

A Times Group publication

ULTIMATE GUIDE TO PROFITABLE MANUFACTURING

THE MACHINIST

RNI No 71129/98

Volume 16 Issue 4 • April 2021 • Rs 75

www.themachinist.in

EMOBILITY
THE CHANGING FACE OF TRAVEL

MACHINING
A HOLISTIC VIEW

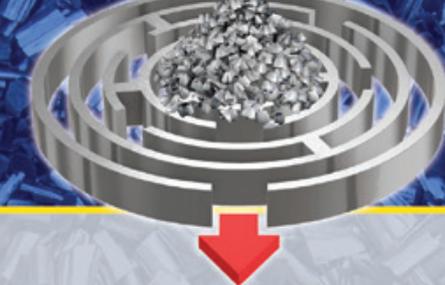
SMART MANUFACTURING
HOW DO WE GET THERE

BRIDGING HERITAGE TO TECHNOLOGY

We delve into the rich heritage of Jindal Aluminium along with **Pragun Jindal Khaitan**, as the company takes a leap into the future by embracing digitization.

AMAZING

PRODUCTIVITY

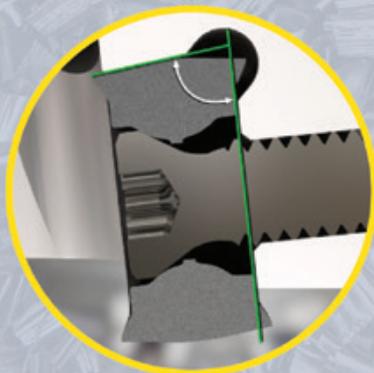


NEODO
S90° LINE

Exact 90° Shouldering

A New Milling Line for Square Shoulder and Face Milling. **A Unique Exact 90° Profile with 8 Cutting Edges** in Combination with a **Dovetail Clamping Method** Enables Higher Cutting Conditions and Assures Better Productivity.

High
Productivity
and Cost
Effectiveness



Dovetail Insert Pocket Locks the Insert Firmly in the Tool



App Store Play Store
Download Now!

NEOLOGIQ
MACHINING INTELLIGENTLY

Member IMC Group
iscar
www.iscar.in



AEROSPACE



ENERGY



DEFENCE



INFRASTRUCTURE



HEALTHCARE



TEXTILE



OIL & GAS



PUMPS & VALVES



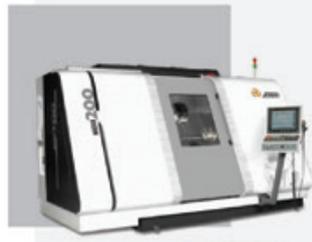
AUTOMOBILE



Tachyon 7
CNC High Speed Vertical Drill Tap Centre



ATM 160
CNC Inverted Vertical Spindle Turn Mill Centre



TMX 200
CNC Twin Spindle Twin Turret with Y-Axis



VTL 750
CNC Vertical Turret Lathe



HX Series
CNC Horizontal Machining Centre



HSX Series
CNC High Speed Horizontal Machining Centre

JYOTI CNC AUTOMATION LTD.

G – 506, G.I.D.C. Lodhika, Village : Metoda, Dist : Rajkot – 360021, Gujarat (INDIA).

T + 91-2827-235100/101, E info@jyoti.co.in, sales@jyoti.co.in jyoti.co.in

JyotiHuron



Chief Executive Officer **Deepak Lamba**

Chief Financial Officer **Subramaniam S**

Head Human Resource **Meghna Puthawala**

Publisher, Print
& Production Controller **Sunil Wuthoo**

Brand Publisher **Rishi Sutrave**
rishi.sutrave@wmm.co.in
+91 9820580009

Assistant Editor **Kruti Bharadva**
kruti.bharadva@wmm.co.in
+91 8591258137

Associate Art Director **Sanjay Dalvi**
sanjay.dalvi@wmm.co.in

Experiential Marketing **Aakash Mishra**
aakash.mishra@wmm.co.in

Project Coordinator **Fiona Fernandes**
fiona.fernandes@wmm.co.in

ADVERTISING

West & North **Ranjan Halder**
ranjan.halder@wmm.co.in
+91 9167267474

South **Mahadev B**
mahadev.b@wmm.co.in
+91 9448483475

Prabhugoud Patil
prabhugoud.patil@wmm.co.in
+91 9980432663

CAREERS

careers@wmm.co.in

SUBSCRIPTIONS

subscriptions.rmd@timesgroup.com
022 67427209 / 67427206

Printed and published by Sunil Wuthoo for and on behalf of owners Worldwide Media Pvt Ltd (CIN:U22120MH2003PTC142239), The Times of India Building, Dr DN Road, Mumbai 400001. Printed at JRD Printpack Private Limited, 78, Resham Bhavan, 7th Floor, Veer Nariman Road, Churchgate, Mumbai - 400 020. Assistant Editor: Kruti Bharadva. Published for April 2021.

Disclaimer: All rights reserved worldwide. Reproducing or transmitting in any manner without prior written permission prohibited. All photographs, unless otherwise specified, are used for illustrative purposes only. The publisher makes every effort to ensure that the magazine's contents are correct. However, we accept no responsibility for any errors or omissions and accept no responsibility for any loss or damage caused as an effect thereof. The information provided in this publication is for general use and may not be appropriate for the specific requirements and / or conditions of the reader/s. The opinions expressed by experts are their own and in no way reflect those of the publisher.

BRIDGING THE PAST AND THE FUTURE

Often when I look at my three-year-old toddler, I think of the kind of world he will grow up to- how different it will be. And I think of the legacy I can leave behind by doing my little bit for the planet, by focusing on just the tiniest bit of 'green' and 'sustainability'- a recurring theme in this month's issue. Read about the new electronic scooter from Simple Energy and Ray Anderson- the world's 'greenest' CEO in our pioneers' page.

We also look at another 'legacy' in this issue's cover story – over five decades of Jindal Aluminium and how the youngest Jindal is walking in his grandfather's footsteps, taking a heritage rich company to digital and sustainable heights.

In the 1960s there was fear that "automation" would produce massive permanent unemployment. In the 1980s, futurist Jeremy Rifkin predicted

WE INHERENTLY KNOW THAT ADVANCES IN INFORMATION TECHNOLOGY AND MACHINE INTELLIGENCE, PERHAPS ALONG WITH ADVANCES IN THE LIFE SCIENCES, WILL PROFOUNDLY CHANGE OUR LIVES IN THE YEARS AHEAD

that technology would bring the "end to work." We hear some similar warnings today as the digital economy advances. Yet, we inherently know that advances in information technology and machine intelligence, perhaps along with advances in the life sciences, will profoundly change our lives in the years ahead. And thus, it is vital for us to recognize that technology is a not a deterministic force. If used creatively and correctly, it can be a complement, a force that supports work. With this view, we give you several interviews giving insight into automation, digitization and other industry 4.0 solutions.

Move beyond that to the cars of the future, the intricacies of machining and a look at the comprehensive list of the Best Brands in metal cutting and Forming through our event report.

As always, I look forward to hearing from you- our readers, an essential part of The Machinist magazine. Drop in your comments, suggestions and thoughts at kruti.bharadva@wmm.co.in.

Stay Safe!

Kruti Bharadva

MOTUL **TECH**

**THE INDUSTRIAL
LUBRICANTS DIVISION
OF THE **MOTUL** GROUP**

THE ECONOMIC TIMES



**BEST
METAL
CUTTING
BRANDS**

2020

SOLUBLE FLUIDS

INDUSTRIAL LUBRICANTS

FORMING OILS

QUENCHING FLUIDS

NEAT MACHINING OILS

HIGH PERFORMANCE GREASES

HIGH PRESSURE DIE CASTING

RUST PROTECTION

CLEANING

motul.com

Motul

119 boulevard Felix Faure
93300 AUBERVILLERS - France
Tel.: +33.1.48.11.70.30
Fax: +33.148.11.70.38

Atlantic Lubricants & Specialities Pvt. Ltd.
301, Ketan Apts., 233, R. B. Mehta Marg,
Ghatkopar East, Mumbai - 400 077
Tel.: +91 22 2501 1960 / 2501 1961
Fax: +91 22 2501 1928

CONTENTS



COVER STORY

Bridging Heritage to Technology **22**



EVENT

Insight to the Best Brands **35**

Editorial 4

News 8

Automotive Updates..... 12

Facility News..... 14

Industry Pioneers: The World's Greenest CEO – Ray Anderson..... 16

Interview:

The 360 Degrees of Machining..... 18

Moving down the Smart Manufacturing Highway 25

Mobility: The Changing Face of Car Travel..... 28

Products 44



Machining

New Ways of Machining

Transmissions----- **33**



Market

Onwards Into the Future ----- **38**



Metalworking

A Step Further in
Metalworking -----

40



Emobility

A New EV Scooter----- **43**

Global Manufacturing Leadership Program

A platform for high-performing, ambitious and passionate manufacturing professionals who will take The Aditya Birla Group's manufacturing prowess to the next level.

The Program:

- Access to wide range of technologies in manufacturing
- Opportunity to contribute to significant roles in manufacturing
- Flagship development roles for manufacturing
- Learning across diverse areas of manufacturing
- Terrific colleagues and warm working environment

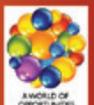
Eligibility Criteria:

- Candidates holding a B.E., B.Tech degree
- 8-18 years experience in manufacturing

**JOIN THE LEAGUE
OF MANUFACTURING
LEADERS**

Get there faster.

Apply at www.abgmip.adityabirla.com



Scan the QR Code
to apply now

Aditya Birla Group:

A USD 46 billion premium global corporation.

**34 COUNTRIES | 120,000+ EMPLOYEES | 42 NATIONALITIES | ONE
ADITYA BIRLA GROUP**

Delta-Q and Varroc Enter an Arrangement for Contract Manufacturing

VARROC ENGINEERING LIMITED (VARROC), a global Tier-1 auto component manufacturer, has entered into a cooperation agreement (“Agreement”) with Delta-Q Technologies Corp (Delta-Q). Varroc will manufacture Delta-Q’s chargers in India to support the expansion of the electric two- and three-wheel vehicle market.

Based in Canada, Delta-Q specialises in the design and supply of high-reliability on-board chargers for original equipment manufacturers in a variety of

industrial and consumer markets in the US, Europe, and Asia.

Arjun Jain, Whole-time Director and the President - Electrical Business Unit at Varroc, said, “Post the implementation of BSVI, the transition to EV is the most significant opportunity in the automotive electronics industry. With this partnership with Delta-Q, we aim to enhance our electric vehicle (EV) component portfolio. Our combined capabilities will create business synergies and strengthen our foothold to achieve

our aspiration of becoming the leading EV component supplier in the country.”

“This contract manufacturing agreement with Varroc is a first for Delta-Q in India,” said Sarah MacKinnon - Co-CEO and CFO, Delta-Q. “Varroc has the capability and resources to support Delta-Q’s manufacturing processes. We are excited to work with them to expand our business into India and support the rapid transition to electric vehicles within our OEM customers.”

New CEO for CHIRON Group SE



CARSTEN LISKE takes over as Chief Executive Officer of CHIRON Group SE from March 1, 2021, thus completing the experienced management team of the machining centers and solutions specialist, headquartered in Tuttlingen. “In

Carsten Liske, our corporate group has appointed a highly competent CEO with more than 20 years’ experience in the international capital goods sector,” says Dr. Armin Schmiedeberg, chair of the Board of Directors. “He will be a real asset to the mid-tier CHIRON Group SE,” he adds.

Carsten Liske began his career with the ABB Group in Zurich and Unaxis in Liechtenstein. In 2006, he took over as Chief Operating Officer of Oerlikon Esec in Cham, Switzerland. In 2009, he moved to Rieter AG in Winterthur, the leading supplier of systems for short-staple fiber spinning, where he held various leadership positions. From 2011 to 2013, in addition to managing global operations, he was General Manager of Rieter in China. In 2015, as manager of the After Sales division, he was appointed to the Group Executive Committee of Rieter Holding AG. His last position at Rieter was as head of its largest division, Machines & Systems.

At CHIRON Group SE, Carsten Liske will be leading the Operations department, encompassing the Global Service, Production, Logistics, Procurement and Quality Management divisions. He will also be responsible for the overseas subsidiaries CHIRON Taicang, CHIRON America, CHIRON Mexico and CHIRON India. The role of CEO, which was filled by CFO Vanessa Hellwing ad interim, passes immediately to Carsten Liske.

Alstom Wins Mumbai Metro Contract

ALSTOM has been awarded by Mumbai Metropolitan Region Development Authority (MMRDA) the contract to design, manufacture, supply, test and commission 234 metro cars, including personnel training for Line 4 and the extension corridor (Wadala-Kasarvada-Vali-Gaimukh). The order is valued at €220 million (INR 1854 Crores).

“These are exciting times, and this first order, following our merger with Bombardier Transportation demonstrates our continued commitment towards partnering in the country’s Make-in-India mission. We are glad to have been awarded this prestigious



project by MMRDA and look forward to commencing work on this. Alstom is proud to play a part in strengthening the country’s infrastructure and providing world-class mobility solutions to the commercial capital of India,” said Ling Fang, Region President, Alstom Asia Pacific.

The Line is a 35.3-kilometre-long elevated corridor with 32 stations. It will provide interconnectivity among the existing Eastern Express Roadway, Mono Rail, the ongoing Metro Line 2B (D N Nagar - Mandale), and the proposed Metro Line 5 (Thane - Kalyan), Metro Line 6 (Swami Samarth Nagar - Vikhroli). Mumbai Metro Line 4 & 4A is expected to reduce the current travel time by 50 per cent to 75 percent, depending on road conditions.

Supporting the government’s modernisation initiatives, Alstom has been at the forefront of introducing several breakthrough technologies in India with world class rolling stock, rail equipment & infrastructure, signalling and services. The company has successfully delivered metro trains for the cities of Delhi, Chennai, Lucknow, Kochi and is currently executing the Mumbai Metro Line 3 project.

India can be Hardware Manufacturing Hub

THERE IS an opportunity for India to become a hardware manufacturing location as the world’s technology majors have been moving their supply chains out of China over the past 18 months, Microsoft president Brad Smith said.

“We are seeing not a decoupling, but some drifting apart. We are definitely seeing an impact in terms of hardware supply chains, with many companies moving parts to, (or) in some instances, perhaps, almost all, or all of their hardware manufacturing out of China to other countries. I do think this is something that creates potential new opportunities from a longer-term perspective for say, India.

The leading machine concept for
the manufacturing of complex
and precise workpieces

MILLTURN®
a trademark of WFL

CLAMP ONCE – MACHINE COMPLETE



Seco Contributes to Circular Economy

SECO TOOLS is uniquely placed to make a strong contribution to the circular economy, which prioritizes separating economic activity from the consumption of finite resources and designing ways to remove waste from our system of economic activity.

Though it is by no means the only aspect, recycling plays a vital role in the circular economy by asking us to look at how we use the earth's scarce and finite resources, and what can be done to ensure that we extract maximum value and usage from them.

Recycling will play a key role in reaching Seco Tools ambitious goal of being 90 per cent circular by the year 2030, with a number of broad changes to processes and business models leading the



way. "It's a challenging target, but we see this as very important for our company and our business," says Ted Forslund, Sustainability & Audit Coordinator at Seco Tools. "What is good for Seco Tools is that we already have very good recycling processes, so now it's about creating a good partnership with our clients so

that they understand the value of us buying back tools, so that it becomes a closed circle where nothing goes to waste."

"Globally, only 8.6 per cent of the resources we use are recycled, which means that over 90 per cent of everything is used once and then disposed of. Due to the nature of the business of Seco Tools, the company is in a strong position to change that paradigm by buying back tools that have reached the end of their produc-

tive lives and recycling or repurposing them into new tools. "If we increase that kind of trade where we buy back old and get customers to understand the advantages of it, we can reduce the climate impact as we won't need to use new materials and metals. It's a win-win in many ways," says Ted Forslund.

Toshiba Provides Water Solutions

A REPORT BY the World Bank points to India being one of the world's most water-stressed countries. Availability of water per person in the country has been reduced to a quarter in the last 60 years. The numbers all indicate that India is in an urgent need of water and wastewater infrastructure upgrade to improve water management and mitigate the water crisis.

The government has announced several initiatives to address the crisis, including the Namami Gange project for cleaning the Ganga, the Swachh Bharat Mission to promote waste management, and the Jal Jeevan Mission, which aims at universal water supply in all 4,378 Urban Local Bodies, as well as liquid waste management in 500 AMRUT cities over the next five years.

