

THE MACHINIST

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OPINION

Why aluminium is the key ingredient that makes today's world

IMTEX SPECIAL

A peek into what to expect at the upcoming IMTEX 2022

INDUSTRY

How customers can scale operations at a global level by investing in CX

“ROLLS-ROYCE LOOKS FOR VALUE ARBITRAGE AND NOT COST ARBITRAGE”

A one-on-one with **Kishore Jayaraman**, President - India & South Asia, Rolls-Royce discussing business plans, innovations to grow and more....



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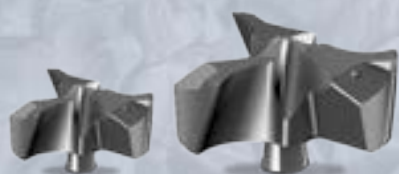
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GREEN IS THE FUTURE!

The consideration of getting green energy or clean energy upheaval is gaining more amazing headway than expected. Solar and wind power have seen outstanding expense declines, and EVs or electric vehicles are surprising the market. While there is a slight degree of hybrid between clean energy and environmentally friendly power energy, they are not something similar. Clean energy is the energy gotten from inexhaustible, zero-emanation sources that don't dirty the climate as well as save energy by energy proficiency measures. India's declaration that it means to arrive at net zero emissions by 2070 and to meet half of its power necessities from environmentally friendly power sources by 2030 is a hugely significant moment for the global fight against climate change. India is spearheading another model of monetary improvement that could keep away the carbon-concentrated approaches that numerous nations have sought previously - and give an outline to other developing economies.

The government of India has set targets to reduce India's total projected carbon emission by 1 billion tonnes by 2030, reduce the carbon intensity of the nation's economy by less than 45% by the end of the decade, achieve net-zero carbon emissions by 2070 and expand India's renewable energy installed capacity to 500 GW by 2030. The country has set an ambitious target to achieve a capacity of 175 GW worth of renewable energy by the end of 2022, which expands to 500 GW by 2030. This is the world's largest expansion plan in renewable energy. India's installed renewable energy capacity has increased 286% in the last 7.5 years and stands at more than 151.4 GW (including large Hydro), which is about 39 per cent of the country's total capacity (as of 31st December 2021). The installed solar energy capacity has increased by 17 times in the last seven years and stands at 49.5 GW. The installed renewable energy capacity (including large hydro) has increased from 76.37 GW in March 2014 to 151.4 GW in December 2021, i.e. an increase of around 98 per cent. India has achieved its NDC (National Development Council) target with a total non-fossil-based installed energy capacity of 158.17 GW which is 40.2 per cent of the total installed electricity capacity.

India direly needs to expand its portion of substitute practical sources to create energy. As of 31st January 2022, practically 60 per cent of India's power age came from non-sustainable petroleum derivatives - diesel, gas, coal and lignite. As indicated by the Research Institute for Humanity and Nature, India positions third on its rundown for carbon ozone harming substance discharges, representing 2.46 billion metric lots of fossil fuel byproducts every year, which is 6.8 per cent of the worldwide aggregate. India discharged 2.88 gigatonnes of CO2 yearly starting around 2019. To fulfil its energy needs, India is assessed to have imported around 180-190 metric lots of coal in FY22. In FY22, until February, India imported 193.5 million tons of raw petroleum worth US\$ 105.8 billion.

A change to clean energy is a gigantic financial opportunity. India is especially all-around set to turn into a worldwide forerunner in inexhaustible batteries and green hydrogen. These and other low-carbon advancements could make a market worth up to \$80 billion in India by 2030. Support from the worldwide local area is fundamental for assisting with moving India's advancement onto a low-carbon way.

Rahul Kamat
Editor

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Fast Sharp Strong



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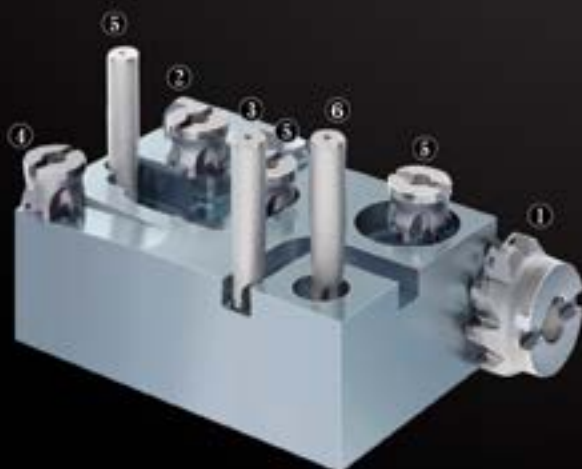
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YOUR GLOBAL CRAFTSMAN STUDIO

The Customer-Oriented REvolution Journey Continues at GrindingHub

THE UNITED GRINDING GROUP, one of the leading manufacturers of precision machines for grinding, eroding, lasering, and combination machining, is the largest exhibitor at the new trade show for grinding technology in Stuttgart: GrindingHub. The Group will present its revolutionary innovations on a booth covering an area of 1,200 m².

Revolutionary Machine Development in Additive Manufacturing

The revolutionary aspect of the new IMPACT 4530 machine is its high degree of automation and its repeating accuracy. While the machines available on the market to date are based mainly on manual processes and are difficult to integrate into the manufacturing process, the IMPACT 4530, by contrast, is designed for safe operation under industrial conditions. The separate operating and loading area, with an automatic changeover system for the metal powder containers and the components, ensures higher productivity. The clever design also keeps cleaning and maintaining the system, a major issue in conventional systems, easy and uncomplicated. This greatly simplifies the handling of the machine and increases productivity.

The machine's high repeating accu-



racy is reinforced through smart software, as the new machine is already equipped with the new CORE technology. The Group's innovative hardware and software architecture enables intuitive operation and networking with other machine tools and allows machines to prepare for production largely on their own.

World Firsts in Grinding Technology

The Group is also presenting several innovations in grinding technology. BLOHM, for example, is presenting its PLANOMAT XT Essential, an economical, high-precision surface grinding machine in the entry-level segment, for the first time at any German trade show.

STUDER is presenting two new products in cylindrical grinding: the S36 external cylindrical grinding machine for production and its uniLoad automatic loading system. The S36 is designed for small to medium-sized workpieces and various components. It is ideally suited for use in the automotive, hydraulic, pump, and tooling industries and comes equipped with the new CORE technology. One outstanding feature of the new machine is its large grinding wheel with a diameter of up to 610 millimetres and a maximum width of 125 millimetres.

With the new uniLoad loading system, STUDER focuses on universality and speed for its two universal external cylindrical grinding machines, the S31 and S33. The system can be operated without special training or programming knowledge and achieves automated processing of about one hour at total storage capacity.

In tool machining, WALTER is presenting the HELITRONIC G 200, a new tool grinding machine with an innovative machine concept and a footprint of less than 2.3m². The compact device is suitable for producing and re-sharpening of rotationally symmetrical tools with a diameter range of 1 to 125 mm.

Ashok Leyland Showcases 'CNG Engine H Series' at EXCON 2022

ASHOK LEYLAND, the flagship Company of the Hinduja Group and India's leading commercial vehicle manufacturer, showcased 'The CNG engine H series' at the EXCON 2022, organised by the Confederation of Indian Industry (CII). Based on the strong leverage of Auto BSVI engine development, the CNG engine H series (4 and 6 Cyl) is designed for off-highway / CEV clients, and this product will be the first of its kind in the CEV / mining and off-highway segment.

The H series CNG engine has several features, including ECU-controlled gas leak detection; improved cold-start capability; enhanced lower-end torque and flat torque from 1200rpm to 2000rpm; gear-based torque control for better fuel economy; durable engine valves and valve seats for CNG operation; proven, durable engine for CEV application; turbocharged engine provides higher torque, fuel efficiency, bet-

ter drivability, and transient response; maintenance-free engine. The CNG engine H series also fulfils CEV V standards without SCR or DPF and features proven multipoint sequential gas injection for dependable performance, a 500 hour oil drain interval, and the maximum power in the sector.

Commenting on the launch, Rajesh R, VP Defence and PSB, Ashok Leyland, said, "Today, we have introduced CNG engine H series', which is a first for the sector and will have multiple applications for the construction equipment market—staying true to our brand promise of 'Aapki Jeet. Hamari Jeet.' we aim to provide innovative products that satisfy the needs of our customers. This introduction will help us become a formidable force in the CNG and alternate fuel technology space. These innovative engines



are the latest in line and can be used across various applications for the growing needs of the construction equipment industry."

With 25 years of CNG experience in India, a pan-India service network with 24x7 support, and in-house development capabilities, Ashok Leyland plans to expand product lines and expand its presence in the fast-increasing CNG engine market.

BFW Group Launches India's First Commercially Available L-DED Machines

BFW specialises in cutting edge advanced manufacturing technology platforms, with over 50,000 machines and systems installed worldwide. BFW sensed the



industry need and opportunity for cost-effective and large format metal additive manufacturing in the Laser-Powder & Laser-Wire Directed Energy Deposition (DED) segment. It entered the DED metal AM industry in September 2021 with a mission to industrialise additive technology and has a technology-driven global team to drive this business.

BFW's 60 years of expertise in machine tools gives it the capability and infrastructure to develop and manufacture a complete end to end range of Additive Manufacturing solutions (Photon

Platform) to exacting specifications and reliability. The photon platform includes the world's largest and fastest L-DED game-changer Photon 4000G, announced in April 2022, is now the Photon 1000H and Photon 1000R hybrid and robotic configurations.

The entire product range of the Photon platform is among the most commercially attractive yet highly capable technologies with strong validation in academia and industrial applications for aerospace, defence medical, die and mould, energy segments. BFW also prides itself in its capability, commitment and track record to provide world-class customer support for installation, commissioning, training, and expert consultancy to any customer within India and worldwide.

The formal launch ceremony for the Photon 1000 series took place in Bangalore at BFW/M2NXT headquarters at the hands of Dr Ashwath Narayan C N, Minister for Higher Education, IT & BT, Skill Development, Entrepreneurship and Livelihood; Dr V K Saraswat, Member Niti Ayog, was the Guest of the Honour. The event was felicitated by TR Parasuraman, President and whole-time Director,

Toyota Industries Engine India, Dr S Devarajan, Sr VP TVS Motor Company, Jaspreet Sidhu, CEO, National Centre for Additive Manufacturing, Brian Mathews, Chief Technology Officer, Meltio, Spain and several senior government/industry officials and experts.

BFW has already installed Photon 1000H and Photon 1000R machines in its Dr Abdul Kalam Centre of Excellence in Bangalore for contract manufacturing, R&D, and alloy development, as well as to market & support the machines in India and globally.

"BFW and m2nxt have introduced market disruptive high technology products for the last six decades. Photon 1000 machine series is one more such product line which will not only bring technology differentiators but would be the first IoT enabled smart AM machine," added Ravi Raghavan, MD, BFW.

