

# MACHINE TOOLS

## WORLD

Monthly Magazine on Machine Tools & Allied Industry

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## IN PURSUIT OF EXCELLENCE IN WELDING

AN INTERFACE WITH:  
MR. SATISH BHAT  
MANAGING DIRECTOR  
ADOR WELDING LIMITED  
PG. 44 - 49

### INDUSTRY FOCUS

Union Budget leaves  
industry guessing  
Pg. 52

Women Achievers  
Pg. 55



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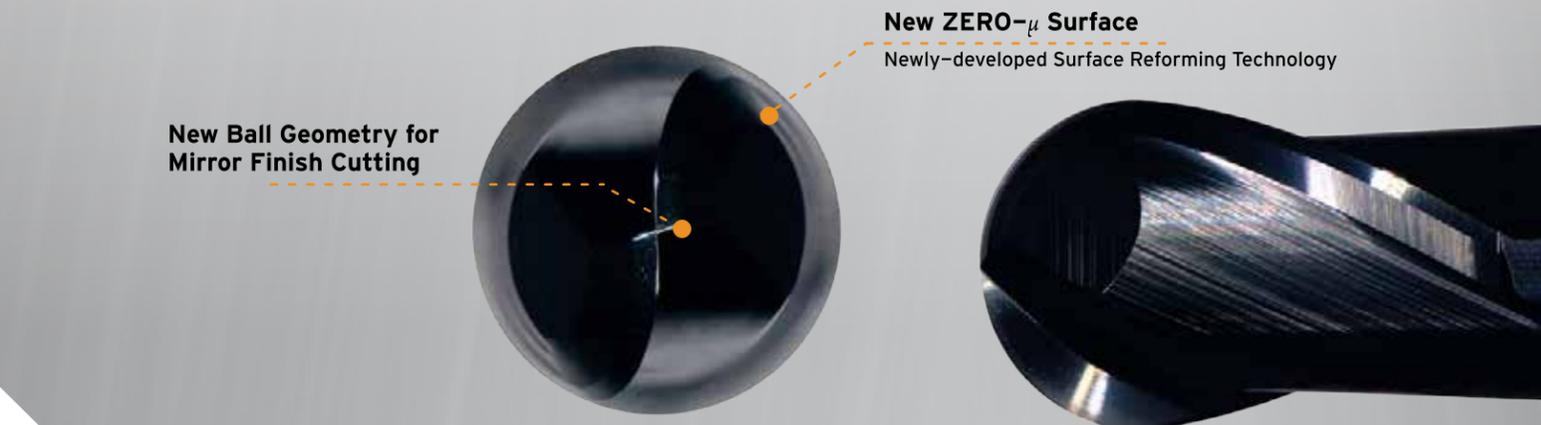
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Printed & Published by Shirish Dongre on behalf of DIVYA MEDIA PUBLICATIONS PVT LTD., Printed at Anitha Art Printers 29/30, Oasis, Next to Vakola Market, Santacruz(E), Mumbai-400055, published from 303/304, Harmony Tower, N.S.Road, Court Naka, Thane West, Thane-400601. Editor : Shilpa Dongre

# CEO CORNER



## Recognizing the women achievers

Why are there so few women in manufacturing? This has always been a widely debated topic in industry circles. Many question that why in a high-growth potential sector like manufacturing, which is facing a major skills gap, do women remain so vastly underrepresented?

Well, these are definitely valid questions. And many progressive companies are taking steps to attract women in the sector with more women friendly policies and work culture.

While these steps are being taken now, there are few women, who despite all odds, have carved out their own path in the industry. These women have broken the traditional perceptions about the manufacturing world and have set an example for younger women with their success stories.

Since March 8 is celebrated as International Women's Day around the world, we at Machine Tools World take the opportunity to recognize the women who have pushed the boundaries and broken gender stereotypes to make a mark in the traditionally male-dominated manufacturing and engineering industries.

In this special edition, we take you through the journeys of women at high and mid-level positions in the industry and made a valuable contribution. They open up about their struggles in establishing their presence, the lessons they learnt along the way and learnings they would share with younger women aspirants.