Toshiba is an active partner in India's quest to build sustainable water and wastewater infrastructure, and in contributing to the government's "Make-in-India" and the "Export from India" flagship programs. Toshiba has headquartered its subsidiary, Toshiba Water Solutions (TWS), here in India, and executed over 450 engineering, procurement & construction (EPC) and Operation & Maintenance (O&M) projects in 35 countries.

Reiterating Toshiba's commitment to India, Mr. Koichi Matsui, Chairman & Managing Director, Toshiba Water Solutions Pvt. Ltd. said, "Water issues such as pollution and shortages are aggravated by increasing consumption by households and industry. More efficient management of available water resources can help mitigate problems. The government is focused on water management, water stewardship, and water advocacy, and is championing water sustainability through various initiatives at the local and national levels. For example, in the recent Union Budget 2021 announcement, the Jal Jeevan Mission initiative calls for an efficient and sustainable countrywide wastewater treatment infrastructure. TWS is happy to utilize its strengths to provide water and wastewater treatment solutions and to support the government's aims."

Signify launches India's first tailor-made 3D printed luminaires

SIGNIFY (EURONEXT: LIGHT), the world leader in lighting, has launched India's first tailor-made 3D printed luminaires. This highly flexible and more sustainable form of manufacturing, using a 100 per cent recyclable polycarbonate material, enables the company to produce luminaires that have bespoke designs or are tailored to customer's exact needs and recycled at the end of their life, supporting a circular economy.

Currently, Signify is the only major lighting manufacturer to be producing 3D-printed lighting products on an industrial and commercial scale in India. In alignment with the Indian government's agenda of 'Make in India' and 'Atmanirbhar Bharat', the company has set up a 3D printing manufacturing facility at its existing lighting factory in Vadodara, in addition to a design lab at its R&D center in Noida where interior designers, architects and lighting designers can experience the technology first-hand and see their luminaire being printed in front of their eyes. They can also work together with Signify's design experts to create a truly bespoke design that meets their specific requirements.

Signify's investment in 3D printing further illustrates the company's commitment to better serving its customers while reducing their, and its own, carbon footprint and to responsible consumption and production (SDG12) with products that can be reprinted, refurbished, reused or recycled. It is a key element of Signify's commitment to doubling its circular revenues to 32 per cent in 2025, as part of the Brighter Lives, Better World 2025 program launched in September 2020.

STANLEY®

www.stanleytoolsindia.com



4X MORE GRIPPING POWER



ANTI-SLIP



STANLEY's patented anti-slip design provides 4 times more gripping power than regular spanners.

Scan & Win*



FREE
STANLEY Spanner Set

*Register & stand a chance to win the Lucky Draw. Valid till May 2021

 @StanleyToolsIndia

 @StanleyToolsIndia

 Stanley Tools India

Maharashtra Automotive Companies Adhere to Lockdown Rules

ON DAY ONE of the lockdown announced by the Maharashtra Government, it wasn't business as usual for automobile manufacturing units in the State. Confusion prevailed over regulations—what is allowed and what isn't. While some units ran with less than half the workforce, others sought clarity from the government on what is permissible and what isn't.

The State accounts for close to 20 per cent of the total vehicle production and is home to manufacturers like Tata Motors, Mahindra & Mahindra, Bajaj Auto, Force Motors, Mercedes Benz and Volkswagen. It is also a critical auto parts hub for vehicle manufacturers outside Maharashtra. The lockdown is estimated to crimp monthly output by 30-40 per cent.



Officials at most firms said they have scaled down operations and are complying with the "Break the Chain" guidelines and adhering to safety protocols, distancing norms and hygiene standards. They are also actively collaborating with the health officials to inoculate eligible employees.

The lockdown is likely to hit overall production for the month by 30-40 per cent," said an official at a large auto component maker. "We are hoping to achieve 60-70 per cent of what was originally planned for the month," he said. The company counts most automakers including car market leader as its customer.

The Future of Solar Vehicles

THE TURNING POINT for solar cars has been reached. This is stated in Solar Vehicles 2021-2041, a report brought out by IDTechEx. This is a market research firm that studies emerging technologies. The British research firm warns that manufacturers who have no plans for solar cars are going to fall by the wayside. The leaps and bounds forward that solar cars have made are primarily due to the expanding capabilities of monocrystalline silicon solar cells (scSI for short). These now supply 50 percent more electricity per unit area than before. They are also so flexible that they can be applied to, for example, the sides of vehicles. The development in solar cell technology is going so fast that the IDTechEx report was republished last month in a revised version. The first version dates from the beginning of 2020.

Germany's Sono Motors, who will bring out the first car featuring a solar-supported bodywork in 2023, stands out. The solar panels of the Sion, as the car is called, replace some of the steel and paintwork, saving on costs. Earlier this year, Sono also demonstrated a solar-powered truck. Sono Motors has signed a licensing agreement to run the EasyMile robotic shuttle on solar power. Now that private cars are being barred city centers (a trend that IDTechEx expects will only increase) robotic shuttles are taking over.

Established automobile manufacturers are also developing solar cars. Hyundai has announced that it will develop translucent sun-resistant bodies for its existing range. However, IDTechEx warns that solar cars have no future if existing models are merely converted. According to the report, solar cars will only have an impact if they are born as such.

New COO for Three Wheels United

THREE WHEELS UNITED(TWU), a Bengaluru-based tech-enabled financier of light electric vehicles, has appointed Hardip Singh Goindi as the company's Chief Operating Officer(COO). An industry veteran, Hardip Singh Goindi, brings 38+ years of leadership experience in managing operations for well-known automotive brands in domestic and international markets. As COO of Three Wheels United, he will lead TWU's expansion across multiple cities and focus on building strategic partnerships for the company.

Commenting on the appointment, Cedrick Tandong, CEO and Co-Founder, Three Wheels United said "We are thrilled to have Hardip join our leadership team. His wealth of experience and successful track record in the automotive industry, specifically in the category of three-wheelers, will be invaluable to us as we rapidly expand into newer markets and enter into the next phase of growth."

Hardip Singh has previously worked at Piaggio Vehicles as Executive Vice President where he was responsible for manufacturing operations, domestic marketing, sales, after-market service, international business, and parts business. Prior to Piaggio, he was President(Marketing) at TVS Motor Company. In his 12 year-long stint at TVS, he also served as the Senior Vice President for International Business and three Wheelers.

On his appointment, Hardip said "It's an exciting time to be joining a mission-driven company like Three Wheels United. TWU's unique ecosystem approach towards driving the adoption of sustainable last-mile connectivity has already shown great success in creating a positive impact on people as well as the planet. I look forward to working with the team to drive significant growth and help chart the company's long-term success."

Sustainable transportation is expected to see a bigger uptake in the coming years. As Three Wheels United prepares for the next phase of growth, Hardip's vast experience in the automotive sector will be a big asset to it.



LOW COST AUTOMATION

by igus®



modular

Linear robots
Room, line, flat gantry



fast

Paralell kine
Delta robot



flexible

Robot
Articulated arm robot



Scan the below
QR to know more



igus.in/automation

igus® (India) Pvt. Ltd.
36/1, Sy No. 17/3,
NCPR Layout, Euro School Road,

Dodda Nekkundi Indl Area-2nd
Stage, Mahadevapura Post,
Bangalore- 560048

Phone - +91-80-68127800
Fax - 91-80-68127802

Emerson Selected to Help India's HPCL Visakh Refinery

EMERSON has been selected to provide its automation software and services including the DeltaVTM Operator Training Solution (OTS), to help the Hindustan Petroleum Corporation Limited (HPCL) Visakh Refinery achieve operational excellence. The DeltaV OTS is a digital twin technology that will support workforce upskilling, process optimization and plant safety at HPCL's Visakh Refinery.

Emerson's DeltaV OTS will enable structured, measurable operator training supporting HPCL's requirement of

improving overall operational excellence. The digital twin will work alongside the plant's DeltaV distributed control system to control process variability to increase production quality. Using digital twin for virtual training will prepare HPCL operators for handling various operational challenges, improve efficiency and flexibility. The HPCL Visakh Refinery is also using WirelessHART™ technologies to monitor machinery health and provide advanced analytics that support maintenance decisions and improve plant reliability.

New Manufacturing Plant for Salasar

SALASAR TECHNO ENGINEERING has announced the launch of its new manufacturing plant for structural steel fabrication in Hapur, Uttar Pradesh. The newly-launched plant is one of the largest installed capacities plants in North India with a total production capacity of 15,000 tpa.

The manufacturing unit is equipped with an automated multi torch CNC plasma cutting machine for extreme precision. It is also installed with twin-wire both sides, advanced beam welding line from Corimpex Italy, 7-axis CNC drilling machine, automated blasting & painting machine for multi-coat painting and much more.

The manufacturing unit is spread over 60,000 sqm to provide heavy structural steel fabrication for bridges, power



plants, process plants, high-rise buildings, PEB buildings, warehouses, airport hangers and also Metro stations. The facility will be aimed at providing 360 degree solutions for heavy steel structures, starting from conceptual/structural design to fabrication, supply erection and handover to end-user.

It has expansion plans of equipping its new heavy steel structural plant with modern techniques and seeks to provide employment to more than 1,000 people including contracted labour.

Rossari Biotech Commissions Greenfield Manufacturing Facility

ROSSARI BIOTECH a speciality chemicals manufacturer announced that it has fully operationalised all phases of its greenfield manufacturing facility at Dahej, Gujarat. The facility will be further augmented by R&D, automation, administration, and other corporate facilities in the coming quarters.

The company informed, "This facility is a state-of-the-art automated unit, bringing higher cost-efficiencies and economies of scale. The plant enjoys proximity to various ports such as the Hazira port, the upcoming deep-water and multi-cargo port of Dahej and another one coming up at Mundra. This will help provide a solid cost and logistical advantage to the company. The Greenfield facility will have a total installed capacity 132,500 MTPA, enhancing the total capacity of Rossari by 2.1x to 252,500 MTPA. A strong upcoming pipeline of new product launches and new business lines within the four core chemistries should enable the company to sustainably ramp-up utilisation levels at the Dahej unit over the next three to four years."

Commenting on the business update, in a joint statement, Edward Menezes, Promoter & Executive Chairman, and Sunil Chari, Promoter & MD, said, "We are pleased to share that we have fully operationalised our Greenfield manufacturing facility at Dahej. This is our second manufacturing plant, which is equipped with flexible and interchangeable capacities for our three business lines of HPPC, TSC and AHN."

JV to Manufacture EV Battery

NANOXPLORE INC (NANOXPLORE) and Martinrea International Inc (Martinrea) announced that they have formed a joint venture, VoltaXplore Inc (VoltaXplore), a battery-based initiative to service the electric transportation and grid storage market.

VoltaXplore will initially build a demonstration facility to develop and produce electric vehicle (EV) batteries enhanced with graphene, one of the world's thinnest and strongest materials, with tremendous characteristics. The

venture combines NanoXplore's position as a world leader in the science and production of graphene and graphene-enhanced materials and Martinrea's expertise as a leading manufacturer of automotive and industrial parts, specializing in Lightweight Structures and Propulsion Systems. VoltaXplore will be developing and manufacturing Li-Ion battery cells for electric vehicles initially in a new 1MWh facility in Montreal. The joint venturers believe that graphene-enhanced batteries will

considerably improve existing battery performance.

Following a successful demonstration of improved battery performance using graphene and based on positive customer feedback as well as building the business case, VoltaXplore intends to build and commission a 10GWh battery cell manufacturing facility in Canada. NanoXplore and Martinrea have each invested \$4 million initially into VoltaXplore as startup capital to support the construction of demonstration facility.



....a passion for precision

HIGH PRECISION 'SWISS MADE' STYLI & ACCESSORIES



Precision for the highest standards is the only Aim of Nüssler Precision AG of Switzerland founded in 1988. The company concentrates on the production, development and worldwide distribution of styli and accessories for dimensional measurement technology.

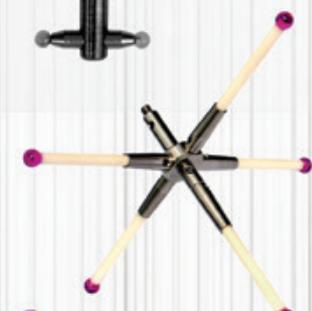
The sale of Nüssler products is supported by a global distribution network in the major European, American and Asian countries.

We Baker Gauges India Pvt. Ltd. are proud to take complete responsibility of the sales of Nüssler's wide range of styli and accessories for the Indian market.

Successful measurement depends largely on the stylus and its ability to reach the measuring point.

The Styli and Accessories are available for-

- Coordinate Measuring Machines (CMMs)
- Measuring Arms
- Thread measuring equipment
- 2D Height gauges
- Special Measuring Devices
- CNC Machine Tools
- Dial gauges



BAKER GAUGES INDIA PRIVATE LIMITED

An ISO 9001 : 2015 Company

Head Office-Pune

Tel. : (020) 66250600

Mob. : 7447449621

E-mail : bakerhip@bakergauges.com

Tel. : (020) 66093800

Mob. : 7447438251

E-mail : bakerbmi@bakergauges.com

www.bakergauges.com

Branch Offices :

Mumbai Tel. (022) 43471701 / 02 / 03

New Delhi Tel. (011) 23328186

Chennai Tel. (044) 28140963

Bangalore Tel. (080) 22217336

Ahmedabad Tel. (079) 27540665

Indore

Rajkot

Kolkata Tel. (033) 22156387

Chandigarh Tel. (0172) 4631027

Ludhiana

Hyderabad

Nashik

Jamshedpur

Coimbatore

• Mob. 7400199752

• Mob. 9810160313

• Mob. 7550055245

• Mob. 7618720651

• Mob. 7435041140

• Mob. 7447438257

• Mob. 7435041142

• Mob. 7447444980

• Mob. 9815601027

• Mob. 7447444098

• Mob. 7447443439

• Mob. 7447438256

• Mob. 7447444978

• Mob. 9884480963



• E-mail : bakermum@bakergauges.com

• E-mail : bakerdlh@bakergauges.com

• E-mail : bakerche@bakergauges.com

• E-mail : bakerblr@bakergauges.com

• E-mail : bakerbar@bakergauges.com

• E-mail : bakermp@bakergauges.com

• E-mail : bakerrajkot@bakergauges.com

• E-mail : bakercal@bakergauges.com

• E-mail : bakerchd@bakergauges.com

• E-mail : bakerldh@bakergauges.com

• E-mail : bakerhyd@bakergauges.com

• E-mail : baker_nsk@bakergauges.com

• E-mail : bakercal@bakergauges.com

• E-mail : bakerche@bakergauges.com

By Kruti Bharadva

THE WORLD'S GREENEST CEO – RAY ANDERSON

In this segment, we look at the true pioneers of our industry – who through their veracity and acumen, have carved a niche for themselves. This month the spotlight is on **Ray Anderson**, who made sustainability his only goal.

The former CEO of Interface, the late Ray Anderson, will be remembered for being a sustainability pioneer long before the idea had currency.

His life's journey moved him from the football field and classrooms of Georgia Tech to performing on the world stage as a leading voice in industrial sustainability. In 1994, at the height of his success with Interface—a company he had built from a dream, grit and determination—he was challenged with a question that would define the rest of his life: “What is your company doing for the environment?” In an effort to discover the answer to that question, he read a book by Paul Hawken. The Ecology of Commerce made him aware for the first time that Interface was doing much more to harm the environment than to protect it.

This “spear in the chest” epiphany led to what Ray later called his Mid-Course Correction—the beginning of his quest to prove that sustainability was not just the right thing to do, it was the smart thing to do for business. His mission led him to deliver his message from shop floors to the White House. More than three decades ago Anderson launched Mission Zero in which he pledged to get all of Interface's energy needs from renewable sources by 2020. Interface currently derives 96 percent of the power they use from renewables. Interface is among the most energy efficient companies in the world and they have achieved all three of their major goals: Footprint Reduction, Product Innovation and Culture Change.

An honours graduate of the Georgia Institute of Technology's (Georgia Tech) school of industrial and systems engineering in 1956, Ray learned the carpet trade through 14-plus years at various positions at Deering-Milliken and Callaway Mills, and in 1973, set about founding a company to produce the first



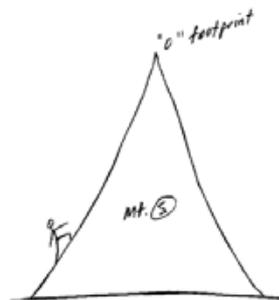
This seemingly small change distinguished him as the radical industrialist who would usher in a new age of industrial sustainability and inspire others to break institutional inertia and innovate a brighter world together

free-lay carpet tiles in America.

