

THE MACHINIST

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A man in a dark blue suit, white shirt, and patterned tie stands in the foreground, smiling slightly. He is positioned in front of a large industrial facility, likely a truck manufacturing plant. In the background, several yellow trucks are visible on assembly lines, with complex metal structures and overhead cranes. The scene is brightly lit, suggesting an indoor factory environment.

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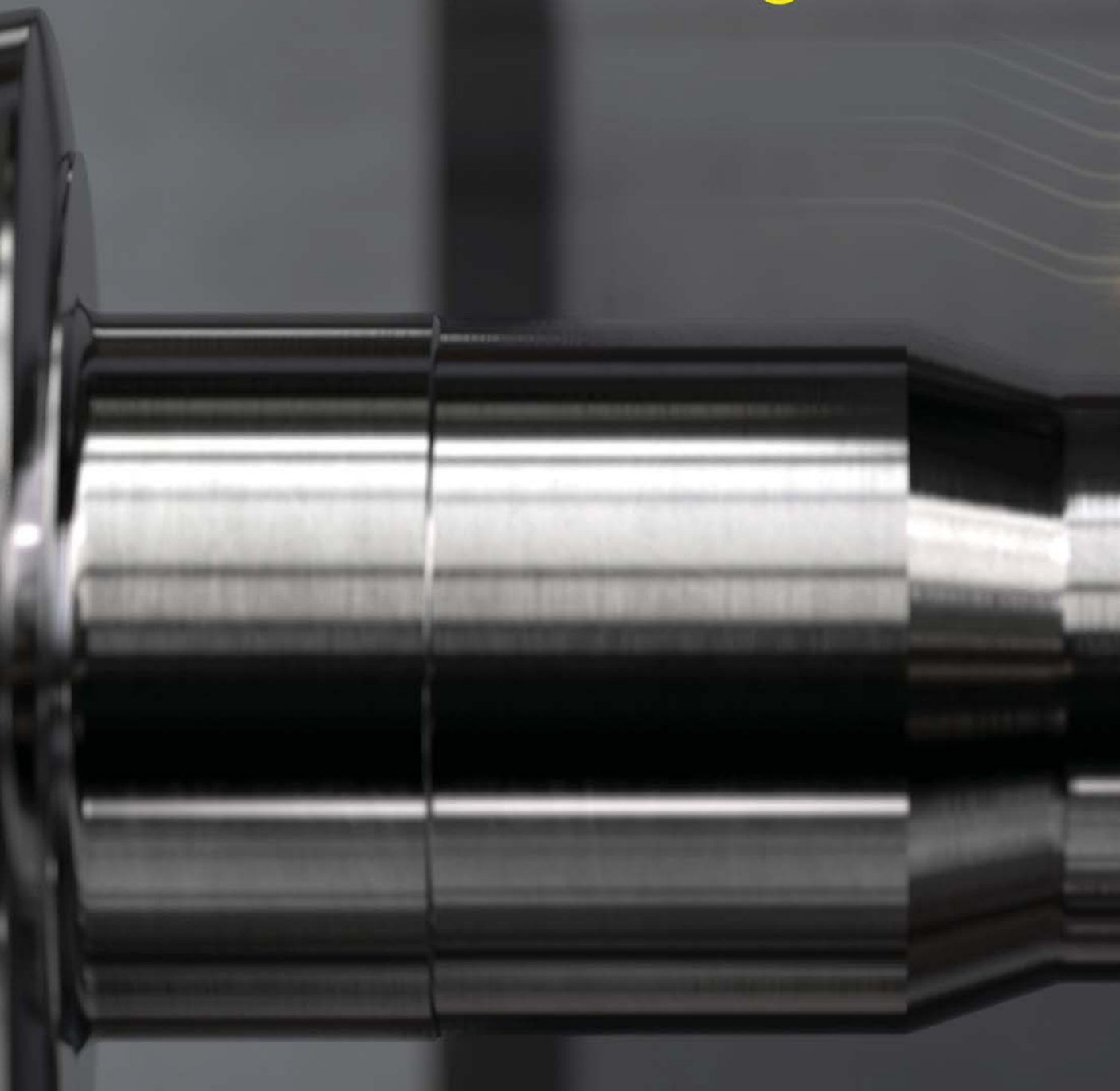
Joerg Mommertz says that MAN Trucks India will continue to develop its products to meet the market demands

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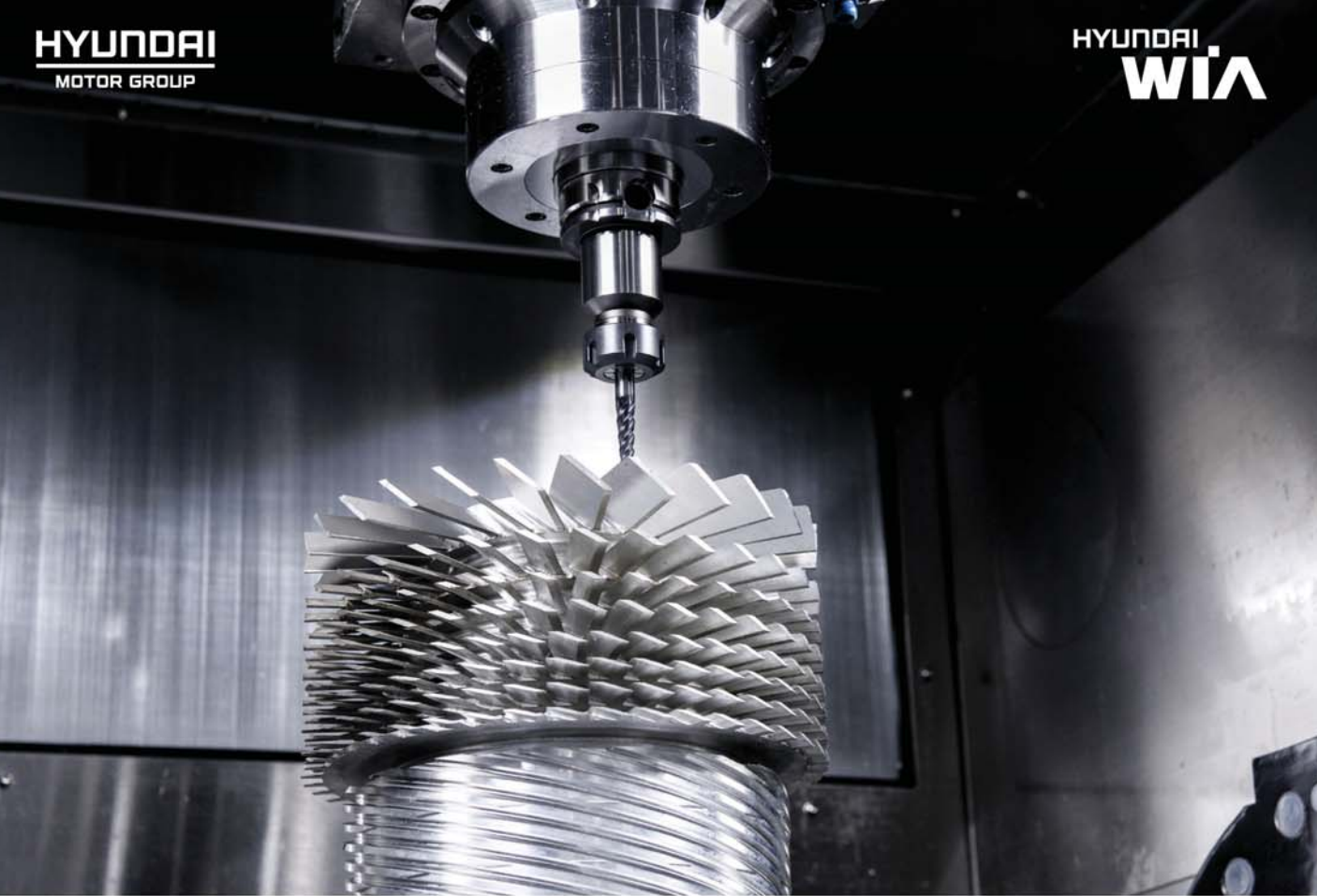


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Creating tomorrow!

Human beings are fundamentally optimistic by nature. That's all the more true about us Indians who are constantly driven by aspirations and ambitions. *(In fact, we are so obsessed with future that many times we even forget to live in the present!)* Most of our 'todays' are fuelled by the hope and dream that 'tomorrow will be better'.

We often do not realise that the foundations for the future need to be built in present. After all, it is the quality, strength and dimensions of these foundations that determine the success, scale and scope of our future accomplishments. Future should not be just a fantasy or a daydream. It should be vision working hard to create itself.

"IF A PROGRESSIVE, POWERFUL, PROSPEROUS AND PEACEFUL 'NEW INDIA' IS OUR DREAM THEN WE NEED TO RISE ABOVE ALL KINDS OF PETTINESS."

And it is as true about the collective future of our nation as it is about every person's individual future. When we speak about this 'collective future', most of us are pretty sure about what we want in the India of tomorrow. But can we really achieve that 'India of tomorrow' if we live with severe and almost irreconcilable differences in today? Also, if we want to bring about a change in our future then why are we afraid of bringing about a change in today? (Well, if you thought I am referring to GST implementation then you are partially right. Change implies a lot of other things!)

If a progressive, powerful, prosperous and peaceful 'New India' is our dream then we need to rise above all kinds of pettiness. We need to work together to create the India of everybody's dream. Politics and ideologies should not distract us from the path of national progress. It is in India's interest wherein every Indian's interest and progress lies.

Editor & Chief Community Officer

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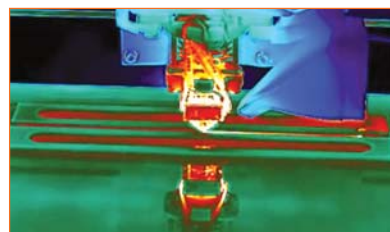
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Facility Tour

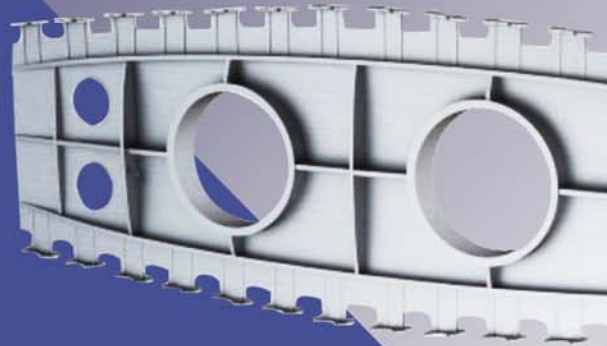
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Startup India Hub launched by Commerce & Industry Minister

THE COMMERCE & INDUSTRY MINISTER, Nirmala Sitharaman recently launched the Startup India Virtual Hub, an online platform for all stakeholders of the entrepreneurial ecosystem in India to discover, connect and engage with each other.

Speaking about the need to bring the entire ecosystem together on one platform, Nirmala Sitharaman mentioned that Startup India Virtual Hub is an effort to create a marketplace where all the stakeholders can interact, exchange knowledge, and enable each other to grow. It will streamline the lifecycle of existing and potential startups, helping them access the right resources at the right time.

She also encouraged all entrepreneurs in India to utilise this portal and all enabling stakeholders to contribute to the



platform as much as possible. The Minister also announced a new initiative, wherein a Startup exchange program amongst the SAARC nations would be organised.

ADB to support East Coast Economic Corridor with \$10 bn

ASIAN DEVELOPMENT BANK (ADB)

President Takehiko Nakao mentioned to India's leaders that the bank's new country strategy for India (2018-2022) will focus on improving economic performance of low-income states and enhancing its support for developing economic corridors under the Make in India initiative.

President Nakao was on a 3-day visit to India.

He met Finance Minister Arun Jaitley, Minister of Commerce and Industry Nirmala Sitharaman, and other senior officials. Nakao applauded the government for its effective macroeconomic management, and appreciated the reforms introduced to improve the investment climate and incentivize economic activities over the last three years.

In particular, he commended the government for its efforts to implement the uniform Goods and Services Tax (GST), that would create a single national market and spur economic growth by removing tax distortions.

ADB expects India to grow by 7.4



percent in the current financial year (FY) ending 31 March 2018, and 7.6 percent in FY2018.

"Several reform measures introduced by the government for rationalising tax structure, boosting competitiveness, and easing foreign direct investment norms in crucial sectors like infrastructure will contribute to its objective of achieving high and inclusive economic growth," Nakao said. "Further reforms both at central and state levels for improving efficiency in the land and labor markets and strengthening the banking sector will boost growth," he added.

Bosch to invest Rs. 900 cr

BOSCH INDIA is driving the transition to the Internet of Things (IoT) era by drawing on its innovations and over a century's legacy. With technological supremacy being built on the foundation of connectivity, Bosch has been developing local solutions that specifically cater to the needs of the Indian customer. "We have been investing in the region consistently and for the financial year 2017-18 we will invest over Rs. 900 crore," mentioned, Soumitra Bhattacharya, President, Bosch Group India, and MD, Bosch Ltd. Elaborating on the need to invest today in future technologies, he commented, "Roughly 15 percent of our yearly investment is directed towards R&D activities. The region accounts for over 30 percent of the Group's R&D engineer pool, making Bosch India the largest centre outside Germany with 18,500 engineers." Bosch creates cutting-edge services to gather intelligence and deliver meaningful insights. Speaking in this regard, Vijay Ratnaparkhe, MD & President, Robert Bosch Engineering and Business Solutions, announced the launch of a locally developed Micro Climate Monitoring System (MCMS)

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NEWS

Tata Hitachi inaugurates Operator Training Center in Dharwad, Karnataka

TATA HITACHI has recently inaugurated its Operator training Center at Dharwad in Karnataka. R V Deshpande, Minister for Large and Medium Scale Industries, Government of Karnataka, inaugurated the Center. The inauguration was also graced by Vinay Kulkarni, Minister for Mines and Geology, Government of Karnataka.

Spread over an area of 8 acres, the land for the Operator Training Center project was cleared by KUM – Banga-



lore in August 2008. The possession certificate was issued in May 2009 by KIADB, Dharwad.

The center is in close proximity to the Tata Hitachi Dharwad plant, which manufactures smaller excavators (under 20 T class) and wheeled equipment.

Imparting training on machine operating and servicing skills for excavators and backhoe loaders to the unskilled, unemployed youth in and around Karnataka, the Operator Training Center aims to enhance employability in the construction equipment industry both in India and abroad.

UL opens new lab in Bengaluru



UL has launched an advanced laboratory for safety and performance testing of composite materials like polymer blends, laminates reinforced with nanoparticles, carbon and glass fibres. Replete with the latest and best in class equipment and technology, the composite material testing lab will offer end-to-end service from laminate preparation, specimen machining and preparation to static tests as per ISO, ASTM and other specific standards. UL's strategic capacity building expansion is envisioned to support the fast growing composite material market in sectors like renewable energy, smart cities, aerospace, automobiles, etc. Lightweight and imbued with high strength and impact resistance, composite materials are chosen for their superior performance or beneficial properties. UL's testing services will enable manufacturers to realign their production matrix by assessing the suitability of the composites they wish to employ and obtain accurate test data on both material and performance metrics such as thermal aging, chemical, electrical and flammability properties and compositional failure analysis.

CSIR signs a contract with MIDI, Ethiopia

EMPHASISING ON stronger and long-term cooperation between African countries and India for mutual benefits, Council of Scientific and Industrial Research (CSIR) has entered into an agreement with the Metal Industries Development Institute (MIDI), Ethiopia to implement a twinning programme. The same is aimed at R&D capacity building of MIDI. CSIR has clinched this multi-million US dollar assignment through a process where many international organisations were considered. The twinning is one of the largest programs (in terms of contractual amount) between a CSIR institute and a foreign entity. It should also facilitate CSIR's future collaborations with African Organisations. The agreement was signed by the Director of National Metallurgical Laboratory, Jamshedpur (CSIR-NML) on behalf of the participating CSIR Laboratories, and the Director General of Metals Industry Development Institute (MIDI), Addis Ababa, Ethiopia. CSIR will enhance the capacity and capability of MIDI under the twinning arrangement and thereby enable it to contribute more efficiently towards the development of Metals and Engineering sectors in Ethiopia and thus enhance their competitiveness.

India ranks 60th on Global Innovation Index 2017

INDIA is ranked 60th among 130 countries on the Global Innovation Index (GII) 2017, launched at the UN Headquarters in Geneva, moving six places up from 66th position last year.

India is the top-ranked economy in Central and Southern Asia and has now outperformed on innovation relative to its GDP per capita for seven years in a row. Switzerland, Sweden, the Netherlands, the USA and the UK retain their top spots as the world's most-innovative countries with Switzerland leading the rankings for the seventh consecutive year.

Key findings of the GII 2017 show the rise of India as an emerging innovation center in Asia. The report states that India's current and imminent development, and its contribution to the region and the global innovation landscape is vital these days. As demonstrated in the GII for some years, India has consistently outperformed on innovation relative to its GDP per capita.

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Turnmill with Y axis & Sub Spindle



Application Examples



Hirth Coupling



Indexing Roller



HSK Tool Holder



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A list of key events happening between August 2017 to April 2018,
both nationally and internationally.