The fact that this world-leading metal AM machine is being manufactured entirely in India is a testament to the Indian Government's Make in India initiative and will address very commercially attractive applications in the defence/space/aerospace/heavy industries/energy/academia and advanced R&D sectors.

ELGi Introduces Energy-efficient LD Series at INTEC 2022

ELGI EQUIPMENTS, one of the world's leading air-compressor manufacturers with over 62 years of compressed air excellence, reiterated its commitment to building tomorrow's India at the 19th edition of INTEC. The international machine tools and industrial trade fair is expected to witness over 100 thousand business visitors with 200+ product categories on display.

A platinum sponsor at INTEC, ELGi unveiled its LD Series two-stage direct-drive, intelligent reciprocating air compressor with a proven Neuron XT Controller at the ELGi stand no. 2, Hall B. The LD Series two-stage direct drive 10HP and 15 HP duplex controller versions are future-ready with three intelligent compressor modes that customers can select based on their compressed air demand and utilisation pattern. ELGi also displayed its range of EG, EN, and EV Series of oil-lubricated screw air compressors as part of the exhibit.



Rajesh Premchandran, Director - ISAAME (India, South Asia, Africa, and the Middle East), ELGi Equipments, said, "With the new controller version, the reliability quotient of the LD Series compressors has increased, with additional protection for both the motor and the top block. These machines are user-friendly with selectable modes based on demand and utilisation. The single control mode allows the compressor to run at half capacity." He also mentioned that the energy

optimisation mode auto-configures to half or full load utilisation to meet fluctuating compressed air demand. The load sharing mode ensures machine utilisation at full capacity to meet compressed air demand.

The LD series controller version comes with a built-in auto-restart option after power resumption and part-level maintenance alerts for proactive maintenance. Also, operational safety is a critical element of the design. The direct drive controller version carries an indigenous fault detection system that detects and alerts faults on phase reversal, motor overload, pressure sensor probe failure, and emergency switch fault to avoid catastrophic failures and ensure high Uptime. We're confident that the LD series will offer a superlative compressed air solution for our customers across the general engineering, automotive, textile, plastics, rubber and woodworking industrial segments.

By Anvita Pillai

“SEMICONDUCTORS WILL BE ESSENTIAL NOT JUST FOR EV TRANSITION BUT FOR DIGITAL TRANSFORMATION”

In conversation with the Machinist, Gaurav Kumar, Head of Supply Chain & Manufacturing, Euler Motors, discusses safety in EVs, requisites for EV localisation, Euler's business target for this year and more. Excerpts....



Safety in EVs has become a big point of concern. In your opinion, what steps can be taken to ensure a safer EV ecosystem?

Thermal runaways are the prime cause behind many EVs catching fire. Further, the risks of not getting good ventilation often cause the battery to heat up. Carefully built EVs with advanced technologies like Battery Thermal Management Systems and liquid cooling should help in protecting the batteries and preventing the cells from reaching extreme temperatures. Due importance must be given to battery designing and packaging along with placement of the battery in the vehicle for proper ventilation to reduce the risk of accidental fires. OEMs must focus on strict quality

standards to ensure the batteries have failsafe measures to protect their overall cell chemistry. Quality of charging infra that is compatible with the batteries can also help ensure overall better battery performance. The battery production and assembly quality are areas where the government can step in and mandate process audits of battery manufacturing in India.

Several factors, such as price, charging facility, maintenance, repair etc., hinder EV adoption. What would be the requisites of localising EVs in India? How can the government aid in this process?

EVs with robust hardware and advanced software are the future. While the primary supply chain to build vehicles exists, battery cell production is yet to be localised in India. The industry and the government need to focus on specific avenues for indigenous production of cells for EVs.

The spotlight is also on semiconductors, which form the prime component for EV batteries and perhaps, now is the right time to try to localise these in India. In the coming years, semiconductors will be essential not just for an EV transition but for digital transformation across other industries as well. The prevalent chip shortage is steering us into collaboration and bringing new players to innovate in this field.

At Euler Motors, we have been working with suppliers from day one of the R&D stage to localise our components and design EVs from India for India. We do not retrofit; we have built our products from the ground up, with a localised component, supply chain, and partnerships. We have already achieved 85 per cent of localisation in our EVs.

Can you tell us about your three-wheeler sales last year and the target for this year? Additionally, how do you plan on reaching the number?

We commenced retail deliveries of HiLoad EV in January 2022 and were market leaders in Delhi NCR



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and Bangalore for sales in February 2022. To date, we have deployed 400 vehicles and plan to put 8000 EVs on the road at the end of this FY.

There are several other EV three-wheeler manufacturers in India. How is Euler standing out in the market? What is your company's USP?

We have focused on building on tech leadership and designing superior products suited for Indian customers and road conditions. HiLoad, has been designed uniquely for India, from India, with powerful attributes and features that make an EV experience extraordinary. With segment-leading features of the highest load capacity at 688 kg, an on-road range of more than 150 km, and a 12.5 kWh liquid-cooled battery, HiLoad is a market differentiator in the three-wheeler cargo segment. Its payload capacity also exceeds the industry benchmark, which stands at 550 kg, along with its battery power (12.4 kWh) and range (151 KM).

Our extensive full-stack ecosystem approach combines our high-powered vehicle along with a presence of 500+ charging infra points with four different types of charging solutions, including fast charging and charge on wheels with overall service support.

Euler Motors has taken the lead in segment

innovation and is the first player in India to provide liquid cooling technology in its battery packs, allowing the vehicle to withstand ambient temperatures and offer a long-lasting battery life. We now boast of a customer order book of 9,000+ vehicles from the market and look forward to fulfilling these in the next two years.

Going forward, what are Euler Motor's short-term and long-term business plans?

We have commenced our retail deliveries in full swing across India and are in the process of building a robust retail presence across the major cities we want to be in. Euler Motors will expand its footprint in 12 new markets in the next fiscal including key delivery hubs like Bangalore, Chennai, Chandigarh, Jaipur, Hyderabad and Kolkata, among others. These deployments will span across in next 18 months with the company's aim to capture around 20 per cent market share by 2025.

We plan to deploy 8,000 units of HiLoad on the road by FY23. The company recently announced an outlay of Rs 200 crores towards Capex and increased production to 35000 units per annum. These investments will come via the ongoing series B and debt fundraising in this fiscal. The company plans to raise \$50 million in 2022. 🚀



By Rahul Kamat

“THE COST OF DATA BREACH HAS RISEN TO \$4.24 MILLION IN 2021”

In a freewheeling interview, Vishal Salvi, Chief Information Security Officer & Head of Cyber Security Practice, Infosys talks about biggest issues that companies must address from a privacy perspective when they suffer a data security incident.

What best practices are organisations following to improve cybersecurity and data privacy preparedness?

The most critical practice is to ensure that both data privacy and cybersecurity are embedded by design into the organisations' policies & procedures and for each technology component being developed. To make cybersecurity and privacy by design a reality, enterprises need to bring about a culture change where all stakeholders understand it is a shared responsibility and not something that the cybersecurity or the data privacy teams alone need to manage. While stringent regulations such as GDPR enforcing penalties if not



adhered to have helped make enterprises take privacy and security more seriously, executive sponsorship and support within the enterprise are needed to make it pervasive. Organisations can improve cybersecurity and data privacy preparedness by resorting to the following:

- **Privacy by design:** Comprehending the different regulatory requirements and embedding privacy right from the design phases ensures that the required controls are built-in and not bolted on. Empowering people be it, employees, customers or partners with meaningful choices that are subsequently respected will make the approach technology agnostic and minimize organisational risks.
- **Secure by design:** Good security wins customers, empowers employees and streamlines compliance. However, most organisations continue to view security as just a technology issue. Instead, CXOs must work with business and technology leaders to design security into systems, processes, and people from the start. To get there, companies must remember that their enterprise is just one node in a larger network.
- **Baseline privacy impact assessment:** Evaluate the current security posture of the technology systems to get a sense of the maturity of the systems and areas to improve on.
- **Minimize and eliminate toxic data** – Any legacy or current data that is no longer needed per regulatory requirements or for business is called toxic data. Improper tracking and disposal of toxic data results in the increase of the attack surface and obligations for the organisation. A few best practices include ensuring that the data collected, has effective purging and data disposal mechanisms deployed to remove data that is no longer needed. Special focus is required to ensure sensitive data is not left on the cloud or in USBs and other endpoints.
- **Managing third party risks:** Security by design



must extend beyond the gates of the enterprise and must include privacy policies. It is of great importance to remember that most large corporations act as a node in a much larger network of suppliers, partners, distributors, and regulators. It is critical to ensure that all third parties brought on board are adequately secured. Passable due diligence must be done to determine the suitability of a vendor for a given task and whether they can keep information secure. Good processes include reviewing, monitoring, and managing the entire vendor lifecycle.

- **Train the insider:** Insider threat today is becoming one of the top security concerns where an insider uses authorised access, wittingly or unwittingly, to harm. Having a robust privacy policy and consistent and mandated employee training program on cybersecurity awareness along with strong checks and balances has proven to be quite effective in controlling this threat.

What are the biggest issues that companies must address from a privacy perspective when they suffer a data security incident?

The most direct and immediate impact of a data breach are fines and penalties arising due to non-compliance with statutory mandates. As per GDPR, there are two levels of fines. The first is up to €10 million or two per cent of the company's global annual turnover of the previous financial year, whichever is higher. The second is up to €20 million or four per cent of the company's global annual turnover of the previous financial year,

whichever is higher. That said, as per an industry study, the cost of the data breach has risen to \$4.24 million in 2021. This includes compensation given to customers, fines, loss of revenue etc.

Infosys and Interbrand, a global brand consultancy firm, earlier this year launched a joint study titled 'Invisible Tech. Real Impact,' examines the long-term impact of data breaches on the value of brands across sectors. The study revealed that the potential risk in brand value due to data breaches to the world's 100 most valuable brands could amount to as much as \$223 billion.

That said, the loss of consumer trust is perhaps the most significant impact a data breach can have on a brand. With brand experiences centred around building relationships and offering "delight" to sustain customer loyalty and repeat purchases, organisations must uphold the trust their customers have placed in them to protect their data. In the event of a breach, customers would simply stop engaging with the brand to safeguard their assets. Additionally, some countries might revoke the license for the organisation in question to operate in that specific country, which can lead to other countries following similar actions.

When companies contemplate M&A deals, how should they factor risks arising from privacy and data security issues into their decisions?

Given the financial and regulatory impact of noncompliance, due diligence (of not just the acquired company but also its legal vendors) of the privacy and security posture for the industry and geography they are



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operating must be conducted. The acquiring company must factor-in risks, considering both these areas, assess the maturity and implement necessary organisational and technical controls to mitigate this risk during M&A. The security posture is fast becoming one of the parameters that are given weightage when comparing options for M&A.