We hope that these inspirational stories will encourage many more women to choose a career in manufacturing and reach significant heights!

CEO

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COVER STORY

## In Pursuit of EXCELLENCE in WELDING: Ador Welding Limited

Mr. Satish Bhat,  
Managing Director,  
Ador Welding Ltd.



44



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- WAX INJECTION

BUSINESS NEWS

**18** ELGi Equipments' Heat Recovery System enables up to 96% wasted energy reuse

**24** Yaskawa India's robotic division hosted customer seminar in Chennai

**30** Mastercam 2021 now released for global public testing

**32** Inter Divisional Cricket Tournaments Organized by M/S. Accusharp Cutting Tools Pvt. Ltd. on the Occasion of their Annual Sports Day

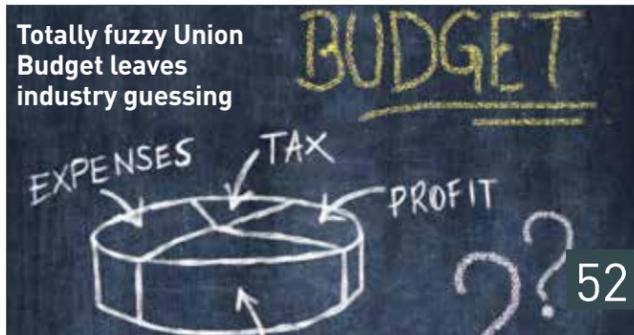
**34** KV Tooling bags first place in ANCA Tool of the Year competition

IN FOCUS



50

INDUSTRY FOCUS



52

IN FOCUS



70

COMPANY PROFILE



76

PLATENS DIMENSION	MM	750 X 980
MAX. CLAMPING FORCE	TON	30
MAX. OPENING FORCE	KN	250
MIN. OPENING BETWEEN PLATENS	MM	320
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THREADED HOLES ON BOTH PLATENS	M	M16
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# Contents

MARCH 2020

## 55 WOMEN ACHIEVERS

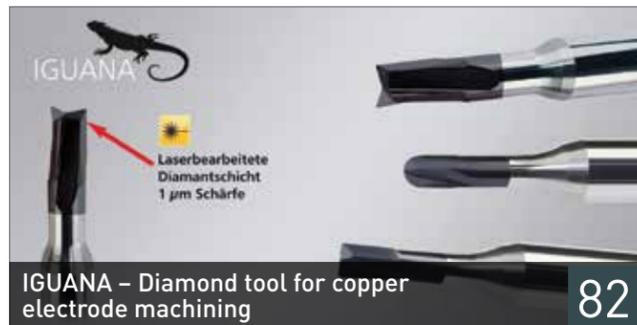


## TECH TRENDS

Advantages of extruded aluminum seventh axis



78



IGUANA – Diamond tool for copper electrode machining

82



84



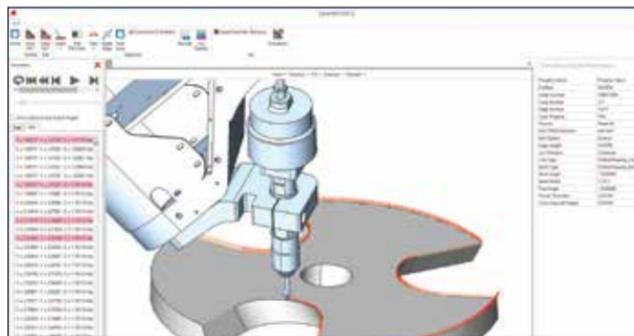
86



98



102



SigmaTEK launches Version 20 of the SigmaNEST product portfolio

110

## CASE STUDY



120

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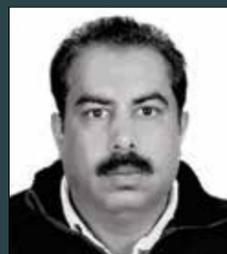
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## Editorial Index