AutomationExpo 2017 August 09–12, 2017 Mumbai www.automationindiaexpo.com	Delhi Machine Tool Expo August 10–13, 2017 New Delhi www.mtx.co.in	Tech India September 08–10, 2017 Mumbai http://www.techindiaexpo.com/	EMO Hannover September 18–23, 2017 Hannover, Germany www.emo-hannover.de
ArabiaMold Sharjah December 11–14, 2017 Sharjah, UAE http://www.arabiamold.com/	ExCon December 12–16, 2017 BIEC, Bengaluru http://excon.in	IMTEX 2018 January 25–30, 2018 BIEC, Bengaluru http://imtex.in	ELECRAMA March 10–14, 2018 India Expo mart, Noida http://elecrama.com/
SIMTOS April 03–07, 2018 Seoul, South Korea http://www.simos.org	Die & Mould India International Exhibition April 11–14, 2018 Mumbai, India www.diemouldindia.org	Hannover Messe April 23–27, 2018 Hannover, Germany www.hannovermesse.de/home	CeMAT April 23–27, 2018 Hannover, Germany http://www.cemat.de/

**OUR
INHOUSE
UPCOMING
EVENTS**

**Global
Conference on
Plastics in
Automotive**

September, 2017
- Pune

**Global
Manufacturing
Summit**
Excel • Enhance • Expand

16th November, 2017 - Indore

**THE ECONOMIC TIMES
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18th January, 2018, Mumbai

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ROLLS-ROYCE APPOINTS BEVERLY GOULET AS A NON-EXECUTIVE DIRECTOR

Rolls-Royce has appointed Beverly Goulet as a Non-Executive Director. She has joined the Board with effect from July 3, 2017 and will become a member of the Nominations and Governance Committee and the Audit Committee.

Goulet, a US national, has most recently been serving as a senior executive with American Airlines Group from which she retired at the end of June 2017. Formerly a practising lawyer, she joined American Airlines in 1993. Her recent roles included Chief Restructuring Officer, helping lead American Airlines through its successful emergence from Chapter 11, and Executive Vice President and Chief Integration Officer, leading the integration of American Airlines and US Airways. Earlier in her career she was Vice President – Corporate Development and Treasurer. She is currently Chair of American Airlines Federal Credit Union.



JENETTE RAMOS TO LEAD BOEING'S SUPPLY CHAIN & OPERATIONS

Boeing appointed Jenette Ramos, a 29-year Boeing veteran with executive leadership roles in fabrication, supplier management, and environment, health and safety, as senior vice president, Supply Chain & Operations, effective immediately. Ramos, 51, replaces Pat Shanahan, who has been nominated to serve as U.S. Deputy Secretary of Defense.

Ramos, most recently vice president and general manager of Fabrication at Boeing Commercial Airplanes, now will oversee the company's Manufacturing Operations and Supplier Management functions, including implementation of advanced manufacturing technologies and global supply chain strategies. She also leads Boeing's Environment, Health & Safety organization. She joins the Boeing Executive Council and reports to Boeing Chairman, President and CEO Dennis Muilenburg.

JUNICHI KYUSHIMA APPOINTED AS MD OF TOSHIBA JOHNSON ELEVATORS (INDIA)

Toshiba Johnson Elevators (India) Pvt. Ltd. has appointed Junichi Kyushima as its new Managing Director with effect from July 06, 2017. Kyushima, was serving as the Vice President of Toshiba Elevator and Building Systems Corporation (hereafter TELC). He has also served as part of senior management responsible for Overseas Division and has played a vital role in TELC's entire global business operations. Also, Kyushima in his earlier stint in India, has served as MD at TJEI from 2012 –15, and with his experience in both strategic global business operations and specialised experience in the Indian market, he will play a key role in TJEI's strategic efforts to grow into a major player in India's elevator/escalator business. Accepting his new role, Kyushima, said "India is a significant market for Toshiba and we are focusing on building strong customer relationships. Since we entered the Indian market in 2011, we have successfully received numerous orders from notable customers across India. TJEI brings innovative and technologically advanced products, with focus on quality and safety, along with installation quality and after-sales maintenance services."



S. N. SUBRAHMANYAN TAKES CHARGE AS CEO AND MANAGING DIRECTOR OF LARSEN & TOUBRO

S. N. Subrahmanyan has stepped into his role as CEO and Managing Director of Larsen & Toubro with effect from July 1, 2017. This follows his appointment to the role by the Board of Directors of Larsen & Toubro at its meeting held on April 7, 2017.

At the meeting, the Board had also requested A. M. Naik, Group Executive Chairman, L&T, to provide guidance and mentorship to the Company's leadership subsequent to his current term. Consequently, Naik will continue as Non-Executive Chairman of the Company for a period of three years effective October 1, 2017.

Speaking on the occasion, Naik said, "Subrahmanyan is the finest among the many top executives I have mentored over the last few years. Three years ago he was identified as the most likely leader to take on the role of CEO and Managing Director. Since then I have worked closely with him and engaged him in all aspects of L&T's operations, going beyond his core domains of infrastructure and construction. Subrahmanyan has a great work ethic and business acumen to take L&T to greater heights in the future. I have full confidence that under him L&T will remain steadfast to its core values, fulfill the expectations of our stakeholders and continue to play a key role in building a stronger India."



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KANSAI PAINTS CO LTD. GETS FIRST NON-JAPANESE BOARD MEMBER

Kansai Nerolac Paints Ltd. (KNPL) announces that its Vice Chairman and Managing Director H. M. Bharuka has been appointed as Director on the Board of Kansai Paints Co Ltd., Japan. In this new role, Bharuka will contribute towards international business and strategy of Kansai Paints Group. The selection makes him the first non-Japanese to be appointed to the Board of Kansai Paints Co. Ltd., Japan.

Since joining KNPL in 1985, Bharuka has been the driving force behind the high-accelerated growth of the company. Under his leadership, Kansai Nerolac has established itself as a leading player in the paint industry, including industrial and decorative coatings segment in India. Bharuka was a member of Global Steering Committee of Kansai Paint Co. Ltd., Japan from 2011. The appointment signifies the recognition and importance Kansai Group places on India and the performance of Kansai Nerolac Paints Ltd. He is currently the Vice Chairman and Managing Director of Kansai Nerolac Paints Ltd., India and will continue in that role.



ATLAS COPCO APPOINTS NEW PRESIDENT FOR COMPRESSOR TECHNIQUE BUSINESS

Atlas Copco has appointed Vagner Rego as President of the Compressor Technique business area and member of Group Management, effective August 1, 2017. Vagner Rego is currently President for the service division within Compressor Technique.

"Vagner is a solid leader with international experience from several different roles," said Mats Rahmström, President and CEO of the Atlas Copco Group.

Vagner Rego joined Atlas Copco in 1996 as a trainee engineer in a service workshop in São Paulo State, Brazil. He steadily took on broader responsibilities, and in 2006 he was appointed Business Line Manager for Compressor Technique Service in Brazil. In 2010, Vagner Rego became Vice President Marketing and Sales for the Compressor Technique Service division, based in Belgium. Before he took on his current position as President for the Compressor Technique Service division in 2014, he was General Manager for Construction Technique's Customer Center in Brazil.

ANDREW ANAGNOST IS AUTODESK'S NEW PRESIDENT AND CEO

Autodesk, Inc. has announced that its board of directors has appointed Andrew Anagnost, current interim co-chief executive officer and chief marketing officer, as the company's new president and CEO, effective immediately. He will also join Autodesk's board of directors.

"The board and I are delighted that Andrew will lead Autodesk into its next stage of growth," said Crawford W. Beveridge, Chairman of the board of Autodesk. "Andrew has been instrumental in the development and execution of Autodesk's successful business model transition, and with his leadership, we are confident that our move to the cloud and subscription will continue to be successful."



MELKER JERNBERG APPOINTED PRESIDENT OF VOLVO CONSTRUCTION EQUIPMENT

Melker Jernberg has been appointed President of Volvo Construction Equipment and member of the Volvo Group Executive Board. Jernberg was born in 1968 and is currently President and CEO of the Sweden-based powder metallurgy company Höganäs AB. Prior to this he held the position of Executive Vice President and Head of Business Area EMEA at Swedish-based steel manufacturer SSAB. Melker Jernberg will assume his new position on January 1, 2018.

Jernberg replaces Martin Weissburg, who due to family reasons has decided to move back to the US and will take up a position as Senior Advisor to Volvo's President and CEO Martin Lundstedt. Martin Weissburg will be stationed in Greensboro, USA.

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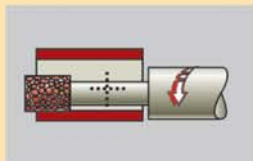


FIG-200 SPL CNC
BIG BORE GRINDER

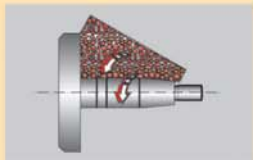


FIGT-300 CNC
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A15/25

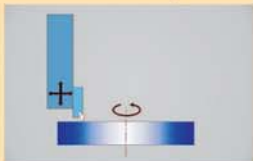


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A42/60

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Mahindra & Shachaf Engineering to collaborate on strategic electronics

Mahindra Telephonics and Shachaf Engineering have signed a Memorandum of Understanding to collaborate on the design, development and manufacture of strategic electronics at Tel Aviv. Under this arrangement, Mahindra Telephonics would look to jointly develop strategic electronics sub-assemblies and systems for aerospace, marine and automotive applications with Shachaf Engineering. The scope of work would involve design, manufacturing and sourcing activities in Israel and India. Technology transfer and organisation of training in specific areas, as jointly identified by the parties, would also be part of the scope of the collaboration.

S. P. Shukla, Chairman, Mahindra Aerospace and Group President-Aerospace & Defence, Mahindra Group, observed that "Both entities are part of large business houses with di-



versified yet complementary interests in strategic electronics. With this first step of collaboration, we expect to offer state-of-the-art, cost-effective solutions for global and Indian customers, and also address Make in India initiatives of the Indian Government. We believe that this Indo-Israeli collaboration would synergistically combine our capabilities with technical strengths of Shachaf Engineering."

Lockheed Martin and Tata Advanced Systems to make F-16 in India



Lockheed Martin and Tata Advanced Systems signed a landmark agreement affirming the companies intent to join hands to produce the F-16 Block 70 in India. The F-16 Block 70 is ideally suited to meet the Indian Air Force's single-engine fighter needs and this unmatched US-Indian industry partnership directly supports India's initiative to develop private aerospace and defense manufacturing capacity in India.

This unprecedented F-16 production partnership between the world's largest defense contractor and India's premier industrial house provides India the opportunity to produce, operate and export F-16 Block 70 aircraft, the newest and most advanced version of the world's most successful, combat-proven multi-role fighter.

F-16 production in India supports thousands of Lockheed Martin and F-16 supplier jobs in the US, creates new manufacturing jobs in India and positions the Indian industry at the centre of the most extensive fighter aircraft supply ecosystem in the world.

Fishtail Air signs HCare smart contract with Airbus Helicopters in Nepal

Fishtail Air has signed a contract with Airbus Helicopters to cover a fleet of 2 H125 helicopters for five years under the manufacturer's HCare service offer. The contract stipulates support for both scheduled and un-scheduled aircraft events, and entitles Fishtail Air for a full Material Management service backed by a parts availability commitment.

"After being the first company to introduce the H125 in Nepal, we will now be the first to benefit from the HCare



Smart programme in the country," says Suman Pandey, CEO of Fishtail Air. "We can now focus on operations to answer the growing demand for helicopter services in Nepal, while also ensuring high maintenance standards together with Airbus."

Emphasising the manufacturer's commitment to quality and performance, Airbus Helicopters' services offer, HCare, provides comprehensive service coverage, grouped into five domains: material management; helicopter maintenance, repair and overhaul (MRO) and upgrades; technical support; training and flight operations and connected services.

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Liebherr-Aerospace to supply new generation air management system



ATR has selected Liebherr-Aerospace to develop, manufacture and supply a new generation air management system for the ATR 42 and the ATR 72 aircraft programs. The system will be developed and produced by Liebherr-Aerospace Toulouse SAS, Toulouse (France), Liebherr's center of excellence for air management systems.

ATR awarded Liebherr-Aerospace for the design, production and service of a new generation air management system for ATR's 42/72 aircraft family. The air management system includes the bleed, air conditioning and cabin pressure control subsystems, together with an optional cooling system that provides supplemental cooling capacity when the aircraft is on ground.

Boeing, Georgia Tech open Advanced Development Research Center

Boeing and Georgia Institute of Technology opened a new advanced development research center that will tackle some of the toughest technical challenges in manufacturing. The Boeing Manufacturing Development Center (BMDC), located in the new 19,000 sq ft Delta Advanced Manufacturing Pilot Facility at the university, will enable Boeing researchers and Georgia Tech students to work side-by-side on implementing automation in industrial applications. "This advanced center will let Georgia Tech students collaborate with Boeing engineers to help drive the development of innovative factory automation solutions in aerospace," said Greg Hyslop, Boeing Chief Technology Officer and Senior Vice President of Engineering, Test & Technology.

One of the first research projects at the BMDC will focus on utilising industrial robotics for machining and fabrication applications that can be applied to the manufacturing processes at Boeing.

Aviall signs agreement with GE

Aviall (subsidiary of Boeing) has announced an exclusive aftermarket distribution agreement with GE Aviation for spare parts supporting F110-100 and F110-129 engines that power the F-16 aircraft for a select list of operators. Aviall will assume distribution responsibilities including forecasting, ordering and delivering all original equipment manufacturer (OEM) genuine replacement parts for F110 engines. The agreement has a potential value of more than \$1 billion over the life cycle of the program. "We are pleased by the continued confidence GE Aviation has shown by joining with us in another agreement utilising our innovative and cost effective engine solutions in support of the F110 engine," stated Aviall President and CEO Eric Strafel. "Our vast global footprint and strategically located material based on fleet demographics and utilisation will provide a number of valuable benefits for F16 operators including enhanced forecast fleet demand, increased operational efficiencies and reduced operating costs."

Rolls-Royce announces £150m investment in UK aerospace facilities

Rolls-Royce has announced a £150m investment in new and existing civil aerospace facilities in the UK to support the planned doubling of engine production and deliver on our record civil aerospace order book. The investment, which will be made over the next few years, is part of Rolls-Royce's ongoing industrial transformation and will provide additional capacity as we develop and test the next generation of aero engines.

The majority of the investment, which is in-line with the Group's ongoing planned expenditure, will provide a new



facility for the testing of large civil aero engines in Derby, the home of Rolls-Royce's civil aerospace division. The new testbed will be capable of testing a range of engines including the Trent XWB, which powers the Airbus A350 XWB. There will also be investment in our large engine Maintenance Repair & Overhaul (MRO) facility in Derby, as well as in our manufacturing facilities in Derby

and Hucknall, Nottinghamshire. The company has also committed to retaining the Precision Machining Facility (PMF) in Derby, which was previously announced would be closed.

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A320 neo. Courtesy: Pratt & Whitney

Soaring high

India is an important strategic market for Pratt & Whitney and the company continues to build on its long-standing history in India, says **Palash Roy Chowdhury**, MD - India, Pratt & Whitney

By **Niranjan Mudholkar**

Pratt & Whitney's partnership with the Indian aerospace community spans more than seven decades. Briefly tell us about the journey so far.

Pratt & Whitney is part of United Technologies Corp., one of the world's largest suppliers of aerospace engines, with an established presence in India. In the past seven decades, Pratt & Whitney has played an important role in India's aviation growth story.

The company has been a partner in the progress of India's aviation industry. The first Boeing 707-437 powered by our JT3D engine was delivered to Air India in 1960. Air India was the first carrier in the country to operate our PW4000 100-inch engines powering an Airbus A330. There are well over 100 aircraft in India powered by V2500 engines made by us and International Aero Engines AG, a consortium in which Pratt & Whitney is a majority shareholder. The company is now delivering the PurePower® Geared Turbofan™ engines for Airbus aircraft ordered by airlines in India. There are also 10 C-17 military transport aircraft in India that are powered by Pratt & Whitney's F117 engines.

Pratt & Whitney Canada powers close to 400 aircraft in general aviation, business aviation, regional aircraft and helicopters in India. This includes small turboprop in PT6

class and PW127 and PW150 on Regional aircraft, PW300, PW500, PW600 turboprops on corporate jets and turboshaft engines like PT6B, PT6t and PW200. Pratt & Whitney Canada also powers the latest Turboprop trainers (Pilatus) inducted by Indian Air Force.

Committed to continued customer support, we opened a world class customer training center in September 2015 in Hyderabad. Early this year, the Directorate General of Civil Aviation (DGCA) certified Pratt & Whitney's India training center. The certification means that the training center is now fully approved to offer DGCA-approved training sessions on V2500-A5 engines.

Our recently launched EngineWise™ Service Brand reflects our commitment to provide smart maintenance solutions to help our customers respond faster to their operational needs. With this launch, we offer a unique combination of technology and innovation that can help improve engine maintenance planning for our customers. We look forward to working closer together to power the future of Indian aviation with this new service platform.

How do you plan to take this partnership to the next level?