As part of the M&A audit, evidence should be sought to identify and mitigate possible risks. If the enterprise is operating in multiple countries, privacy impact assessment for all must be conducted. If a security incident were to occur, the risks that would be transferred to the cyber insurance provider must be explicitly quantified and factored into the cost of acquisition.

When it comes to data protection, how vulnerable is the manufacturing industry? How can data privacy be strengthened in India?

Threat actors are increasingly targeting lucrative, non-information technology industries, such as automobile or manufacturing. With the adoption of the cloud and advanced technologies such as IoT, AI and ML to power the industry 4.0 wave, the attack surface has increased significantly in the manufacturing industry. With the increase in digital connectivity, manufacturers face threats from various quarters and attacks on key assets such as IT/IIoT systems, intellectual IP systems etc. Indian manufacturers employing Industrial Internet of Things (IIoT) solutions pay premiums of a little over \$8,000 a year for \$1 million worth of coverage.

Currently, India is in the process of having the Data Protection Act. It doesn't have a separate and comprehensive data protection regulation to address the privacy concerns in this increasingly digital age. Data protection is covered under Information Technology Act (2000), however, there must be a robust process to enforce this action and awareness among the people in India.

What is your outlook for data security in the manufacturing industry, and what role could your company play? Does it have wider applications within automotive data?

As manufacturers find their footing in the fourth industrial revolution, they must urgently overhaul existing systems and processes and replace them with more advanced approaches. Digital transformation, bolstered by the IoT, cloud computing, big data analytics, robotics, and AI, is the most effective way for manufacturers to compete in an increasingly complex marketplace. That digital path can help firms in their quest for greater efficiency and lower costs, and it can help boost business performance by increasing

connectivity and making shop floors smarter. The downside of these interconnected technologies is the increased vulnerability to data breaches and other cyberattacks. Creating and implementing an effective cybersecurity strategy is imperative.


Which sectors/industries would you say are most attentive and least attentive towards information security?

The banking, financial services & insurance (BFSI) sector were the early adopters of cybersecurity a few years ago. However, other emerging sectors like manufacturing, oil & gas, automobile, and retail are adopting left, right and centre. Due to the indiscriminate nature of ransomware attacks, we have seen an exponential rise in manufacturing, healthcare, mining, retail etc., and now all cyber investments are on par across all the industries. Therefore, cybersecurity is not just a priority of any one segment anymore. It is being recognised and adopted across all industries.

What are your thoughts on the Data Protection Bill in India?

The India PDPB has been in the works through multiple iterations since 2018, as part of an effort to bring our data protection regime in line with the overall ecosystem of modern technologies, business requirements and regulations globally. And some of the salient aspects covered in the last draft were considering non-personal data in scope, additional focus on data localization, and coverage for social media platforms and hardware devices. However, per the latest inputs available, apparently based on feedback from multiple stakeholders, this has been scrapped to be replaced by a more holistic and comprehensive one.

Some of the areas which could be looked at for the next iteration are as follows:

- Having a broader consultative approach involving all applicable stakeholders - with a longer-term view so that the regulation stands the test of time, without needing major amendments soon.
- Appropriate balancing between individual rights and business interests – this will ensure stringent regulations don't become an impediment to doing business, especially in a flat world where many global companies do business in/with India and we continue to promote ourselves as a preferred investment destination – thus approaching data localisation, data classification, cross border data flow etc. as key factors.
- Following a security/privacy-by-design approach – ensuring data protection by default, with applicable opt-in or opt-out options for specific use cases. 

By Rafiq Somani, Area Vice President – India and South Asia Pacific, Ansys

CASTLE PRECISION ENGINEERING – COMPETING ON A GLOBAL SCALE

A case study on how Castle Precision Engineering has improved its productivity and efficiency using CG Tech's Force module



Glasgow-based Castle Precision Engineering has advocated for using Vericut CNC simulation software on its shopfloor for many years, protecting high-value customer components and its advanced machine tools. More recently, the company has embraced the efficiency and productivity gains offered by the Force module of the software.

While Castle supports several advanced industry sectors, such as medical devices and power generation, the majority – around 90 per cent – of its circa £20m annual turnover comes from the aerospace and defence sectors. To cater to the diverse needs of its customer base, three focused sub-divisions encompass what the business has to offer; Rotatives, Prismatic and Toolroom.

Roy Yuile, Manufacturing Engineering Manager at Castle, explains: “Rotatives and Prismatic are the two core areas of our production business, and both require extremely high levels of precision and machining expertise. Over the years, we’ve carved out a niche for

ourselves in manufacturing critical rotating parts for the aero engine market – failure of these parts can bring an aeroplane out of the sky, so our OEM customers are not only trusting us with their reputations but also with the safety of the pilots and passengers whose flights they power. We also manufacture a wide range of complex prismatic products to exacting tolerances for applications such as defence optronics and hydraulic actuation systems for control surfaces and landing gear.”

Prismatic parts are typically machined from relatively straightforward materials, primarily aluminium alloys, along with some steel and titanium. However, rotating aero-engine components usually involve more exotic and difficult-to-machine materials, including titanium and nickel-based super alloys, where forgings valued up to \$100,000 for a single workpiece are not uncommon.

With a population of around 60 CNC machine tools representing the latest multi-axis manufacturing technology from DMG Mori, Makino, Doosan and

Grob, the shopfloor at Castle is a lesson in housekeeping and efficient organisation for all to see. Looking more like a clean room than a workshop, it highlights what a class-leading aerospace supplier should strive to achieve and creates an environment that nurtures professional behaviour at every level.

Protecting this advanced manufacturing capability is Vericut CNC simulation software. Roy Yuile says: “CAD is at the front end of our engineering workflow – we’ll either import a 3D model supplied by the customer or draw one up from a 2D definition and break this down into the various stages of manufacture from material supply to finish part. These stage models and their accompanying fixtures or work holding devices are transferred to CAM, where we’ll build tools, generate toolpaths, post NC code and then port the whole job straight into Vericut using their CAM interface.”

He continues: “Vericut has been an established part of our workflow for over a decade – nothing goes out to a machine without first going through Vericut, and that is across the board. It is an essential safety net, not just for the product but for our machines and personnel. We’ll have some programs in our factory that have been around for 10 or 20 years, alongside jobs fresh out of CAM. We use Vericut to simulate any new or modified code before it goes out to a machine – we have a digital twin for almost every machine tool, and because Vericut reads the same G-code as the machine controller, it’s completely CAM-agnostic and can simulate code from any source.”

Process improvements are often made using Vericut because the software offers the opportunity to prove edits in a virtual environment. “We don’t edit at the machine console because of the risk involved,” Roy Yuile adds, “if you mess up, you have no safety net. Instead, our engineers will bring the code back into Vericut, make their edits and then hit simulate to check that the program is safe to release. Smashing Pixels is much cheaper and safer than writing off a machine tool, so verifying code using a digital twin before we put anyone or anything at risk is an integral part of our workflow. This risk-based approach is crucial not just in aerospace and defence, but for any high-value product and business.”

With Vericut, an established part of Castle’s business for the past 12 years, the software has proven its ability to protect the company. It is a key improvement tool for their manufacturing processes. Roy Yuile states: “Vericut Force is a step further along this curve. Moving beyond the goalkeeper functionality, Force allows us to start optimising our processes as well as proving that they are safe.”

Every manufacturing business faces the same three challenges from its customers; quality, delivery and cost. “Generally, quality and delivery are a given, and the cost is where we win or lose,” Roy Yuile says. “The pressure within the aerospace industry on cost is enormous, and for us to be competitive against the global competition, we have to be smarter, faster and more efficient. The physics-based optimisation software has been on our radar for a while, and we started looking at it seriously a couple of years ago.

“There are a few key players in that market, and we evaluated them all. There’s a lot of clever maths behind it. Still, the basic idea of physics-based optimisation is to analyse a toolpath line by line, calculate the forces acting on the cutting tool at any given time, and then adjust the feed rate to balance or control that force and chip load.

“This means there’s a lot of number-crunching involved, but before you even get there, you need to build an accurate digital model of the machining process. Since we already simulate every job in Vericut, the major advantage of Vericut Force is that building this model takes almost no additional effort – all Force needs is a bit more information on tool geometry and material characteristics; everything else is already there. The cycle time savings you can expect from this kind of optimisation are typically 10-20 per cent, and Vericut



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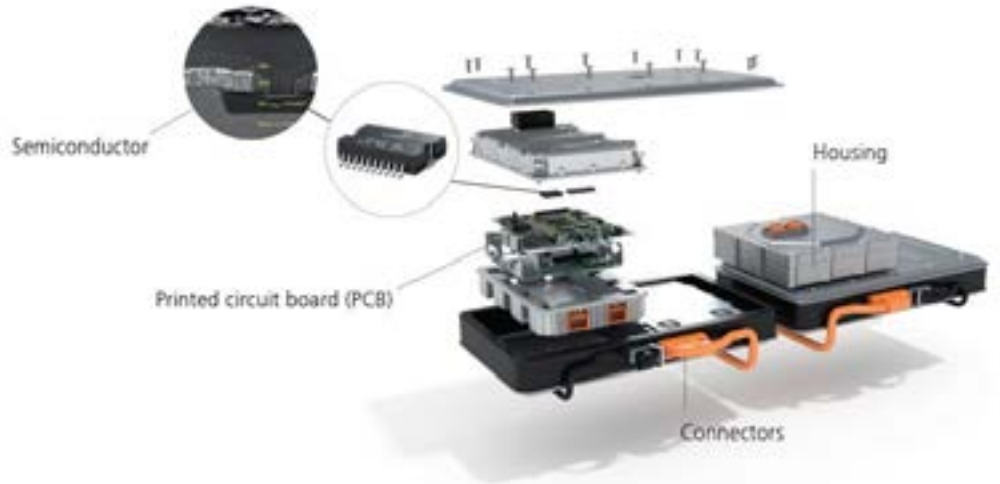


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offered an almost 'plug and play' solution for milling and turning that was attractive to us."

During the evaluation phase, the engineering team at Castle worked with CGTech UK to create a test case based on an existing process involving turning and milling provided to multiple software vendors. As Roy Yuile points out, "To be honest, they all came back with broadly similar results for cycle time reduction, but the usability was the differentiating factor for us. We have everything built up in Vericut already, and because CGTech has done a good job of making Force as user-friendly as possible, it helps make the benefits of physics-based optimisation much more accessible."

He says: "It is exciting, the idea that we can go through our existing workflow, take a job that we have proven as a stable process and then say 'Right Vericut, analyse this for me and tell me where there's room for improvement'.

