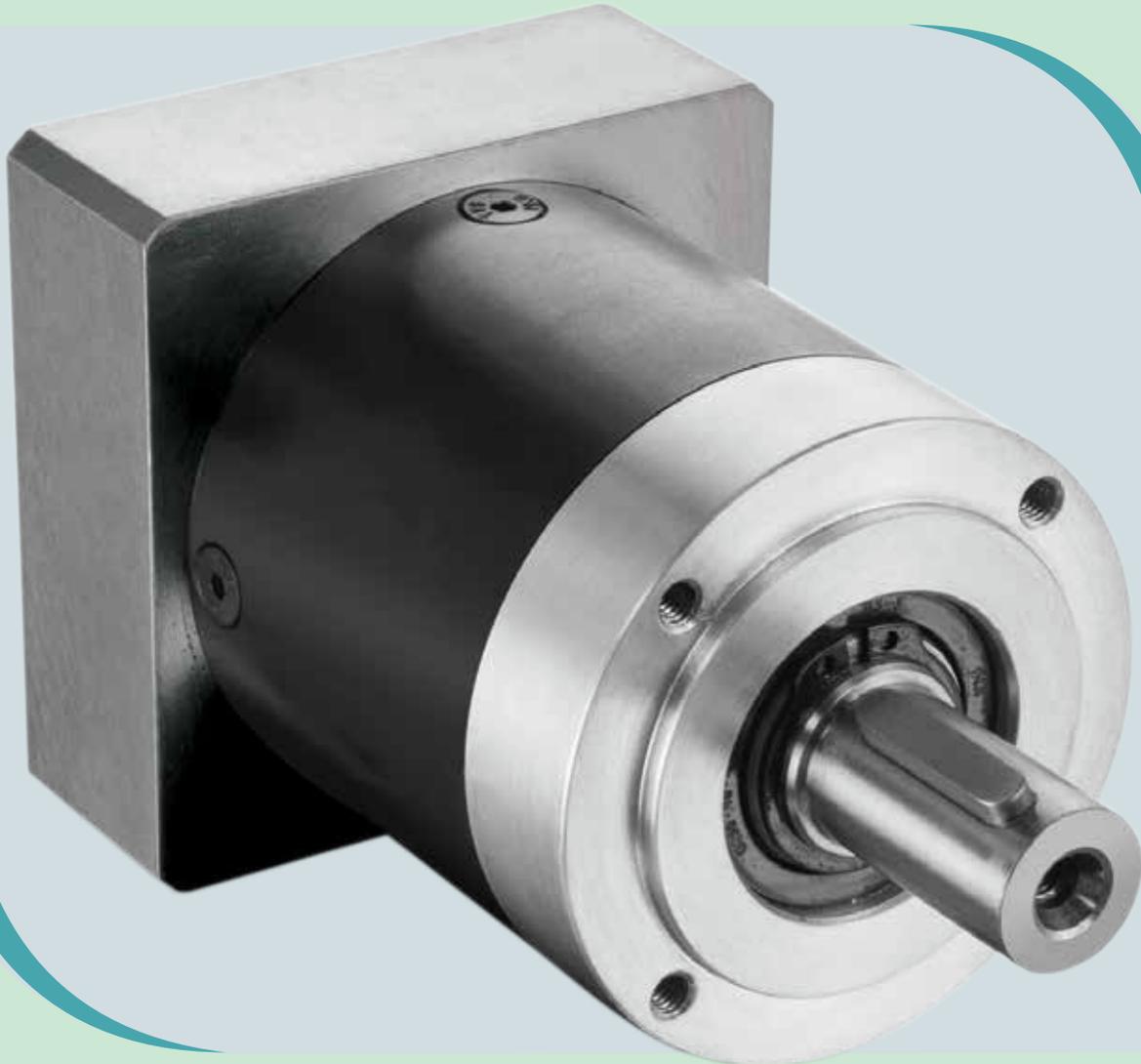
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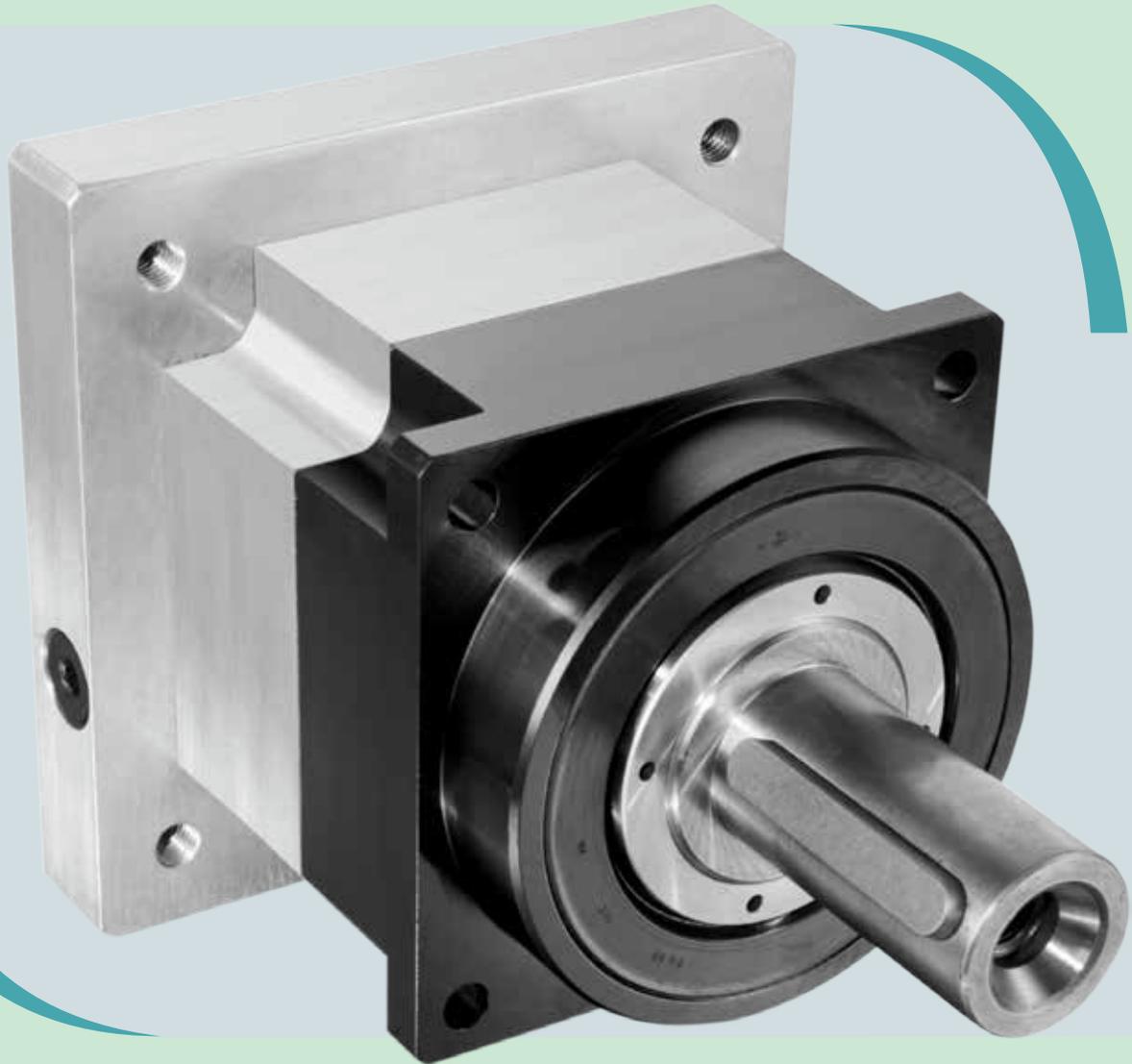
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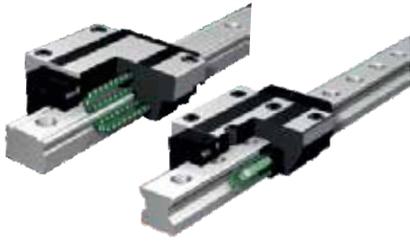