<b>A</b>		<b>J</b>	
Accusharp Cutting Tools	32	JUNKER	30
Ador Welding	44, 90	<b>M</b>	
ANCA Tool	34	Marvel Gloves	125
<b>B</b>		Mastercam	30
Bettinelli Automation Components	72	Micro-Epsilon	98
Birla Precision	109	Millenia Technologies	50
<b>C</b>		<b>P</b>	
Cosmos Impex	56	Pitz	114
<b>D</b>		<b>R</b>	
Delta Electronics	60	Renishaw	58
Drake Manufacturing	84	ROLLON INDIA	78
Dynaspede Integrated Systems	76, 126	RR Global	62
<b>E</b>		<b>S</b>	
Elesa and Ganter	124	Schmersal India	64
ELGi Equipments	18	Seco Tools	42
Erwin Junker	119	Shavo Technologies	96
<b>F</b>		SigmaTEK Systems	110
FACCIN	86	Steel Plant Specialities	127
FLIR Systems	126	STUDER	36
FutureSkills Consultants	66	Superslides & Ballscrews	118
<b>G</b>		Surya Manufacturing Company	106
GEM Equipments	125	<b>T</b>	
GP Petroleums	42	TRUMPF	120
<b>H</b>		<b>Y</b>	
Hexagon	70	Yaskawa	22
<b>I</b>		<b>Z</b>	
ISCAR	102	ZECHA Precision Tools	82

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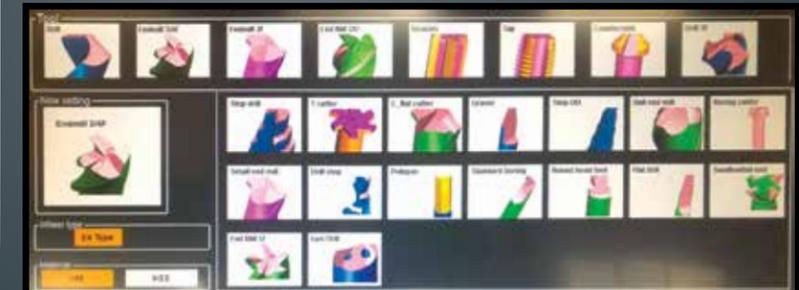
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Elgi Equipments (BSE: 522074 NSE: ELGIEQUIP), one of the world's leading air-compressor manufacturers, has witnessed wide adoption of the ELGi Heat Recovery System (HRS), a solution for utilizing waste heat energy from an air compressor. Approximately 96% of the heat generated during the compression process, normally dispelled into the atmosphere, can now be recovered through the heat recovery system and then utilised to heat air (space) and water. This eliminates the need for additional equipment to heat air or water, thereby reducing CO2 emissions and energy consump-

tion significantly.

The ELGi Heat Recovery System (HRS) is best suited for customers across process industries spanning paper, sugar, food and beverages, dairy, textiles etc, mainly companies who require compressed air and use hot water for their process requirements. The Heat Recovery System is a perfect solution for utilizing waste heat energy from the compressor and finds applicability across companies committed to building energy efficiency in their compressed air system and paving the way for a clean environment.

One of our customers, a paper mill, experienced the



Dr. Jairam Varadaraj, Managing Director- Elgi Equipments

benefits of the HRS system, within the first few hours of installation, by way of continuous warm water availability with no external heating. With the implementation of HR 110, the customer was able to recover a heat load of ~ 89.14 kWh / 0.077 MKcal through the continuous water supply of ~2000 lit/hr at a temperature of ~70°C throughout the year. This resulted in an annual energy savings of 800~900 tonnes of LP steam and a carbon emission reduction of ~170-190 tonnes of Co2 / Yr. With the ELGi's energy efficient compressor and heat recovery system, our client was able to achieve significant energy savings resulting in accomplishing the target stipulated by PAT Scheme I and winning the prestigious GREENCO award.