"The interesting thing is that because we are working with many difficult-to-machine materials, it's not always about cycle time. It sounds counterintuitive, as typically, the main benefit of optimisation is the opportunity to speed things up. Still, sometimes it's also about slowing things down to reduce peak loading on the tool. Smoothing out spikes in cutting Force or chip load can have a major effect on tool life, but it is harder to quantify the benefit as you can't tell until you go and try it.


"On one of the jobs we were analysing recently, we were looking at a histogram of chip load and seeing that for maybe 5 per cent of the time, it was twice as high as the average load, telling us that there were regular spikes throughout the tool path. Now we can identify where these occur and slow the feed rate to level them

out, reducing tool wear and improving both tool life and process stability."

Force has been in use at Castle for about a year, and Roy Yuile is keen to highlight one of the often-overlooked benefits, consumables spend. He says: "Carbide cutting tools are a major expenditure for us. When we cost a job, the two key variables are how long it will take on the machine and how much we will consume in carbide. Any reduction in cycle time Force can deliver good, but so is any improvement in tool life.

"Although cycle time is a monetary saving in the sense that you free up machine capacity that you can sell to somebody else, consumables are direct cash spend. If it takes £100 of carbide to make a particular part and we can reduce that to £80, we are literally not spending £20; that's £20 that stays in our bank account. Cycle time savings are soft money, they're potential revenue, while consumables spend is hard money, it's cash."

Castle has always been an early adopter of manufacturing technology, and Vericut has established itself as an essential part of the company's digital workflow. "We put a lot of effort into ensuring our simulations accurately represent the real process, as the benefits Vericut delivers are massive, both as a safety net and as an improvement tool. All of our programmings are done offline, and accelerating the proving out of new jobs by doing most of it virtually saves a huge amount of production downtime, as well as de-risking the entire process."

"We trust Vericut," Roy Yuile concludes, "and that trust comes from experience. When manufacturing high-value components for such critical applications, we need to be confident that we're using the best tools for the job, which Vericut delivers." 

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By R.K Jain, Senior Vice President – Corporate Affairs at Jindal Aluminium

THE WORLD WITHOUT ALUMINIUM

Transportation, construction, consumer goods and packaging are sectors where the metal continues to make very practical items. Its lightweight and sturdy properties are qualities why aluminium continues to be used vastly, even in intricate industrial uses.

Aluminium, which began to be commercially produced in 1886, is the second most widely used metal globally. The amount of aluminium at our disposal makes it no surprise that the metal finds its use in so many varying aspects of our everyday life. Aluminium's universal appeal is its odourless, malleable, conductive, and corrosion-resistant qualities that make it an intrinsic metal. It is so vital to modern mobility, environmental sustainability and the economy that without it, many of the conveniences of today's world would merely not exist.

Transportation, construction, consumer goods and packaging are sectors where the metal continues to make very practical items. Its lightweight and sturdy properties are qualities why Aluminium continues to be used vastly, even in intricate industrial uses. Aluminium today is not just the fastest growing metal but a versatile product whose positive efficiency, safety and durability are noteworthy. It helps the metal in catering



R.K Jain

to present-day requirements and complex engineering demands.

CONSUMPTION & DEMAND

Though low in comparison to a world average of 11 kg, India, with a per capita aluminium consumption of 2.5 kg, is continuing to show growth. With anticipated policy changes, the metal's consumption is only set to grow further. Globally, data indicates that the auto and

transport sector are spearheading the consumption pattern with 23 per cent of aluminium consumption, construction at 22 per cent, packaging at 13 per cent, electrical at 12 per cent, and machinery and equipment at 8.5 per cent, each. Aluminium in consumer durables is 4.5 per cent, with other segments amounting to 4 per cent.

The power sector is the biggest consumer of Aluminium at 48 per cent used in India's vast electric distribution system. The transportation and automotive sectors are at 15 per cent, building and construction at 13 per cent, and consumer durables contribute to 7 per cent of aluminium consumption in the country. As the world turns green, with electrical vehicle manufacturing being one of the critical measures, economic growth led by aluminium in this space is expected to increase rapidly.

The future is bright for the use of aluminium. The Make in India initiative offers the most significant potential opportunity for its consumption to grow manifold. It has set the ball rolling with several central and state government backed mega-projects to see aluminium being used as a critical component. These include creating smart cities, ensuring housing for all, the rural electrification mission, dedicated freight corridors, high-speed railway lines, etc.

The often-asked question is, why is aluminium so wanted? It is because aluminium is uniquely positioned to meet the needs and



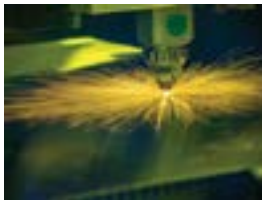


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challenges of the 21st century. The downstream aluminium industry has created capacities and capabilities to provide engineered Aluminium products that meet the most detailed requirements of industries and are also a great fit in a circular economy. These are energy efficient and suited for extreme weather conditions. This lets it offer itself to different applications in almost every industry and finds a role in creating every other product in use today.

INTRINSIC BOND


Aluminium shares an intrinsic bond with the world we live in today. Its strength-to-weight ratio makes it particularly useful as a structural material weighing 65 per cent less than steel. It leads the complexities of executing perfection in transportation, construction, consumer goods and packaging industries to a possibility. It may not be the strongest on its own, but aluminium draws incomparable strength when alloyed with other metals. We find it being used in cars, trains, and aeroplanes because it allows the vehicle to withstand impact. Aluminium's feather-light weight enables it to travel at increasingly higher speeds without adding much drag.

For the construction sector, its corrosion-resistance qualities let aluminium forego the need to apply any anti-corrosion coating, which is an added cost. But

what makes this a developer's delight is that building fenestrations with aluminium are almost free of maintenance, and they have higher thermal efficiency and can be moulded into various desired shapes supporting modern design innovations. Some advanced countries are experimenting with photovoltaic devices and micro-wind turbines that can be integrated directly into the aluminium façade offering green buildings a new meaning.

The consumer goods sector has witnessed aluminium replace other materials like steel and plastic as it allows heat to dissipate at a much faster pace. New age gadgets and appliances like flat-screen TVs, smartphones and tablets have included aluminium over time, and its applications in various consumer products have let the devices work for hours without overheating.

LARGER GOOD

The use of aluminium alloys has revolutionised the world, especially through green initiatives. While we would perhaps have lived similar lives without aluminium, the world would have been less comforting. Less comforting concerning the use of a metal, whose applications and capabilities enriched by the downstream sector have added a host of modern conveniences to our lives. The world would not have achieved industrial development as quickly without aluminium. 

By Vasudeva Rao Munnaluri, RVP India & SAARC, Zendesk

HOW CX CAN MAKE OPERATIONS AGILE IN MANUFACTURING

With India witnessing the fourth industrial revolution, this article, touch-base some of the essential factors on how Indian manufacturers scale operations at a global level by investing in CX.



India is witnessing a large manufacturing revolution with Industry 4.0. Large-scale manufacturers are adopting intelligent technologies aided by the “Make in India” and “Samarth Udyog Bharat” initiatives and are projected to acquire greater shares of the global market by 2030. Most often, Industry 4.0 is equated to automation in operational excellence that would help scale globally but the truth goes beyond that.

What Indian manufacturers need to factor in is ever-evolving customer preferences, making it critical to find new ways to deliver experiences that excite and inspire. A majority of Indian businesses (88 per cent) see a direct link between customer service and business performance, with nearly half of them viewing CX as a revenue driver, according to CX Trends Report 2022. Manufacturers in India need to shift their value proposition from products to ongoing, data-driven services if they want to scale quickly. And this can be achieved with a greater focus on

customer experience. Which brings us to the question: How can Indian manufacturers scale operations at a global level by investing in CX?

AUTOMATION FOR BETTER CUSTOMER EXPERIENCE

A key characteristic of Industry 4.0 is automation. While it can help scale operations, automation can also be used to change the way manufacturers communicate with customers in the ever-increasing supply chain. Most Indian customers (87 per cent) expect a majority of customer service interactions to be automated and at the same time increase the quality of service.

As smart factories are bound to use data from connected, smart tools to understand a product's performance and customers' interactions with it, investing in the right CX tech can help take this relationship one step further. AI and ML can enable manufacturers to use customer data such as previous

purchases and interactions with the brand to deliver faster and better experiences tailor-made for each customer.

Companies will be better positioned to deliver value to end-users with every digital interaction, from simple product performance alerts to services throughout the customer life cycle like product exploration, education, buying, service, and maintenance. With a full customer history, manufacturers can make the

process more seamless so customers feel valued and understood. At the same time, manufacturers can use the valuable customer insights to their benefit and use them to further product innovation.

CONVERSATIONAL EXPERIENCES

Manufacturers are realising that more granular customer information captured through AI and ML technologies can help them better understand the risk of attrition or service defection within their existing customer base—and potentially address it preemptively. This is where conversational experience comes into play. In the fast-paced digital-first world, customers look for quick and easy ways to resolve their issues. When customers are provided with the option of maintaining a conversation with companies and picking up where they left off, it adds to accountability and builds loyalty.

Conversational experiences delivered with the right CX tech can streamline customer inquiries into a unified platform, where multiple agents can coordinate actions on each request. For instance, agents tackling customer queries related to product inventory or maintenance can easily coordinate with different departments. Agents don't have to keep track of six or seven emails related to a single order when they can have a unified view of the customer with the right CX tech. This is a huge time-saver for manufacturers as it reduces the margin of errors significantly, enabling them to become more agile and improve revenue generation.

A 360-degree view of the customer allows teams to identify trends in tickets, where workflows can be adjusted accordingly as teams will be better equipped to compare and analyse areas of operational improvement. Let's take the case of SMC, a market-leading manufacturer in the industry-automation space. In 2020, SMC centralised its customer support into a global solution. Within four months of its implementation in 10 different languages, SMC was able to scale globally by delivering conversational experiences. The right CX




tech-enabled SMC to positively impact 130,000 end-users and increase operational efficiency.

INVESTINCX ENABLES SMART MANUFACTURERS

Smart factories require smarter solutions that allow them to unify processes of managing orders, and customers and sales requests in a reliable, streamlined manner. But there is also the pressure for continuous innovation. Investing in CX can go a long way in enabling innovation. The vast amounts of customer data will enable manufacturers to tailor products that are in demand.

Internally, teams can improve workflows, and identify areas of improvement based on customer feedback, which empowers them to innovate constantly. Product innovation and quality can be improved with customer insights. And when customers know that their insights are valued, it builds loyalty. Data from interconnected devices and smart tools enable manufacturers to understand a product's performance and customers' interactions with it. With these insights the value shifts from product feature to the data-driven insights derived from the physical product in operation, enabling manufacturers to develop custom-designed products that suit their customers. Constant data-driven innovation is a key element that helps manufacturers scale globally and remain competitive.