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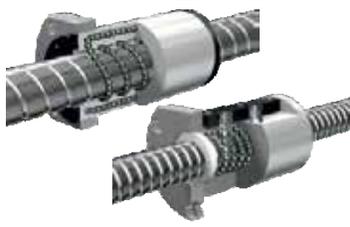
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PRODUCT SHOWCASE

Renlub's Portable Oil Skimmer, OilSKIM OS001



Users of cutting fluids often complain of lubrication oil leakages seeping in to their machining centre sumps. This deteriorates the health of the cutting fluid and causes frequent machine breakdowns which ultimately affect productivity. Conventional oil skimmers such as belt type and disc type are ineffective due to limited reach, slow rate of oil removal and removal of cutting fluid along with the floating tramp oil.

Our Portable Oil Skimmer, OilSKIM OS001 is an enduring solution to this problem. OilSKIM OS001 has the following distinctive features and advantages:

- High rate of oil removal, from 6 to 40 litres per hour
- Reaches and removes oil from areas under the machine centre
- Works for long hours due to quick cooling motor
- The tube comes in standard sizes: 1.2, 1.8, 2.2 & 2.5 mtr.
- The tubes can also be custom-made as per clients' requirements
- Easy mounting, dismantling and portability

The Skimmer weighing 5 kg, comes in dimensions: 8'x 8' x 6'. It uses an AC single phase synchronous motor with a torque of 20 kg/cm.

This is how the oil skimmer works:

The tube floats from one corner to the other of the sump and it does not sink in the solution or emulsion or water below the oily surface. It attracts only floating oil, leaving aside water and other solid and sticky particles below the oil. Oil which is adhered to the tube is scraped by the scrapers and the scraped oil flows through an outlet and is collected in a container. The clean tube is now cycled back to the surface of the sump to collect more oil.

OilSKIM OS001 is used with advantage in multifarious applications in machine shops, tool rooms and metal industry; industrial washing machines; automobile washing stations; heat treatment and rolling mills; ETP & other waste water treatments; chemical, food processing, poultry; disposal sites, etc. **MTW**

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The Nexgen Refrigerated Air Dryers from Gem Equipment are known for engineering excellence, innovation and reliability. The heat exchangers are designed to provide worry-free, highly efficient heat transfer whether you are processing simple fluids, viscous solutions, or particulates. They feature honey comb construction of aluminium fins, true cross-flow for greater effective temperature differences, non-clogging larger cross-sectional area for air flow, integral air-air and air-refrigerant exchanges, with stainless steel demister moisture separator, robust non-corrosive grade aluminium, and larger heat transfer area for higher efficiency.

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Welding Fume Extractor, King Extractor-II-MU 3



Welding Fume Extractor, King Extractor-II-MU 3 is a mobile mechanical high efficiency self-cleaning filter designed for workplaces. The filter cleans air from different kinds of dry dust, welding aerosols and other dry contaminants from most industrial processes.

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- Relative humidity : 80% at 25 deg. C
- The compact construction integrates the filter, extraction arm and fan
- The filter can be used at workplaces unreachable to other ventilating equipment, and
- The filter requires connection to a general compressed air supply.

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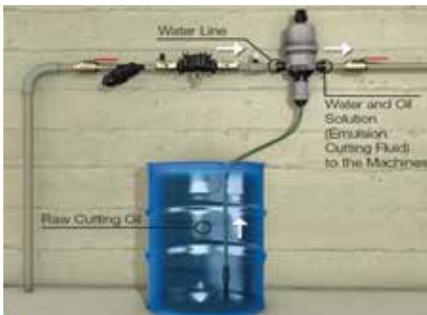
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Y.1772 Z-3.6576 A-147.4250 B-180.2650 F4769.55
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Y.1620 Z-3.9624 A-150.8500 B-187.5050 F4913.63
Y.1601 Z-3.9999 A-151.2750 B-188.4100 F4931.64
Y.1582 Z-4.0379 A-151.7000 B-189.3150 F4949.65
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Y.1050 Z-5.1019 A-163.6000 B-214.6550 F5453.93
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Y.1012 Z-5.1779 A-164.4500 B-216.4650 F5489.95
Y.993 Z-5.2159 A-164.8750 B-217.3700 F5507.96
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Y.727 Z-5.7479 A-170.8500 B-230.0400 F5759.10
Y.708 Z-5.7859 A-171.2750 B-23



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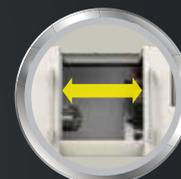
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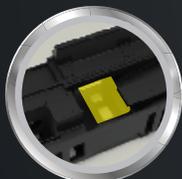
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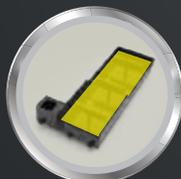
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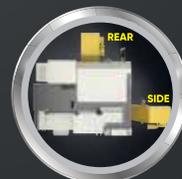
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