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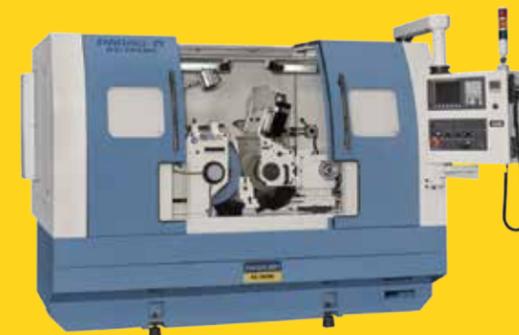


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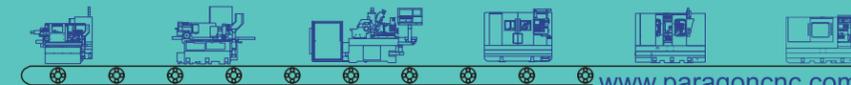
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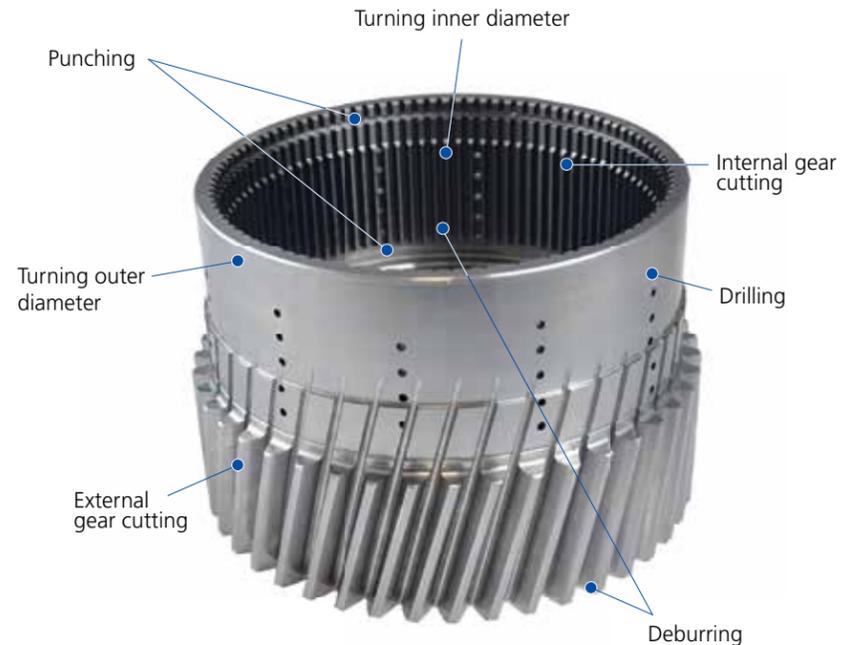
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## Yaskawa India's robotic division hosted customer seminar in Chennai



The alleys and halls of Hotel Hyatt Regency, Chennai were filled with echoes of clacking heels and chatter as 250 plus associates assembled for Yaskawa India Customer Seminar in Chennai on Jan 24, 2020. The seminar, hosted by Robotics Division of

Yaskawa India Pvt. Ltd., had its strategic business partners from the Robotics business and respective Yaskawa team participating.

Starting off the another decade 2020 with full swing, building up its bonds with customers and proving out to

be a productivity partner year after year for Indian Industry by offering world's best products, excellence in engineering, innovation, after sales support and proximity. Confidently, client's belief on Yaskawa India, an Indian Subsidiary of Yaskawa Elec-

tric Corporation-Japan, made this long journey of growth possible while accomplishing 2019 objectives together.

The theme of seminar "your productivity partner" and concept of "an year of change"- 2020 campaign running across different channels, made the event atmosphere thriving and keeping the determination and enthusiasm of the gathering high to achieve 2021 vision. With no second thought, once again team Yaskawa India showcased its competences performing as an efficiency partner to its customers.

The occasion began with an auspicious lamp lighting ceremony attended by who's who of Indian industry along with Mr. Akinori Urakawa – President & CEO of Yaskawa India Pvt Ltd. The guest of honour include Mrs. Latha Pandiarajan – Managing Trustee of Ma Foi Foundation, Mr. Yukio Kayama – Managing Director of YOROZU JBM Automotive Tamil Nadu Pvt.