For smart manufacturers, CX is surely good for business not just in terms of increasing operational efficiency but also to become product innovators based on the knowledge they gain from superior conversational interactions with customers. In the age of Industry 4.0, manufacturers need to ensure that processes are consistent and match up to global standards and CX will provide this competitive edge. By investing in CX, smart manufacturers can give customers the help they need and introduce operational excellence in the industry. 

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“LEVERAGE INNOVATION TO BRING POSITIVE CHANGE TO ENVIRONMENT AND SOCIETY”

From being a mechanical engineering student to becoming the **President of Rolls-Royce, India & South Asia Kishore Jayaraman**, is a man of few words but those of great magnitude. With his career spanning nearly 33 years (out of which 10 with Rolls-Royce), he has been vital in developing the company's engineering, digital, supply chain and manufacturing footprint in India. In a tête-à-tête with The Machinist, Jayaraman reveals details of their MoU with HAL, the effect of the Ukraine-Russia war on Rolls-Royce's business in India, its navy projects and more. Excerpts...

by Anvita Pillai

The world is moving towards technology, but you mentioned that you are quite wary of it in your personal life in a recent interview. What is the reason behind it?

I am a technologist, but at the same time, I feel there are some basic inherent abilities within us which should be used quite frequently. When I look around in today's world, everything is dependent on a watch, an app, or social media. And for me, I like keeping it simple. I try to do basic mathematics in my head, and if I can do that, why would I need a calculator? If I can do my calendar schedules in my head, why would I need a scheduling assistant? There are so many things available today that people keep jumping from one to another, trying to find solace. I don't like making it too complicated. Remember, the world is changing very fast around us, and we need to pick and choose what's best for us.

Businesses and the world are opening for travel, but there is also a rise in fuel prices. Are there any trends you envision picking up in the near future?

When we look at the emerging world, many

people want to get out and meet their friends, family, and relatives, mostly within India. There is an emotional rush in people that is happening. Therefore, flights and hotels are full these days, and this is expected to continue for some time. Then you see international travel; people are hesitant as they are unsure of the controls outside India; how safe is it to travel? Is it good to travel? These are all the questions playing in the minds of the people. In my view, the world will return to normal. We will all go back to the pre-covid days; if the question is when it could be by the end of this year or mid of next year, provided there are no more outbreaks. Because people are moving quickly, it's easy to come back. I believe we cannot continue in a world where there is a constraint on people to travel, be it economically that the costs are so high, or be it from a technical point where the aircraft is not available or cannot carry the loads. So, I feel the world will come out of this by the mid of 2023 and start accelerating towards a whole different world. In a country like India, we continue to grow. The three ds in India – demographic dividend, democracy and demand will continue in India for the next 20-50 years.



What are the few technologies you envision coming into play post Covid?

People like us at Rolls-Royce take it up and say we got to make the world a better place for all of us and our future generations. So, we believe going electric is going to be their future. Not just electrical, but it is green electrical, which means the way you generate electrical energy has to be green. So, we are looking at sustainability as a key initiative paired up with electrical and digital. Digital because we can learn a lot with the new computing power and data storage capabilities and translate all this into a place where we are looking at technology from our technology standpoint and a sustainability standpoint. I feel it's fantastic because, before 2022, I didn't see so many companies coming up with electric vehicles. It's great to see the growing awareness because along with it comes the infrastructure, clean air, etc., and I think even the aviation sector will see more and more of it.

What is the difference between wide-body aircraft and normal aircraft? What benefit does it pose to the aviation industry?

If you have to transport more and more people from point A to point B, you need to have a greater number of small aircraft or a few large aircrafts. So, the narrow-body aeroplanes, typically used to

travel, have a single aisle and two seats on both sides. Wide-body aircraft have twin aisles, and you have three sets of seats on each side.

When you have the rate at which the travel is growing in a place like India, which is nearly 150 million people travelling today and the rate at which it is growing, this will be 450 Mn people soon. The space in the air is limited and restricted, but you have to transport people faster. So, wide-body aircraft are useful for longer distances as they are more efficient on longer routes.

How profound will be the effect of the Russia-Ukraine war? How much do you think it will affect India's defence and aviation sectors? Does it affect Roll-Royce's business, given that the company has stopped its business with Russia?

There will always be a collateral effect, but we must abide by the global rules and regulations because it is way outside what we do in India now. Although business continues as usual in India for us, we don't deal with Russia or Ukraine from India. So, we are not, in any formal fashion, stopping what we do yet. Yes, it's a significant impact on the world at large and it is a very sad situation.

What is your outlook on the current EV business in India?

There's always a tipping point. If you look at 1993, in Delhi, we had nothing that ran on CNG, while today, nobody can enter Delhi without CNG. So, yes, it will take a while, but it won't take as much time as it took for CNG. I believe EVs in all commercial vehicles will take maybe 10 years.

Can you share some advice for the automotive industry to ensure their journey to becoming electric is green?

Currently, there is electricity cut in different parts of India, and we know it's because of the coal shortage. This shows us how dependent we are on coal. So, our journey has just started towards sustainability, climate change and those areas. We need to continue to push for it. How we get our electricity matters. If you are doing it using renewable sources such as solar, I consider it green, but if you are using water, I do not consider it green because that water has been taken from someone else's part.

I believe, eventually, people will start looking at the upstream than just looking at an individual automobile or aircraft.

Last year, Rolls-Royce signed an MOU with HAL to service MT30 marine engines in India. Can you elaborate on the project and its timeline?

We all know it is essential for us to be self-reliant in today's world. We must build a self-reliant India, and Rolls-Royce wants to be a partner of India in that. We have partnered with HAL to create a creative strategy around AatmaNirbhar India, so with the spirit of these things, we have a Marine Turbine (MT) 30 partnership with HAL. It is used to power frigates, destroyers, and aircraft carriers. It is an aircraft engine that has been marinised. We have also partnered with HAL to work with the Indian Navy. We will be using this product in India and also for extrusion.

You were also working on bringing hybrid engines into the navy. How far along is Rolls-Royce on the project? What would be the benefits of it?

Rolls-Royce has signed up for the UN Net Zero campaign, so we say all our products and services will be net-zero by 2050, and all our factories will be net-zero by 2030. We have already started the journey of that by finding sustainable alternative fuels which our products can naturally take. So, in that whole scheme of things, it is called Integrated Fully Electric Propulsions (IFEPs) when you go into the marine world. We already use a very large frigate class in the UK, and then we have the aircraft carrier. These all have these fully integrated electric propulsions, which allows one to have a much



As a company, we like looking for value arbitrage and not the cost arbitrage, as we know how to do that

cleaner form of generation. Even though the system is the same, it compacts all energy and people requirements and provides the same efficiencies. It can convert it into a fashion where we will have the ability to go more and more towards a sustainable world.

Rolls-Royce was also keen on co-developing and manufacturing Made in India engines for the ACMA programme. How are you working on co-creating IP locally here in India?

We are working closely with DRDO, GTRE, NAL and many different research labs, and we help formulate what it takes to build a trans medium combat aircraft engine. To that effect, we have the capabilities, but we would like to collaborate with the British to have the best of both worlds. So, the UK-India partnership in co-creating a trans medium combat aircraft will only be good for both nations.

With the increasing spotlight on AatmaNirbhar Bharat, how is Rolls-Royce engaging with companies in India in both the public and private sectors?

We have a lot of partnerships for the supply chain in India. We have a partnership with HAL for technology transfer, and we have a lot of joint ventures, collaborations on engineering services, etc. We have more than 2000 people in India supported by Rolls-Royce activities. They might not be directly our employees, but these are people working exclusively for Rolls-Royce initiatives. A lot of things in this are global work being done in India.

As a company, we like looking for value arbitrage and not cost arbitrage, as we know how to do that. A lot of work that we do here is being exported from India. It's a great way to leverage the capacity of India and mix and match the capabilities of both the nations like the UK, Germany and the US and have a value arbitrage.

Yours was amongst the first few companies to announce plans to go electric in the aerospace sector. In 2021, Rolls-Royce also completed 15 mins of flight time. Other than environmental, what kind of benefit does an all-electric aircraft pose? Do you envision commercial aircraft going

all-electric anytime in the future?

The electric plane is something that we believe we can bring to the market much sooner. But how quickly, only time will tell because we have to cross each step as they come. However, we have achieved some significant milestones, like a 15-minute ride. The next step would be 100 miles, and then we'll have to cross a channel, maybe. We'll keep moving forward in the same way.

Having a foot in sectors ranging from navy to aerospace, how are you ensuring sustainability? What measures has Rolls-Royce taken to ensure cleaner and safer engines, both in aerospace and marines?

This sustainability initiative has been dropped down in the organisation and is fully accepted by the people. We all believe sustainability is the future. And so, in every step that we take daily, we think about sustainability. It is a state of being for us.

Rolls-Royce had started a program to collaborate with the start-up communities in India. How many start-ups have the organisation collaborated with to date? What kind of support does Rolls-Royce offer to these start-ups?

We started working with the start-up community back in 2019, and unfortunately, due to the pandemic, we had a lot of changes in the world, including what we could do in India with the start-up community. So, it became a little slower during this time. We are waiting to take off again in that space soon.

Innovation using technology has been the focus of every company in the manufacturing sector, especially since the pandemic. How is Rolls-Royce innovating using technology?


Our tools are digital primarily. We are going over to a data world, so we are building stronger digital capabilities. But as we do that evolution happens, we have many applications to come out of it, and those applications have been held on as we speak. Most of them are internal at this point in time. We are not doing anything with the external world. But at some point, what we do internally can also be externalised.

**Several companies are struggling to get back to pre-pandemic levels with the pandemic receding. What, according to you, are the essentials to restore stability to business? Additionally, what is some key steps leaders should instil to ensure innovation?**

A lot of things during the pandemic have changed. There is a lot of productivity loss, and there have been changes to people's efficiency to become more and more of an outcome-based world and a very agile world. In this world, accountabilities and responsibilities have to be placed differently. I feel we must find a balance between the world we are in and the world we will be in.

Further, it is essential to understand that people will be in silos with their friends and relatives because of the hybrid working models. Hybrid working models are much better than working out of offices, but they also need to be re-evaluated based on outcomes, measurements and responsibilities.

What is Rolls-Royce's business outlook for 2022?

In 2021, all international travel was stopped, so I believe 2022 will be a great year for Rolls-Royce, as people have started moving around. Our defence business is doing well, given that there is so much happening in the world. We want to have more defensive capabilities which will be served responsibly. The third is our systems business; if you look at diesel engine usage, it will change in the future and be replaced with something more sustainable. These three things will majorly be the highlight of the year. 