In 1997, Ray described his vision for his company, then nearly a quarter-century old, that stands true today: “If we're successful, we'll spend the rest of our days harvesting yester-year's carpets and other petrochemically derived products, and recycling them into new materials; and converting sunlight into energy; with zero scrap going to the landfill and zero emissions into the ecosystem. And we'll be doing well, very well, by doing good. That's the vision.”

Ray was lauded by government, environmental, and business groups alike. In 2010, he received a host of accolades, including: the American Society for Interior Designers (ASID) Design for Humanity Award, a Lifetime Achievement Award from GreenLaw; the inaugural Global Sustainability Prize from the University of Kentucky's Tracy Farmer Institute for Sustainability and the Environment; a River Guardian Award from the Upper Chattahoochee Riverkeeper organization; a Sustainability Award from the Women's Network for a Sustainable Future (WNSF), the first time the WNSF has honoured a businessman; and a Pillars of EARTH Sustainable Leadership Awards given by EARTH University in Costa Rica.

In 2007, Ray was honoured as



Ray's 'Climbing Mt. Sustainability'



His mission led him to deliver his message from shop floors to the White House. More than three decades ago Anderson launched Mission Zero in which he pledged to get all of Interface's energy needs from renewable sources by 2020

a recipient of the Purpose Prize from Civic Ventures, a think tank and an incubator, generating ideas and inventing programs to help society achieve the greatest return on experience, and by Auburn University with its International Quality of Life Award. In 1996, he received the Inaugural Millennium Award from Global Green, presented by Mikhail Gorbachev, and won recognition from Forbes Magazine and Ernst & Young, which named him Entrepreneur of the Year. In January 2001, he received the George and Cynthia Mitchell International Prize for Sustainable Development.

As an impassioned entrepreneur, Ray turned his company's focus toward environmental stewardship and never looked back. This seemingly small change

distinguished him as the radical industrialist who would usher in a new age of industrial sustainability and inspire others to break institutional inertia and innovate a brighter world together.

Anderson died on August 8, 2011. On July 28, 2012, Anderson's family re-launched the Ray C Anderson Foundation with a new purpose. Originally created to fund Ray Anderson's personal philanthropic giving, family members announced the rebirth and refocus of the Foundation on Anderson's birthday, nearly one year after his 2011 death. The purpose of the Ray C Anderson Foundation is to perpetuate shared values and continue the legacy that Anderson left behind - to promote and advance the concepts of sustainable production and consumption. 

DASSAULT SYSTÈMES JOINS THE EUROPEAN GREEN DIGITAL COALITION

Dassault Systèmes has announced that it is a founding member of the European Green Digital Coalition, a first-of-a-kind group of leading technology companies with a joint mission to support the green and digital transformation of the economy both inside and outside Europe.

The EGDC was formally established by the European Union on March 19, 2021 on the occasion of the "Digital Day 2021" conference, to emphasize the key role that digital networks, technologies and applications can play in delivering environmental and climate benefits that can transform the economy in response to concerns about climate change, the depletion of natural resources, pollution and biodiversity loss.

"Dassault Systèmes is a world leader in Product Life Cycle Management (PLM). Our science-based industry solution experiences are widely recognized across most of the manufacturing industries sector. Our roots are in Europe. Headquartered in the EU, we are proud to play a role as founder of this important coalition that reflects and actively supports the EU's commitment to the environment," said Bernard Charlès, Vice Chairman and CEO, Dassault Systèmes. "As part of our purpose to harmonize product, nature and life, we have a strategic ambition to become the world's leading partner for reinventing a sustainable

economy. Sustainable innovation can only be achieved by leveraging virtual worlds to imagine radically new materials, products and processes that reduce industry's carbon footprint, and advance the circular economy. By working with other sectors as part of this coalition, we can take actions to drive this innovation and the role of our customers in contributing to a better world."

The EGDC will commit to investing in the development and deployment of green digital solutions in a wide range of sectors; developing standardized impact assessment methodologies for such solutions; and working across sectors to create deployment guidelines for them.

Dassault Systèmes' commitment to the EGDC aligns with its purpose to provide business and people with virtual universes to imagine sustainable innovations that harmonize product, nature and life. The company has outlined a sustainability strategy for 2025 to actively reduce both its own environmental footprint and that of its customers – from multinational corporations to startups. In addition to committing to set its own science-based emissions target and prioritizing partnerships with stakeholders to drive the role of digital technology in global sustainability efforts, this strategy involves helping its customers reduce their emissions by using the 3DEXPERIENCE platform to create virtual twins.

By Kruti Bharadva

THE 360 DEGREES OF MACHINING

Günther Mayr, Managing Director Sales, Technologies and After Market Sales, WFL Millturn Technologies GmbH & Co KG, takes us through the complete machining solutions the company provides, through an in-depth interview



WFL specializes in providing complete machining solutions. Could you briefly describe your solutions portfolio, specifically the MILLTURN machine concept?

Having focused on complete machining since 1983, we are the technology leader in the field of metal-cutting production machinery. The combination of different machining technologies such as turning, milling, drilling or grinding in one machine tool is known as complete machining. Clamp once – machine complete: this goes hand in hand with enormous economic and production-related advantages. It is applicable for part types that were previously manufactured in several process steps on various different machines. We have been building complete machining centres for various well-known customers in the aviation, automotive, engineering and plastics machinery industries. With a ratio of exports of 95 per cent and sales branches and distribution partners in all major industrial countries, we achieved a record-breaking turnover in 2019.

Complete machining is about maximum quality, maximum flexibility, highest degree of utilisation, short lead times and highest level of productivity. Complex machining components are manufactured to the narrowest tolerances and with minimal clamping. In-process measurements guarantee and maintain high levels

of precision and stability. Shortened setup times and a reduction in clamping devices and special tools increase flexibility in terms of machining options. This allows for an efficient manufacturing process and technological optimisation. Several important factors come into play in achieving an increase in the degree of utilisation. Minimal clamping and few internal transport movements increase the efficiency of the production process significantly. Lead times are minimised due to short wait and handling times. The combination of maximum quality, maximum flexibility, maximum utilisation and short lead times results in the highest possible level of productivity.

Briefly tell us about the automation solutions WFL provides.

Together with our automation expert, FRAI Robotic Solutions, we support customers at all stages of their project such as initial concept development as well as implementation, commissioning and maintenance of the automated system. FRAI's gantry robots and robot cells allow for an extensive range of high-quality automation solutions and maximum customer benefit.

Because of innovative developments and intelligent automation concepts, we are able to meet the constantly growing requirements regarding customized solutions.

WE ARE PROUD TO ANNOUNCE



The 7th Edition of

AceMicromatic
Group
Presents

THE
MACHINIST
SUPER SHOPFLOOR AWARDS 2021

Powered By



TOOLING PARTNER



ASSOCIATE PARTNERS



CALLING SHOPFLOORS ACROSS INDIA TO NOMINATE FOR

- SAFETY • QUALITY • PRODUCTIVITY • GREEN MANUFACTURING • INNOVATION (PRODUCT / PROCESS)
- MACHINING EXCELLENCE • DIGITAL MANUFACTURING • HUMAN RESOURCES (HR)
- CORPORATE SOCIAL RESPONSIBILITY (CSR) • SUPPLY CHAIN • MAINTENANCE

For more details: **Fiona Fernandes** | +91 9930723498 | fiona.fernandes@wmm.co.in

For partnership opportunities:

(West & North)

Ranjan Haldar
+91 9167267474
ranjan.haldar@wmm.co.in

(South)

Mahadev. B
+91 9448483475
mahadev.b@wmm.co.in

Prabhugoud Patil
+91 9980432663
prabhugoud.patil@wmm.co.in

Our standard components are combined with high-quality purchased components in order to manufacture flexible solutions for small batches and high-productive series production.

Depending on the customer's requirements, different automation solutions are used for automatic loading and unloading of workpieces. The offer ranges from gantry loaders to articulated robots. Peripheral transport and storage systems for workpieces, tools and jaws can be combined as desired.

How have you come embracing digitization and Industry 4.0 solutions?

With our development as a total solution provider, in combination with highly motivated, educated and trained employees, we can meet these trends and provide our customers with comprehensive and sustainable support over the entire life cycle of a MILLTURN. We can also offer many great solutions around the topic of Industry 4.0 or digitization: starting with the updated version of CrashGuard Studio, the completely new process monitoring WFL iControl and further developments in sensor technology in tools and the MILLTURN, we prove strong progress.

The new process control software iControl protects the MILLTURN, even during autonomous production throughout the night. Depending on the machine's equipment, up to 16 freely configurable process signals are continuously monitored. The new design contains more complex and more intelligent monitoring options, offering comprehensive safety during production. Multi-stage monitoring logics are used, which respond, if the collision limit or adaptive process limit is exceeded, or if there are significant, rapid changes in force.



Complete machining is about maximum quality, maximum flexibility, highest degree of utilisation, short lead times and highest level of productivity

Please tell us about WFL's software solutions, specifically geared towards process optimization, safety and increase in efficiency.

WFL customers enjoy tailor-made solutions. Our aim is to evolve from a solution provider into a system provider. Complete machining is subject to different demands today, or more accurately put, greater demands. Which is why we are always on the ball, striving to integrate a wide range of technologies, measuring tasks, finish machining operations, gear teeth and much more into our MILLTURN complete machining centres, all to suit our customer's needs. Right from the very start, our motto has been "clamp once – machine complete". That is and remains our goal.

Machining operations are increasing in complexity, so we are responding accordingly and ramping up our technological processes. However, we focus on more than just the machining operation itself; we cover the entire process. And by this we mean defining the machining process, workpiece programming, simulation, production and finally, support throughout the entire service life of a machine. We want to play our part in maximizing productivity.

The realistic 3D simulation software CrashGuard Studio is the ideal tool for testing and optimising CNC programs after they have been created or modified. This can be done either on an external workstation or directly on the machine control unit. Thanks to the optimisation of the entire processing sequence and an error correction at an early stage, the risks of collisions and of producing scrap parts as well as unproductive run-in and down times are now a thing of the past.

This allows the use of a whole new range of potential features and thus achieves significant competitive advantages. CrashGuard Studio is the ideal supplement to any CAD-CAM software and for the WFL CrashGuard collision prevention software. Data for workpieces, tools and clamping devices can be transferred as required.





With the interactive graphics of the Millturn PRO programming software, NC programs can be created efficiently and easily, thereby enabling CrashGuard Studio to become a universal programming system for complex workpieces (without freeform surfaces). Programming can be carried out on an external programming station or directly at the control panel of the machine itself. The programmed machining operations can be checked continually and step by step in CrashGuard Studio.



Thanks to the optimisation of the entire processing sequence and an error correction at an early stage, the risks of collisions and of producing scrap parts as well as unproductive run-in and down times are now a thing of the past

The technology cycles of WFL cover an extremely broad range of standard and special technologies for all conceivable cases of application. These program modules, which only require the input of parameters, make it possible to carry out efficient programming directly on the machine control or on a PC. The program can therefore be created for both complex and simple workpieces within the shortest period of time.

Furthermore, we offer the appropriate technological solution for every gear cutting operation - from filigree internal gears with high accuracy requirements to large external gears, which require high roughing efficiency.

Briefly tell us about the business connect WFL has with the Indian market. How successful has it been?

India is a very important market for WFL. Therefore, measures have been taken in the past few years to strengthen our sales and service activities. Service and

spare parts are available in India and can therefore be quickly available at the customer's site. We have been working with an experienced service partner for years. The sales activities have been intensified in the last two years and another "WFL Regional Sales Manager" has been employed.

It's been a tough year for all businesses globally. Please tell us the strategies WFL adopted to navigate the pandemic and any residual long-term effects.

The pandemic affected us, of course, since the beginning of March and the economic downturn has of course had an impact to every company. Such a crisis can only be overcome with combined strength and personal commitment from everyone. Practically - being regarded by our customers as the technical leader - we are less influenced as most machine tool-companies like the big producers of standard-machines, because we have many customers who see us as product and technology development partner. With our business model we are involved in R&D and prototyping of turbine parts for example in the aerospace industry.

At WFL, we have continued to act according to the motto "best in complete machining" and continue to offer our customers the most efficient manufacturing solutions, high-quality machines and the highest quality of service.

Despite the difficult times, we produced many innovations and further developments in the course of 2020. Throughout the year, despite the constant presence of COVID, our MILLTURNs were shipped worldwide, assembled in the respective country and put into operation. In summary, one can say that we got through the crisis well. We owe this above all to the special commitment of all employees at home and abroad during this difficult phase.

Lastly, tell us about WFL's vision in terms of growth for the coming years.

Our target for 2021 is to grow faster than the market, because we see a strong trend of customized machines. Many machine tool companies strongly depend on the investments of the automotive industry and they are looking for other business fields. While they are still looking - we are already here for decades. We intend to do this with outstanding products from machines to software and from production solutions to customer services. We want to have a stronger presence in the markets, establish additional branches and look after national regions. We want to use the latest technology, not just in its machines but also in its processes and service support. The expansion of the sales and service network (with 24/7) in the markets is a key strategic goal. 

By Kruti Bharadva

BRIDGING HERITAGE TO TECHNOLOGY

Pragun Jindal Khaitan, Vice-Chairman and Managing Director, Jindal Aluminium Limited, takes us through the story of Jindal Aluminium – a story which is rooted in building upon a rich heritage whilst embracing the new and the sustainable.



A journey which began in 1968, when aluminium was relatively unknown in India, to 2021, when the company- India's largest aluminium extrusion company is on the threshold of adopting digital solutions across all its business functions – Pragun Jindal Khaitan, Vice-Chairman and Managing Director, Jindal Aluminium Limited, takes us through the story of Jindal Aluminium – a story

which is rooted in building upon a rich heritage whilst embracing the new and the sustainable.

Jindal Aluminium is a family-run business with a rich heritage. Please tell us about the company's roots and background and how Dr. Sitaram Jindal sowed the first seed of Jindal Aluminium

My grandfather, Dr Sitaram Jindal, is the fourth of five brothers who jointly set up an industrial empire unparalleled in modern India. While studying at Kolkata (then Calcutta) University, he worked with his brothers towards setting up a steel pipe factory. After establishing the factory in Kolkata, he and his brother set up a giant steel pipe factory (Jindal India Ltd) in Hissar, Haryana. Back then, this was one of the first companies to manufacture steel pipes and tubes on a large scale in India. Since the initial period, the company played a vital role in the green revolution by manufacturing and supplying larger diameter steel pipes for use in the sinking of tube wells needed for irrigating in Punjab, Haryana, Himachal Pradesh, and Rajasthan. It was the time of an acute shortage of food grains in India.

Post this success, he envisioned a future beyond steel and wanted to do something that could lay the foundation for another vital industry fuelling growth, and the foundation of now 'Jindal Aluminium Limited' was laid in 1968 (It is to be noted, the company was incorporated in 1970). Aluminium was relatively a new metal at that time.

Currently, we have a production capacity of 1.75 lakh metric tonnes, meeting 25-30 percent of the aluminium extruded and 10-12 per cent of India's aluminium flat-rolled products.

You joined the company in 2013; tell us about your journey with the company

I joined Jindal Aluminium as a whole-time Director in the year 2013. The company's revenue has multiplied three times since then, but it's a collective effort of many people, including our employees, customers, and suppliers.

In my journey spanning eight years, the potential of growth for the company given the work put in over



the past five decades by my colleagues – both past and present are among my biggest motivators. However, it will be incomplete without mentioning Dr. Sitaram Jindal - my grandfather, and our Chairman and Managing Director. His visionary outlook and business acumen are honestly why the company is as strong as it is today.

There's no secret; in the end, it's the happy employees leading to more delighted clients. For Jindal Aluminium, the most significant point of focus has been the customer. We have put in a lot of time and energy in understanding what the customer wants from our products. This understanding helps us cater to their exact requirements. We listen to our customers keenly and support our employees with the best resources, facilities, and technologies.



Over the next several months, the company will witness a leadership-driven initiative paving the way to implement a digital ecosystem across our business functions

Jindal Aluminium is going digital across its business functions. Please describe the initiatives and approaches being taken to achieve digitalization.