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“Coupled with the recent initiatives by the government and key industry players, we feel that the sector is on a high growth path and India will soon become a larger and much more successful aviation market.”

We are transforming aviation with the most technologically advanced engines on the commercial engines, military engines, small jet and turboprop engines, and other general, regional and civilian powered flight engines. With 26 development and production engine programs, today is one of the most exciting chapters in our history.

As a long-cycle business, we have made substantial investments in the future of jet engines for commercial and military use and will continue to make significant investments to improve jet engine technology, which will power the industry for decades to come.

We are slated to have hundreds of Geared Turbofan engines powering aircraft here in India. This will be one of the largest install bases for our GTF engine on aircraft. We are honoured to be here and work hard every day with our customers, employees, the authorities and government officials to deliver on our commitments

■ The Government of India is already putting in a lot of efforts to open up the defence aerospace segment from the manufacturing perspective with the ‘Make in India’ campaign. How do you analyse the situation and how will you be contributing to the same?

We recognise the country’s world-class engineering and technical capabilities as well as market opportunities it offers. As a company that is deeply embedded in India as an investor we firmly support the ‘Make in India’ campaign that translates the government’s vision of making India a global manufacturing hub. India is one of the most important strategic markets for us and we continue to build on our long-standing partnership with the country.

We source engineering and design services from a number of Indian companies, for some of its most advanced aerospace products. There are more than 1,000 engineers in India working on global projects for Pratt & Whitney. We have established a chair and a centre of excellence at the renowned Indian Institute of Sciences (IISc) focusing on high-end research in the area of turbo machinery.

We are constantly evaluating opportunities to grow our footprint here to support our customers better.

■ Your customer training centre in Hyderabad has been certified by the Directorate General of Civil Aviation recently. How important is this and how do you plan to leverage on the same?

We are committed towards contributing to the development

of aviation sector in India and is playing a significant role in bridging the skills gap that exists in this area.

To help address the shortage of a skilled work force in India’s aviation industry, Pratt & Whitney Training Center was established in September 2015 in Hyderabad. This world class facility received certification from DGCA, which means that the training center is now fully approved to offer DGCA-approved training sessions on V2500-A5 engines. It is expected to soon offer courses on PW1100G-JM and other models from the PurePower® Geared Turbofan™ family of engines.

We have already provided more than 2,000 student days training and are working with a number of universities and state governments to establish a robust aviation skill development platform in the country.

■ What is your assessment of the overall Indian aviation market and how do you see it growing in the next five years?

India’s civil aviation industry is currently positioned as the world’s third largest and fastest-growing aviation market. Strong economic growth, expansion of the middle class, and low air travel penetration rates have been the key catalyst for growth of this sector. We believe that the government’s UDAN scheme will accelerate air travel penetration through the regional connectivity and will make air travel affordable for many in India.

A report by Centre for Asia Pacific Aviation (CAPA), released recently stated that with over 1,000 aircraft set to be on order, India is poised to become the third-largest buyer of



“Pratt & Whitney sources engineering and design services from a number of Indian companies, for some of its most advanced aerospace products. There are more than 1,000 engineers in India working on global projects for us.”

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Pratt & Whitney Training Centre, Hyderabad. Courtesy: Pratt & Whitney



West Palm Beach PW1100G JM Production Line. Courtesy: Pratt & Whitney

commercial passenger planes in the world, with only the US and China ahead of it. Additionally, the aircraft order book of the Indian airline industry will soon touch 1,080, which would mean that for every aircraft in service, there will be 2.2 aircraft on order. In the last five years there have been significant investments by large and small domestic companies that have entered this industry.

Coupled with the recent initiatives by the government and key industry players, we feel that the sector is on a high growth path and India will soon become a larger and much more successful aviation market. UDAN - government's policy encouraging regional aviation is expected to open up significant growth opportunities for us.

How has Pratt & Whitney grown in India in terms of business numbers in the last two years and what are your projections for the next two years?

The company has a strong presence in India and has been doing business here for more than 60 years. Today, more than 500 aircraft in India are powered by Pratt & Whitney engines.

The company is investing and transforming its global operations to meet its commitments to commercial and military customers. We have a backlog of orders for our new PurePower® engine family and we see production more than doubling by 2020. We are spending more than \$1.3B to transform and modernise our manufacturing footprint globally.

As a long-cycle business, our company has made substantial investments in the future of jet engines for commercial and military use and will continue to make significant investments to improve jet engine technology, which will power the industry for decades to come.

In an earlier reply, you mentioned about the EngineWise™ service brand. Can you please elaborate on how will this help your customers?

Pratt & Whitney is unifying its aftermarket service portfolio through EngineWise™, the branded suite of aftermarket services, and will introduce new offerings to support customers' evolving needs. This service brand reflects our commitment to provide smart maintenance solutions to help our customers


respond faster to their operational needs. It offers a number of advantages, including:

- State-of-the-art data analytics and real-time intelligence to help predict and prevent operational disruptions before they occur,
- Significant investments in new technology and resources to increase responsiveness and flexibility,
- A growing portfolio of service offerings to provide smarter, more straightforward solutions, and
- Improved customer communications to drive more transparency and connectivity with our customers.

Major offerings under this service brand include:

- Fleet Management Programs – A customised, comprehensive dollar-per-flight-hour agreement to optimize cost of ownership over the life cycle of an engine.
- Engine Overhaul Services – For operators that prefer the assurance of a fixed price or time and material engine maintenance solution.
- Material Solutions – New and serviceable parts and part repair services provided by the engine OEM designed to extend part life and improve residual value.
- New service offerings will continue to be added over time, based on customer needs.

Pratt & Whitney has recently launched its 'Go Beyond' campaign. What does it entail?

This new brand platform represents both the company's long-standing commitment to accelerating the technology of modern flight, and the 'never stop solving' mindset of its employees. We 'go beyond' for our partners, customers, and most of all, for each other, because what we do results in people connecting with each other, economies benefitting from greater access to markets and trade, and ensuring militaries around the world are mission-ready. Our employees consistently 'go beyond' to find ways to make aircraft engines faster, stronger, quieter and more efficient across its diversified portfolio. As we move forward, we will continue to go beyond for our customers, whether it is in data analytics for better predictive maintenance or developing the next suite of services. 



Over three decades, we honed our strengths in Super Abrasives, to set bench marks for quality, performance and reliability. Catering to Customer's diverse requirements, we grew to offer a comprehensive range of Super Abrasives covering almost every conceivable application.

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Mercedes-Benz to build EUR250 million plant in Russia

Mercedes-Benz is starting construction work for a new fully flexible passenger car plant, thereby strengthening Daimler's industrial commitment in Russia, which so far has concentrated on commercial vehicle production.

"Establishing a passenger car production in Russia is a strategic investment in an important sales market for Mercedes-Benz. We are extending our local footprint and, at the same time, strengthening our global competitiveness," said Markus Schäfer, Member of the Divisional Board of Mercedes-Benz Cars, Production and Supply Chain, during the groundbreaking ceremony.

The new passenger car plant in the Moscow region is scheduled to start local production in 2019 beginning with the E-Class Sedan, which sets new standards as the most intel-



ligent sedan in the business class with technical innovations such as partially automated driving.

Magneti Marelli opens auto lighting plant in China



Automotive Lighting, the Magneti Marelli division dedicated to car lighting, and Changchun Fudi Equipment Technology Development Co. LTD. (FUDI), a Chinese investment company with activities in the automotive component industry, have inaugurated the new plant of their joint venture Changchun Magneti Marelli Automotive Lighting System Co., Ltd, established in December 2015.

The plant is located in the Emerging Industrial Park, Economic and Technological Development Zone in Changchun, capital of the province of Jilin, in the North-East of China, and covers an area of 30.000 square metres, 17.000 of which are dedicated to the production of LED headlights and rear lights.

"The new Changchun plant – said Pietro Gorlier, CEO of Magneti Marelli, – represents the ideal completion of the wide-ranging footprint of the lighting business in China, also covering the North-East of the country, a strategic region for the automotive industry, where important clients focusing on high technological value are located. In this sense, Fudi represents the ideal partner for Magneti Marelli for the establishing of the lighting business in this region and for the offering of support to clients in the best possible manner."

Capsula.Studio at Tel Aviv University partners with Pinnacle Industries

Capsula.Studio at Tel Aviv University have entered a strategic partnership with Pinnacle Industries Ltd to establish a one-of-its-kind start-up accelerator, Pinnacle Capsula.Studio in Pune. The partnership aims to accelerate innovative entrepreneurs to market through Capsula's proven Mentored Customer Validation program and knowledge center which connect entrepreneurs with global value network players and the research community.

Pinnacle Capsula.Studio in Pune is conceived as a Not for Profit entity, which will allow novel ideas to rapidly gain market traction with through Mentored Customer Validation under the able guidance of mentors. The facility will be located at The BHAU Institute, which is a part of the College of Engineering, Pune and home of an innovation incubator. The Studio will also act as a bridge between Indian and Israeli entrepreneurs.

Speaking about this new initiative, Sudhir Mehta, CMD, Pinnacle Industries Ltd highlighted, "Incubators and accelerators continue to play an important role in the growth of the Indian start-up ecosystem. Pinnacle Capsula will mentor and foster such talent and ideas focused on IP creation and provide them with the right guidance, opportunities and approach."

Pinnacle will provide the initial funding and endeavor to develop sustainable partnerships with prospective investors and value network firms. The initial focus of Pinnacle Capsula.Studio Pune is Smart Mobility, with additional domains to be added in the future including agriculture and food, health and medicine, education and other sectors which can bring-in major economic and societal benefits to India and the world.

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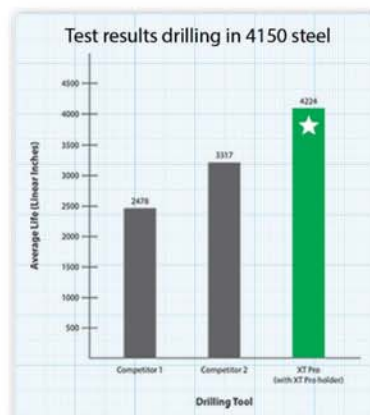
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Magna introduces D-Optic LED headlamps to improve visibility

To improve forward visibility for drivers and provide customised styling options for automakers, Magna introduces D-Optic LED headlamps. D-Optic lighting represents the next generation of LED headlamps and an auto-industry first by combining multiple high-power LEDs with precise, injection-moulded lenses to achieve high performance with efficient energy use.

D-Optic lighting is unique for automotive applications because it is scalable and is custom-developed for a vehicle's specific shape and styling. LEDs and lenses can be added or subtracted to suit each unique design. The innovative headlamps are expected to make their market debut on the 2018 Chevrolet Traverse.

"Automakers are looking for ways to differentiate vehicle



styling and also incorporate the latest in performance and efficiency," said John O'Hara, President of Magna Closures and Mirrors. "Our lighting group is excited to launch D-Optic on the all-new Traverse after working closely with the vehicle team at Chevrolet to create a custom solution."

Hitachi Automotive Systems and Honda establish JV

Hitachi Automotive Systems, Ltd. and Honda Motor Co., Ltd. have announced the establishment of a joint venture company for the development, manufacture and sales of motors for electric vehicles on the premises of Hitachi Automotive Systems in Hitachinaka-shi, Ibaraki Prefecture.

The newly established company will receive a financial grant from Ibaraki Prefecture as it has been recognised as a relevant project that 'promotes the establishment of corporate head office functions' within the prefecture. The new company will respond to the growing global demand from automakers for electric vehicle motors by developing competitive motors that combine the expertise of the two companies.

SAIC Motor Corporation to start manufacturing cars in India

SAIC Motor Corporation Ltd., one of the biggest corporations in the world and the largest automobile giant in China, has announced its plan to enter the Indian automobile market through a fully-owned car manufacturing facility in the country.

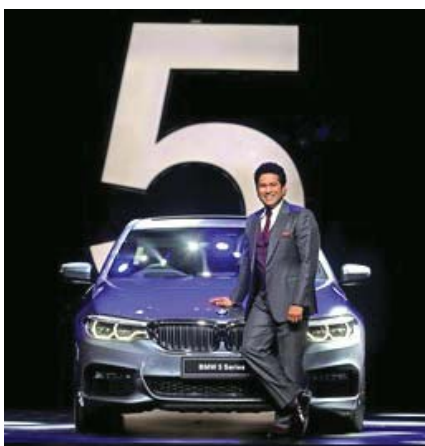
With an annual revenue of over \$100 Billion, SAIC Motor is pleased to be part of the expanding Indian automotive market, slated to be the third-biggest in the world by the year 2020.

The operations, which are expected to commence in 2019, will create sizeable employment opportunities under the 'Make in India' and 'Skill India' initiatives and positively contribute to the economic development of the region. The company is in the process of finalizing its manufacturing facility and is firming up its product strategy for the Indian market, details of which will be announced at a later stage.

The all-new BMW 5 Series launched in India in two variants

The all-new BMW 5 Series has been launched in India recently. Seventh generation of the premium sedan was unveiled by the Sachin Tendulkar. The all-new BMW 5 Series will be available in diesel and petrol variants at all BMW dealerships across the country.

Vikram Pawah, President, BMW Group India said, "With the all-new BMW 5 Series, expect nothing less. The unique combination of elegant and dynamic design, intelligent BMW technologies and innovative control concepts in the all-new BMW 5 Series,



means you can absolutely enjoy your drive. Fuelled by top performers, it combines outstanding output with powerful athletics and reaches all destinations with efficiency and purpose. It is time to discover ultimate driving pleasure with a true business athlete: the all-new BMW 5 series."

The all-new BMW 5 Series adapts perfectly not only to an active lifestyle but also to personal taste. The three exclusive design schemes - Sport Line, Luxury Line and M Sport offer options that meet individual requirements.

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By Swati Deshpande

Engaged in precision mould making of plastics and supplier of injection moulded parts, CAM Tools is a well-known name in the tooling industry. Started as a service provider for toolmakers, today CAM Tools offers solutions for complex tooling challenges to companies across the globe.

“We started as a service provider for toolmakers in and around Mumbai. Our manufacturing activities started in 2002 and now we are focused on the tooling activity for the automotive industry and develop mould up to 850 tonne,” said Paresh Panchal, CEO, CAM Tools. “We also have an injection moulding plant in Pune, you can say that we are taking total turnkey solution for injection moulding components i.e. right from the tooling to the production of the components.”

Prestigious projects

Expertise in CAD/CAM helped CAM Tools with very fast turnaround time and the company soon bagged some of the prestigious projects. “With the help of Autodesk PowerShape, we work on the mould designs, initial concept drawing and feasibility studies. PowerShape boasts of user-friendly comparison tools, along with up to the mark estimation tools. The core/cavity wizard is also a useful feature. It divides a solid model into cavity and core pieces that can then be separated dynamically using a simple slider. Individual faces can be split quickly and efficiently and then attached to the correct part of the tool. Clear graphical feedback, including undercut shading, shows any potential moulding issues, giving you complete control,” added Panchal.

Yet another software from Autodesk that has been beneficial to CAM Tools is PowerMill. Speaking about it, Panchal mentioned, “We work on un-manned machining environment where programme embedded by PowerMill is very safe. Its all Automatic Tool Changer (ATC) programmed so on weekneds or on holidays we leave the programmed machine for 36 to 40 hours together where practically no body is attending it,” confirmed Panchal.

Elaborating on his experience in working with Autodesk, Panchal mentioned, “We have been using these software



Jesse Ervin, Director of Sales, Europe, Advanced Manufacturing Delcam Ltd (Autodesk)



Paresh Panchal, CEO, CAM Tools




Pankaj Gauba, Head Digital Manufacturing Group – India & Middle East, Autodesk

Change of licensing model

At the beginning of this year, Autodesk changed the licensing model for its CAM software. Speaking on the new subscription-based licensing model, Pankaj Gauba, Head Digital Manufacturing Group – India & Middle East, Autodesk mentioned, “A key advantage that tilts the scale in favour of subscription-based model is that it provides customers immediate access to the latest software and product enhancements. The other advantage of this model is affordability. With the new licensing method, the CAM software are now economical. This is a huge benefit for SMEs as best-in-class software now fits into their budget. Use of this software will help SMEs enhance their efficiency.”

Elaborating on the same, Jesse Ervin, Director of Sales, Europe, Advanced Manufacturing Delcam Ltd (Autodesk) mentioned, “We understand our customers and their changing needs. With the new method, we are able to offer customers exactly what they are looking for at the affordable price. Also, it is advantageous for the customers to opt for subscription-based model as it offers instant access to updates as and when they happen.

for more than 15 years and have grown along with the improvement in the software. Autodesk has done a great job by constantly working on the improvement in efficiency of the software by introducing new features. It has also been very user-friendly.”

“Additionally, Autodesk’s robust support system to its customers has impressed me. All these years, the company has been a partner in our success. I would certainly recommend PowerMill and PowerShape to any companies looking for high-end design and manufacturing software,” concluded Panchal. 