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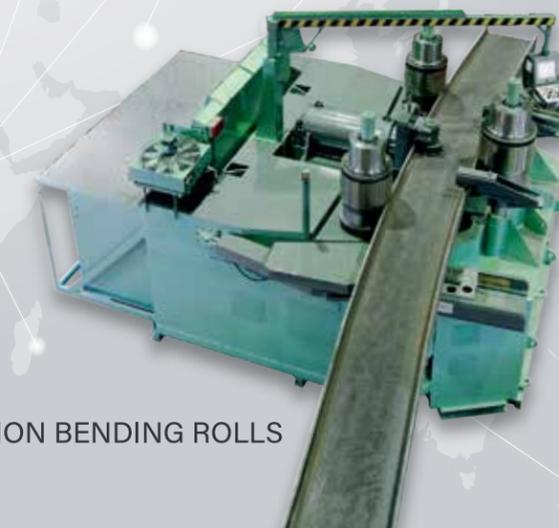


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Ltd., Mr. Ashok Verghese – Director, Hindustan Institute of Technology and Mr. James Kim – Managing Director of Autoweld India Limited.

As the event progressed further, the audience was astonished when Mr. Ajay Gurjar – Dy. COO Yaskawa India (Robotic Division), arrived on stage with world's smallest and lightest robot, MOTOMINI, to address the listeners. He briefed about the entire range of robotic offerings, AC Drives and Servo & Motion control products, Industry 4.0, i3 Mechatronics, System engineering, Aftersales and regional support model of Yaskawa.

Considering this platform as best opportunity, Mr. Gurjar spoke about the idea behind ongoing 2020 campaign "an year of change" as well, which signifies "Yaskawa Offering a New Value To Society Through Fusion Of Core Technology Advancement And Open Innovation". "We certainly have plans for the bright future and are constantly making that possible with the technological advancements and open innovation along with strong service and support. We shall continue to evolve technology and contribute to the development of the world through new solutions; further empowering innovation and delivering results" he enlightened.

Recent win of "Weld-FabTech award 2019" by Yaskawa India for its outstanding performance and



dedication towards the welding community and innovation of Polarity Switching Unit (XACU) developed for thin sheet welding and aluminium welding, also got a huge applaud from delegates gathered in the hall. Initiatives taken by Yaskawa in establishing Robotic Centre of Excellence in various engineering institutions and acknowledgement by Indian media was appreciated by one and all.

Eminent clients present during the event include automotive giants like Hyundai Motor India Limited, Daimler India, ISUZU Motors India, Renault Nissan, Royal Enfield, Bridgestone India Automotive, Komastu India and T-1 & T-2 suppliers and General Industry custom-



Automation and premium institutes like IIT Madras, Sri Venkateswara College of Technology and Thiagarajar Polytechnic College were also amongst the audience.

The evening was followed by the Lucky Draw anonymously, two winners of Lenovo tabs, further with the gala dinner participants enjoyed the music, fun and Yaskawa MOTOMINI serving Tequila shots, creating a great deal of friendliness and vigour to work towards the 2021 goals.

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## Mastercam 2021 now released for global public testing

If you are a currently maintained Mastercam customer, you can now participate in the Beta Program for Mastercam 2021. Shops all over the world, from small job shops to Fortune 100, get a chance to test-drive Mastercam 2021 before it is released and provide valuable feedback to help shape the final product. Participants in the Beta Program get an early look at dozens of powerful new tools for simple to complex jobs.

As more shops continue to

rely on streamlined multi-axis cutting for single-setup precision, Mastercam 2021 adds new techniques and strategies such as Expanded Multi-axis Pocketing, a new 3+2 Automatic Roughing toolpath, enhancements to the 5-axis Flowline toolpaths, and more.

Mastercam 2021 introduces the new Lathe Custom Thread toolpath to support custom thread forms and expands the support for modeling chucks and chuck jaws. Mastercam supports collet chucks as in-

dividual component types which greatly expands the range of machines that can be directly supported. Mastercam Mill-Turn simulation enhancements are included, as well as support for select Swiss machining.