We have recently introduced SAP technology. It will allow us to leverage digital solutions in our business strategy. Over the next several months, the company will witness a leadership-driven initiative paving the way to implement a digital ecosystem across our business functions. In the past, Jindal Aluminium has launched an order management system for dealers. The idea is to make sure that we optimize all our operations using available technologies. As I mentioned earlier, we have scaled people up the value chain, invested in them, and using the company's legacy knowledge base and latest technology to create a distinct advantage. These steps ensure that we usher in market growth and position us

well to benefit from it.

Please tell us in detail about the SAP enabled technological systems being implemented across the organisation, the key points and changes it will bring about

We are implementing an enterprise resource planning architecture covering the Presentation, Application, and Database layer. The step is a part of the digital ecosystem that we want to build around the business. It is being done across the entire organization using the SAP ERP solution S/4HANA. This enterprise solution adds value to digitalization simplifying the IT landscape and allowing real-time insights through in-memory data processing.

We have set multiple benchmarks over these decades. Implementing an integrated IT system is a part of the business technology roadmap to smoothen, simplify and improve the integration of people, process, and technology. It will help us bring most of the company's operations into one IT system, ensuring more effortless information flow between individuals and departments, ultimately leading to swift and efficient process and business decisions.

Please tell us about the impetus behind choosing to go digital

Connectivity, intelligence, and flexible automation are the way forward for manufacturing in the digital world. We only see this scope expanding from here. It will change the way products are manufactured, distributed, serviced, and refined. While we want to embrace this change, the idea behind choosing to go digital is extending our experience of over five decades to the benefit of everyone involved in our business ecosystem - People, Planet and Community. It will advance our working environment to delivering optimum value to our customers.

Kindly tell us in detail about UDAY - your order management system

Investing in establishing a robust distribution network and providing better value and earnings to our dealers is one of the core decisions that went into Jindal Aluminium's making. UDAY – rise with aluminium is taking this belief forward. It is a dealer's order management system built by our team. We have rolled out some of its functionalities among our dealers, but the system will be a vital part of dealer management when fully deployed. It will act as a robust tool to place, manage and track orders, facilitate shipping and fulfilment, encompass reverse logistics into inventory management, forecasting and inventory planning, as well as business



Implementing an integrated IT system is a part of the business technology roadmap to smoothen, simplify and improve the integration of people, process, and technology

reporting and intelligence.

Briefly tell us about Aluminium, its versatility, and its use in vital sectors such as automotive and aerospace

Aluminium is a highly versatile metal. Meaning it can be processed to be thin, lightweight, bendable, non-corrosive, and non-reactive yet providing exceptional tensile strength. All these features make it a much sought-after metal in various industries.

For example, the automobile sector finds it attractive because every kilogram of Aluminium used in a car brings down the vehicle's overall weight by one (1) kilogram. Now aluminium is the second most used material in the auto industry, next to steel. There was a significant weight loss in aircraft manufacturing on account of using Aluminium alloys. The Boeing 737, famous narrow-body aircraft, comprises 80 per cent aluminium alloys in its making. Its lighter but strong and high corrosion resistance functionality makes it ideal for application in aerospace.

Aluminium alloys make for being the perfect material for defence applications in ammunition, missiles, rockets and rocket launchers, military bridges or air-drop platforms, cartridge cases, and military aircraft. It is the perfect metal to meet even the most complex and stringent requirements. Over the next five years, India has set a target of 1.75 lakh crore worth of domestic defence manufacturing, including 35,000 crores worth of military hardware for exports. Aluminium extruded and rolled products have a very significant role in making this possible.

At Jindal Aluminium, we are committed to meeting various sector's requirements through innovation and excellence in manufacturing using the best of technology and talent. We see a rise in business from automotive, aerospace, and defence.

Aluminium is regarded as a critical element in sustainable manufacturing. Could you describe for us why this is so?

Indeed, aluminium-in-use is the most circular and low carbon material. It offers 100% recyclability - reusing the material again into the production cycle without any quality degradation. Today an unbelievable seventy-five (75 per cent) percent of all aluminium ever produced is still in use.

Many sectors are now reducing their carbon footprint through the usage of aluminium over plastic and other metals. As we rebuild, we must adopt sustainable practices to ensure a green recovery from COVID-19

and also tackling climate change. Aluminium-in-use advantage is that it takes just five (5 per cent) percent of the energy required in

recycling than producing primary Aluminium from Bauxite, reducing energy usage by ninety-five (95) per cent and significantly the CO₂ (Carbon dioxide) emission. That makes it an essential element and scores over other metals in a circular and low carbon economy. With the projected eight (8%) percent growth, India should be among the countries with a low carbon economy through aluminium in the next eight to ten years.

How does it feel to be at the helm of such a legacy and what is the way forward?

The legacy is truly remarkable. The values that we have built over these decades are my most significant assets. I feel fortunate that the transition was natural, given that I got the opportunity to work with my grandfather, Dr. Sitaram Jindal, who has prepared me for this role. Since I joined the company in 2013 and even before, he has been a torchbearer for me on this journey.

What I value most of all is that Jindal Aluminium takes a holistic view of society at large and has a strong understanding of what role we play in it. From day one, our focus has always been on making sure Jindal Aluminium has a positive impact on society; we are committed to society's upliftment. It's an intrinsic value of the business we haven't been vocal about. We consider People, Planet and Community as a part of our business ecosystem; being responsible for them comes naturally.

It has been a long journey with multiple path-breaking decisions determining the growth of the company today. But if I have to put this across as a part of the foundation of the legacy, I would say the decision to stick to quality even though it was not demanded (by customers or industry) has set the tone for the industry and a benchmark for our products. We have customers to whom we have been supplying for decades. The cost-optimization-focused business approach has built a fiscal discipline culture, driving spending and cost reduction while maximizing customer value. It has helped us maintain profitability and, thus, low leverage. It was a challenge to establish a robust distribution network during those times, but it was a bold decision that proved to be wise to build and invest in a unique distribution network. It now forms the backbone of our sales.

So, producing only quality-focused products, following a fiscally disciplined approach, providing value to our dealers, and building an extended family of employees are the core decisions that have shaped the company that it is right now. 

By Kruti Bharadva

MOVING DOWN THE SMART MANUFACTURING HIGHWAY

Sridhar Dharmarajan, EVP & MD, Hexagon India and MSC Software IndoPACIFIC, takes us through the latest in smart manufacturing and sustainability solutions

Briefly describe for us Hexagon's presence and business activities in India – in particular the sectors it caters to

Hexagon is a global leader in sensor, software and autonomous solutions. We are putting data to work to boost efficiency, productivity, and quality across industrial, manufacturing, infrastructure, safety, and mobility applications. Our technologies are shaping urban and production ecosystems to become increasingly connected and autonomous – ensuring a scalable, sustainable future.

We have had a strong presence in India since the mid-eighties. Hexagon's Global Research and Development Centre in India is at the front and centre of innovation in areas such as eMobility, autonomous Internet of Things, Artificial Intelligence, etc. Currently, Hexagon Manufacturing Intelligence has centres in Maharashtra, Karnataka, Tamil Nadu and Uttar Pradesh.

Hexagon Manufacturing Intelligence is enabling the rise of smart factories and Electric Vehicles (EV) with a focus on simulation technologies especially for autonomous vehicle testing.

Hexagon's Virtual Test Drive (VTD) customer experience centre in Pune is aimed at highlighting and promoting the need for simulation technologies in a digital arena- It utilises CRADLE Software to resolve simulation scenarios and is the perfect toolchain for the development of autonomous vehicles and its relevant environment. It is currently being used for the development of Advanced Driver Assistance Systems (ADAS) that create real-world road tests and driver training scenarios.

Hexagon Manufacturing Intelligence is also the

Data utilisation is the most innovative way to make manufacturing smarter. Data is utilised in all aspects ranging from design to engineering, production and metrology



innovation partner of Startup India which held the Enabling Engineering Convergence Startup Challenge in January 2021. The challenge required participants to employ Hexagon's digital and simulation manufacturing technologies in tasks themed around smart manufacturing, autonomous vehicles, etc.

Please describe for us your product portfolios

At its very core, Hexagon Manufacturing Intelligence creates smart solutions leveraging on data driven smart technologies. All our products employ data to arrive at sustainable and innovative solutions – this includes real time data assessment, continuous learning cycles and connecting departments to ensure intelligent ecosystems where quality drives output. Our products and systems leverage geospatial enterprise solutions and industrial enterprise solutions.

Hexagon's Metrology solution portfolio division is of industrial capacity to ensure accurate dimensional measurements. As the largest software developer in the metrology industry, we offer customisable and innovative metrology solutions for seamless data acquisition, analysis and management.

SFx Solutions is the latest from Hexagon Manu-



facturing Intelligence, which works to connect ecosystems and enhance enterprise intelligence. It is geared towards ensuring seamless autonomous and smart environments.

Hexagon also offers production software as well as design and engineering software. production software utilises simulation technologies to provide solutions for production methods. Whereas the design and engineering software simulates component behaviour to allow the design of quality into products.



The only way forward is sustainable development in manufacturing that will increasingly design sustainable processes, products and value chains that won't compromise future resources.

Hexagon says data is in the company's DNA. Please describe for us why data is such a powerful tool and how Hexagon leverages this into solutions for the manufacturing sector.

Data is axiomatic for all Hexagon's solutions, software, and systems. Data is utilised in all aspects ranging from design to engineering, production and metrology. Data utilisation is the most innovative way to make manufacturing smarter.

Hexagon's software and systems form a digital matrix that is the nexus or DNA that creates solutions throughout the entire manufacturing process. This enables a conceptual, productive, and holistic view of the factory as a whole, thus enhancing quality assurance, productivity and lean processes with machine speed

and confidence to achieve the desired outcome.

This nexus or data DNA is what we at Hexagon refer to as the Digital Thread and which is anchored by metrology to improve and enhance the accuracy of operations. The data allows the formation of interconnected links in the manufacturing ecosystem by capturing quality data for measurement, positioning and inspection.

Hence, data is the nodal point between the real and virtual worlds, transitioning real-world data into the digital domain. Our measurement-assisted production

technology is best-in-class, and we continue to innovate towards more real-time feedback loop applications. This then allows us to create a future where data is autonomously employed to drive sustainability and productivity.

How is Hexagon contributing towards the Indian manufacturing sector Industry 4.0 and digitalisation drive?

Hexagon is at the vanguard of Industry 4.0 as our solutions and services focus on smart and connected systems, in particular simulation technologies. Smart cities are our future, not our present. Hence, the need for simulation technologies that will allow us to arrive at a fully functional digital future, well equipped to handle all eventualities and drive unprecedented levels of manufacturing competence.

Thus, design and engineering at Hexagon Manufacturing Intelligence is focused on embedding quality into product D&E. Our software solutions, including simulation software, facilitates the exploration of prototypes without the need for physical manifestations that can be a drain in resources. All our solutions ensure that quality assurance is maintained in component manufacturing and productivity, including factoring in a huge number of variables that can affect downstream manufacturing processes. Our computer-aided engineering (CAE) software allows for optimisation that drives innovation, product quality and efficiency throughout the manufacturing process.

Hexagon smart manufacturing technologies unlock and enhance the potential of Coordinate Measuring Machines (CMMs) and systems, which is at the core of all smart factories. CMMs integrate me-

trolgy hardware and software capabilities that allow for automation of cross-sectional measurement, quality assurance, inspection capacity, and productivity⁵. Digitalisation allows for real-time data and intuitive navigation via Hexagon's HxGN SFX Asset Management System; fully automating measurement jobs with Hexagon's TEMPO and EYE-D; and even monitoring environmental variations with Hexagon's Pulse Wireless device.

By having CMM enhanced smart factories, Hexagon will raise the Indian manufacturing sector to unprecedented global levels. Our technology is helping manufacturers to pioneer mechanisms to inform design and engineering processes and provide feedback to the production process. By driving both profitability and sustainability, the seamless automation and digitalisation of routine tasks will increase efficiency and make manufacturing smarter. India has the potential for long-term competitiveness and sustainability which in turn will solidify its position as a global manufacturing hub

Sustainability is the need of the hour. How do your solutions help drive sustainability?

All of Hexagon's technologies and solutions are about being scalable and sustainable – we believe that this is the true future of humanity. Digital innovation is driving emergent technologies, which in turn, are being harnessed to provide scalable and sustainable solutions and services. These are core tenets of business-centred strategies and policies, setting the stage for any organisation's digital transformation initiative.

Global consumer trends are indicative of change in consumer behaviour that is predicated on sustainable technologies. The global pandemic is a point in case where businesses had to pivot and innovate to survive. Hexagon was able to rise to the challenge by facilitating the manufacturing industry to adapt swiftly to global disruption.

Our agility and focus on innovation ensured that our business transformation was dynamic and fluid, delivering value to all our customers in a global time of need. Data-driven technologies and intelligent software have enabled us to create a future with long-term growth initiatives. For Hexagon, that means an accelerated pace of sustainability centred on the rise of smart connected cities, autonomous Internet of Things and Artificial Intelligence. The future will consist of autonomous vehicles, smart manufacturing and connected cities.

All of Hexagon's solutions are developed with this as the guiding principle, underscored with continuity and best business practices. We adopt a holistic view and practice by driving sustainability throughout the

entire value chain. We strive to ensure unparalleled productivity, lean processes and uncompromised efficiency which can only be enabled with smart solutions and simulation technologies⁶.

For example, the eMobility or electric vehicles sector has seen a huge spike in demand due to the awareness of climate change. Adjacent technologies include autonomous vehicles and smart technologies in automotive innovation, especially in pioneering road-testing capabilities for these disruptive innovators to the automobile industry.

Hexagon's simulation technology such as the Virtual Test Drive (VTD) software is the best possible solution to such dilemmas, allowing for complete and immersive virtual environments to thoroughly evaluate and validate outcomes. VTD is used to test Advanced Driver Assistance Systems (ADAS) and autonomous driving systems. It can simulate every possible driving condition including 'black swan events' or outlier scenarios such as total system faults and terrain undulations in 3D. Hexagon's system is well-organized in its collection of data, to extract all simulations to compute meaningful performance indexes and more.

Hexagon has also recently founded R-evolution to drive sustainably developed green-tech projects towards a more sustainable future and environment for our planet. Our focus in doing so is to embrace the four foundations of future humanity - Planet, Society, Business, and Technology - and make them sustainable in their growth.

Modern day manufacturing processes touch on multiple industries such as aerospace, automotive, energy, oil & gas, and electronics. Across the spectrum, all these sectors contribute to harmful emissions and environmental pollution. We are also depleting our world's precious energy and water resources. The only way forward is sustainable development in manufacturing that will increasingly design sustainable processes, products and value chains that won't compromise future resources.

The advent of Industry 4.0 has seen the rise of the Internet of Things, 'Big Data' and AI (Artificial Intelligence). These have driven a digital transformation to optimize both manufactured products and processes, taking product quality, manufacturing productivity, and ultimately sustainability to the next level of the circular economy of renewable product life cycles. Sustainable design and development, thanks to Computer-aided engineering (CAE) simulation, will ensure responsible and sustainable economic benefits for all users. Hexagon is primed to lead the transformational renewables and digital evolution with our sensor, software, simulation, and autonomous smart technologies and solutions. 

By Harikrishna Khandavilli

THE CHANGING FACE OF CAR TRAVEL

The cars of yesteryears were very different from the ones today. As cars get 'smarter' travel takes on a whole new dimension. Here is a peek into the technology involved in the cars of the near future.

The rapid advancement in automotive technology means the changes in the future are not just limited to within the vehicle. These changes will impact the way our vehicle interacts with us, passengers, the infrastructure, and other vehicles on the road. The vehicles of today, be it passenger or commercial, will essentially become 'Computers on Wheels' in the coming future. And a critical aspect of this transformation is connectivity.

Globally, connected vehicles are gaining traction. According to a report by Deloitte, 80 percent of Indian customers think they will benefit from the increased vehicle connectivity.



THE TECHNOLOGY INVOLVED

We don't just buy a car today. We also buy a lifestyle. We are investing in 'mobile living spaces.' This means a device that can transport us from Point A to Point B is no longer sufficient. Today, we want intuitive and on-demand information that makes our driving experience convenient, comfortable, and safer. For this to happen, cars need to be connected and perform complex tasks.

For example, smartphones, which are considered an extension of the personal self, are required to be integrated into the car. The phone syncs with the car's dashboard and navigation system the moment the driver enters the car. In fact, the process starts before the person sits in the car.