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HIGHLIGHTS

- + Turning, gear hobbing, deburring / chamfering – including automation, all from one resource.
- + Process example: Soft turning the 1st side, soft turning the 2nd side, gear hobbing. Turnkey solutions for the complete process chain.
- + Modular machine integrated with automation.
- + This concept leads to easy line set up.
- + System requires less operators and provides easy maintenance.
- + Cycle times are minimized due to short travel distances for loading and machining.
- + The TrackMotion automation system performs the entire part transportation process, including turning the parts.
- + The use of stacker pallets allows autonomous operation for hours.





Ready for long haulage!

Joerg Mommertz, Chairman & Managing Director, MAN Trucks India Pvt. Ltd. says the Company will continue to develop its products to meet the market demands.

By Niranjana Mudholkar

It's been about eight months (from October 2016) since Joerg Mommertz took charge as the Chairman and Managing Director of MAN Trucks India Pvt. Ltd. And Joerg surely is enjoying it as he terms it 'quite exciting and interesting'. "This country's tagline 'Incredible India' says it all. It's a very interesting and promising market and I am personally feeling very good to be here," he says with a very warm smile.

I am told that Joerg's been a professional boxer in his younger days; something that's evident from his fitness at the age of 59. While I could hardly find any aggression in his demeanour throughout the interview, his approach to business and his overall plans for MAN Trucks India are surely quite aggressive.

Truck business in India

With more than three decades of diversified management experience, Joerg has worked in different markets like Belgium, Scandinavia, Poland, Denmark and Russia. So how would he compare the Indian market to the regions he has

worked in before? The answer comes quicker than I thought. "Truck business is truck business anywhere in the world." Then he adds: "Okay, there is about 25–30 percent difference in each market but the principles of the business are similar. Market circumstances are different. Product specifications and requirements are different. But the way of doing business is quite similar. Of course, you have to get adjusted to that important 25–30 percent differentiating factor in each market."

Coming back to India, Joerg recognises that it is an emerging market. "But it is in a transition period and it is also quite

dynamic. It is very complex and challenging, and therefore I was a little bit surprised and also happy about how the Indian government implemented Bharat Stage IV emission norms. And it gives us hope also for the future. As an industry, what we do not like is an unpredictable situation. Will it come or will it not come? Will it come with a grace period? That's not what the industry likes or wants. But if there is clarity on policy issues then you can plan your business accordingly. I think the Indian government is going in the right direction here. And we welcome it whole heartedly," he shares his perspective.

Joerg says that as a strategy, MAN Trucks India is very clear about the segments that it wants to address. At present, the Company wants to focus on the 16–49 tonne range with higher horsepower trucks. "We still have a lot of market segments quite heavily dominated by domestic manufacturers.


These are the sectors where we cannot compete because the customer demand in that segment is different from what we want to offer. But we see a huge potential in the upper segment or what we describe as the 'premium budget' segment. Whatever you call it, we

see a growing potential in that market and here we want to get a piece of the cake," he mentions.

Made in India and for India

Earlier this year, MAN Trucks India rolled out the New CLA EVO range whose market introduction coincided with the BS IV emission norms that came into effect on April 1, 2017. The series includes tippers, rigids and tractors, besides special application trucks that address diverse customer requirements. "The CLA EVO range is something that we have specifically

MAN Trucks India has a strong R&D team based in Pune with about 100 engineers. "This is our competence center providing technical support. The focus for this team is to take care of the CLA range and further development of the same," Joerg says.

A man in a blue suit and red tie stands next to a yellow MAN truck. The truck is a heavy-duty model with a large grille and a prominent MAN logo. The man is leaning against the front of the truck, looking towards the camera. The background shows a paved area and a building.

made to address the Indian market conditions and customers' requirements. We have always listened to our customers to understand their changing requirements. The new CLA EVO range is a good example of our ability to develop solutions in India, for India. MAN trucks are seen as a reference for strong performance over long duty cycles. Going forward, we will work towards bringing newer solutions to raise the bar for our customers," Joerg adds

The new range of trucks is powered by the proven MAN D-0836 common rail engine that delivers 250HP and 300HP based on the application. Joerg is confident that in the new economic scenario, this new range of trucks would do quite well. "With the implementation of GST, demand for haulage trucks is expected to rise. The MAN long haul trucks can operate up to 20 hours duty cycles, which will benefit operators in terms of faster turnaround. The engines have been enhanced to deliver more power, while being fuel efficient. Besides the product range, we are also expanding our after sales service network in order to cater to requirements across all key routes and locations."

Joerg says that MAN Trucks India will continue to develop its products to meet the market demands or to even be a little advanced. "This was also the reason why we designed and developed the CLA range because the old approach of the

"The Indian market is very complex and challenging, and therefore I was a little bit surprised and also happy about how the Indian government implemented Bharat Stage IV emission norms. And it gives us hope also for the future."

European manufacturers having a European product and then down grading it again and again for the Indian market does not work. So we need to have the right product hitting the market demand," he says.

What are the things that Joerg sees working in the favour of MAN Trucks in India and what are the things that he would like to improve upon? "What works for us are factors like product performance, reliability, fuel economy, horse power, payload, rupees per kilometre and so on. We believe that our product is offering the customer added value and the customer is ready to pay for that added value," he states.

The key challenges? To enter new market sectors where we have not entered in the past and to develop a strong dealer network. "These are I think the two biggest challenges. When it comes to the designing and manufacturing of trucks, we are quite experienced. We can make the best of the product but without a strong and committed dealer network, it will not be successful. So our focus will be on continuously developing the product, entering new segments and building the dealer network," he shares.



About MAN Trucks India

MAN Trucks India started operations in India in 2006 as a joint venture. Eventually with the takeover of the joint venture, MAN Trucks India Pvt. Ltd. became a wholly owned subsidiary of MAN Truck & Bus AG in 2012. Headquartered in Pune, the company has its manufacturing facility at Pithampur, Madhya Pradesh. The product range manufactured in this plant caters to the 16 tonne to 49 tonne haulage and includes tippers for off-road & construction, haulage for regular & over-dimensional cargo, and special application trucks such as fire tenders, garbage compactors, concrete mixers, boom pumps, tip trailers and bulkers. The product range for India is developed at MAN Trucks R&D centre in Pune. The trucks made in India are also exported to African and Asian markets. The company has sold more than 25,000 trucks since it started its India operations in 2006.

Manufacturing prowess

Joerg is quite proud of MAN Trucks India's manufacturing strength. In fact for the Group, the Pithampur plant is the only integrated plant globally that manufactures from aggregates to the final vehicle. Importantly, the local content in our trucks is more than 80

percent. "Local content helps to balance the business in terms of cost. Having a strong footprint and getting brand identification is much better if you have local production. It helps us react and respond quicker to the market," he says.

Stressing on the plant's quick turnaround time, Joerg adds that MAN Trucks India has a very short process and a very flat hierarchy in terms of the organisational structure. "So if we receive a feedback in terms of change, then we are able to address it much quicker. I have daily contact with the heads of R&D, purchase, sales and after sales. So if you have all the competences here then you can take decisions faster. Also, it is not just about having all the competences; we also have all the necessary decision making powers. So that definitely helps particularly when reacting to the market demands," he explains.

With rising input costs, the biggest concern for manufacturers is to keep down the costs. What is MAN Trucks India doing on that front? Joerg believes that the best way to keep the cost down is to improve productivity. "Every year our production team gets a target of improving the productivity by three percent. The rest is about optimising the product design, savings on material costs and to optimise the processes," he adds.

"The new CLA EVO range is a good example of our ability to develop solutions in India, for India. MAN trucks are seen as a reference for strong performance over long duty cycles. Going forward, we will work towards bringing newer solutions to raise the bar for our customers."

The current installed capacity at the Pithampur facility is 9,000-10,000 units per year and current utilisation is 35 percent. About 40 percent of production volume goes for exports. Joerg wants this facility to become MAN Trucks' manufacturing hub for Asia and other

emerging markets like South Africa, Middle East, CIS countries and Central Asia. "My aim is that our Pithampur facility should contribute 10 percent to the Group's sales in terms of production volumes." Of course, he is not very keen to put a time frame to this ambition but is hopeful that it would happen sooner than later.

Business growth

Although MAN Trucks India does not share its sales numbers publicly in India, Joerg points out that the year 2016-17 was much better than 2015-16 in terms of sales. "We do not share our results publicly in India but I can say that it was quite okay. In fact, 2017-18 has started even better and we are growing despite the market going down. So, we will see significant growth in 2017-18," he adds.

One of the major areas of growth that MAN Trucks will pursue in India is that of specialised applications. "Yes, we now have a strong focus on special applications. For example, we have been supplying fire fighting trucks here in Mumbai. But I see more room for special applications. If the government issues any tender in future for defence trucks, we are ready to participate. MAN is known for defence trucks and we have a good footprint in European armies. We won a big

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tender in Australia two years ago,” he shares emphasising on the organisation’s high competence in the defence segment.

Way ahead

So what is Joerg’s personal vision for MAN Trucks India? “We want to be more visible in the market and more anchored in the customer’s mind. I don’t want to look at a fixed position as such; it is very difficult in a volatile market. But in the business segment, we want to be the preferred partner of our customers in all transport related aspects. This is the position we want to achieve,” he says.

“Local content helps to balance the business in terms of cost. Having a strong footprint and getting brand identification is much better if you have local production. It helps us react and respond quicker to the market.”

Is MAN Trucks India ready for the transition to the BS VI emission norms? “We are absolutely ready for that change whenever it happens. My expectation from the government is the same as they have done with the implementation of BS IV norms. It is important to have a clear scenario and a clear deadline.”

And how does Joerg differentiate MAN trucks vis-a-vis its competitors? “Well, it starts with the product and grows with all the services related to that product. We want to be successful in the market by making the business of our customers easier and profitable,” he says.

Joerg is also happy that MAN Trucks India is able to contribute to the Make in India campaign. “This initiative is very important for the Indian economy. Of course, we want to be

Pithampur facility


The Pithampur manufacturing plant of MAN Trucks India in Madhya Pradesh has been manufacturing trucks for the Indian market and for export to countries in Asia and Africa since 2006. Its products range from chassis to tippers for the construction industry and semitrailer tractors for long haul transport.

By acquiring full ownership, MAN Truck & Bus India has now taken sole responsibility for the production and sale of the trucks both within and outside India.

Truck in the Box: As the name suggests, Truck in the Box (TIB) is the MAN concept for CKD (Completely knocked down) or SKD (Semi knocked down) vehicles – i.e. the disassembly of a vehicle in order to ship it to another site for final assembly.

Aggregate shop: The aggregate shop is the place where various activities related to components like machining, assembly, manufacturing, alignment, painting and testing takes place. Components primarily include engine and axles. There are 27 CNC machines at the machine center ranging from three to seven axles. The aggregate shop also houses an advanced engine testing lab where each and every engine is tested fully for a 32 minutes cycle. All engines are tested for critical parameters including power, emissions and fuel efficiency.

Vehicle assembly: The vehicle assembly division has three sections. These include the chassis assembly, the testing section and the trim assembly. The chassis assembly has 14 stations with the marriage of the engine and chassis happening at the eleventh section. Testing includes pre-series, cabin testing and harness testing.

a part of it and we want to contribute to it. Having said that, I want to emphasise that wherever our trucks get manufactured, they come with our global benchmark of quality and technology and that is one assurance that we want to give to our customers,” he says. 

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What makes Mahindra World City Jaipur stand apart is the integrated approach it takes towards overall development with sustainable urbanisation as its guiding factor.

By Niranjan Mudholkar

When one thinks of Rajasthan in general, some of the first things that come to the mind are the royalty and the Rajputs, the culture and the cuisine as well as the hospitality and the heat. Of course, there's a lot more to Rajasthan. And one of these many positive features is the emergence of the state as an industrial hub for a variety of sectors including for manufacturing.

In this context, the Mahindra World City Jaipur (MWCJ) is surely playing a key role in transforming the region. Importantly, what makes MWCJ stand apart is the integrated approach it takes towards overall development with sustainable urbanisation as its guiding factor. Spread across 3000 acres, MWCJ is being developed in partnership between the US\$19 billion Mahindra Group and the Rajasthan State Industrial Development Corporation (RIICO - an agency of the Government of Rajasthan) since December 2006. In fact, MWCJ is the second edition of the Mahindra Group's ambitious and visionary 'World Cities' project under the umbrella of Mahindra Lifespaces' Integrated Cities and Industrial Clusters. It carries forward the tradition started with Mahindra World City Chennai, which is India's first private SEZ.

Home to 75 corporates spread across its SEZ and DTA facilities, the MWCJ is the first city in India which is a pre-certified SEZ with Gold certification under the Indian Green Building Council (IGBC). Moreover, the Evolve IT Park situated within MWC Jaipur is a LEED platinum certified Green Building. "Sustainable urbanisation is at the core of this development and that's the reason why Mahindra World City Jaipur is the world's largest, and Asia's first project, to receive Climate Positive Development Stage 2 Certification from the C40 Cities Climate Leadership Group," said Sanjay Srivastava, Business Head, Mahindra World City (Jaipur) Limited. "Of course, the fundamental concept is about creating an economic nerve centre, and then drive the overall growth



"Well planned integrated cities can take care of people's employment, how they stay and their quality of life. Secondly, by doing so, it not just improves the economic ecosystem but can also contribute to India's urbanisation in a sustainable way. Thirdly, it also helps the government in reducing the pressure on infrastructure."

Sanjay Srivastava, Business Head,
Mahindra World City (Jaipur) Limited.

Overview of MWC Jaipur

PPP between Mahindra and RIICO Group (74:26)

Spread over 3000 acres

3 Sector Specific SEZs* and a DTA (Approval for Multi-Product received, notification expected soon)

Residential, Social & Retail Infrastructure at Launch stage

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and development around it. Integrated approach is what we think we are doing different," he added.

Integrated approach

Srivastava further explains why Mahindra World Cities take an integrated approach to development. "Firstly, well planned integrated cities can take care of people's employment, how they stay and their quality of life. Secondly, by doing so, it not just improves the economic ecosystem but can also contribute to India's urbanisation in a sustainable way. Thirdly, it also helps the government in reducing the pressure on infrastructure."

The core of Mahindra World City's integrated approach is built on three 'Ls' - Livelihood - Living - Life. "It is almost like a spiral - we start at 'livelihood' - because first you have to create jobs. Obviously, people need a reason to go to a new place. So you have to attract the best in class companies to come and create employment opportunities. Secondly, when people would see the quality of infrastructure that we have created then they would also be interested to stay there. And that's how you develop the 'living' part. When people come for livelihood and living, then you need to create a sense of community. That's when comes the third L - 'life'. The idea is to create this virtuous circle with Livelihood - Living - Life," added Srivastava.

Advantages of being in Rajasthan

Being located in Rajasthan, MWCJ offers several strategic

Highlights of Mahindra World City, Jaipur

	2011 - 12	2012 - 13	2013 - 14	2014 - 15	2015 - 16	2016 - 17
Exports (Rs. in Crores)*	299	656	1,077	1,119	1,128	1,245
Employment (Direct)**@	2,803	3,561	5,045	6,836	7,996	8,259
Investment (Rs. in Crores)**	1,014	1,322	1,824	2,377	2,872	3,258
Companies**	46	53	58	64	68	75

**Figures are cumulative

*Additive

@Direct

"Located just off the National Highway 8 (Jaipur-Ajmer highway), MWCJ is less than a 30-minutes drive away from the heart of the Jaipur City during the morning rush hour. It is only 22 km from the Jaipur Airport and 21 km from the Jaipur Railway station."

advantages to the companies operating there. "The fact that it comes within the Delhi Mumbai Industrial Corridor (DMIC) influence zone is quite advantageous for businesses. Secondly, Rajasthan being a power surplus state with 17500+ MW installed capacity and having abundant skilled manpower are very encouraging factors for the industries," informed Srivastava.

According to Srivastava, the State Government also has a very good policy framework that is conducive for new businesses. "There is huge focus on ease of doing business with the integration of top 14 departments to make approvals faster and more efficient. The overall ecosystem is quite positive and that is why accelerated investments are happening in the state. There is single window clearance and the state offers customised incentive packages to companies making investment of Rs500 crore or for creating direct employment for 500 people."

Connectivity is a huge plus point in Rajasthan with the second largest National Highways and Rail network. The State has 20 National Highways and 147 Railway stations and as a result it is very well connected to key ports in the country. Importantly, the state also provides excellent telecom/internet connectivity. "Speaking specifically about Jaipur, in the recent times, the city has also seen the influx of several corporates due to its investment friendly climate and pro-business approach. Besides being a famous tourist destination, Jaipur is also known for its fairly cosmopolitan lifestyle and good social infrastructure," Srivastava said.

Marquee manufacturing firms at MWC Jaipur

Company	Highlights
JCB	One of the world's largest construction equipment manufacturers. Largest plant in Asia.
Perto	Brazilian company manufacturing ATM machines, money counting and card reading machines. First FDI outside Brazil.
BSDC	First of its kind in India, Swiss Dual-Model based 'Skill Development Center'. Providing skilled manpower for Industry needs.
Ball	World's largest manufacturer of Beverage Cans. Third facility in India and the 1st in North India.
TTK Healthcare	Engaged in manufacturing of Ready-to-Fry Pellets. Entry into Northern Markets through Jaipur plant.
KnitPro	World leader in hobby market segment with major exports to Germany & other European countries and the US.