New toolpaths in Mastercam 2021 consist of Advanced Drill which is a customizable multi-segment drill cycle, as well as the new Chamfer Drill toolpath that chamfers holes after calculating the correct depth. When

creating a bounding box in Mastercam, the new Wrap option allows you to create the smallest bounding box possible. And, the new Check Tool Reach function lets you to check your tool and holder against the selected model geometry to view where the tool can and cannot reach.

**Mastercam 2021**  
**PUBLIC BETA**

For more information  
Web: [www.mastercam.com](http://www.mastercam.com)

## The JUNKER Group to display new technologies and innovations at GrindTec in Augsburg

The JUNKER Group, with the JUNKER, LTA, and ZEMA brands will present its extensive portfolio, new technologies, and innovative concepts at GrindTec, an International Trade Fair for Grinding Technology, to be held in Augsburg from March 18 to 21, 2020.

According to JUNKER Managing Director Isabelle Mansoux, "The JUNKER group identifies steadily increasing requirements and changing developments as dynamic processes and implements them in new technologies for a wide range of sectors."

As grinding specialists well known in the industry, JUNKER and ZEMA develop pioneering solutions for individual or complete machining operations from a single clamping process through to



complex production lines. These diverse machine lines can grind all workpiece geometries and sizes.

With standardized filtration systems and numerous individual solutions, LTA finds the right concept for all ambient conditions. All LTA filtration systems adapt flexibly to a wide range of applications – from major production halls to small workshops. Customers

receive a comprehensive package for individuals, group, or centralized systems from one company. The JUNKER Group rounds off its product range with the very latest filtration systems.

The JUNKER Group's global service network offers rapid support and expert advice 24 hours a day. The reliable service team customizes its offered solutions according to

customer needs and requirements. Striving for quality means not only creating the perfect machine, but most importantly satisfying customers.

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The JUNKER Group will be displaying its pioneering technologies in Hall 5, Stand 5033.

For more information  
[www.junker-group.de](http://www.junker-group.de)



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## Inter Divisional Cricket Tournaments Organized by M/S. Accusharp Cutting Tools Pvt. Ltd. on the Occasion of their Annual Sports Day



Accusharp Management has always been promoting the sports and artistic skills of the employees. The company had organized an Inter-Divisional Cricket Tournament on the occasion of their “Annual Sports Day”.

The Cricket Tournament of this year was held at the Annasaheb Magar Stadium in Pimpri. 78 employees participated through six teams; and the contest was spread over two days. The Inauguration of the Contest took place at the hands of an eminent social dignitary

Shri Amit Bhosale on the 5th Feb 2020. The contest concluded on 6th Feb 2020 and Corporate Consultant Shri. Arvind Khadke distributed the Prizes.

The final match was a closely fought contest, held between the C.N.C. Division and the Cylindrical Division. The Cylindrical Division Team won “Runner-up” Trophy.

Shri. Matloob Ahmed was announced, “The Man of The Match”. Shri Sandip Patil was declared “The

Man of The Series”. While Shri Mohammad Tafsir Khan was declared “Best Player of the Series”.

All the employees as well as prominent dignitaries attended & witnessed the two days cricket tournament. The Managing Director of the company, Shri Ilyas Shaikh congratulated all the players, who participated in the competition and he appreciated them for their unity and team spirit.

The Marketing Director Shri Ayaz Shaikh also praised all the players, for their sportsmanship and unity of they showed on the field.

Shri Girish Kulkarni – Technical Director was also present on the field to motivate the players.

Corporate Consultant Shri Arvind Khadke graced the occasion of distributing of the prizes with his golden words of wisdom & motivation.

Admin Officer Shri Ashkin Inamdar ably undertook the total planning and arrangements of the tournament under the guidance of other Directors Shri Zoheb Shaikh and Shri Faiyaz Shaikh. [MTW](#)



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# KV Tooling bags first place in ANCA Tool of the Year competition

KV Tooling recently took the coveted first place in ANCA's first ANCA Tool of the Year competition, which celebrates the knowledge and imagination of cutting tool craftsmen, creating tools with the perfect geometry, profile and finish that shape and build our world every day.

The cutting tool industry has cultivated and refined their craft over the years to design beautiful tools, applying science to achieve a sub-micron surface finish and superior cutting performance.