A smartphone today is the key to the car. The technology that has made this a reality is CoSmA. It allows the user to access, unlock and start the car using their

smartphone. The onboard architecture of the CoSmA solution also features a central electronic computer unit with a state-of-the-art secure element as certified secure storage for any digital vehicle key application. The vehicle owner can generate and manage multiple digital keys and share them with friends or family.

Once inside the car, there are a host of connected technologies that understand what is required from it. Navigation to the desired location, responsiveness to voice commands, alerts on the state of the car, or any issues that needs the driver's attention.

Human Machine Interface (HMI) technologies today are designed to be intuitive and complement vehicle safety. Be it a digital instrument cluster or digital companion, the focus is on seamlessly connecting various parts of the ecosystem to ensure minimal distractions to the driver.

CONNECTIVITY AND THE HIGH-PERFORMANCE COMPUTER

As vehicles are connected, informed, and integrated with different technologies, they require simpler solutions that can solve complex problems within the shortest time. This requires particularly high computing power.

The high-performance computer (HPC) becomes critical for the future of mobility. This comprehensive



The vehicles of today, be it passenger or commercial, will essentially become 'Computers on Wheels' in the coming future. And a critical aspect of this transformation is connectivity



solution for software and hardware provides the basis for interaction between humans and vehicles in the connected cockpit of tomorrow, and it needs to be executed at the highest level of quality and accuracy. HPC also allows the integration of multiple functional domains into few in-vehicle servers.

With the integration of all cockpit domains (3D displays, Augmented Reality Head-Up displays, on-demand displays, and buttons, etc.) into one powerful HPC, it facilitates maximum personalization for drivers and passengers. At the same time, it offers reduced cost and complexity over the whole vehicle lifecycle.

Using Cockpit HPC, content can be shown regardless of display limits and also be individually arranged by the user. In potentially critical situations, only the information that is needed at a particular moment is displayed as a priority. This prevents the driver from receiving too much information or being distracted. On the other hand, the driver is also provided with all the services and apps in an automated driving mode that can otherwise only be found on the front passenger's side.

WHAT ABOUT SAFETY?

Technologies like these enhance the comfort and ease of driving and also focus on ensuring safety.

Safety is becoming a vital factor for the success of a vehicle, and with passing time more safety solutions are becoming connected. This is critical to achieving vision zero - a future with zero fatalities, zero injuries, zero crashes.

Connected vehicles exchange safety-critical information between the infrastructure and nearby cars, which eventually helps in averting possible road crashes or mishaps. One such example is eHorizon, which assists the vehicle to see around the corner and beyond sensor vision. eHorizon also processes the data collected from the entire vehicle fleet with the aid of artificial intelligence and other technologies, which again

increases the reliability of the predictions. This data is saved in cloud servers, making it accessible in real-time to all involved stakeholders.

While connected technologies are making great strides in enhancing mobility experience and safety, one of the primary concerns remains - "What if I am driving in a remote location?" This is addressed by Cellular Vehicle to Everything (V2X) technology. Cellular V2X communication has a strong potential to become a key enabler for automated driving and intelligent mobility. Cellular V2X is also designed to directly connect vehicles as well as with the infrastructure and further road users. Even in areas without mobile network coverage, C-V2X communication allows an exchange of time-sensitive and safety-critical information, for example - about warnings of potentially hazardous situations.

BEYOND MOBILITY TECHNOLOGIES

Connected technologies are not restricted to just vehicle-to-vehicle communication. Today, vehicles communicate with the environment (V2X) as well. A perfect use-case of this technology would be Intelligent Intersection. It is an end-to-end solution comprising a sensor set for the intersection, the powerful sensor (radar, camera, lidar) fusion algorithms that generate the environment model, and the Dedicated Short-Range Communication (DSRC) units, both at the intersection, and in the vehicle. While the concept is integral to protecting Vulnerable Road Users (VRUs) such as pedestrians and cyclists (aka. "Intelligent Crosswalk"), it can also support drivers in complex intersection traffic scenarios like preventing right-turning cars from running head-on into traffic that approaches from behind an obstacle.

The concept can enable the collection of information and statistics from intersections, which are often high-incidence zones. The collected information can be processed and analysed on the city data as a service platform to determine criticality areas so specific safety plans can be implemented to minimize accidents and contribute to Vision Zero.

CONNECTIVITY IS THE FUTURE

Connected technologies have opened doors for smart, autonomous, and convenient mobility. From intuitively enabling seamless information display, or transforming smartphones into a secure key, connectivity is changing vehicles into 'mobile living spaces.' Connected technologies also increase the safety quotient of the vehicle by sharing safety-critical information with peers and infrastructure. Connectivity is critical for the industry's transformation towards autonomous vehicles, and along the way changing the way we travel. 

By Kruti Bharadva

ACHIEVING DIGITAL TRANSFORMATION

As India moves towards becoming a global manufacturing hub, it is essential for industries to transform themselves using industry 4.0 solutions, digitization and IoT solutions. **Sudheesh Narayanan**, Founder and CEO, Knowledge Lens, talks about why these solutions are vital to India

Can you briefly tell us about Knowledge Lens and the products it offers to the manufacturing sector in India?

Knowledge Lens is a digital acceleration product company delivering measurable business value to clients through actionable business insights by leveraging Artificial Intelligence (AI), Industrial IoT & Big Data Analytics. Without any external funding, Knowledge Lens is in its eighth successful year and we have been focused on accelerating the business transformation for 3000+ customers worldwide, including several Fortune 500 companies in the US.

We have successfully transformed companies into smart enterprises by implementing Next Generation Enterprise and Manufacturing Data Lakes, AI Powered Intelligent Apps, Industry 4.0 solutions and Sustainability Cloud for Enterprises. In addition, our strong partnerships with industry leaders such as Microsoft, Intel, Databricks, and Informatica has accelerated digital transformation for many of our customers.

Key products and offerings:

Our Industrial IoT solution, “iLens” helps in shop floor digitization with capabilities like seamless connectivity with Industrial assets, Edge Analytics, Asset Efficiency, Predictive Maintenance, Quality Enhancements using AI and Vision Analytics, and Digital Logbooks. iLens

is currently powering automation, manufacturing, energy and utility companies. iLens provides early warning alerts on machine downtimes and thus helps save millions of dollars for the manufacturer by eliminating downtime and enabling more of a controlled downtime. Our Vision Analytics solution has been effective in bringing in accuracy in Quality Control, thus enriching our customers’ product quality and eliminating wastage. Our efficiency monitoring app provides proactive alerts on any potential efficiency drops and thus providing early warnings to the operators.

Our Sustainability Cloud focused offering “GLens” provides Real-time Environment and Energy Data Acquisition, Monitoring, Analytics, and Climate Change Accounting. The platform is currently live in 3000+ industries in India across industry segments such as Oil & Gas Refinery, Cements, Pulp & Paper, Fertilizers, Power, Sugar, Manufacturing, and Agriculture. It provides a simplified view for our customers to meet Climate Accounting, Environmental Compliance, and Regulatory needs. It enables customers to connect various makers of OEM (Original equipment manufacturer) products and assets in a single window and perform compliance monitoring and climate accounting. By leveraging AI, we have been able to provide early warning indicators, forecasting and predictive analytics to our customers. This has helped them to take proactive steps to reduce the carbon footprints and also control their environment pollution and thus avoid penalty from the regulators.

Our Enterprise Data Migration offering “MLens” provides a very unique value to our customers who are looking for cloud migration where they can perform a cloud assessment in less than a day’s time. MLens quickly enables both data and workload migration to accelerate the cloud migration journey for our customers. MLens has been delivering value to customer by 75% reduction in the cloud migration efforts and reducing migration time by a factor of 10x.

We are an ISO 9001, ISO 27001, CMMI, MCERTS certified company and have been recognized by CIO Insider, NASSCOM and CIO Review for our excellence.





What are the key differentiators that make Knowledge Lens stand out in the market?

Our key differentiator is our customer focused approach towards solving their business problems by leveraging technology solutions. The focus of our products is derived from a business outcome perspective and every feature is built considering the priority of our customers. This approach has helped us to evolve the product as per the needs of our customer and thus has created relevance of the product/solution in the marketplace. One key factor that stands out for us is that majority of our business comes from the existing customer referrals and thus demonstrates our strong customer focus.

How has Knowledge Lens accelerated the digital transformation needs of manufacturers over the past 7-8 years. Please elaborate with some examples.

We are serving large manufactures across the globe in various verticals including Fertilizers, Textiles and Dyeing, Flooring, Electronics, Cement and Oil and Gas etc. There are multiple instances of customer success stories where our solution has created significant business value and enabled digital transformation for our customer. Elaborating this point with below examples: **Example 1:** A leading Industrial Automation Company in the US leverages our solution in their shopfloor for Predictive Maintenance of their machines. This enables them to reduce their raw material wastage by 30 per cent and reduce 90 per cent of their earlier downtimes. The solution provides high accurate prediction on machine failures and proactively provides alerts to operators on the shop floor for corrective interventions before it is too late to prevent downtime.

Example 2: For a Large chemical manufacturer, we deployed an AI Based system that identifies the deviations of the critical parameters that impact the batch yield and proactively alerts the operator intervention to correct these critical parameters before the yield gets re-

duced. The critical parameters are constantly monitored through the AI Based system and it self learns based on the output yield and optimize for higher yields.

Example 3: For a leading manufacturing firm, we have incorporated a complete Digital Twin model of their manufacturing line, enabling them an AI powered solution for Remote Troubleshooting, Predictive Maintenance, and Equipment Logbook etc.

Similarly, we are working with another large manufacturer on their Digitization journey and connected worker initiatives for their entire shop floor. We also have many use cases where we have leveraged Vision Analytics to improve quality, reduce losses etc.

Please share your views on the importance of IIoT to make enterprises Industry 4.0 ready.

The market potential and tangible business value presented by IIoT is huge. In the current times, Industry 4.0 solutions are gaining traction in the Indian market. However, there are still some apprehensions regarding its actual implementation but in the US, these solutions have proven to be effective. In the Indian market, it is ideal for enterprises to move to Industry 4.0 in incremental steps. Enterprises that have switched to the IIoT paradigm now reap benefits in terms of seamless integration, cost-effectiveness, operational transparency, centralized control, adaptability and flexibility.

Now, siloed systems are coming together to streamline processes, improve productivity, and reduce time-to-market. Previously, the IT and OT domains operated in different orbits, but now there is an increasing alertness about convergence.

What are some of the challenges/ roadblocks faced by manufacturers in their journey for digital transformation?

The biggest challenge for the manufacturers is the lock-in with certain automation vendor on the shopfloor who has provided them with Industry 3.0 solutions for automation. There is a large inertia to think beyond these siloed solutions that are built on outdated technologies. The challenge is that the current manufacturing data is in "Jail" and there is a great resistance to unlock this data. The current providers are not technology ready and they has been greater reluctance adopting newer technologies that is required for the Digital Transformation.

Second challenge is the apprehension of Cyber security of the OT systems as manufacturers adopt the Industry 4.0 journey where the OT systems now gets connected to the IT Systems. There is a need to have clear security measures that are put in place to protect the OT layer. There is a need to bring awareness to the manufacturers on IT-OT security challenges and solutions.

Third important roadblock we see is in the lack of a comprehensive vision for Digitization in many of the manufacturers. Today, the focus is on siloed solution that address point solutions which are labelled as Industry 4.0 solution. Each of these solutions act in isolation and thus take the manufacturer away from the Digital Transformation journey. For example, we worked with a manufacturer who had already invested in a siloed Energy Management Solution and quickly realized that they have just created another silo that is not aligning to their business goals. Thus, there is a need for awareness in the manufacturer for the need of a Centralized Manufacturing Data Lake and the concept of Intelligent Apps that can make them agile and accelerate the business value realization compared to point solutions.

How can we make manufacturing environmentally friendly, socially inclusive and economically efficient with IIoT?

There is a growing trend in sustainability-driven innovation in the manufacturing sector and technology will play a major role in accelerating this trend. COVID-19 has put forth an opportunity for industries and companies to reinvent their products and services to meet new demands and achieve market advantages through sustainability initiatives. If utilized accurately, IIoT can

prosper employees to prepare for a career in the manufacturing sector by gaining a deeper understanding of the technologies used in smart manufacturing. With digital disruption, it is vital for all industries including manufacturing to reinvent existing processes to survive and stay ahead in the innovation game. Hence, the right kind of partnership will help.

How can smart factories help India become a global manufacturing hub?

To become a global manufacturing hub, there is a need to be able to produce at scale in a cost-efficient manner with high quality. So essentially there are 3 pillars to achieve this:

- a. Reduce human dependency in the manufacturing process to the maximum and make it automated so that it can scale
- b. Product Quality control has been looked at beyond the traditional methods and AI interventions in Quality enrichment is the key requirements
- c. Reduction in overall cost includes reducing waste, automation, reducing downtime, proactive maintenance etc.

To enable these three pillars, adopting Smart Factory construct is critical. Digital Transformation is required on the shop floor to reduce human dependency, reduce cost, enhance quality and operate the plant efficiently. Leveraging technology driven interventions to create an agile manufacturing is the need of the hour.

Once the factories adopt the Smart Factory construct, the scaling operations become simple and the dream to be global manufacturing hub can be easily achieved.

Can emerging technologies like IoT and AI fast track the 'Make in India' initiative by the Government?

Technology interventions through AI and IoT are the key pillars that can drive a cost effective, high quality, scalable manufacturing operations. To realize the full potential and benefits of "Make in India", there is a need for manufactures to adopt the latest technology advancements to drive the digital growth. I believe that Digital Transformation is the only way any manufacturer could sustain profitable operations thereby making "Make in India" successful.

We aim to bring the power of Digital to Small and Medium Manufacturers and bring in a significant change in how they do business. Enabling the connected worker, improving their operational efficiency, enhancing quality control in their manufacturing processes and enabling Predictive Maintenance are on the top focus of our roadmap. Our innovative and agile business models to achieve the cost-effective business outcome will always keep us ahead of the game. 



Digital Transformation is required on the shop floor to reduce human dependency, reduce cost, enhance quality and operate the plant efficiently

play a major role in bolstering the manufacturing sector. In fact, IIoT can have a tangible benefit to sustainability. Organizations must invest time to understand how efficiently IIoT can be deployed to lower the use of their resources. One major barrier with organizations is the lack of knowledge on how to deploy IIoT/ what to do with the technology. Therefore understanding the technology first will enable us to design sustainable strategies for the long run.

Another important aspect to make manufacturing socially inclusive is via industry-academia partnership. This will generate a demand for innovation. Most manufacturing players have a good understanding of various systems and processes that need to be followed in their sectors, however, collaboration between industry and academia will bring the best of both worlds to an open platform.

Encouraging vocational education and training programs in partnership with educational institutes will ensure a continuous supply of highly qualified talent. This will also enable the students who could be

By Harish Maniyoor

NEW WAYS OF MACHINING TRANSMISSIONS

Harish Maniyoor, Global Product Manager, Automotive, Sandvik Coromant, explains how three new ways of machining transmissions can help manufacturers do more with less



Transmissions for electric vehicles (EVs) must be hard-wearing to withstand higher rpms and are tougher to machine as a result.

The definition of insanity is the repetition of the same action and expecting better results. This could apply to machining gear components, around which the landscape is changing and demand for cost-reduction is rife.

Machine shops have faced variable high and low-demand scenarios during the COVID-19 pandemic. However, whatever their circumstances, cost-cutting remains a priority. Take the machining of gears. Manufacturers want more flexibility in gear machining, but achieving this while reducing costs is not straightforward. Traditionally, projects that involved machining gears would depend on special machines and processes, especially in mass production. This means limitations — and often higher costs — in the production process.



Manufacturers want more flexibility in gear machining, but achieving this while reducing costs is not straightforward

Three new ways of machining transmissions that make getting beyond these limitations possible. Moreover, these advantages go beyond automotive into areas like general engineering, wind power, aerospace and even robotics.

POWER SKIVING

Power skiving is a rotary cutting technique where the tool meshes with the gear being made. The continuous cutting process enables all machining to be carried out in one single set-up. In essence, it combines hobbing and shaping, and the intersecting angle between tool and gear axis and the revolution speed is decisive for productivity.

Power skiving has been around for more than thirty years — so, why am I talking about it in an article on new ways of machining transmissions? Because, the machining landscape is changing in ways that will affect a variety of sectors — including manufacturing transmissions for electric vehicles (EVs). Let me explain.