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JCB India

One of the major success stories at the MWCJ is the JCB India facility. It signed up in October 2012 and had its facility up and running by November 2014! Interestingly, besides being absolutely state-of-the-art, the 114 acre JCB India facility at MWCJ is also addressing the gender diversity issue. Close to 30 percent people on the shopfloor are females. In fact, a young woman bagged the best welder award recently. Today, most of the welding and assembly is actually done by the women. Of course, the plant layout is also superb and it helps shopfloor employees to work comfortably adding to their productivity. There is huge focus on safety. "In fact, JCB's mantra till last year used to be one global quality. We are now moving towards one global health and safety. We want to be at par even on health and safety with the rest of the world," shared Jasmeet Singh, Head - Corporate Communications & External Relations, JCB India.

Singh also shared that JCB initially started with fabrication and then added finished products at the MWCJ facility. "We are manufacturing mini excavators and are now also gradually shifting the skid steer production from our Ballabhgarh facility to Jaipur." While JCB already had two facilities in India – one each at Ballabhgarh and Pune, Singh explained the reason why JCB started this facility. "We have added a lot of new products in the last few years considering the evolving construction scenario in the country. Our Ballabhgarh facility has been running to full capacity and the Pune facility is dedicated for excavators, wheel loaders and compactors. So for any new product, we had to look for a new facility."

There are a few reasons why JCB India opted for Jaipur. Jaipur is located on NH 8 and it goes straight up to Mumbai. "Considering that we are exporting a lot of products, we needed to be on some sort of a national route to access Mumbai. Then there is the Delhi Mumbai Industrial Corridor. Also, when we set out to look for a plant location,



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we were given a fantastic response by Rajasthan. They were up to speed. So the government response was very good and we got all our clearances in two months to start the factory. There is genuine single window clearance. Also, there was no issue with regard to the availability of man power and power," Singh stated. Coming to MWC, Singh said that JCB shared a fantastic working relationship with them. "Their response too was fantastic. Right from the beginning, we had a very good rapport with them."

Manu Yantralaya (P) Ltd.

While JCB India is a large global player, MWCJ also successfully houses home grown SMEs who are doing a fantastic job. One such example is Manu Yantralaya (P) Ltd. "We are a 26 year old organisation that is primarily in sheet metal components for the bearings industry. We make parts that are supplied to all ball bearing companies in the country as well as to their overseas plants. We also do some stampings for some automotive applications besides a polyamide business done through a joint venture. We have four locations in Jaipur and MWC is the latest location, which we started about two years back," said Abhinav Banthia, Director, Manu Yantralaya (P) Ltd.

The key objective for Manu Yantralaya in coming to MWC was to grow its overseas business. "From this location, we are exporting to countries like Germany, Portugal, Italy, Bulgaria, Argentina, China and Indonesia. We are further expecting to grow the business in the European region as well as in China. And to export to China, we need to maintain a competitive edge. That's the reason we thought that an SEZ could give us those advantages. Secondly, the infrastructure offered by Mahindra is absolutely world class. So when we have an overseas buyer visiting us at this facility, it creates a good impression right from the entry gate to the plant not just for us but also for the country," Banthia added. 

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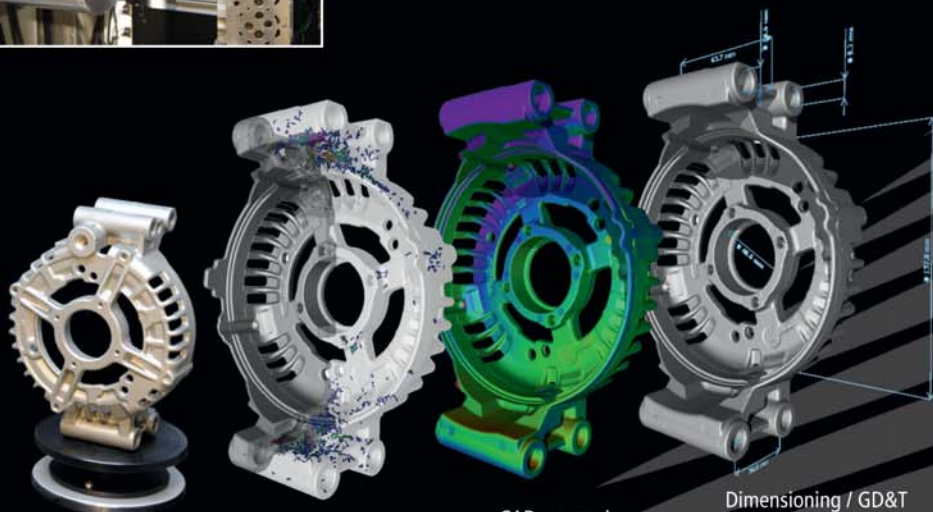
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■ Telecommunication satellite: the three additive manufactured brackets easily withstand a temperature range of 330°C and meet the high demand of permanent space missions (Source: Airbus Defence and Space).

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A global aerospace company uses Additive Manufacturing for the production of satellite parts

The literal translation of the word satellite (companion) does not come close to explaining how complex these technical devices are and what they do for our daily lives. Their tasks range from weather forecast to message transport and navigation information. The Airbus Defence and Space division is one of the world's leading suppliers of satellite and space transport technology. Its Spanish subsidiary is part of the satellite business and the largest aerospace company in its home market.

The portfolio ranges from satellite systems to components for the International Space Station ISS. A competence centre for composite materials is also located at the headquarters in Madrid – because innovative materials and production methods play an important role in the aerospace industry. The requirements for the devices are particularly high because of the tremendous temperature differences and external forces involved. To achieve the best results in component manufacturing, Airbus Defence and Space relies, among other things, on Additive Manufacturing technology by the German company EOS.

“The Additive Manufacturing method brought measurable benefits to critical aspects of the project, without requiring cuts to be made elsewhere. No compromises – this is something engineers like to hear, but don’t get to hear very often.”

Otilia Castro Matias,
COC Antennae at Airbus
Defence and Space

Challenge

The current generation of satellites includes specific brackets that serve as a link between the body of the satellite and the reflectors and feeder facilities mounted at its upper end. The engineers at Airbus Defence and Space faced two key challenges with regards to the construction of these retaining brackets: on the one hand, the brackets must fix the securely to the body. On the other hand, however, the task of the brackets is to mitigate the extreme temperature fluctuations in space. The brackets are very important as a layer of insulation: the temperature ranges from –180 to +150 °C, so the stress on the material is extremely high.

Very few materials are able to meet these requirements. As so often in the aviation and aerospace industry, titanium turned out to be the appropriate choice. In addition to its well-known advantages with regards to weight and thermal conductivity, it offers an acceptable

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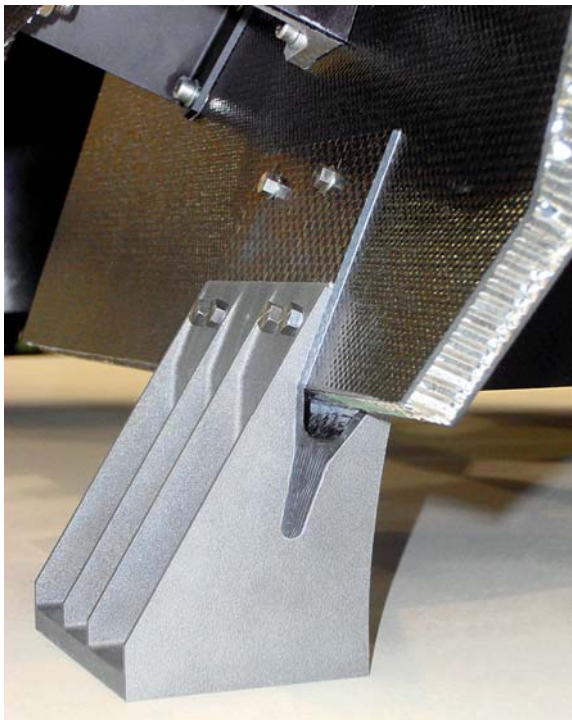
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✓ The robust titanium brackets were manufactured using an EOSINT M 280. They easily and permanently withstand the high temperatures and external forces in space (Source: Airbus Defence and Space).

density. After all, every kilogram to be carried into space costs many thousand dollars; the exact amount depends on factors such as the carrier system and the orbit to be reached. However, six-figure sums and higher are not uncommon.

The brackets manufactured in the conventional way and especially their connection with the carbon components of the satellite – a function subject to high thermal stress – did not meet the expectations of Airbus Defence and Space. In addition, subsequent installation on the satellite component was very time-consuming so costs needed to be reduced. The engineers therefore began looking for alternatives. Special attention was paid to the fact that the design of future components could be optimised accordingly.

Solution

The choice fell to the Additive Manufacturing technology for metal parts offered by EOS. This meant that titanium was still usable as a tried and tested material. It also allowed the design of the components to be adapted easily. As Otilia Castro Matías, COC Antennae at Airbus Defence and Space, explains: “The solution now found by us has two advantages. For once we were able to optimise production itself. In addition, we have improved the design, so the entire workpiece can be manufactured in a single step. Hewn from a single block so to speak, even though technically speaking it is the opposite of this traditional technique.”

“The use of titanium as the material for the retaining

brackets of our satellites has proven highly effective. The main weakness, however, was the connection of the brackets with the carbon panel of feed and reflector assembly because here the thermal stress was negative factor. Thanks to Additive Manufacturing, we were able to redesign the bracket and eliminate this vulnerability. There were other benefits, too, such as shorter, more cost-effective and more lightweight production,” adds Matías.

After the design was established, the well established process followed: the engineers loaded the 3D construction plans from the CAD software into the production machine – an EOSINT M 280 – and started the manufacturing process: a laser beam precisely melts and hardens the deposited metal powder layer by layer, so when the precision made workpiece is complete, no excess material remains except for re-useable raw material.


Results

The new devices meet all expectations of the experts involved. Most important of all is the improved temperature resistance of the entire structure, which now can easily and permanently withstand a margin of 330°C under a force of 20 kN. In addition to this, the Spanish aerospace experts were able to reduce production time of the brackets during assembly of feed and

“In addition to the technical advantages, targeted cost reductions were achieved: savings in production alone amount to more than 20 percent. What is more, the engineers successfully put the part on a diet: the weight advantage is about 300 g, which means nearly one kilo per satellite.”

sub reflector units by five days. Production time of the three brackets required for each satellite is now less than a month.

“These improvements significantly reduce thermally induced failure during the qualification test campaign. The cost of space activities is relatively high, so it is even more important to protect any hardware from possible failures,” adds Matías. “The Additive Manufacturing method brought measurable benefits to critical aspects of the project, without requiring cuts to be made elsewhere. No compromises - this is something engineers like to hear, but don’t get to hear very often.” In addition to the technical advantages, targeted cost reductions were achieved: savings in production alone amount to more than 20 percent. What is more, the engineers successfully put the part on a diet: the weight advantage is about 300 g, which means nearly one kilo per satellite.

Incidentally, European Space Agency (ESA) supported this program. Its successful completion it allows further use of this efficient production technology in the aerospace field. 

Source: EOS

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Disruptive Innovations

In order to stay relevant, aerospace players need to understand these disruptive changes and incorporate them in to their business.

By Aravind Melligiri



The sector will witness a shift from 'print to build' projects to 'design to build' projects in the near future.

India is on the verge of a new age in manufacturing. The estimate by the United States Department for Agriculture Economic Research Service (USDA) forecasts that the Indian economy is on its way to be the third largest in the world by 2030 and the fifth largest manufacturing country by 2020.

According to a study by India Brand Equity Fund, the manufacturing sector is expected to contribute 25 percent to India's total GDP and create 90 million domestic jobs by 2025. This accelerated growth and the government's 'Make in India' scheme will propel India to become a popular manufacturing hub.

The Government of India has proposed several initiatives to indigenise the aerospace industry and attract global industry players to bring their manufacturing needs to India, as well as decrease dependency on imports. Strong economic growth, favourable policies, cost advantages and strong intellectual capital are some of the key drivers of this sector.

The sector will witness a shift from 'print to build' projects to 'design to build' projects in the near future. Both global

and Indian aerospace companies, along with the Indian government, have set up R&D centres to develop state-of-the-art aerospace technologies to improve India's profile and to create disruptive technological advancements.

Disruptive innovations can be in terms of technology, tools or new materials that can be characterised by their ability to not just update existing markets, but also to create new ones entirely. Manufacturing technologies have seen some revolutionary changes in the last few decades. Various practices like lean manufacturing have been incorporated to drastically improve productivity, quality, and cost efficiency.

Fuel Efficiency

In order to stay relevant, aerospace players need to understand these disruptive changes and incorporate them in to their business. One of the key areas of interest for aerospace companies is fuel efficiency or optimisation. Fuel consists of at least 33 percent of the total operational costs therefore global companies like Airbus and Boeing have dedicated their resources and new age technology to optimise fuel capabilities. These companies are offering various packages to boost fuel efficiency. They add aerodynamic devices to wingtips which can cut fuel by up to five percent on single aisle jets.

Composite Materials

Composites are the most preferred type of aerospace materials as they are low in weight, increase manufacturing productivity (processing speeds), lower VOC emissions, and have better corrosion resistance, among others. A composite is made by combining two or more distinct materials to achieve superior properties, one for binding and the other as a reinforcement material. It is an excellent choice of material for new generation aircrafts and will see larger use than aluminium in near future.



"Both global and Indian aerospace companies, along with the Indian government, have set up R&D centres to develop state-of-the-art aerospace technologies to improve India's profile and to create disruptive technological advancements."



"The aerospace manufacturing industry is at the cusp of disruption. Additive manufacturing, IoT integration, efficient fuels amongst others are just the start of a digital manufacturing process which, in the near future, will ideally involve automation, big data applications, AI, and robotics."

Internet of Things (IoT)

IoT has the potential to revolutionise the aerospace industry and change the way it functions, entirely. It can transform day to day tasks at even the lowest level and make the manufacturing process more integrated. IoT has a profound effect on assembly, manufacturing, maintenance and safety among others. It can tackle complex situations effortlessly and help the aerospace industry adopt global trends such as embedded sensors in engines, device monitors, data storage and other IT advancements.

Additive Manufacturing

3D printing or additive manufacturing is an upcoming trend in manufacturing, including the aerospace manufacturing sector. 3D printing uses sophisticated computer simulations to directly print objects from materials like nylon, clays, thermoplastics and metals. It is still at its nascent stage in the aerospace sector but undeniably has the potential to change the entire process of manufacturing.

Additive manufacturing can increase production rate and assembly of complex aerospace parts. Some of the other advantages of additive manufacturing are that companies can use it to replace metals with plastic components to decrease the entire weight of the aircraft and also reduce project time, material wastage and warehouse space. One of the main challenges in additive manufacturing is to ensure and convince customers that 3D components are as efficient, if not more, as their counter parts. Global companies have also entered this sphere to tap into India's potential and to develop the country's manufacturing capabilities.

Way forward

The aerospace manufacturing industry is at the cusp of disruption. Additive manufacturing, IoT integration, efficient fuels amongst others are just the start of a digital manufacturing process which, in the near future, will ideally involve automation, big data applications, AI, and robotics. Other emerging trends are customisation, energy efficiency and environmentally sustainable manufacturing tools and processes. Rapid advances in these sectors will help transform manufacturing technologies to meet the increasingly competitive industry demands.

The author is Chairman and CEO, Aegis.

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Building Next Generation Supply Chain

The event discussed future of the supply chain and various changes that it is expected to undergo.

The 4th Annual Economic Times Supply Chain Management & Logistics Summit 2017 held in Mumbai saw industry forerunners discuss the impact and implementation of GST on the Supply Chain Management & Logistics Industry in addition to other topics relevant to the sector. The summit highlighted the next generation supply chain in India and centred on the theme 'Gateway to the Future: Building Next Generation Supply Chain.'

The summit brought together the industry's brightest minds to debate the future of the supply chain that will drive change and deliver transformation. It was attended by manufacturing and supply chain executives from distinguished FMCG, Retail, E-commerce, Pharma and Logistics firms. The power-packed day proved to be a distinctive experience featuring insightful content and networking opportunities. The panellists were optimistic about GST and said that there are many ways in which GST will improve Supply Chain Management (SCM) and logistics in the country.

Swatantra Dev Singh, Minister of State for Transport, Uttar Pradesh said, "I would like to thank The Economic Times for inviting me to this conference which focuses on the eco-




"The recent developments in the sphere of supply chain management and logistics has changed the way trade takes place across the country, benefiting end users and businesses."

Swatantra Dev Singh, Minister of State for Transport, Uttar Pradesh

nomi well-being of the country. The recent developments in the sphere of supply chain management and logistics has changed the way trade takes place across the country, benefiting end users and businesses."

Addressing the evening session, Diwakar Raote, Minister of State for Transport, Maharashtra said, "It's a pleasure to be a part of this summit. Our vision is to have better roads, a better supply chain for the villages as well as we welcome all the logistics and transport traffic passing through or headed to Maharashtra. Our government is different to what has been experienced in the last 15 years, and we look forward to ushering in great change over the next five years."