// The three ds in India – demographic dividend, democracy and demand will continue in India for the next 20 – 50 years

By Praveen Kumar Singh, Chief OPC Solution Architect, Utthunga

OPC-UA AND ROLE IN INDUSTRIAL AUTOMATION

Ethernet-based OPC-UA communication could be the key to securing manufacturing's future. The article elaborates on the challenges of implementing it and how it can be a key enabler of industrial automation.

Think about a production plant or a manufacturing unit; it is a visual cacophony of machines, robots, assembly lines, drives and many more parts, yet completely (almost!) synchronised and working together. Bringing all of them together is the Industrial Internet of Things coupled with the open, Ethernet-based OPC UA communication standard that forms a critical part of the industrial automation landscape.

OPC UA integrates IT/OT technologies with diverse products, solutions, and services across factory and process systems. Whether it is the security measures,



Praveen Kumar Singh

networking, establishing standardised communication or needing vendor and platform neutrality, OPC UA lays the foundation for digitised industrial automation.

It is a fact that automation in the industrial world opens doors for new business opportunities, enhanced solutions, and services. But the reality faced is how to effectively transfer the raw data generated from the shop floor equipment to the business

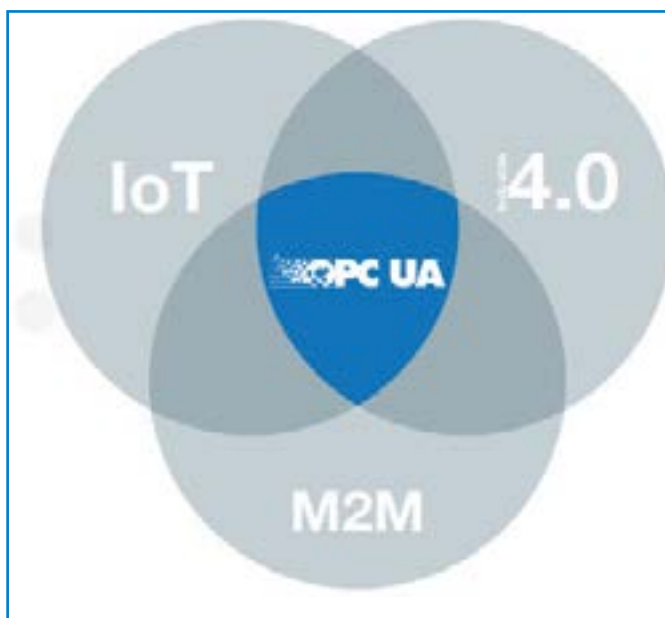
applications like ERPs and CRMs, and draw insights to make actionable decisions for a competitive advantage. Hence, there is an imminent need to fully automate the manufacturing process and access real-time and accurate information from these systems for analysis, machine alerts, maintenance notifications etc.

OPC UA is the open-source communication standard platform explicitly designed for achieving industrial interoperability. It acts as a bridge that connects the IT (Information Technology) with the OT (Operational Technology) and for information exchange between the various assets in the OT layer.

Industry 4.0 mandates interoperability and standardised data connectivity for meeting its specific requirements, including but not limited to,

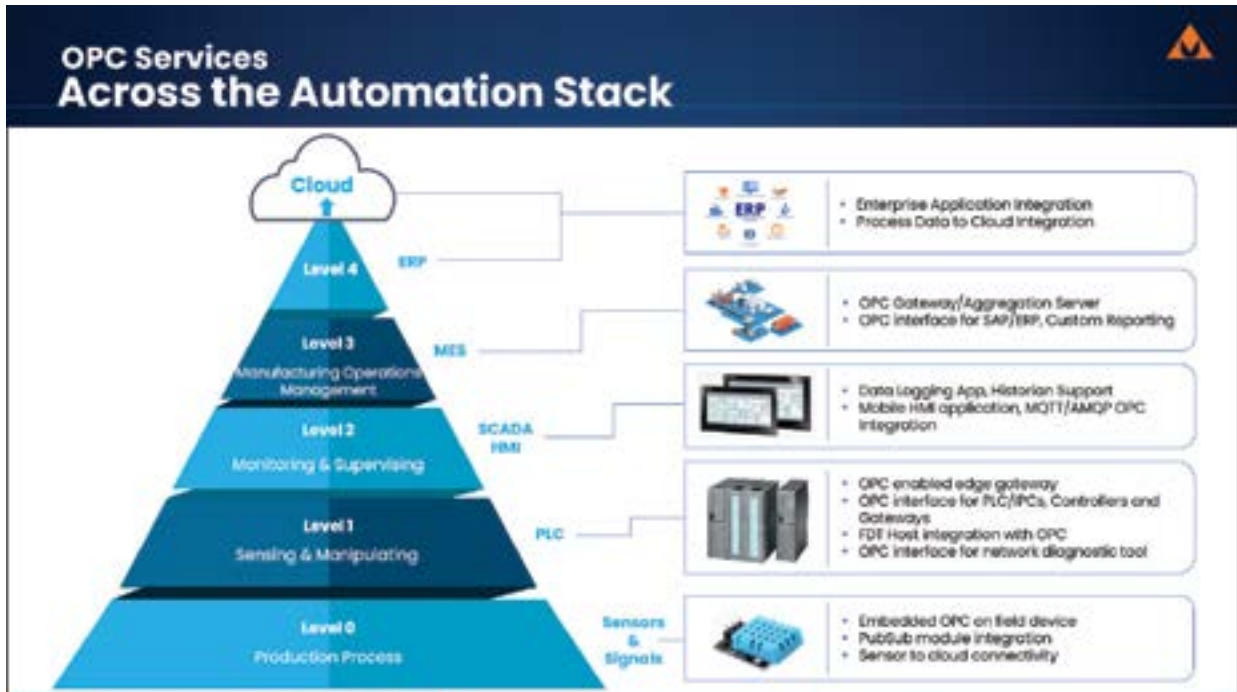
- Integration across all levels
- Secure transfer and authentication at user and application levels
- Conformity to industry standards
- Scalability

OPC UA serves as the common data connectivity and collaboration standard



OPC UA Interoperability for Industry 4.0

(Source: HYPERLINK "<https://opcfoundation.org/>" opcfoundation.org)



OPC UA Interoperability across the Automation Pyramid

that enable interoperability of local and remote device access in IoT, M2M, and Industry 4.0 settings.

LIMITATION & CHALLENGES OF INDUSTRIAL INTEROPERABILITY

It is essential to establish seamless interoperability between the enterprise's components and the automation systems. Over the years, industries have faced many challenges in building a unified structure that connects all the components, from factory floor devices to host applications. OPC UA serves as the common data connectivity and collaboration standard that enables local and remote device access interoperability in IoT, M2M, and Industry 4.0 settings. We are now closer to the goal of building a unified system that delivers reliable interoperability, thanks to the development of OPC Unified Architecture and its easy implementation in the embedded layer.

However, it is important to understand the challenges associated with implementing industrial interoperability.

- **Standardisation**
IIoT researchers state global standardisation as one of the top challenges for industrial interoperability. Industries use systems from various manufacturers and follow unique processes. So, it can be difficult

to come up with a one-size-fits-all solution.

- **Compatibility and connectivity issues**
There is a gap in the communication between the existing resources and the production process. In most cases, industries have islands of data maintained and accessed by different teams. Creating a cohesive network that can build a bridge between these data islands can be a huge challenge for developers.
- **Security**
Data security is one of the critical factors that need to be considered while implementing industrial interoperability. With all the data accessible from one-point, cyber threats and hacks also rise. Therefore, security needs to be strongly considered while building an interoperable system.
- **Usage access**
It is important to clearly define who will be given access and what they can access. Monitoring accessibility, especially on the production floor, can be a huge challenge for all stakeholders.
- **Cost**
The cost can be a huge limiting factor when you completely overhaul the existing system in the initial stages. Many companies worry about the returns on investment and hesitate to invest in OPC UA solutions. Therefore, it is important to work

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with experts with domain expertise and in-depth experience in OPC UA to maximise your time spent and investment made.

OPC-UA - A KEY ENABLER FOR IIOT

There is a simple analogy for OPC-UA. Currently, OT systems & IT systems speak different languages in various heterogeneous protocols. For example, machines speak Japanese or German, and our IT systems speak English. And as a result, they can't talk to each other besides basic hand signals. Enter OPC-UA! A translator that allows them to talk to each other in the same language and thus homogenise the data exchange for better horizontal and vertical integration of assets in OT and IT.

There is much more scope for implementing analytics at the top level when inter-machine communication or direct communication between assets and enterprise applications. This ability to enable interoperability in manufacturing facilities has led to OPC-UA being called an "IIoT Enabler and Conqueror of the Cloud" by the International Society for Automation (ISA) and "The Global Production Language" by VDMA, respectively.

It is important to understand the OPC-UA is not a communication protocol but a communication platform. It provides a mechanism to model everything from factory data to parts of the entire factory itself. OPC-UA works in conjunction with a host of other communication protocols such as MQTT, AMQP, Profinet, Ethernet/IP, etc.

OPC UA enables semantic mapping of various information models to represent the actual products and their product steps and thus ensures that these products can plug and produce. The below image shows how OPC-UA has a role to play across the different layers in an Industrial Automation setup for various products.

OPC-UA & CYBERSECURITY OF MODERN INDUSTRIES

OPC-UA enables both horizontal and vertical integration, as well as the communication and management of devices and data from every part of the network, from the field to the enterprise. Manufacturing organisations and our customers are looking for continuous strategies to improve their cybersecurity strategies and implementation. A core pillar of OPC UA is the focus on security, not just for data integrity reasons but also service availability. The OPC UA Specs summarise the security focus in three areas:

1. Authentication between client and server applications

2. The ability to determine whether a user is authorised to connect and/or perform the requested action
3. The confidentiality and integrity of the communications.

OPC-UA provides communication layer security by ensuring,

- Data Confidentiality: Encrypting of messages
- Data Integrity: Signing of messages
- Data Availability: Minimal message processing before authentication


OPC-UA provides application-layer security by ensuring,

- Authentication of applications: Ensuring exchange of application instance certificates
- Authentication of users: Username, password, security token, certificates
- Auditability: Generating audit events for security operations

It is important for manufacturing organisations to understand that there are other security-related factors to be considered outside of OPC-UA in their cybersecurity implementations, such as,

- Data Ownership: Where the data resides and who has access to this
- User Management: Ensuring password policy rules are in place
- Organisation Issues: Physical access control and security policies in secure zones

Having OPC-UA natively implemented in systems provides a starting point to ensure secure data communication. But the key cybersecurity issues associated with the opening of ports, security levels and related matters fall in the hands of IT teams in manufacturing organisations from a business context.