ELECTRIC VEHICLES

The received wisdom used to be that EVs don't need multiple gears or transmissions. But this view has changed, and the likes of Tesla and Porsche are rolling-out multi-gear EVs. Electric motors achieve much higher revs per minute (rpm) than conventional cars — 20,000 rpm in electric motors versus just 4,000 to 6,000 rpm in conventional combustion engines. So, a reduction gearbox is needed to reduce these rpms to a manageable level.

These EV transmissions also must be hard-wearing to withstand higher rpms and are tougher to machine as a result. Less obvious is that, when producing these parts, manufacturers must focus on the metal removal rate, which expresses the speed of the machining of the workpiece.

Another major demand for EV transmissions is lower noise from the gearbox, since there is no noise from engine. This means producing components with tighter tolerances and entails more challenging machining.

So, the question for machine shops should be: is it fast productivity you're looking for, or something else? Such agility cannot depend on traditional transmission manufacturing processes. Instead, power skiving makes it possible to machine the complete component in a multi-task machine or machining centre, in a single set-up. This shortens production time, improves quality and reduces handling and logistics costs.

The advantages of power skiving were shown when

Sandvik Coromant was asked by a large automotive customer in Sweden to supply a component machining solutions. Working with the customer's automotive development team, the project proved that power skiving is possible with two 5-axis machines, using Sandvik Coromant's own CoroMill 180 indexable power skiving cutter. The CoroMill 180 is designed for high-output gear and spline production.

The customer achieved a better-than-expected cycle time. The customer had demanded it be within 14 minutes-per-component and achieved a cycle time of less than 1-minute-per-component.

AEROSPACE

The advantages of power skiving are not limited to automotive, but stretch into other sectors, including general engineering, wind turbines, aerospace and robotics. Aerospace is actually prioritizing cost reduction. The effects of the COVID-19 pandemic on the industry have reported extensively with Airbus reporting that its aircraft production rates have dropped by 30 per cent.

Like EVs, older aerospace engines are being upgraded for better performance and efficiency, so well see an evolution in their production. The flexibility of power skiving has much to offer here, such as in its ca-



Power skiving, with tools like CoroMill 180 indexable power skiving cutter, enables all machining to be carried out in one single set-up

the alumina coating layer. Each crystal points in the same direction — this can be seen at the microscopic level — which creates a strong barrier towards the cutting zone, giving the insert even higher wear resistance and longer tool life.

Like power skiving, inserts like GC4415 and GC4425 can deliver predictable wear — and therefore improve machine utilisation and cost savings. Again, the advantages go beyond automotive into general engineering, wind power aerospace, robotics — in fact, any application with a need for gear components.

Whatever the sector, the real advantages are improving metal removal rates, the ability to machine components with one machine in a single set-

up, and improved machine utilization. According to Sandvik Coromant's own findings, a twenty per cent increase in machine utilization can provide a ten per cent higher gross profit margin.

MAXIMIZED OUTPUT

Achieving these benefits requires more than using tools like the CoroMill 180. A wider ethos is also needed. That is where PrimeTurning comes into play.

The PrimeTurning methodology is based on the tool entering the component at the chuck, and removing material as it travels towards the end of the component — again, prioritising all-important metal removal rates. This allows for smaller entering angles, higher lead angles and higher cutting parameters. What's more, conventional tooling can be performed with the same tools, so machine shops can alternate traditional or new processes.

We believe that some applications could see productivity increases over fifty per cent with PrimeTurning. This is aided our CoroPlus Tool Path software which supplies programming codes and techniques to set up parameters and variables that maximize output.

Whether your answer lies in power skiving, new carbide inserts or PrimeTurning, these new ways of machining can deliver improvements to manufacturers' processes and most importantly, their bottom lines. Using these methods, machine shops can break away from doing the same old thing and ensure the price of change really is worth it. 



These EV transmissions also must be hard-wearing to withstand higher rpms and are tougher to machine as a result

pability to machine close to shoulders, allowing greater freedom in component design. As aerospace components are made from tougher materials, this can require tougher inserts.

This includes launching a pair of new ISO P-turning carbide insert grades for steel turning, GC4415 and GC4425 to its range. Their names apply to the ISO P15 and P25 application area, which refers to the demands that different working conditions impose on machining parameters. Each are designed to deliver improved wear resistance, heat resistance and toughness.

The inserts contain second-generation Inveio technology, with a uni-directional crystal orientation in

By Kruti Bharadva

THE BEST BRANDS IN METAL CUTTING & FORMING

Lets have a look at the list of brands felicitated at the Best Brands in Metal Cutting and Forming, 2021, and a comprehensive best brands list compiled through market research done by BMGI India

Ace Micromatic Group

Ace Designers Ltd: They are an undisputed market leader in India for last three decades in the CNC turning segment. The company is led by three experienced design engineers and powered by a dynamic team of more than 500 members

Acemicromatic Manufacturing Intelligence Technologies: which is popularly known as AMIT. The company's software is aimed at delivering greater operational excellence and productivity.

It aspires to be the global leader in providing innovative productivity solutions for manufacturing

Ace Manufacturing Systems Limited: Popularly known as AMSL. It is one of the largest manufacturers of Machining Centre's in India. The company has expertise in manufacturing of CNC vertical machining centers, CNC horizontal machining centers and in providing manufacturing solutions centered around these products

Micromatic Grinding Technologies: Also known as MGT. Starting in a rented shed, MGT now has three plants at Ghaziabad and one plant in Bangalore. Over the years, MGT has strived to build an organization with the motto of "Becoming the Best"

Bharat Fritz Werner: They are India's leading solution provider of machine tools. They are manufacturer of

THE ECONOMIC TIMES



THE ECONOMIC TIMES



horizontal machining centers, vertical machining centers, horizontal turning centers, vertical turning centers, multi-process technologies, five axes simultaneous machines, special machines and customized solutions
Ceratizit India Pvt. Ltd: For over 95 years, Ceratizit has been developing and producing sophisticated hard material cutting and wear protection solutions.

This includes solutions from highly specialized cutting tools, indexable inserts and carbide rods to new types of carbide and cermet grades for wood and stone working
Chiron Group SE: A global company headquartered in Germany, It's represented in India by Chiron India Machine Tools Pvt. Ltd, established in 2011 in Bangalore. Chiron is specializing in CNC vertical milling and mill-turn machining centers, as well as turnkey manufacturing solutions, which supports all the pre-sales and after sales service activities of Chiron Group Products sold in India

Cosmos Impex India Pvt Ltd: Cosmos offers a wide range of latest machine tools. They believe in making a significant difference to their customers by improving their technology and productivity

ExxonMobil Lubricants Pvt Ltd: They are a pioneer in lubrication technology helping the Indian manufacturing companies to increase their productivity and profitability goals. With a legacy of over 120 years in India, Mobil has become a byword for lubricants. Mobil has a deep knowledge of its customers and their needs – it works directly with more than 6,000 OEMs to understand new industry trends and technologies. Mobil lubricants are formulated to meet the requirements for precision, protection and performance. In addition to providing cutting edge lubricants, Mobil provides a host of services to help save time and money, while boosting equipment reliability and productivity. In its endeavour to help India achieve its 'aatmanirbhar'



mission in manufacturing, Mobil has been working closely with industries to give them a competitive edge.

Forbes & Company Limited: The company manufactures precision engineering tools under the brand name Totem for threading, milling, drilling, and deburring for industrial applications. With three state-of-the-art manufacturing facilities, Forbes is considered one of the manufacturing giants in the cutting tools business.

igus (India) Private Limited: The motion plastics specialist. igus operations in India started in 1998 with headquarters in Bangalore. The company undertakes turnkey projects in moving cable management system in numerous industries including material handling, power plants, defence and automation.

Jyoti CNC Automation Ltd: It is the largest one-stop solution for computerized machine cutting tools. The company's products are manufactured and assembled locally with a customer centric approach. Jyoti caters to the wide range of industries including automobile, aerospace, allied machinery, agriculture, defence, medical equipment, etc.

KENNAME TAL: They entered India in the year 2002 and since then have become one of the leading metal cutting brands in India. It has been a brand of choice for customers who look for performance and premium services allied with improvement in productivity and reduction in total cost of manufacturing.

Lakshmi Machine Works Limited: LMW collaborated with Japan's Mori Seiki Co. Ltd to establish the Machine Tool Division, which is the first of its kind plant in India to manufacture CNC Lathes, Machining Centers and Turn Mill Centers. Till to date they have supplied more than 20,000+ CNC lathes and machining centers with 50 Products & 88 Variants to a wide customer base.

LVD Strippit India Pvt Ltd: LVD has been headquartered in Bangalore as Headquarter for more than a decade and has been a leading brand in the sheet metal forming technology. LVD has grown to become a technology leader and global source of state-of-the-art sheet metalworking solutions.

MMC Hardmetal India Pvt Ltd: A subsidiary Of Mit-subishi Materials, the company's product portfolio includes a variety of cutting tools meant for metal working solutions like turning, milling, drilling etc. These tooling solutions are developed to serve sectors like automotive, aerospace, energy, medical, die & mould and general engineering.

MotulTech: MotulTech is the industrial lubricants division of the Motul group. In India, MotulTech develops and manufactures specific high-performance product ranges for the metal working industry. The company also offers industrial and specialty lubrication.

Murata Machinery Ltd: Murata's roots in the sheet metal machinery department can be traced back to 1970. Since then, it has pursued product development and released new products one after another, including plasma-ark combined machines and laser combined machines, and also construction of large-scale flexible manufacturing systems.

ET BEST BRANDS IN METAL CUTTING AND FORMING FOR 2020

ABB India Ltd
ACC (Advanced Cutting Company)
Accurate Engineering Company FM. Ltd
Acumac Machine Tools Pvt. Ltd
Ahno (Suzhou) Cutting Tools Co., Ltd.
Amada Machine Tool
American Broach & Machine Company
Andy Machine Tools
API (Automated Precision Inc)
Autodesk India Pvt Ltd
Baker Gauges India Pvt Ltd
Barliboi Ltd
Bharat Fritz Werner Ltd
Bhavya Machine Tools
BIG Kaiser
Bosch
Bourn & Koch
Broaching Machine Specialities (BMS)
Brother International India Pvt. Ltd
Carl Zeiss India (Bangalore) Pvt. Ltd
Ceratizit India Pvt Ltd
Chiron Group SE
Circle Machinery India
Citizen Machinery
CNC India Tools & Services Pvt. Ltd
Comau
Creaform
Danobat Grupo Machine Tools India
DMG Mori
Doosan Machine Tools India Pvt, Ltd.
DVS Technology Group
ECM Technologies
Eley Metrology
EMAG INDIA Pvt. Ltd
Emkay Tools
Empire Machine Tools (MCAT - Metal Cutting and Allied Technologies Division)
Fagor Automation
FANUC
Feidadrills
Felsomat USA Inc.
Flexbar
Flow International
Francis Klein
GDW Werkzeumaschinen – Herzogenaurach GmbH
GF Machining Solutions
Gleason Works (India) Pvt. Ltd
Grauer and Weil (India) Limited
Guhring
Guindy Machine Tools
Gujarat Lathe Manufacturing Company Pvt. Ltd
H.P. Singh Machinery Pvt.Ltd
Haas Automation
Haco
Hans-Juergen Geiger Maschinen-Vertrieb GmbH
HCL Technologies Ltd
Heller India Pvt. Ltd/Gebr Heller
Hexagon Metrology

HMT Machine Tools Ltd.
Hoffmann Quality Tools India Pvt. Ltd
Holroyd Precision Ltd
Hyundai Wia India Pvt. Ltd.
Ingersoll Machine Tools
Involute Gear & Machinery Company
ISCAR India Pvt Ltd
Italian Technology Center - ITC
Jyoti CNC Automation Ltd
Kennametal India Ltd.
Klüber Lubrication
KMT Waterjet
Komatsu Machine
Komet Precision Tools India Pvt Ltd / Ceratizit Group
KörberSchleifring
Lagun Milling Machines (Part of Maher Holding)
Lakshmi Machine Works Ltd.
Liebherr Machine Tools India Pvt. Ltd.
LK Metrology
LMT Tools India Pvt Ltd
Lokesh Machines Ltd.
Machine Tools India Ltd
Macpower CNC Machines Pvt Lid
Maher Holding
Mahr Metrology India Pvt Ltd
Makino India Pvt. Ltd
Marposs India Pvt Ltd
Marshall Machines Limited
MAZAK INDIA
Micromatic Machine Tools Pvt. Ltd
Micron
Microtek Grinding Machines Pvt. Ltd
Nimble Machines (part of UCAM pvt ltd)
OKUMA INDIA
Phillips Machine Tools India Pvt Ltd
Pinnacle Engineering Enterprise
PMT Machines Ltd
Precihole Machine Tools Pvt. Ltd
Premier Ltd.
Reishauer
Renishaw Metrology Systems
Sandvik Coromant
SCT (part of KSG group)
Setco Spindles India Pvt Ltd
Sparkonix
SPM Tools
Starrag Heckert
Sumitomo
Suntech Landriani Machine Tools Pvt. Ltd
Taegutec
Toshiba Machine (Chennai) Pvt. Ltd
Tussor Machine Tools India Pvt. Ltd (Coimbatore)/ Pinacho (Spain)
Union Tool
Walter
Wendt (India) Ltd - JV Wendt Germany
Widia
Wohlhafter GmbH

Pro-Arc Welding & Cutting Systems Pvt. Ltd: They are market leaders in the manufacturing of high-tech CNC machines for metal forming applications. Their product range includes CNC plasma cutting, laser cutting and welding, gas cutting and drilling machines. A customer centric approach with strict focus on quality drives Pro-Arc in delivering cutting edge products to the Indian and global markets

Rajamane Industries: Rajamane was established in the year 1975 for the manufacture of coolant pump for the machine tool industry. Starting with three models, today the company produces over 100+ models to meet the various industry needs namely machine tool, printing, packing, filtration and chemical

S&T Machinery Pvt Ltd: Located in Coimbatore S&T provides world-class machining solutions through its comprehensive range of machining centers and grinding solutions to customers in India. S&T is flexible in terms of service and is planning to come up with horizontal machining centers and five axis machines

SLTL Group (Sahajanand Laser Technology Limited): As a technology driven group of companies, it undertakes manufacturing of solutions in the fields of laser systems, medical, diamond & jewellery, rf & microwave, renewable energy machine tools

Sphoorti Machine Tools Pvt Ltd: Established in 1996, Sphoorti is specialised in the manufacturing of a variety of slotted tool discs and holders for CNC turning centers and turn mill centers. Today, its exports more than 15 countries around the world. it is a leading Indian player in this segment

Trishul Machine Tools Pvt Ltd: The company offers a wide variety of advanced Polygon Turning Machines well known for their high precision cutting and reliability. Polygon forms can be achieved by their highly advanced and Artificially Intelligent TPT Series of machines

TruCut Precision Tools Pvt Ltd: They are the manufacturers and exporter of metal cutting tools for automotive / aerospace/ die & mold & precision engineering – industries

TYROLIT India Superabrasive Tools Pvt Ltd: The family-run TYROLIT Company has been synonymous with superior quality, innovative spirit and outstanding service since 1919. They combine the strengths of being a part of the dynamic Swarovski Group with a century's worth of individual corporate and technological experience

WIDIA: This brand has been a cutting tool brand of choice for Customers for the last 54 years in India. The Brand continues to manufacture a broad range of cutting tools at global manufacturing sites, including modernized facilities in India

WIDMA: WIDMA Machining Solutions Group was established in 1984 as a brand of Kennametal, it is a proud "Make-in-India" designer-&-supplier of world class machinery a complete machining solutions provider with mastery in machines, fixtures & tooling 

By Dr. Jairam Varadaraj

ONWARDS INTO THE FUTURE

When the global humanitarian and economic crisis that is COVID-19 unleashed its wrath across the world, individuals and companies, alike, had to change how they live and work, overnight. Here is a look at leveraging the precious lessons learnt

When the global humanitarian and economic crisis that is COVID-19 unleashed its wrath across the world, individuals and companies, alike, had to change how they live and work, overnight. With millions of people in complete or partial lockdowns, the pandemic forced societies to quickly and dramatically change how work happens, how people communicate, socialize and consume products and services. The impact of COVID-19 on customer behavior was far-reaching and instantaneous. Spending across most industries plummeted, purchases shifted from traditional to digital channels, and public safety became top priority.