The summit offered fresh thinking on the opportunities and challenges facing the sector, as well as providing the ideal environment to discuss best practices and trends in global markets, quality, supply chains, talent issues and more. It focussed on skilling the modern workforce, the evolution of the warehousing sector in India and highlighting five technologies that will self-orchestrate the supply chain. The panellists also threw light on maximising supply chain revenue, enhancing the customer experience & increasing profits through strategic management of suppliers, logistics & costs. 



"Our vision is to have better roads, a better supply chain for the villages as well as we welcome all the logistics and transport traffic passing through or headed to Maharashtra."

Diwakar Raote, Minister of State for Transport, Maharashtra



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Improving additive manufacturing with the help of Infrared

Read on to know more on how infrared cameras can help manufacturers find systematic problems and determine what changes are needed to maintain product quality.

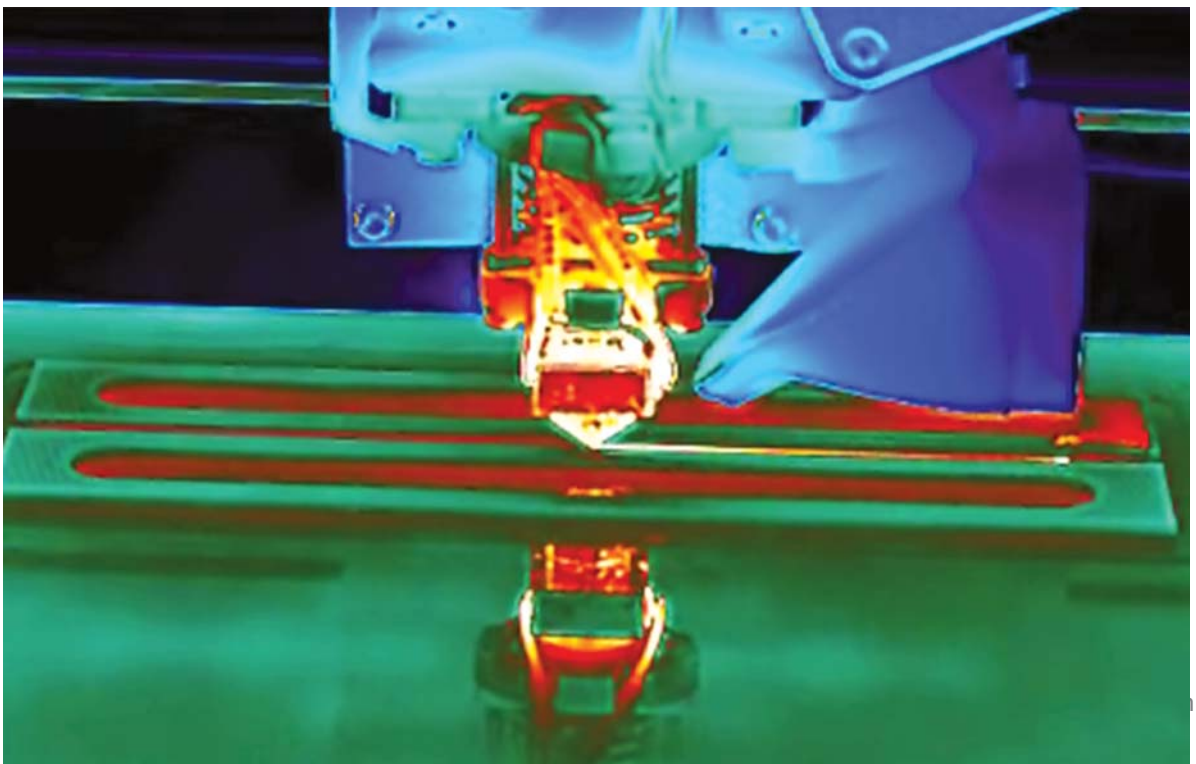
Additive manufacturing (AM), also known as 3D printing, is revolutionising manufacturing. In contrast with subtractive manufacturing methods such as machining, AM technologies create components directly from a computer model, adding material only where needed. Heat is often an integral part of this process – one that needs to be monitored closely in order to see consistent results.

Growing numbers of high-tech organisations are pioneering additive manufacturing (AM) technologies to use in applications ranging from product development to specialised manufacturing in fields such as architectural design, aerospace components, and medical implants. NASA has even sent two different 3D printers designed to operate in zero-G to the International Space Station. The advantage of AM is it allows for far greater design flexibility, decreased energy consumption, and a faster time to market. But AM parts can be subject to quality issues, thermal stresses, and distortions that can be difficult to diagnose. Studying the process and its thermal properties with an IR camera can help manufacturers make quick corrections with minimal production delays.

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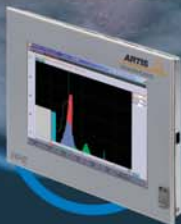
Taking Control of the Process

While researchers are experimenting with a variety of base materials – from carbon-fiber reinforced thermoplastics to living cells – the majority of additive manufacturers use metal- or polymer-deposition technology. These materials are proving tricky in their own right, as researchers are still working to improve the AM processes and to understand the reasons for process failures. Additively manufactured parts are subject to a variety of quality issues, most often due to unknown cause-and-effect relationships between the manufacturing process parameter settings and the process characteristics. Too often, process parameters are set using trial and error techniques,



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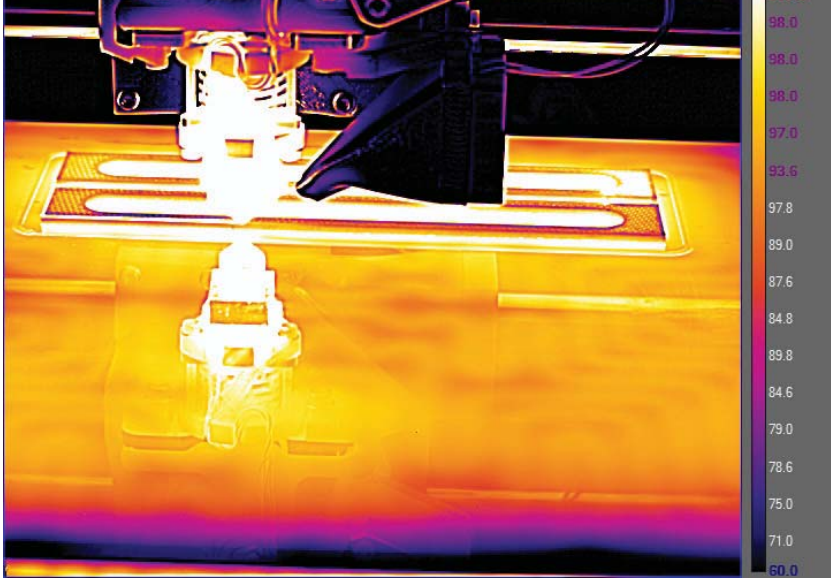


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which are time-consuming, costly, highly subjective, and machine- and material-specific.

The ability to monitor processing equipment, materials, and in-process part temperatures quickly and accurately is crucial to additive manufacturing research. Typical contact forms of temperature measurement, such as thermocouples, RTDs, and thermistors, would be difficult or impossible to use effectively.

The solution for many researchers is to use infrared science cameras: high speed, noncontact temperature measurement tools that can provide the data accuracy necessary to correlate in-process temperature data with measures of finished part quality. IR cameras can monitor the effect of changes to printer settings or to the materials used. These cameras can also help identify the source of quality issues such as part porosity, delamination of layers, shrinkage, poor surface finish, and dimensional and form errors, as well as thermal stresses and distortion.

Tools for temperature monitoring

IR cameras have the features needed to monitor temperature changes in a variety of materials. Ralph Dinwiddie, an AM researcher at Oak Ridge National Laboratory in Knoxville, Tennessee, says his lab uses IR cameras to measure temperature over several locations and stages of the production process. “We need the ability to record temperatures at high speeds and to calibrate these cameras with our own black-body source,” Dinwiddie explains. Common tools for AM researchers can include high speed, midwave infrared (MWIR) cooled cameras, such as the FLIR X6900sc, and lower resolution, long-wave infrared (LWIR) uncooled cameras, such as the FLIR A65sc. The differing capabilities of these cameras make each particularly suitable for specific sets of tasks. For example, the uncooled A65sc is compact and can be mounted easily on a polymer 3D printer to monitor the temperature of the extruder tip and/or the extruded material. Its thermal sensitivity of less than 50 mK allows A65sc cameras to distinguish between minor variations in temperature. For tasks for which high speed temperature measurements are crucial, the cooled X6900sc’s windowing capability allows for the faster frame

rates necessary.

Dinwiddie says it’s vital to his research to have a camera with windowing capabilities. This means the camera reads out a smaller sub-group of pixels on the IR detector, reducing the number of pixels per frame. This allows the camera to send out more frames per second, achieving faster frame rates.

Accessories can be important, too, says Dinwiddie. “My work also demands a lot of flexibility in terms of lenses. For example, I’ve


The ability to monitor processing equipment, materials, and in-process part temperatures quickly and accurately is crucial to additive manufacturing research.

used telephoto lenses, wide angle lenses, standard 50-millimeter lenses, as well as microscope lenses, and a macro lens. I’ve also used extension rings so I can focus much closer than I’d normally be able to do.” Although each new AM system or material presents its own set of characterization challenges, some common tasks include real-time detection of porosity while the parts are being printed with the e-beam systems. A pore typically appears on a thermal image as a dark spot. The cameras have also proven especially useful for “dialing-in” the correct processing parameters needed to prevent the formation of pores when working with new metal powder formulations.

IR cameras can help researchers better understand the role of temperature in the construction of polymer 3D systems. They can use the camera to measure the temperature of each layer of a part as it is applied and study how the temperature of lower layers affects the bond strength between layers. The

cameras are also used to measure the temperature of the build chamber and monitor the thermal gradients in the part itself as it cools. With many polymer materials, uniform cooling helps reduce distortion in the finished part, which is why some 3D printers have a heated build chamber to slow the cooling of a part’s outside edges.

Conclusion

IR cameras have proven their value in advancing a wide range of emerging AM technologies by giving materials scientists the accurate results they need to fine-tune materials, equipment, and process parameters. This refining of the AM process will help the industry meet its expected rapid growth in the coming years. 

Source: Flir



Heat-resistant polyamide Ultramid

Collaboration with ABC Group and Magneti Marelli for innovative parts on the 2.0-liter turbocharger system


BASF has introduced its heat-resistant polyamide Ultramid Endure in two new powertrain applications on the 2017 Alfa Romeo Giulia: the air intake manifold with integrated charge air cooler and the hot-side turbo duct. As heat under the hood increases, Ultramid Endure with its high heat-aging resistance up to 220°C enables automakers to achieve engine downsizing and turbocharging without sacrificing performance. The Ultramid Endure grades offer good processability, excellent weld line strength and are available globally.

Hot-side turbo duct

BASF collaborated with the automotive supplier ABC Group, Canada, to develop the hot-side turbo duct for the Alfa Romeo Giulia. For this application, ABC Group decided on BASF's Ultramid Endure D5G3 BM, a 15 percent glass fiber reinforced blow moulding grade, which has high hose strength and shows good swelling.

ABC Group leveraged BASF's joining technology expertise to optimize the infrared (IR) welding parameters for this part. It was crucial to achieve strong weld lines to ensure the long-term durability of the duct.

Air intake manifold with integrated charge air cooler

BASF worked with Magneti Marelli, a business of Fiat Chrysler Automobiles (FCA), to develop the air intake manifold with integrated charge air cooler for the Alfa Romeo Giulia. The need for a material to withstand a 200°C continuous use temperature made this air intake manifold a prime candidate for Ultramid Endure D3G7, a 35 percent glass fiber injection molding grade. The air intake manifold also required an excellent burst pressure performance; therefore, Magneti Marelli needed a material that offered reliable weld strength at elevated temperatures. With the company's design, material and processing expertise, Magneti Marelli could achieve the required burst strength and durability for the assembly. 

Source: BASF

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Cutting manual intervention time

Learn how Renishaw helped Equinox 3D to re-create a concept car.

As a specialist producer of fibreglass products across a wide variety of industries, Equinox 3D is often approached with intricate and bespoke designs. Thanks to the introduction of Renishaw probing systems to its manufacturing process, the company based in Faversham (UK), is able to meet the most unusual of customer requirements accurately and reliably within a short time frame.

Background

Equinox Products began as a producer of glass fibre products for customers operating in a range of industries; from automotive and architectural, to the manufacture of amusement arcade machines. Its regular requirement for mould tools led to the creation of Equinox 3D; a company that has evolved to provide four-axis CNC machining, 3D scanning, reverse engineering, CAD design and other non-mould tool related engineering activities.

The addition of an XYZ 1020 Vertical Machining Centre (VMC), equipped with a Renishaw OMP40 part setting probe and a TS27R tool setting probe, has greatly improved the productivity of Equinox 3D. Despite working to tolerances of ± 0.1 mm rather than microns, Equinox 3D finds probing a valuable addition to its manufacturing process. With all of its work being visible and tactile, aesthetic appearance is key. Many of the moulds are assembled from multiple sections, meaning accurate

alignment is crucial. Previously, a multi-section mould would require many hours, if not days, of manual input in terms of polishing, fitting and finishing. This frequently added both time pressure and cost to the process, and time is a commodity that Equinox 3D simply does not have. A recent time-critical job is a typical example.

Challenge

"We were approached out of the blue by the organisers of the Best of Italy Festival, a two-day event in Emilia-Romagna Piacenza, Castell'Arquato, culminating in a hill climb featuring Italian supercars, superbikes and pedal cycles," says Darren George, Technical Director, Equinox 3D. "Their requirement was to re-create a concept car produced by Maserati; the Super Monoposto.

The starting point for this was a standard Maserati 4200, which had its soft top and windscreen removed with an angle grinder. "With a date set for the festival and certain processes with fixed time, we were left with a couple of weeks to completely design and manufacture the new fibreglass monoposto cover for the cockpit area, ready for the car's unveiling at Brooklands with its celebrity driver; model and TV presenter, Jodie Kidd," explains Darren George.

The canopy stretched from the rear of the car and covered the passenger area, leaving just the driver exposed to the elements. This required Equinox 3D to machine a

"We had to run the machine 24/7 over 10 days to get the moulds produced on schedule, which meant coming into the workshop at midnight to set up the next block. At that time of night, the fact we could set datums automatically was a major bonus,"

Darren George, Technical Director, Equinox 3D



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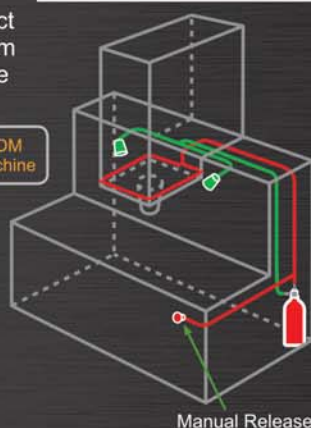
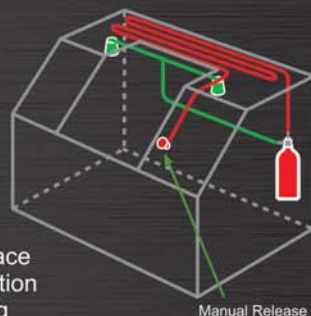


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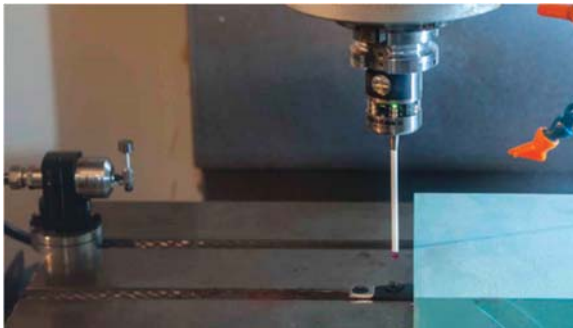
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The Renishaw OMP40 part setting probe was used to set the datum of 16 blocks of 0.7 density PU modelling board



An OMP40 part setting probe and TS27R tool setting probe were used in the setting processes for the 16-section mould for the fiberglass cover

multiple section pattern; 16 sections in total. These sections had to fit together accurately to ensure that the fibreglass mould would require the minimum of hand finishing.

Solution

A Renishaw OMP40 part setting probe was used to set the datum of each of the 16 blocks of 0.7 density PU modelling board. Using probing, setting the datum took around one minute per block.

Previously, simply setting the datum in the X and Y axes would take 3-4 minutes for each axis, and the Z axis datum could take as long as five minutes to set. The Renishaw probe saved Equinox 3D in the region of three hours in set-up time alone.

Probing was especially beneficial due to the time pressure of the job in question. "We had to run the machine 24/7 over 10 days to get the moulds produced on schedule, which meant coming into the workshop at midnight to set up the next block. At that time of night, the fact we could set datums automatically was a major bonus," says Darren George.

Given that most of its production is of freeform shapes, Equinox 3D also makes full use of the Renishaw OMP40 probe for on-machine post-process inspection. The probe is used to confirm that datum points match up with CAD data prior to the part being removed from the machine.

Similarly, Equinox 3D uses the Renishaw TS27R tool setting probe to confirm and amend tool offsets in-process. This again ensures parts are machined accurately first time.