With the evolution of open standards in Industry 4.0 and IIoT process control, most DCS/PLC vendors have adopted OPC UA as an interoperable standard for distributing data streams to consuming edge applications like SCADA, PI, Historian, Alarm Logger, ERP etc. And this has resulted in exponential growth in deployments. And with leading cloud providers like Amazon AWS, Microsoft Azure, Google Cloud Platform, and IBM Watson already acknowledging the benefits of OPC-UA for moving shop floor data to the Cloud, this adoption will only increase in the next few years. This is primarily because OPC-UA has been developed to be secure by design and includes semantic information models that ensure that data is easily consumed by enterprise and cloud applications to realise IIoT and digital transformation solutions for manufacturing organisations. 

FABRICATING THE ENGINES FOR TOMORROW

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3rd Edition of The Economic Times Smart Manufacturing Summit 2022, will bring together industry experts and technology leaders to exchange best practices and lessons learned in creating, deploying, and managing growing technological capabilities.

SPEAKERS



CHIEF GUEST

**DR. MAHENDRA
NATH PANDEY**

Minister of
Heavy Industries
Government of
India



**ASHOK
RAMACHANDRAN**

CEO & President
Schindler



DIEGO GRAFFI

Chairman and
Managing Director
Piaggio Vehicles



KAMAL BALI

President & MD
Volvo Group India



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FLEXIBLE AUTOMATION – INNOVATING THE MANUFACTURING DNA

Salvagnini has been innovating and selling sheet metal for over half a century and offering flexible automation. Read how the company helps implement Industry 4.0 through the factory floor.



Puneet Sharma, Director, Salvagnini

Salvagnini has been designing, producing and selling flexible systems for sheet metal working for over fifty years, and flexible automation has always been part of the company's DNA. According to Salvagnini's vision, flexible automation means transforming sheet metal packs into a wide variety of products in a lean environment and with no intervention by the operator in a progressive production process, using proprietary punching, cutting, bending and panel bending technology.

The growth of Salvagnini in India has been excellent as the mindset of Indian customers has changed to investing more in automated process solutions. The first automated job shop is installed with Industry 4.0 Salvagnini system, with automatic labelling, traceability, store management, upstream and downstream of the cutting, punching and bending activities. This increases the efficiency of the whole production process, extending its effects beyond the factory boundaries and throughout the whole supply chain. AJS indicates a set of Salvagnini systems orchestrated by the OPS process software for the intelligent integration between machines and the customer's ERP.

Industries like elevators, doors, HVAC, kitchens, steel furniture, and subcontractors are growing stronger, in line with the global market. During the pandemic, the customers' mindset has changed in investing more in automation and moving away from dependence on skilled manpower. Customers want to automate not only blanking but bending as well. Salvagnini introduced a new automated bending solution, especially for the cost-conscious market, and we see customers adapting to it.

Extending the vision to manage and optimise the process obliges us to talk of digital transformation, which has been some of the hottest industrial topics for the last few years. There is an increase of interest from customers in all industries that help part tracking



and operator visual guidance. In India, retaining skilled manpower has become very difficult, and more and more industry moving towards automation with Industry 4.0 to avoid dependency on skilled manpower.


HOW SALVAGNINI IMPLEMENTS 4.0

- **OPS:** Connection with the company's ERP is possible for every Salvagnini system. The systems can be equipped with OPS, the combinable and modular software that permits data exchange with the factory's information system: from the order to the generation of machine programs to the return of product quantities and consumed materials.
- **MAC2.0:** The intelligent closed chain sensors and proprietary algorithms developed in all Salvagnini product lines permit every machine to adapt automatically in the cycle to external variations (material being processed, temperature, etc.)
- **Flexible Automation:** Thanks to the original integrated solutions, Salvagnini systems are suitable for being inserted in flexible production cells or lines and can produce the correct quantity of product at the right moment, concentrating on added value operations while minimising WIP, waste and inefficiencies and reducing delivery lead-times.
- **Links:** Salvagnini's IoT solution, developed on a maximum-security Microsoft platform, guarantees continuous and effective monitoring of systems

in production, also remotely, and allows technical support to respond in a targeted and quick manner. The progressive shift from a make-to-stock strategy, with large batches, towards a lean, make-to-order, just-in-time strategy based on medium and small batches and an increasingly variable production mix. And the industrial scenario is moving increasingly towards a substantial reduction in work-in-progress, eliminating the intermediate storage of semi-finished parts.

SALVAGNINI AT IMTEX FORMING 2022

Salvagnini has coined the concept of 'Social Industry', which is powerful because it puts the man in the centre. It gives him the right place in the context of an industrial revolution (the 4th) that is taking a strong shape across countries and industries. It's been well accepted by India, and at IMTEX 2022, we will present an evolution: the concept of "Beyond Manufacturing".

An unusual year is behind us. A year that changed many things and forced us to rethink and act in different ways. The pandemic was difficult, but it also showed us our strengths and that a crisis always offers opportunities. Here again, we are at IMTEX 2022 and will bring new technology in bending automation - Please visit us and see first-hand information at Booth No B-102, Hall No-4. 

IMTEX FORMING 2022 TO SPIRAL MANUFACTURING GROWTH

IMTEX 2022, organised by Indian Machine Tool Manufacturers' Association (IMTMA), is set to take centre stage from June 16 – 21, 2022, in BIEC, Bengaluru.

A pre-event report of what you can expect at the event.

The country's economy, manufacturing and machine tool industry have shown great resilience and are steadily moving on a recovery path. Enterprises and individuals have been testing times for the last two years. The Government of India's stimulus measures has also ushered in positive sentiments. Besides the government, a great enabler for the machine tools industry has been the IMTEX exhibition.

Southeast Asia's largest trade fair on metal forming and manufacturing technologies, IMTEX Forming 2022 & Tooltech 2022, along with Digital Manufacturing, organised by Indian Machine Tool Manufacturers' Association (IMTMA), will be held

from June 16 - 21, 2022, at Bangalore International Exhibition Centre (BIEC) in Bengaluru.

IMTEX FORMING 2022 & Tooltech 2022 would display state-of-the-art technologies and solutions in metal forming in a gross area of 33,000 square metres of exhibition space in BIEC.

Globally, the Indian machine tool industry occupies the 11th position in production and is at 8th place in consumption per Gardner Intelligence's World Machine Tool Survey 2021. Metal forming consumption in India for FY 2021-22 is estimated to be approximately Rs. 3,079 Cr (US\$ 411 Mn), and the import market share of the metal forming machine tool industry is estimated



to be around 66%. The sector is evolving, and IMTEX FORMING 2022 will augment this segment further. It is also important to note that metal forming will play a significant role in battery enclosures. With the Government of India keen on promoting electric vehicles, IMTEX FORMING assumes prime significance.

Around 350 exhibitors from over 16 countries are

participating in the show, which is being held after a gap of more than two years. Technologies in metal forming such as presses, bending, welding and joining, high-speed laser machines, robotics and automation in sheet metal working, additive manufacturing, metrology, and CAD/CAM essential for manufacturing will be displayed 'live', enabling visitors to make informed decisions. Technology enthusiasts will have a lot to unearth at the show.


Complementing the metal forming solutions on display at IMTEX FORMING 2022 are the two concurrent shows – Tooltech and Digital Manufacturing and two special highlights – AatmaNirbhar Bharat Pavilion and i2 Academia Pavilion. Tooltech, held concurrently with IMTEX FORMING, will showcase the world of parts, accessories and systems for machine tools and manufacturing technology. With Digital Manufacturing, IMTMA is bringing the future into the present. Sensors, robots, software, and cobots – all connected seamlessly will be on display. Moreover, IMTMA will also organise a Live Demo on Industry 4.0 concepts at its Technology Centre in BIEC to enable participants to gain hands-on experience.

Academic / R&D Institutions will showcase R&D capabilities in metalworking. A strong industry-academia linkage will provide rich dividends to the manufacturing industry. Around 20 institutions are participating in the i2 Academia Pavilion, including IIT-Madras and IIT-Bombay.

Firmly backing the Government of India's vision of a self-reliant India, for the first time,



IMTMA is setting up an AatmaNirbhar Bharat Pavilion at IMTEX FORMING 2022. Industries are developing technologies and products to localise imports either through self-funding or with Government backing. Visitors will get access to indigenously built technologies and products that could be used for manufacturing as well as for exports.

With the country having just recovered from the global pandemic, the exhibition is crucial for advancing India's manufacturing capabilities. 

HOW IGUS ENERGY CHAINS BECOME POWER-SAVING CHAMPIONS

Wholesale electricity prices are skyrocketing. This is a serious challenge to the competitiveness of many industrial companies, so saving electricity is on the agenda. This is true for entire production lines, individual machines or components such as energy chains that guide cables and hoses for energy, data and hydraulics in industrial plants. As a rule, the upper run of an e-chain glides on the lower run. On short routes, energy is not a problem because the igus high-performance plastics ensure low-friction operation. For longer travels (several hundred metres) and high payloads (up to 100kg/m), the coefficients of friction increase and, consequentially, energy consumption.

E4.1R: Rolling instead of gliding saves energy

For 20 years, igus has been offering energy chains for long distances, in which the upper run rolls over the lower run, reducing friction and wear. “Due to rising prices and energy costs, many industrial companies have become interested in cost-saving measures. They ask themselves how operating costs can be cut with the components in use, such as energy chains



Reduce drive energy and thus costs with the E4.1R roller energy chains. (Source: igus GmbH)

- especially on long travels with high additional loads”, says **Jörg Ottersbach, Head of the e-chains Business Unit, igus.** “We also offer a version of our E4.1, the E4.1R, with integrated rollers. This series is one of our best-selling energy chains and a universal solution for 90 per cent of gliding applications.”

Rollers reduce drive power by up to 37 per cent - savings that minimise energy requirements now that electricity prices are soaring. A pleasant side effect

is that the E4.1R runs more smoothly thanks to the rollers, with noise and vibrations reduced.

The roller chain links are also fully compatible with the entire E4.1 series modular system so that indoor linear robots in the machine tool industry can still be retrofitted, for example. In addition to internal heights of 42 and 56mm, a height of 80mm is available for the E4.1R. Add several widths and radii, and you have a total of over 900 variants for individual applications.

TOOLLESS RECTANGULAR CONNECTORS FOR 10,000 MATING CYCLES

Industrial applications require frequent mating cycles throughout life, such as measuring/controlling drawer-mounted equipment, moulding control equipment, and

replaceable tools. Since the connectors of these applications need to be connected and disconnected several times a day, failing to install high-performance connectors with a sufficient mating cycle rating could result in unstable connections with lower reliability, which will cost more in the long run.

Mencom offers the new Squich HNM (High Number of Mating) inserts designed to maximise ease of use while minimising maintenance downtime. These rectangular inserts feature special contacts with galvanic high-performance gold plating and lubrication, which allow up to 10,000 mechanical mating cycles when installed in compatible HNM enclosures. In addition, the Squich spring clamp technology with actuator buttons provides not only fast & reliable wiring but also high resistance to vibration from industrial applications.