The pandemic's impact on the manufacturing industry was extraordinary. Initial forecasts by the IMF indicated that the pandemic would cost the world \$28 trillion in lost output over the next five years. Business elements were challenged – from ensuring an effective crisis response, managing supply-chain disruptions, ensuring customer needs were met, to safeguarding the well-being of employees while adjusting daily working practices. For the first time in manufacturing history, demand, supply, and workforce availability were affected globally, and what's more, at the very same time. Every major manufacturer experienced disruptions across their supply chains of parts and raw materials, driven by the volatility of supply everywhere. The lockdowns, coupled with social distancing protocol and employee safety measures put an additional level of pressure on manufacturers, as over an estimated fifty per cent of the workforce was unable to perform functions on-site.

ON THE GROUND REALITIES

However, the manufacturing sector proved to be far more resilient than predicted; while Q1 was sluggish



Agility and resilience took center stage as, despite the challenges, employees across the world endeavored to remain fully operational while adhering to social distancing and remote-working

worldwide, things did begin to look up in Q2, not just in India, but across the world, signaling an improvement in economic activity. Demand rose in specific sectors spanning pharmaceuticals, food processing, construction, medical equipment, and general engineering, as manufacturers adapted their product lines to meet demand volatility. To cite our example, industries across critical sectors such as healthcare, hospitals, food & beverage, and pharmaceutical plants, witnessed significant demand for air compressors. While some companies that provided essential goods such as pharmaceuticals, paper, food & beverages, etc struggled to surmount challenges to meet the demand driven by panic buying. Others experienced significant drops in demand, which led to extreme pressure to reduce operational costs.

Agility and resilience took center stage as, despite the challenges, employees across the world endeavored to remain fully operational while adhering to social distancing and remote-working where possible. Sales teams dispelled traditional notions that sales can only be carried out face-to-face; instead, they quickly adopted virtual methods to engage with their customers, reach new audiences, all while continuing to grow. Doing business differently also led to a reduction in fixed costs, primarily travel-related, as organizations realized all those long commutes weren't as essential as they thought they were. We also witnessed 'virtual shifts' wherein remotely connected workers augmented on-site personnel with real-time data using AI and collaborative project management tools. Take us for example, despite several challenges, our sales and service teams worldwide remained operational, and for those whose work required them to be onsite, safety policies and practices were institutionalized ensuring both workforce health and productivity.

THE LESSONS LEARNT

If coronavirus has taught us one thing, it's that it's never too early to invest in people, products, processes, and technology that will ensure optimal financial performance in times of heavy disruption.

For one, during some of the most uncertain times caused by the pandemic, it was the strength and re-

silience of our people that saw us through testing times. Even during the restrictive lockdowns, our teams across the world never faltered for a minute in their focused approach to creating value for the customer. Our people are most definitely our biggest asset. And investing in their well-being while saving human capital, ahead of productivity, is the most crucial task.

Second, as the pandemic unfolded, companies that did have a global footprint with a broad customer base across countries, saw their risk spread out while they weathered regional challenges in the short run. Take our case, for instance – over the last few years, a consistent, aggressive focus on pursuing a globalized business strategy has enabled a significant shift in the contribution of our global markets to our revenue. During the first quarter of this year, India contributed to about 40 per cent of the revenue whereas the rest of the world has contributed to 60 per cent, a first and significant shift in the contribution of our global markets to the revenue of the company.

Thirdly, technology and digital infrastructure assumed a critical role in keeping us connected during the crisis. You may argue that connectivity is a business given. However, the crisis tested an organization's ability to fast-track digital investments and strategies while embracing new ways of working via the use of technology.

INSTITUTIONALISING THE LESSONS LEARNED FROM COVID-19

Build technology that will enable competitiveness globally

Technology is, without doubt, an enabler encouraging manufacturing organizations to move up the value chain and ensure that both future disruptions and crises are navigated more efficiently. True economic recovery will be driven by manufacturers who use technology to augment human creativity.

During the pandemic, we witnessed the need for production flexibility with renewed urgency. Flexibility from over-dependence on workers with specific skills and flexibility to shift production as per customer demand. For example, we've recently installed collaborative robots that work in partnership with our employees in production. Our largest compressors require specifically skilled labor and to protect against future crises we've installed semi-autonomous production



lines which have reduced the reliance on specifically skilled employees. These measures have paid dividends during the pandemic which restricted the number of employees that could safely work in our production lines.

Build experiencing

The pandemic has amplified the importance of digital channels, especially for businesses who ordinarily interact with customers on a face-to-face basis. It has also accelerated the evolution of digital user interfaces resulting in the need to redefine omnichannel

strategy to create unique, compelling customer experiences. To win in the new reality, manufacturing organizations will need to identify the current behaviors that will define customer experience. Three priorities will define the customer experience in the post-pandemic era: safe and contactless engagement, on-time, dynamic customer insights, and digital excellence.

Build quality that is world-class

That quality, or meeting/exceeding customer expectations, every day, every shipment, in each product, year after year, is key to increasing market share, is a well-known fact. But when faced with a crisis of this sort, quality becomes the sine qua non to achieving the necessary sustainable advantage an organization needs to succeed.. And the secret sauce by which an organization can build an intrinsic focus on quality and develop a sustainable competitive advantage in the market is via the adoption and implementation of deliberate organizational processes such as TQM.

Protect the financial wellbeing of people and their growth

People focused, well-being initiatives will become an essential part of every organization's ammunition – not only for attracting and retaining talent but also for demonstrating a commitment to every employees' health and safety.

To conclude, 2021 will epitomize the new possible. Individuals, businesses, and our society will start looking forward to shaping the future rather than just contending with the uncertain present. Perhaps this evolution has seen us scramble to adapt under intense pressure. But I firmly believe that we have, every step of the way moved from reacting to myriad obstacles to building and institutionalizing what we've done well so far. Onwards and upwards to the future. 

By Kruti Bharadva

A STEP FURTHER IN METALWORKING

We are witnessing serious upheaval with far-reaching effects on manufacturing. NEOLOGIQ provides the answers to typical questions that modern metalworking faces today due to the latest changes in technology

Several years ago, ISCAR launched a unique and innovative LOGIQ product line – a campaign that brought new families of cutting tools to the world market. These families were designed to address challenges in metalworking industries, from increasing productivity to finding cost-effective indexable alternatives to small-in-diameter solid carbide tools. Today, ISCAR introduces NEOLOGIQ, a logical extension to the previous campaign comprising of an entire range of advanced products and technological solutions for metal cutting tools - a quantum leap in the field.

ISCAR believes that NEOLOGIQ provides the answers to typical questions that modern metalworking faces today due to the latest changes in technology. Today, we are witnessing serious upheaval with far-reaching effects on manufacturing. A distinct course for electric and hybrid cars will lead to a gradual abandonment of traditional cars with an internal combustion engine and a lot of parts that need to be machined.

A rise of accurate metal shaping methods, such as precision investment casting, precision forging, and 3D printing, which are all capable of shaping a part very close to its final profile, significantly diminishes the stock that is traditionally intended for chip-removal processes. A logical result of this is the considerably reduced share of machining operations in a part manufacturing cycle and this trend is already noticeable in the market today. Does it mean that a few good metalworking shops, factories, or even whole branches will abandon machining? Of course not, but the requirements for machining operations in engineering processes will be changed. The role of productive and accurate cutting with a small allowance at high speeds and feeds will substantially grow, and metalworking industries will require a wide range of suitable tools that are expected to be more precise and

durable.

Digitized manufacturing, which is dictated by INDUSTRY 4.0 momentum, has its own demand and expects a new level of a cutting tool “intellect” to be suitable for smart manufacturing. In preparing for the upcoming changes, ISCAR considers NEOLOGIQ as the next logical step to the cutting tool for the smart factory. ‘Machining with no Boundaries’ is the motto of ISCAR’s NEOLOGIQ products.

LOGICAL MILLING

High feed milling (HFM), also referred to as fast feed milling, is considered a commonly used effective method for rough machining both complex and plane surfaces. ISCAR has an extremely wide range of HFM products to meet the requirements of a customer. However, even in this niche of products, there is place for new innovations.

LOGIQ4FEED, a family of high feed milling cutters carrying specific bone-shaped inserts, was enriched by new tools with greater insert sizes. These new tools have several features that substantially improve performance in high feed milling, especially when machining big cavities and pockets in steel parts.

Another HFM product that provides the customer with a reasonable cost saving solution is NEOFEED, a family of mills with square, double-sided inserts. This insert has 8 indexable cutting

edges to use on cemented carbide and a dovetail-shaped insert pocket that ensures reliable mounting to withstand heavy loads to enable higher cutting data and increased productivity. The progress in 5-axis machining and CAD/CAM systems opens new horizons for machining 3D surfaces using barrel-shaped endmills. Although such endmills are still not common in the metalworking industry, advanced accurate metal shaping methods will dramatically increase the demand



Figure 1: NEOFEED high feed milling cutter carries cost-effective inserts with 8 cutting edges.



Figure 2: Anti-vibration boring bars WHISPERLINE enable stable cutting with the overhang up to fourteen diameters.

for these barrel-shaped endmills. Therefore, the development of effective “cutting barrels” is one of ISCAR’s highest priorities. In the NEOLOGIQ product range, the barrel-shaped endmills are represented by two configurations: a solid carbide design and a MULTI-MASTER head. Combining MULTI-MASTER advantages with the precise barrel profile of a cutting-edge will result in a cost-effective and sustainable solution for finishing complex-shape surfaces by milling with minimum machining stock.

The MULTI-MASTER family has expanded the boundaries of its product range by introducing a new threaded connection size, T21, which enables increasing the nominal diameter of an exchangeable endmill head to 32 mm (1.25”).

INTELLIGENT TURNING

In internal turning, a boring bar is the main factor of tool rigidity. A large bar overhang to diameter ratio leads to the tool deflection and vibrations; and is the bane of machining accuracy and surface finish. WHISPERLINE, a family of anti-vibration boring bars, was developed to exceed the ratio bounds. These bars have a specially designed built-in absorber and a vibration-dampening mechanism that enables stable cutting with an overhang of up to 14 diameters.

WHISPERLINE bars are important elements of the new versatile modular system NEOMODU, providing a rich variety of assembly options for turning tools. A combination of different system units such as shanks, anti-vibration capsules, and interchangeable heads with indexable carbide inserts result in a tool assembly, which is maximally customized to a specific application. The shanks may be cylindrical, square, or with a polygon taper interface in accordance with ISO 26623 standard.

Speaking of new turning products, one cannot pass the XNMG insert. It is a beneficial combination of two famous ISO rhombic insert shapes: CNMG and

DNMG inserts with 80° and 55° including angles. This intelligent integration resulted in the XNMG 70° angle insert that features improved clearance and ramping angles, when compared to the CNMG, and strengthened cutting corners against DNMG. The advantages of the new insert are visible in efficient multi-directional turning applications. The cartridges carrying insert XNMG, which are intended for mounting on NEO-MODU units, are available as well.

COMPETENT PARTING

ISCAR began its leadership with just parting tools. That is why every company’s innovation in parting gains special interest.

Adapters and holders occupy a prominent place among ISCAR’s NEOLOGIQ parting products. The concept of the LOGIQFGRIP family is based on a 4-pocket adapter that is clamped in a reinforced tool block. High rigidity of such an assembly in combination with an inner high-pressure coolant supply (HPC) option facilitates productive cutting with extremely high feed rates.

In parting, one of the secrets to success is well-directed high-pressure cooling. If an adaptor has no HPC channels, mounting a specially designed crown-shaped accessory pushes the boundaries of application limits and enables effective pinpointed coolant flow to the active cutting edge of an insert.

Growing capabilities of modern multitasking machines and turning centers pushed the common boundaries of cutting strategies. Particularly, they brought the method of efficient turning along Y-axis. In quite a few cases, it is a worthy alternative to the traditional X-axis machining. In Y-axis turning, the dissipation of cutting force components is more favorable, and the main load is directed to a holder. The cutting process



Figure 3: A JETCROWN accessory provides pinpointed high-pressure coolant, maximizing productivity in parting.



Figure 4: Helical flutes with variable helix angle in a LOGIQCAM drill body improve the dynamic behavior of the drill and increase the drilling depth to eight drill diameters.

becomes more stable, and this facilitates increasing cutting data to improve productivity. Therefore, providing appropriate cutting tools for turning operations along the Y-axis is one of the central points of NEOLOGIQ.

LOGIQGRIP, a new Y-axis parting modular system enables vibration-free machining with high-efficiency. A wide range of exchangeable TAGPAD-T adapters for inserts ensures the exceptional versatility of the system.

EFFICIENT HOLEMAKING

One of the more impressive product lines introduced in the LOGIQ campaign is LOGIQCHAM, a family of

drills with replaceable carbide heads and three cutting edges, providing an effective tool for significantly increasing productivity for drilling depths up to five drill diameters.

In drilling, especially in drilling deep holes, efficient chip evacuation is extremely important. It is not enough to optimize chip control by an advanced design of the head geometry. The flute shape should ensure seamless chip flow. Undoubtedly, the need to organize three grooves weakens the body: when comparing a two-helical-flute drill of the same diameter, the three-flute body is less rigid. When the depth grows, longitudinal vibrations may occur, and this reduces tool life and adversely affects the accuracy and roughness of a machined hole. It was the decrease in stiffness that determined the barrier for the drilling depth and limiting it by five diameters maximum.

A new design of the three-flute drill body is based on a variable flute helix angle. Such a concept considerably improves the dynamic behavior of the drill and results in expanding the drilling depth boundaries: the maximum depth can now reach eight diameters.

The metalworking community faces new challenges and must find the shortest way to get out of the maze. ISCAR believes that new innovative solutions, which take machining to a whole new level, can become the new "Ariadne's thread". NEOLOGIQ, a logic of development for a new range of tools, has expanded the boundaries of intelligent machining. 

CONTINENTAL EMBRACES SUSTAINABILITY

As of fiscal 2020, Continental procures all the electricity for its production sites from renewable energy sources. This is the clear conclusion reached in a reasonable assurance report by auditor KPMG. By purchasing approximately four million megawatt-hours (MWh) of green energy, Continental reduced its own direct and indirect global CO2 emissions by 70 per cent from around 3.2 million metric tons in 2019 to 0.99 million metric tons in 2020. All relevant renewable energy sources such as water, sun and wind were used. "Sustainable business is the future. With our ambitious goals, we are decisively pursuing the transformation to a sustainable economy," says Dr. Ariane Reinhart, who is responsible for sustainability within Continental's Executive Board. "We are delighted by this objective validation of our work. The result of the audit shows that we take our sustainability ambitions seriously and are meeting the targets we have set ourselves."

Clear traceability of green electricity to each source Continental applies strict standards to achieve its am-

bitious sustainability goals. To ensure that green is not only green in theory but also in practice, the technology company relies on self-generated energy, specially designed green power purchase agreements and so-called energy attribute certificates (EACs). These certify from which sources and from which locations the green electricity originates. Only in a few exceptional cases were energy attribute certificates obtained in 2020 from countries that were directly connected to the electricity grid of the country in which the electricity was consumed, for example because no accepted certificate system was available locally that met Continental's strict criteria. If there is no direct connection between the countries, Continental purchases energy attribute certificates from the nearest neighbouring country.

Continental bases the quality characteristics of its energy attribute certificates on the criteria of the RE100 initiative, which the company joined in June 2020. RE100 is a worldwide alliance of companies that have set themselves the goal of using only green electricity in the future.

By Kruti Bharadva

A NEW EV SCOOTER

Simple Energy is an Electric Vehicle (EV) start-up that focuses mainly on range anxiety, charging time and affordability. The company used Dassault Systèmes 3DEXPERIENCE platform on the cloud to create a digital mock-up of the vehicle exterior and develop the electric two-wheeler

Dassault Systèmes announced that Bangalore based Simple Energy, an electric vehicle (EV) startup, has deployed the 3DEXPERIENCE platform on the cloud through value added partner, EDS Technologies. Simple Energy was part of the SOLIDWORKS for Entrepreneurs program before migrating to SOLIDWORKS applications for designing the electric scooter through value added partner, Best Engineering Aids & Consultancies. Simple Energy regulated project management for designing and manufacturing their first electric scooter, Simple Mark 2, through design and governance applications based on the 3DEXPERIENCE platform.