Results


While these on-machine time savings through use of the Renishaw OMP40 probe are significant in themselves, the most significant time savings occurred once the 16 sections were assembled. Darren George estimates that a mould of this type and size would normally require between one and two days

"Time was the most critical factor on this job and we delivered the finished and painted monoposto canopy with 12 hours to spare. Without probing this would not have been possible. We had one chance with this project, and a finished product that was 2.4 metres in length, which had to fit a 3D shape that we didn't have any CAD data for, brought into focus the tolerance issue."

of hand finishing. This was virtually eliminated thanks to the accuracy of the initial machining. This meant that assembly was straightforward, with minimum discrepancies between neighbouring sections.

"Time was the most critical factor on this job and we delivered the finished and painted monoposto canopy with 12 hours to spare. Without probing this would not have been possible. We had one chance with this project, and a finished product that was 2.4 metres in length, which had to fit a 3D shape that we didn't have any CAD data for, brought into focus the tolerance issue," explains George. "While we may not be working to microns, this item simply had to fit to the location points that we were given. Probing gave us the confidence that we could achieve that."

And, although the company employs 3D non-contact scanning technology, this has its limitations when it comes to some small internal features. Here again, it turns to its Renishaw OMP40 probe to accurately datum

these features. This capability is especially useful when reverse engineering intricate components. A recent project which involved the production of a bell housing for a gearbox of a kit car would have been extremely difficult without the capability enabled by Renishaw probing systems. 

Source: Renishaw

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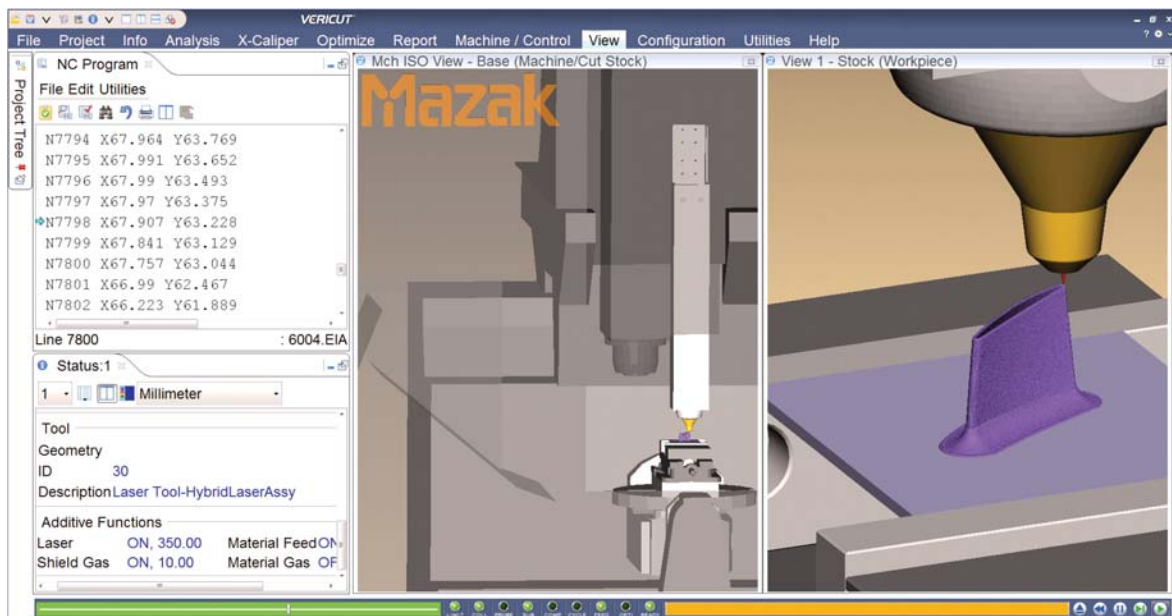


Image courtesy: CGTech

Smooth & efficient workflow

Matthew Olivolo, Marketing Communications Manager, CGTech talks to The Machinist about CGTech's offerings for the aerospace industry.

By Swati Deshpande

How do you think the aerospace manufacturing industry is faring in the country?

India's aerospace and defence manufacturing sector continues to grow and expand through partnerships, new factories and research facilities. In recent months, there has been a flurry of activity in the country that is enabling to build one of the world's major aerospace hubs. The industry has got this momentum from 'Make in India' initiative. It has been driving expansion and growth of the aerospace and defence industry. Airframe manufacturers are encouraged to use aerospace suppliers based in the country. The initiative also aims for a certain percentage of the aircraft to be produced in India. Hence, giving boost to the industry.

Please tell us about how do CGTech software help customers in the aerospace industry achieve new heights?

CGTech's VERICUT software is the standard for CNC simulation, verification, optimisation, analysis, and additive manufacturing. CGTech also offers programming and simulation software for composites automated fiber-placement, tape-laying, and drilling/fastening CNC machines. Whether traditional machining or complex composites applications, CGTech's simulation software has helped hundreds of aerospace manufacturers across the globe. Many manufacturers consider VER-

ICUT as a competitive advantage over their competition.

In addition to industry leading software, CGTech offers services and training. They take pride in ensuring VERICUT is correctly integrated with manufacturers CAD/CAM systems, and their electronic workflow is as smooth and efficient as possible. CGTech also offers on-site advice and training. This helps with initial pilot projects, and eliminates false starts and confusion.

CG Tech has recently unveiled Additive Manufacturing simulation capabilities. Please tell us about how will it help the aerospace industry in specific?



Additive Manufacturing has reached a maturity level that has captured the interest of many of our customers, and proven to be a valuable addition to manufacturing strategies.



VERICUT 8.1 includes a new Additive Manufacturing module that simulates additive and hybrid machining processes used in any order, and on any brand NC machine. Additive Manufacturing has reached a maturity level that has captured the interest of many of our customers, and proven to be a valuable addition to manufacturing strategies. VERICUT has long been known as best-in-class software for simulating all types of traditional machining, and the Additive module extends that capability to accurately show material deposition, while checking for collisions between machine, laser and other additive components and the additive part being built. Additive functions, such as laser activity/power, material feed, gas use, etc. are constantly monitored and errors inform users when conditions are incorrect for material deposition.

In the Additive module, the user can access detailed 'history' stored with VERICUT's unique droplet technology, which saves programmers time by quickly identifying the source of errors, in most cases using a single mouse-click. This Additive capability checks: accurate laser cladding and material deposition, detects collisions between the machine and additive part, and finds errors, voids, and misplaced material. For the highest accuracy, VERICUT simulates the post-processed NC code that will be used to drive the CNC machine, and ensures proper usage of AM functions and laser parameters. Users can virtually experiment with combining additive and metal removal processes to determine optimal safe hybrid manufacturing methods. This new module will help aerospace manufacturers ensure their parts are made properly, and in an efficient manner.

CG Tech plans to launch new version of VERICUT Software for Aerospace Manufacturers at Paris Air Show 2017. What new features the company is adding?

CGTech previewed its latest simulation software release of VERICUT 8.1 at the Paris Air Show. Version 8.1 includes its new Additive module (mentioned above), along with several substantial enhancements to the following existing modules.

Force Optimisation

Force optimises NC programs by analysing cutting conditions such as force, chip thickness, and feed rate. In 8.1, Force can display graphs and charts in real-time, revealing cutting conditions and forces as they are encountered by cutting tools. This feature allows the NC programmer to identify undesirable cutting conditions such as excessive forces, chip loads, tool deflection, or material removal rates represented as spikes in the graphs. Force Charts are dynamically linked with VERICUT's NC Program Review, making it easy to review problem cutting conditions. With one click on the chart, the user is taken to the location in the CNC program and shown the actual cut in the graphics window. By optimizing toolpath feed

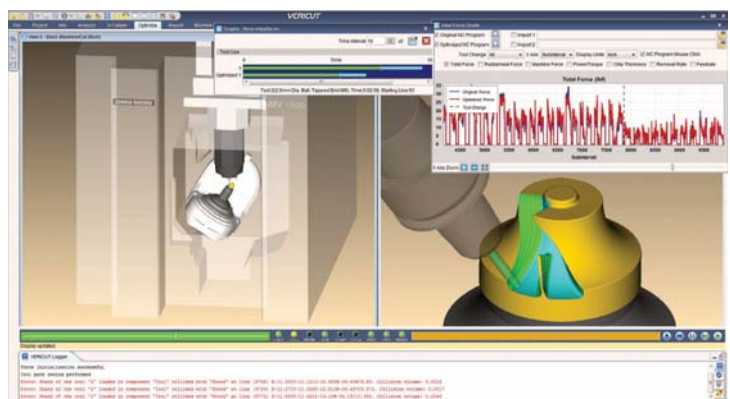
rates: Force reduces production time, prolongs tool life, and produces a higher quality finished product.

Enhanced Sectioning

VERICUT's new Section dialog makes it easier and faster to see inside a part during simulation. This allows the user to check proper fit, and identify interference between the workpiece and machine components. Sectioning abilities in 8.1 extend to machine views, which help with complicated machines where visibility is challenged. Simulation can be stopped, rewound, sectioned, and zoomed to achieve unobstructed viewing needed to pinpoint errors highlighted during the simulation.

X-Caliper Dimensions

The X-Caliper measuring tool identifies model thickness, length, and width dimensions. In 8.1, measurements are shown on the part, and can be rotated with the part, zoomed, or dragged to a different location. Multiple dimensions can be displayed to quickly document key measurements with on




part dimensions, and setup dimensions designed for inspection aids. Dimension images are easily referenced in VERICUT reports.

Improved report template

Revisions in Report template make creating a custom report easier. Now the NC programmer can: edit in template directly, replace report editor with what you see is what you get (WYSIWYG) editor, edit HTML objects and code directly, and modify text/fonts and insert images similar to standard Word documents.

Grinding and Dressing

VERICUT 8.1 enhanced support for Grinding and Dressing operations. Users can now simulate Dressing: where a secondary tool is applied to a grinding wheel to freshen the grinding surface, or to change the grinding wheel cutting shape. VERICUT can simulate the Dynamic compensation needed while the dresser is used, even when the grinder is engaged with the part. 

Enabling India to fly high

S. M. Vaidya, EVP & Business Head, Godrej Aerospace speaks to The Machinist about the company's contribution towards Indian aerospace industry.

By Swati Deshpande

Godrej takes pride in working along with ISRO. Can you please tell us about projects that the company has undertaken recently from ISRO?

We are proud to have been partnering ISRO since 1985 on several break-through missions. Godrej has worked with ISRO on complex systems such as liquid propulsion engines for PSLV and GSLV rockets, thrusters for satellites and antenna systems.

Some of the recent ISRO projects that we contributed to include the record-breaking PSLV C37 rocket that launched 104 satellites, making it the most in a single mission anywhere in the world. In addition, Godrej played a crucial role in ISRO's heavy rocket GSLV-F09 that launched the satellite GSAT-9 which has multiple applications including tele-medicine, tele-education, terrain mapping and weather forecasting, for countries of the SAARC region. Most recently, we have contributed to ISRO's GSLV Mk III, which is a giant leap for Indian space technology. With this launch our nation is now completely self-sufficient in launching heavier class satellites. These momentous achievements are major milestones for ISRO and Godrej Aerospace as well.

The company has been working with defence organisations such as BrahMos, Ordnance Factory. How has been the technological prowess of the country transformed over the period of time in the defence segment?

Over the years, Godrej has been contributing significantly towards the country's defence and space programmes. In defence, Godrej & Boyce has manufactured riveted structures, tankages, engines for the IGMDP missile programme and actuators for aircrafts.

The Indian aerospace industry is one of the fastest-growing aerospace markets in the world. With the low cost of labour and a pool of engineers, India has emerged as a player in the global market. The growth in India's manufacturing sector and the rising stock of its R&D capabilities are bound to have repercussions not only in the Indian but also in the international aerospace markets. Hence, it has attracted major global aerospace companies to India. All segments in the aerospace industry, including civil and military aviation and space, are showing a significant level of growth. What is needed is a better understanding of where the Indian aerospace is heading to in a highly dynamic political, economic, social and technological environment. There are several factors driving growth in manufacturing in India's aerospace industry. These include both macro and micro factors - strong economic growth that has resulted in rapidly growing domestic aircraft demand, the liberalisation of civil aviation policies, offset requirements, a strong domestic manufacturing base, cost advantages, a well-educated talent pool, the ability to leverage IT competitiveness and a liberal Special Economic Zones law that provides attractive fiscal benefits for developers and manufacturers. The

Need of the hour is better understanding of where the Indian aerospace is heading to in a highly dynamic political, economic, social and technological environment.





challenges include access to technology, funding, poor availability and high cost of raw material and certification processes.

Q Aerospace is a crucial sector that demands for precision and accuracy. Tell us about your manufacturing capabilities that enable achieving these parameters.

Godrej Aerospace represents the organisation's strong engineering expertise. Our aerospace business had its beginning in a small way, back in 1985, with development of critical, high precision spacecraft components, made with exotic alloys. We have demonstrated capabilities in precision engineering, material handling, cutting edge technology, precision fabrication (welding & brazing), heat treatment, surface treatment, assembly, testing & supply of complex & air worthy systems.


Today, our company is executing major aerospace projects that involve high-precision machining. Godrej Aerospace has amassed a rich experience in successful development and productionisation of Liquid Propulsion Engines, Defence Systems, Satellite Components & Assemblies and Dish Antennas with Feed Systems - all duly approved & accepted by our customers, both Domestic & Global.

The growth in India's manufacturing sector and the rising stock of its R&D capabilities are bound to have repercussions not only in the Indian but also in the international aerospace markets.

One example is the second stage engine of the PSLV called Vikas Engine, which is manufactured by Godrej Aerospace. So far the company has delivered more than 50 such engines. For GSLV, Godrej Aerospace manufactures the Thrust chamber for the Cryogenic Engines. On the exports front, Godrej Aerospace has been working with global customers since 2004 and currently manufactures assemblies for aircraft engines, Line Replacement Units and structures. Recently, we have also set up a facility for manufacturing rubber and composites.

Q Currently there has been emphasis on development of indigenous technologies. How is this fact boosting Godrej Aerospace's growth?

For over three decades, the company has been associated with ISRO for complex systems such as liquid propulsion engines for PSLV and GSLV rockets, thrusters for satellites and

antenna systems. Godrej Aerospace contributed to the prestigious Chandrayaan and Mangalyaan missions. The company has been committed to the cause of indigenous manufacturing for India's space programmes, and with the current emphasis on indigenous technologies, we look forward to partnering further in the Indian space program. 

UPDATES

Digitalised factory

Siemens India inaugurated its showcase digitalised Low-voltage Switchgear factory at Kalwa recently. The globally-benchmarked factory is capable of producing more than 180 variants at the rate of one product every nine seconds. The plant can manufacture over five million devices annually. Products at the plant communicate with machines and all processes are optimised for IT control, resulting in a minimal failure rate. The production methods deployed at the plant are expected to be a standard for small and medium-sized manufacturing units in India, achieving a visionary model for the future of manufacturing: end-to-end digitalisation where the real and virtual worlds merge in 'Digital Factory'. Speaking on the same, Karlheinz Kaul, CEO – Control Products, Digital Factory, Siemens AG said, "With the launch of the showcase digitalised factory in India, we further deepen our ties with a country in which we have a very strong presence. The SIRIUS range of switchgear products that will be manufactured here requires a very high degree of precision and quality at global standards that can be achieved only through digitalisation. The technical and engineering effort required to transform this 40-year-old manufacturing fa-



cility is a true showcase for Indian enterprises who wish to follow the path towards digitalisation!" The digitalised factory is a proof of how adopting digitalisation will help Indian SMEs, achieve manufacturing excellence.

SMEs can utilise digitalisation to address growing demands like mastering increasing product and process complexity, reducing time to market, adapting to changing market requirements, deliver individualised products and secure continuous product improvement. The Low-voltage Switchgear factory at Kalwa Works has achieved end-to-end digitalisation across its value chain through Product Lifecycle Management software like NX and Teamcenter, Totally Integrated Automation (TIA) Portal and manufacturing execution system.



More smart plastics intelligence for greater plant availability

Monitoring the operating state of all e-chains with just one module

Predictive maintenance is part of Industry 4.0 and the factory of tomorrow. For this future, igus has developed a family of products under the heading of 'isense', where different sensors and monitoring modules make the plastic solutions intelligent. At the Hannover Messe 2017, igus showed new and improved products. These included, for example, isense EC.RC, a new system for monitoring e-chains, the optimised CF.Q module for the intelligent chainflex cables that customers are already using today and the intelligent iglidur PRT slewing ring bearings.

Making production processes easier and more reliable – In order to enable its customers to do this, igus the motion plastics specialist, develops intelligent solutions that warn of potential failure in good time before unplanned and very costly

"Real applications in which we are already using our intelligent products and our chainflex cables include, for example, robot gantries for transportation in automobile factories, where even short unscheduled standstill times result in very large production losses."

Michael Blaß, Head of Sales and Marketing e-chainsystems, igus

downtimes occur. One year ago, igus presented its first products at Hannover Messe – Due to the considerable customer demand, visitors coming to the stand a year later could now experience the new generation of 'smart plastics'.