The standard HNM inserts (RSH) are available in 6, 10, 16, and 24 poles, and the high-density versions (RDSH) are available in 9, 18, 27, and 42 poles. The high-density versions (RDSH) feature probing points for multimeter measurements on each contact and an additional coding system.



'ALL-IN-ONE' LASER PRECISION MACHINING OF DIAMOND TOOLS

EWAG presents a new laser processing machine, the Laser Line Precision – the perfect device for the modern tool manufacturer wanting to get started in laser technology. The latest short-pulse fibre-laser technology used in the green-wavelength range (532 nm) offers highly efficient machining results for the commercially available diamond cutting materials such as CBN, PKD and CVC-D. Rotationally symmetrical tools of up to 200 mm diameter and up to 250 mm length, as well as indexable inserts from 3 mm, inscribed diameter and up to 50 mm, the circumscribed diameter can be machined without force with the Laser Line Precision.

The unique and patented Laser Touch Machining® machining process offers excellent surface quality, even on tools with complex or delicate geometries. Any cutting contours, clearances and 3D machining of chip breaker geometries can be performed in one clamping operation. The resulting flue gas and the vaporised material are suctioned away and carried to a corresponding suction/filter system.

With a footprint of only 5 sqm, compared to the globally tried-and-tested Laser Line Ultra, the Laser Line Precision is the most compact high-end laser production centre for super



hard tools. An optional 6-axis robot offers the highest flexibility during minimally manned multi-shift operation.

NEW UNILOAD LOADING SYSTEM

Studer focuses on universality and speed with the uniLoad loading system. The automatic loading system enables users of the S31 and S33 external cylindrical grinding machines to increase quality and productivity.

The control was developed by Wenger Automation and continues the Studer operating philosophy. Thanks to modern and intuitive control, the system

is so easy to operate that no special programming training is required. No programming skills are required. The user only needs to know the dimension and weight of the workpiece to use the loading system. The set-up wizard then guides the user conveniently through the necessary steps to start the grinding program.

uniLoad is offered based on a linear

portal cell with two parallel grippers and is suitable for shaft components up to a length of 350 mm and a diameter of max. 100 mm. It thus covers a large proportion of the component ranges produced on these machines. The parts are supplied via a standardized, adjustable V-belt. The housing for the base module, which is provided with a loading hatch as standard, has been adapted to suit the machine design and enables safe and clean operation of the system.

uniLoad is currently suitable for distances between centres of 650 and 1000mm. The loading system is docked onto the machine and, with the racks at full capacity, enables automated processing of around one hour. In the case of workpieces with an external diameter of 34mm and a gripper diameter of 22mm, 50 parts can be loaded automatically. The look of the loading system is reflected in the aesthetic design of the machine and, as a standard product, enables quick response and delivery times. Customised solutions are also possible. In addition, uniLoad is expandable, so future requirements can also be met.



MACHINING WITH NO BOUNDARIES

“Where Innovation Never Stops!” is the slogan that appears on the walls of the production facilities at ISCAR headquarters and has been synonymous with the company for several decades. The pandemic did not interrupt the

size. The main feature of the new heads is a multifunctional cutting geometry, which enables effective drilling of various engineering materials such as steel, stainless steel, special heat-resistant alloys, and titanium (ISO P, M, and S groups of application), assuring hole

Modudrill is a family of modular drills with replaceable carbide heads that carry indexable inserts and provide an alternative solution. Mounting an exchangeable extension holder on a drill body increases the drilling depth by 200 mm when machining holes in a diameter range of 33–40 mm.

In high-speed reaming, combining a carbide reaming head with a rolling device in one single tool results in a short operational time for achieving accurate hole diameter along with a mirror-like surface finish.

Key aspects turning

A modular tool concept is a way to reach high versatility. Neoswiss, a new tool system with quick-change heads, follows this concept. There are different types of heads for indexable inserts. The heads are mounted on a tool holder using a unique high-clamping-force mechanism. The mechanism provides an accurate, cutting-edge position and utilises high position repeatability. The system is suitable for turning, parting, grooving, and threading applications. The system intended mainly for Swiss-type machines enables removing heads and replacing inserts within the tight confines of CNC machining centres.

ISCAR has developed a new lever dual lock securing mechanism for improved clamping rigidity intended for ISO turning inserts. The new design, referred to as the Combi-D-Lock family, combines the advantages of two conventional clamping methods by using a lever and a top clamp. An insert



A NEOSWISS turning tool carries a quick-change head with indexable insert.



3-flute LOGIQ3CHAM drills provide nearly flat bottom holes.

innovation process, and between 2020–2021 ISCAR introduced the Neologiq marketing campaign comprising advanced cutting tools and tooling solutions for modern metalworking. The significant changes in manufacturing, such as intensive digitising, the shift to electric drive in the automotive industry, and growing precise workpiece fabrication, have emerged new demands for cutting tools. Notwithstanding, the accelerated pace of changes sharpens the demands and requires more ISCAR Neologiq products that answer to modern age machining. “Machining with No Boundaries” is the Neologiq mindset.

Hole making news

Cham-IQ-Drill, the family of assembled drills that mount exchangeable carbide heads, is now upgraded with new heads in the diameter range of 33–40 mm. These heads can be mounted on any drill possessing the appropriate pocket

precision within IT10-IT9 accuracy grades. ISCAR’s customers will benefit from using the new heads, guaranteeing to maintain less stock of tools for machining diverse materials.

The ISCAR Logiq-3-Cham is also based on exchangeable carbide heads with three flutes for improved productivity and is now supplemented by new carbide heads for achieving a nearly flat bottom hole. Flat bottom holes are necessary for screw head sockets, spring seats, washer ports, etc. The heads ensure drilling up to an 8-hole depth-to-diameter ratio without a pre-hole. The new design facilitates generating holes with a nearly flat bottom using a single pass. The heads are mounted on existing Logiq-3-Cham tools that significantly expand the application range of the family and reduce inventory costs.

So, how do you increase the drilling depth? Use a longer drill?



A 90-degree NEODO S890 face mill.

is locked in two directions, from the top and the bottom. This provides better stability and rigidity and, compared to the conventional lever, improves tool life and increases productivity.

Logiq-F-Grip features a new, highly advanced tool family for parting solutions. The central component of the family is a robust tool block that mounts a 4-pocket adapter. There are cases when the rib, a reinforcement element of the block, interferes and prevents clamping the block on typical turret positions. Neologiq overcomes this problem by providing additional blocks with the rib placed on the alternative side of the block. The revolutionary Logiq-F-Grip parting system was designed to achieve extra stability and vibration-resistant high productivity parting and grooving operations. The highly engineered LOGIQFGRIP is an assembled tool block that comprises a unique durable holder and a high-stiffness quad blade with pockets for mounting inserts.

Innovations in milling

Neodo S890 is a family of 90° indexable face mills for rough and semi-finishing operations. The mills mount durable square double-sided inserts with eight cutting edges. Neodo S890 facilitates face and square shoulder milling while providing an additional option for milling close to shoulders where

there are workpieces or work-holding fixture constraints. ISCAR customers have requested additional corner radii and tool diameters. Therefore, this tool family was expanded with additional pressed-to-size inserts with a 0.8 mm corner radius and cutters in diameters of 32 and 25 mm, including endmill design configurations.

A durable double-sided round insert is now available. The combination of an innovative pocket design and a special peripheral shape of the insert provides reliable insert clamping and fail-proof insert indexing. Depending on the depth of cut, there are up to 6 insert indexes on each side (up to 12 indexes total). When indexing, there is no need to remove the insert clamping screw. The main application of the new cutters is for rough and semi-finish milling complex surfaces, especially in die and mould, power generation, and aerospace parts. The range of solid carbide endmills has been expanded by adding new tool diameters and corner radii.

Upgrading toolholders

ISCAR Spinjet, a family of coolant-driven high-speed compact spindles for small diameter tools, intended to upgrade existing machines to high-speed performers, is now supplemented with Micro 90 intended for miniature rotating tools in milling, drilling, countersinking, thread milling, engraving, chamfering and deburring operations. Micro 90, made of a solid titanium shell and assembled from only six parts, enables rotating velocities that range from 35000 to 53000 rpm while the main machine spindle remains idle.

The chuck thickness is a factor that limits the working space of a tool. This factor often causes increasing the tool overhang to reach a machined surface. A novelty in X-Stream, a family of thermal shrink toolholders, is a series of slim design chucks to eliminate such a restriction. The new chucks follow ISCAR's coolant jet channel technology providing direct coolant supply to the tool cutting edge.

Changes in metalworking technology place new demands on cutting tools. Cutting tool manufacturers develop new products to ensure increased performance to meet these demands. The industries' response to the products sprouts new requirements. ISCAR's Neologiq campaign is based on new tools developed according to customers' input. You can expect more Neologiq sequels to ensure advanced machining in the new era of metalworking.



A Micro 90 coolant-driven high-speed compact spindle ensures extremely high rotating velocities.

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Extend the flexibility and productivity of Salvagnini panel benders



Rapid industrial developments of recent years continue to set tough challenges. Because industry has changed: the large batches typical of series production have changed to small-medium sized batches, or have been completely replaced by just-in-time production. A high item turnover rate, shortened lead times, and a constant lack of highly qualified personnel, have moved the focus to automation and robotization, which allow production to be extended beyond traditional manned work shifts and ensure operatives are engaged only in activities with high added value.

“We wanted a smart solution which was much simpler than those already on the market: simpler to program, simpler to use, and able - if possible - to exponentially improve the flexibility and productivity of our panel benders. And we also wanted a solution suited to our compact panel benders, not just the automatic ones. With P-Robot, we are sure we have achieved our goal.” explains Nicola Artuso, Salvagnini Product Manager for bending technologies. The P-Robot can be incorporated with all the panel bender models – P1, P2, P4 & PX.



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ALLOY WHEEL TURNING



HORIZONTAL CNC LATHE **WLH 22**

FEATURES & SPECIFICATIONS

CAPACITY

Swing over bed	Ø750 mm
Swing over carriage	Ø600 mm
Max. turning diameter *	Ø630 mm
Max. turning length #	350 mm

HEADSTOCK



- Cartridge type spindle design for easy serviceability
- High power AC spindle motor

Spindle nose	A2-8
Max spindle speed	3000 rpm
Spindle motor power	30 kW (cont.) 37 kW (30mins.)

* With appropriate workholding # Request machining range diagram

AXES

- Hardened & ground box type guideways
 - High wear resistance
 - Easy maintenance
- Electro magnetic failsafe brake for X-axis

TOOLING

- Servo turret delivers quick indexing
- Large size tool disc with large interference free zones

Max. no of tools	12
Max. boring bar diameter	Ø50 mm
OD turning tool size	25x25 mm