Simple Energy focuses on R&D and works closely with stakeholders to launch new affordable EV scooters catering to students, professionals and in tier 2 and 3 cities in India. The company adopted the 3DEXPERIENCE platform on the cloud to address the current challenges about insights in all disciplines, improve collaboration, and visualize 3D design with real-time simulation. The 3DEXPERIENCE platform helped Simple Energy to collaborate and streamline the design



be done in-house and made in India to manage costs. Our team with the technical knowhow needed a platform to integrate a comprehensive and real-time collaborative view on product engineering, simulation and manufacturing,” said Suhas Rajkumar, Founder & CEO, Simple Energy. “Dassault Systèmes’ 3DEXPERIENCE platform on the cloud and brand applications like SOLIDWORKS and CATIA enabled us to work remotely and collaboratively developing a digital mock-up of the complete vehicle with real-time simulation and real-time engagement with the suppliers and manufacturing teams. Furthermore, the community helps us connect with innovative global companies in EV technology to understand, adopt and customise the best practices of EV development.”

“Globally we see successful start-ups are integrating mechanical engineering, systems engineering, electronics engineering and creating EV platforms for mobility of the future. This is an interesting shift in India too as more and more companies are emerging in traditional industries integrating technology and business experience platforms. The future business leaders are today’s start-ups and we have a complete program for start-ups to conceptualise, design, engineer, manufacture, produce and assemble and even digitize sales and marketing activities,” said Deepak NG, Managing Director, India, Dassault Systèmes. “We want to be a preferred business transformation partner for companies like Simple Energy in domains that will define the consumer experience in mobility of the future.” 

//

The company designed Simple Mark 2, the vehicle exteriors, and developed a digital mock-up of the electric two-wheelers leveraging SOLIDWORKS and CATIA applications

process as per production and manufacturing requirements, thereby reducing costs. The company designed Simple Mark 2, the vehicle exteriors, and developed a digital mock-up of the electric two-wheelers leveraging SOLIDWORKS and CATIA applications with the aim of starting production from June 2021 and deliveries starting September 2021.

“We at Simple Energy aim to provide eco-friendly two-wheelers in the budget segment for college students and IT professionals without compromising on the features. Therefore every aspect of design of components, chassis and battery development et al, has to

E-SPOOL FLEX FOR CONTINUOUS PANEL FEED

A control panel forms the robot's control centre. If it is to be used flexibly, its cable must be not only several metres long, but also movable and safely stowed. To this end, igus has developed the e-spool flex. The new igus cable reel has no slip ring, so it can even supply bus signals with no interruptions. The cable can also be easily retrofitted into the system. These advantages won ARAGON over. It offers a complete cable set, consisting of e-spool flex with a standard cable and a pre-assembled panel mount, as a service for its industrial robots.

The task of ARAGON Industrielektronik GmbH is to breathe new life into old robots. The leading industrial robotics provider offers global solutions for repairing, maintaining, retrofitting and tuning industrial robots. Some of its customers are relatively small companies that use up to ten robot systems. But larger companies and OEMs in the automotive industry also rely on ARAGON's expertise. The company was looking for a practical cable solution specifically for use in control panels: "We are always trying to ensure our customers' safety with innovative solutions. Until now, the cable was always on the floor, which made it easy to damage or trip over. So we went looking for a cable reel that had no interruptions and was quick and easy to retrofit", says Iryna Geike, Global Country Manager at ARAGON.

The company found what it was looking for in igus. "The new e-spool flex cable reel system was introduced to us and won us over immediately", Geike recalls. The



major advantages of the e-spool flex over other cable reels is that it does not use a slip ring. Media, data, and the power and signal supply for the emergency stop button can also be integrated into the system. Existing panel cables can simply be inserted into the system's spiral guide and are automatically rolled up. "Our customers now receive a pre-assembled set consisting of the e-spool flex, ARAGON panel mount, cable, and a robot control cabinet mounting bracket for their control panels. The e-spool flex greatly extends the service life of the cable used and ensures more safety and order in the control panel," Geike explains.

igus offers the e-spool flex in several variants. One is a low-cost version with a manual turner or a cordless screwdriver to wind up the cable. Another is an automatic solution with a spring-driven return mechanism, a locking mechanism, and an optional retraction brake. ARAGON decided on the variant with the retaining spring. The cable roller is available in three sizes for cables with diameters of 5 to 15 millimetres and extension lengths of 5 to 15 metres. Cables can be replaced quickly at any time. In addition to subsequent integration of the e-spool flex into an existing cable system, igus offers the cable reel solution fully harnessed with chainflex cables specifically designed for moving applications. Cable durability in the e-spool flex is currently being extensively tested in the in-house 3,800 square metre igus test laboratory.

For more information contact Kaushik Ramanujachar, kramanujachar@igus.net

GROOVING GROWTH CONTINUES

Dormer Pramet has expanded its GL assortment for parting-off and deep grooving applications with a range of tools, double-edged inserts and geometries. The additions provide new tooling options for small part machining and grooving with a shorter overhang. These support copy profiling and longitudinal turning in a variety of materials.

It follows the company's development of its parting-off and grooving range in November 2019, when the global manufacturer introduced the 25mm GL insert and the G8330 PVD grade to provide a versatile and stable option when machining steel, stainless steel and cast iron. These latest tools include new 12x12 holders to support additional radial operations, accommodating various insert widths and depth of cut capabilities. A reinforced brace design provides high rigidity and vibration resistance for good quality surface finish. Users can also benefit from set-up time savings due to an easily accessible clamping screw [30° angled] and a one-hand insert replacement feature.

The new Pramet tool holders include the universal GLSF (RL) EXT for an overhang of 24-32mm and the GLSF (RL) EXT-G for grooving operations with a 10-12mm overhang. The GLSF (RL) EXT-S is the shank tool option and suitable for small parts machining and Swiss lathes. The long GL insert, which achieves 60 per cent deeper capacity, over the previous LCMF16 insert, is also now available in two new geometries, GM and MM. Both feature a positive T-land for prolonged tool life due to low cutting forces and reduced risk of build-up



edge. With a round cutting edge, the MM geometry is suitable for turning and copy profiling operations, while the GM geometry is designed for grooving and longitudinal turning.

In addition, a range of wider inserts are available (up to 6mm) for small part machining.

Contact: Steve Hutton
Steve.hutton@dormerpramet.com

SAVING TIME IN DESIGN

Behind every electrical engineering project are many individual components and thus a whole collection of data: 2D/3D CAD data, data sheets, type sheets and certificates are all part of any decent documentation. “Comparatively more time is spent on article research and the collection, conversion and storage of related documents than on the design itself,” says Andreas Wedel, Director of Digital Transformation at the HARTING Technology Group. That is why he and his team are working on new functions that will facilitate the data management for HARTING’s products and solutions.

“Many of our customers still cling to old HARTING catalogues, not so much out of nostalgia, but because they are full of notes and bookmarks,” explains Wedel. “We wanted to make this practical way of working also possible in our online catalogue.” The option to add items to your own wish lists has been available in the HARTING eShop for a long time. A new option is to add own text notes for individual HARTING articles. These notes can be managed via the myHARTING customer portal and filtered for all the articles that have been noted.

Saving time with data packets

Additional functions are aimed at the rapid provision



of product data and documents that are necessary in the electrical design documentation. The design data, data sheets and type sheets for all individual components often add up to hundreds of documents. Previously, these often had to be downloaded from the provider (including from HARTING) in individual steps. Using the new data manager, product data for up to 50 HARTING articles can now be obtained in a single step from the HARTING website as a collected data packet.

Up until now, HARTING has provided design data for

its products in STEP and JT formats. In practice, however, significantly more formats are used. Thus, many HARTING customers still had to convert the data into their desired format. With the new MultiCAD download function, native 2D/3D CAD data are now available for download in over 50 different formats. This means that HARTING articles can be processed immediately in the desired data format for design purposes. This MultiCAD function is currently available for over 13,000 items in the HARTING online catalogue.

Contact: HARTING India Pvt Ltd
Ms. Ada Fung
Marketing Communications Manager,
Asia Pacific
New Delhi house
801, 8th floor, Connaught lane,
Barakhamba road, Delhi 110001
Phone: 011 40564860
Ada.Fung@HARTING.com
More information:
www.HARTING.com/IN

OPTIMIZED TAPPING TOOLS

Sandvik Coromant, is upgrading its range of tools for steel tapping operations with two updates to its solid round tools range. The next generation CoroTap T200 spiral point tap and T300 spiral flute tap for ISO P deliver improved process security, longer tool life and a reduced cost per component.

Part of Sandvik Coromant’s solid round tools offering, the CoroTap range delivers material-specific solutions for threading a variety of metals. In particular, the CoroTap T200 and T300 are optimized for ISO P1 and P2 steel workpiece materials, making them suitable for machining components in the automotive and general engineering industries. This includes crank shafts, steering knuckles, and general engineering components such as housings and flanges. Both tools are suitable for mass production.

The CoroTap T200 has a spiral point, while the T300 is a spiral flute tap. While the spiral point of the T200 is suited for machining through holes, where chips are pushed forwards, the T300 is catered to blind holes, where there is no exit hole and chips must be pulled backwards. As part of the upgrade, both tools have a new surface treatment, as well as improved edge round-



ing for better finishing inside the machined hole. An improved flute form also offers better overall performance.

As a result of these upgrades, manufacturers will benefit from improved process security with increased resistance to edge chipping, leading to fewer tool breakages and an improved quality of the machined thread. In addition, cutting speeds are higher than previous versions of

the tool and there is an overall reduction in the cost per part.

Another major difference compared to previous versions of the CoroTap range is the improved CoroTap T200 and T300 can benefit from Sandvik Coromant’s tailor made web assortment. Serving the industry with tailored manufacturing tools, the Tailor Made service gives customers the freedom to specify their own dimensions, without paying for a specialist tool. The taps can be adjusted to meet the demands of multiple industries and are adaptable to specific requirements.

“Performance case data demonstrates significant improvement for the tools,” explains Lisa Belfrage, Global Product Manager, Sandvik Coromant.

BESPOKE FIRE RESISTANT POLYMERS



As We get future ready for Electric Vehicles fire resistance for plastic components is gaining more attention.

We at APPL have just the right solution with Bespoke Fire-resistant Grades of Engineering Plastics and Thermoplastics Compounds.

Our High-performance FR Grades are made as per UL94 Flammability Ratings and Halogen free for certain applications.



Unlock your business dream with SIDBI's Credit Schemes



SPEED

Target Customers / Eligibility / Key Features

- New / Existing to SIDBI: upto ₹1/2 crore
- 3 years vintage and 2 years cash profits / stable sales
- No operating losses
- Greenfield allowed with co-borrower
- 100% finance based on 25% FD(interest bearing)
- No Immovable Security needed
- Attractive RoI 7.99 - 8.42% p.a. (as per rating)
- Repayment period of 2-5 years
- Quick turnaround time : sanction within 4 days of submitting complete information



SPEED PLUS

Target Customers / Eligibility / Key Features

- New / Existing to SIDBI: upto ₹ 2/3 crore
- 5 years vintage with min. sales of ₹ 5 crore
- 3 years cash profit/stable sales
- No operating losses in last 2 years
- 100% finance based on FD of 15% to 30% (interest bearing)
- No immovable security needed
- Attractive Interest rates:7.85% - 8.62%p.a. (as per rating):
- Repayment Period of 2-5 years
- Quick turnaround time: sanction within 4 days of submitting complete information



STAR

Target Customers / Eligibility / Key Features

- Across the segment coverage with ₹10 lakh to ₹250 lakh loan size.
- Vintage : New/Existing Customer - 3/2 years
- 2 years cash profits
- 100% finance based on FD of 15% to 25% (interest bearing)
- Very low collateral required (5% to 20%)
- Attractive Interest rates: 7.95% - 9.34% p.a. (as per rating)
- Repayment Period of 2-5 years

To know more, visit our nearest branch. Locate us at: www.sidbi.in

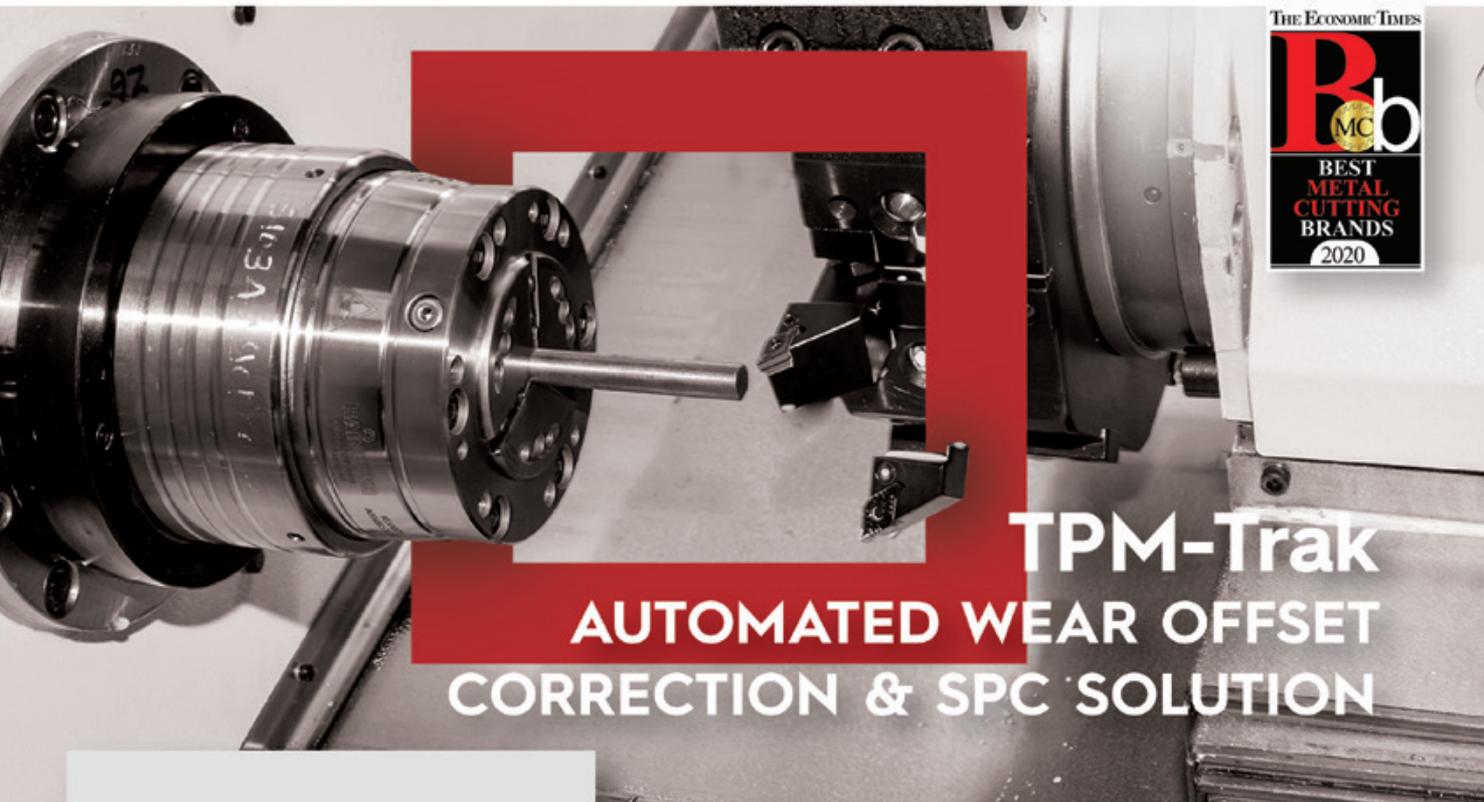
Follow us on  SIDBIOfficial  sidbiofficial  sidbiofficial  SIDBI Official

 SIDBI (Small Industries Development Bank of India)

Email : ccg@sidbi.in | Contact : 0522-4261642, 0522-4261674, 9811886384, 8080345526



To apply online, scan the QR code



TPM-Trak AUTOMATED WEAR OFFSET CORRECTION & SPC SOLUTION

Manually entering tool wear offsets are time-consuming and susceptible to operator error.

It can result in scrapped parts or machine damage and downtime.

Auto Wear Offset Correction Solution from **Amit, AceMicromatic Group** is designed to provide automatic wear offset corrections to CNC machines.

Ensure Quality At Source.
Eliminate Operator Intervention.



Interfaces directly with CNC control and Corrects Wear Offset values automatically.



Improve production quality and reduce machine downtime.



Generates X & R Charts and computes Process Capability values automatically.

ENQUIRE NOW

✉ salesmmt@acemicromatic.com
☎ +91 99720 92970 | +91 80 4020 0555

Scan code to Know More