Continuous monitoring for safe operation

Including the new isense EC.RC (e-chain Run Control). It monitors the operating status of the e-chains, especially in guide troughs used on long travel applications. Sensors measure and check the position of the energy chain. In this way, the machine is prevented from continuing to operate when mechanical faults occur; meaning that total loss of the chain or an electrical shutdown (for example, due to cable damage) are a thing of the past. In this way the isense EC.RC, like all isense products from igus, guards against any unscheduled machine shutdowns.

Intelligent motion plastics for diverse applications

Another new product from the smart plastics family is the EC.M module, which is mounted on the moving end of the chain and automatically records its status, i.e. acceleration, speed, temperature and completed cycles. The distance travelled and the remaining service life of the system can be de-



rived from this. igus has also improved the CF.Q module, with which the data of the intelligent chainflex cables are gathered. Due to continuous measurement of the electrical properties, ambient temperature and the number of cycles, a possible failure of the cable is predicted in good time. "Continuous testing in our test laboratory and in customer applications help us to make analysis of the measured values increasingly more precise", explains Michael Blaß, Head of Sales and Marketing e-chainsystems at igus. "Real applications in which we are already using our intelligent products and our chainflex cables include, for example, robot gantries for transportation in automobile factories, where even short unscheduled standstill times result in very large production losses."

One module for many energy chains and cables

Whereas igus presented different isense measuring systems for its linear guides, energy chains and cables last year, the icom communication module, which gathers, and transfers all the values of these systems, was improved at the same time and now communicates mostly without cables. It is even easier to integrate into existing production, one of the reasons being that only a single icom module is needed for several systems. In addition, customers can now connect other manufacturers' data-generating units which monitor status to the icom module. igus showed live on the stand, how the operating states of all moving e-chains are measured by only a single icom module. In addition, igus showcased the intelligent iglidur PRT slewing ring bearing, a new member of the smart plastics family. Thanks to an integrated wear sensor, which is mounted in a cut-out niche under the slide elements, the so-called PRT.W sensor ('W' for wear) also measures the abrasion so that replacement of the bearing in good time without an unscheduled machine shutdown can be ensured, thus contributing towards increased security in production.

For more information, contact:

Shery George
igus (India) Private Limited
sgeorge@igus.in
www.igus.in



Okuma's new 2-saddle CNC lathe, the LU7000 EX is a large smart machine that was especially designed for applications with large work envelopes, powerful cutting capacity, and process-intensive machining to achieve best-in-class productivity of hard-to-cut parts.

The machining capacity of the machine is the best in class. The turning capacity is 10mm². Further, it is capable of effi-

New 2-saddle CNC lathe

Learn more about Okuma's 2-saddle CNC lathe

ciently cutting oil-well pipes in one pass (chaser threading). The powerful milling spindle enables process-intensive machining of large difficult-to-cut parts. The end milling capacity is 120cm³/min. Maximum working diameter is 900 mm (1.4 times more than previous machine). The 200mm long Y-axis travel is the best in class. The high-efficiency simultaneous turning with upper and lower turrets achieves minimum cycle times.

Okuma offers innovative productivity improvement for the heavy industries that have large, difficult-to-cut components.

For more information

OKUMA Corporation; www.okuma.com

Automated tool changing press brakes

New models offer mode bending flexibility

LVD Company nv expands its line of ToolCell automated tool changing press brakes with the ToolCell 220/30 Plus and ToolCell 220/40 Plus. The new Plus models can handle bend lengths of 3 and 4 m and have 220 tons of bending force. They feature an open height of 570 mm to accommodate higher tools. The new tools—231 mm punches and 130 mm dies—allow to bend parts with higher flanges.

Automatic set-up

LVD's ToolCell hydraulic press brake features an integrated tool changer and tool storage system. The machine automatically selects and places the tooling required for the job. While the operator is preparing parts for the next job, the machine unloads the previous tool setup and loads the next setup, all without manual intervention. The tool storage system offers a flexible tooling configuration to suit specific application requirements.

Increased open height

The new ToolCell Plus press brakes have a standard open height of 570 mm with a stroke of 300 mm. This can be enhanced to an opening of 670 mm and a stroke of 400 mm. This gives the flexibility to bend a wider range of parts, from simple to complex.

In-process angle control

The accuracy of bending operations is assured with LVD's patented Easy-Form Laser adaptive bending system, standard on all ToolCell models. Easy-Form Laser provides in-process angle monitoring via laser scanners located on the front and back of the press brake table. The system transmits information in real time to the CNC control, which adjusts to ensure the



correct angle. The bending process is not interrupted, and no production time is lost. Using Easy-Form Laser, the machine is able to adapt to material variations such as sheet thickness, strain hardening and grain direction, automatically compensating for any changes. As a result, ToolCell delivers consistent bending results from the first part.

Industry 4.0 ready

ToolCell is Industry 4.0-ready thanks to LVD's latest generation TOUCH-B control. TOUCH-B features intuitive graphical icons used to control all parameters of the machine, ensuring fast and efficient operation.

The control is linked to a central CADMAN database where all production-relevant data is stored. This makes a fluent, digital transfer of production data from management systems to the shop floor possible. Communication to management, planning, production, quotation, costing and other external software modules is handled via a standardized open interface.

For more information

LVD

www.lvdgroup.com



Process knowledge makes machining more efficient

Complete machining solutions at component level are improving the cost-efficiency of
Walter tools for the aerospace industry

Although the topic is not new, it appears as a new item on the agenda on a daily basis: The demands made on manufacturers in the aviation and aerospace industry are becoming increasingly more demanding and complex. And what applies to production businesses, also applies to the machining industry that provides them with the tools they require.

In order to be more cost-efficient, manufacturers need to not only use tools with perfect performance and a long tool life, but also continuously optimise their machining solutions and processes. In this area in particular, Walter – the Tübingen-based machining specialist – has taken on the task of supporting its aerospace customers.

The Goal is to create complete solutions that address the complexity of the task and help to increase productivity and cost-efficiency. Thomas Schaarschmidt, Director Business & Application Development at Walter, explains: “Today customers expect their tool supplier to have a high level of expertise in all key operations that are carried out using its tools. This reduces the increasing cost pressure and compensates for the loss of expertise which arises as a result of outsourcing a large number of tasks.”

More specifically this means that, in addition to the tools required for the relevant machining solutions and the associated comprehensive service, suppliers must have an impressive recycling and reconditioning program. They must provide extensive technical support and offer simple order processing which is integrated as seamlessly as possible into the customer's workflows. The supplier programs the machining systems (or helps the user's staff to

do so) and trains the customer's employees – to name a few of the most important basic requirements.

Crucial beneficial effect

The crucial beneficial effect that Walter has been offering its customers for some time now, goes well beyond this: The tool specialist develops complete machining concepts, including all process steps which arise during the production of a component. These concepts are individually tailored to the customer's needs and contain detailed recommendations regarding which tools are used in which step.

Thomas Schaarschmidt says: “We have taken our customers' list of requirements and developed it further. In other words, we have been systematically building on the comprehensive expertise that our customers need to take on the problems and challenges associated with the production of their components. We make this expertise and the discoveries which result for the production process available to our customers. We are thereby actively helping them to use our tools as efficiently, and as cost-effectively, as possible.”

First, Schaarschmidt's team defined specific components that are frequently used in the aerospace industry: Structural parts made from titanium aluminium alloys, for example, or engine and landing gear components. The Tübingen-based experts developed complete machining solutions for these components in close collaboration with technology partners from the sector: Key customers, machinery and software manufacturers, suppliers, universities and research institutes.

“Our goal is to offer a complete solution for 80 percent of the different variants of a component – all documented down to the finest detail, partly standardised and accessible to our specialists at all times.”

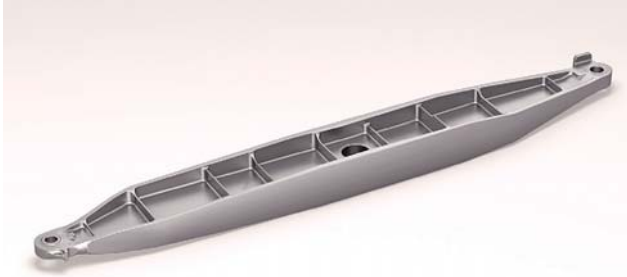
Thomas
Schaarschmidt, Director
Business & Application
Development at Walter



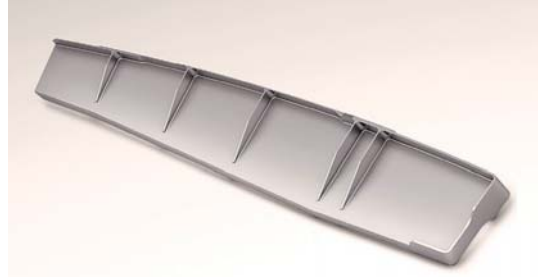
Walter M2131 ramping milling cutter for rough milling and semi-finishing of pockets with high chip volumes. Image: Walter AG



Walter M3255 porcupine milling cutter for roughing titanium alloys. Image: Walter AG



Landing gear mounts are complex structural components that are situated horizontally in the wing structure above the landing gear. These elements connect the wing and the landing gear and act as a shock absorber in conjunction with the main cylinder of the landing gear. Image: Walter AG



Wing ribs are structural components inside the wing. Together with the longerons, they form the frame for the wing skin. Wing ribs are predominantly manufactured from aluminium wrought alloys. These are light, have a high load-bearing capacity and are extremely robust. Image: Walter AG

Practical development

“For every component for which we develop a machining solution together with the customer, we analyse the features and look at which and how many variations exist for each component. Then we map the entire process chain as it is implemented at the customer, at Walter in-house or at technology partners. This means that we know every detail that is relevant for machining the customer component.”

In the next step, a roadmap is created that defines which steps are to be taken to the finished solution. The specialists identify what they can do where, which processes they have already mastered, where there is need for development and how this should be covered most effectively and in the quickest way possible.

The creation of machining concepts involves tool specialists who bring their expertise in machining turning, drilling, threading or milling using a wide range of different materials. The process also involves component experts who know exactly which challenges associated with the manufacture of specific components need to be overcome.

To enable them to tailor their solutions as closely as possible to the specific requirements of the user, Walter's component managers visit their customers on a regular basis. “Our component managers are deeply involved in the topic, they speak the language of our customers and know exactly where the problem areas lie,” explains Thomas Schaarschmidt. Their task is to keep up to date with what the users of Walter tools are currently doing and what optimisation measures or open topics they are looking at. Of course, they also gather feedback on the machining solutions recommended by Walter. “Generally speaking, there are one or two large manufacturers for every component – the market leaders, if you will. We use our component approach to work very closely with these companies – with great success.”

Solutions with a competitive advantage

The solutions that Schaarschmidt's team develops with customers are extremely detailed, with the purpose of creating

competitive advantages for customers. It is therefore not uncommon for one machining concept to include hundreds of pieces of detailed information or machining steps or more. This includes numerous variant-specific machining solutions for every component. “Our goal is to offer a complete solution for 80 percent of the different variants of a component – all documented down to the finest detail, partly standardised and accessible to our specialists at all times.”

The result is recommendations that present exactly which tools, machining parameters and processes can be used to produce a certain component at what cost. The experts at Walter pass this detailed information on to their customers via technology days together with technology partners, via roadshows, using training videos or animations on YouTube and, in the future – to deal with the trend in digitalisation – via our homepage and augmented reality. “We make absolutely sure that the skills that we have built up for our customers and are continuously adding to are also available to them globally.”

It goes without saying that extensive knowledge about future products and requirements also flows into the development processes. Thomas Schaarschmidt clearly explains that this is another definite advantage for Walter's customers: “Forward-looking planning and development enables us to offer our customers a completely new type of machining solution, often right at the start of production of a new product, which is precisely tailored to them. The best example is our new generation of cutting tool material, Tiger Tec Gold. Selected customers from the aviation industry have already tested and verified the new coating platform in conjunction with material-specific substrates, e.g. for titanium machining. After the official introduction at the AMB, we are able to support our customers with new component-specific cutting material solutions with immediate effect.” It goes without saying that the start-up costs are reduced, the time between development and series production (time-to-market) is considerably accelerated and that this has a positive impact on cost-effectiveness.

Source: Walter AG



Clamping different geometries fast and flexibly

The jaw quick-change system allows fast, flexible and safe clamping.

Regardless of shape or size, the SCHUNK PRONTO prism jaws allow different geometries to be clamped fast, flexibly, and safely. The jaw quick-change system is unique in its kind. It can be retrofitted on any lathe chuck (no matter what manufacturer or design). It allows high flexibility and short set-up times of just 15 seconds for a complete set of jaws. The operator can mill the customized required workpiece contour into the soft SCHUNK PRONTO prism jaws himself. Alternatively, configured jaws, based on the workpiece data of the individual prism jaws can be machined and delivered by SCHUNK on short notice. For raw parts clamping, the prism jaws are additionally equipped with SCHUNK claw inserts.

Fast and precise jaw change

In combination with the SCHUNK PRONTO support jaws, SCHUNK PRONTO prism jaws can be used very flexibly. For a fast jaw change, all that is needed is loosen the locking is an Allen key, to remove the clamping insert from the prism jaw, and to replace it by another clamping insert. During jaw change an incorrect positioning on the serration can be prevented. Excellent repeat accuracy of 0.02 mm allows for less time reboring inserts and turned or milled clamping inserts can be used again. In the locked condition, a six-sided form-fit locking ensures maximum process stability and allows a high force and torque transmission.

Modular design for maximum efficiency

SCHUNK PRONTO supporting jaws are available in two mounting variants: fine-serrated (1/16" x 90° or 1,5 mm x 60°) for conventional lathe chucks, or with straight or angled serration for implementing the PRONTO system on modern quick-change chucks. The supporting jaws can be combined with different quick-change inserts, such as soft jaws, claw jaws, or prism jaws. By using the quick-change inserts, the clamping insert can be enlarged with soft jaws by up to 55

mm, or with claw jaws up to 45 without having to change the base jaw's position. In turn, prism jaws allow maximum flexibility of the workpiece geometry. With the excel-based PRONTO configuration tool, which is available for free, the selection and positioning of the supporting and changing inserts are quick and easy to do. The tool automatically determines the required changing inserts and correct position of the supporting jaws after input of the chuck type and the workpiece diameter.

The jaw quick-change system can be retrofitted onto every 3-jaw chuck for the sizes 200, 250/260, 315, and various 2-, 4- and 6-jaw chucks. The modular design allows an individual and economical combination of individual components. Every changing insert is compatible with every supporting jaw. On option, a setup cart is available, which ensures clean storing and fast access to claw inserts, soft changing inserts, supporting jaws with assembled screws and T-nuts, adjustment aids. Storage possibility in the machine is available: every component can be carried on a tray and a quick lock for assembly can be directly located in the machine.

For more information, contact:
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Fire safety in a CNC Grinding / EDM machine

Here is how one can protect its machines and people from fire in the CNC/EDM machines



We have seen a spurt in the incidents of fire in a CNC/EDM machine. No doubt, technology has evolved over time, and manufacturers globally have been addressing the fire risk in their machines! But few situations

Fire in a CNC/EDM machine can occur instantly and without warning. A hot metal chip, a tool crash, or even a spark of static electricity can ignite the petroleum-based cutting oils used in many of these machines. Oil-based machine fires produce high heat and dense black smoke which makes it difficult to control using handheld fire extinguishers.

A machine fire has the potential to quickly spread through mist collectors and along electrical lines and ducting to the building's structure with catastrophic results. Even when an automatic sprinkler system activates, the cost of water damage often far exceeds the cost of the fire damage; and indirect expenses, such as business interruption, downtime, and lost customers can be many times as costly.

Solution

Firetrace is an automatic fire detection and suppression system for micro environments. Firetrace deploys a patented and UL approved pneumatic detection tube within the hazard area to be protected. In case of a fire, the tube bursts at its hottest point, there

At the heart of every Firetrace system is the unique, pressurised red Firetrace Detection Tubing. This proprietary polymer tubing is actually a linear pneumatic heat sensor that ruptures when exposed to a fire's radiant heat.

A Firetrace system can be fitted to virtually any CNC or EDM machine and will automatically detect and extinguish a fire inside the machine before it can cause appreciable damage.

by activating the system and discharging the extinguishing gas directly on the fire, thru strategically placed nozzles within the compartment to be protected.

A Firetrace system can be fitted to virtually any CNC or EDM machine and will automatically detect and extinguish a fire inside the machine before it can cause appreciable damage. Upon detection of a fire, the system discharges either CO2 or 'clean' extinguishing agents such as Dupont FM-200® or 3M Novec 1230 fire protection fluid.

These gaseous extinguishing agents are non-conductive, non-corrosive, leave no residue on the machine or work place, and will not contaminate expensive metal working oils or fluids.

At the heart of every Firetrace system is the unique, pressurised red Firetrace Detection Tubing. This proprietary polymer tubing is actually a linear pneumatic heat sensor that ruptures when exposed to a fire's radiant heat. The flexible detection tubing can be easily routed in and around the hazard areas of a CNC or EDM machine, providing fast and reliable fire detection in areas that other detection methods cannot reach.

Because Firetrace detects and suppresses a fire at its source – inside the machine – the system reacts far faster than traditional fire suppression methods, and reduces or eliminates the collateral damages that they cause. In many cases a machine can be returned to service just minutes after a fire.



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