Pat Boland, ANCA co-founder, said, "All finalists were of a very high standard and demonstrated a deep understanding for tool geometry, as well as taking full use of ANCA's software to design unique and special cutting tools. We congratulate the winner KV Tooling, runner up Eshed Tools and Zaklady

Mechaniczne Kazimieruk who we gave a special creativity award for daring Bat Man design."

Brian Beland, president of KV Tooling Systems, said on winning the award: "Competing with world class tool grinding shops from around the world with same grinding machines and winning - regardless of the size of the shop - is something we are particularly proud of. Our entry was a very complex tool with many features incorporated into one tool. We designed the cutting tool to satisfy a customer's problem, where our one tool replaced a machining requirement that previously required six tools. The customer was very happy with the production gains and for us to submit to ANCA Tool of The Year. We believe winning the competition makes our company more marketable and will give us



KV Tooling won the ANCA Tool of the Year competition.



The finalists in the ANCA Tool of the Year competition.

great exposure and hopefully expand our customer base."

Eshed Tools entered the competition to share its special tool manufacturing skill set with ANCA users. Shmulik Arbel, the toolmaker's production manager, commented that the company was proud of its expertise to "produce special geometries that are difficult to achieve and save our clients expensive production time."

Reflecting on coming runners up Shmulik continued, "Taking out this prize creates a great opportunity for global exposure through the Tool of the Year competition. For us ESHED tools as a small and growing tool manufacturer, worldwide recognition is important and will help us expand beyond the local market." Zaklady Mechanic-

zne Kazimieruk on winning the "most creative tool," said, "We thought outside the box and were motivated to inspire the grinding community with our entry. During every day work our team make a lot of customized tools so we wanted to make something fresh and unique - even to us. Furthermore, entering was a great test for our grinding skills. We relished the opportunity of seeing others craftsmanship and the entries in the tool of the year competition demonstrated to us the range and type of cutting tools that are possible." The competition was based on the passion and the craft of tool making and celebrate our highly skilled tool grinding community.

For more information [www.kvtooling.com](http://www.kvtooling.com)



Pat Boland (left), co-founder and managing director at ANCA, with Ralph Van Hoorn, owner of Van Hoorn Carbide.

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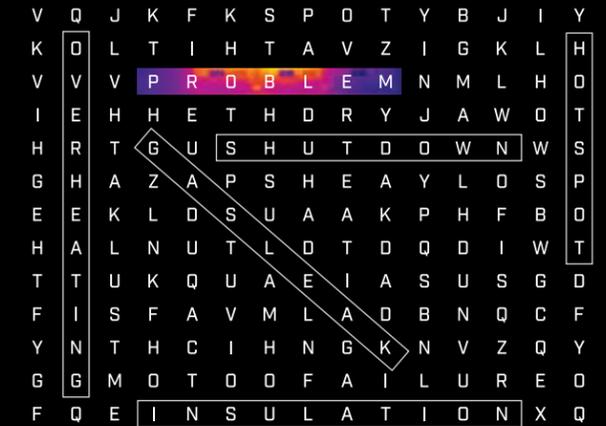
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## STUDER reports further increase in market share in 2019



After a record year in 2018, Fritz Studer AG reported another very successful year in 2019. With the third best annual turnover in the company's history, the cylindrical grinding machine manufacturer

increased its market share again, despite difficult market conditions. One reason for its success is the high proportion of new customers, at almost 40%.

At the annual press conference

Bleher reported a successful 2019, even if the economic situation has deteriorated significantly. "With the third best year in the company's history we were able to further increase our market shares", says Sandro Bottazzo, the company's CSO. STUDER recorded strong growth in North America in particular, where it achieved the second-best result in the company's 100-year history. The company was also able to further increase its turnover with internal cylindrical grinding machines.

"In the Asian region in particular we maintained incoming orders for internal cylindrical grinding machines at the high level of 2018", continues Bottazzo. Three machine types also achieved record incoming orders: the S121, the S141 and the S151, the flagship of internal cylindrical grinding machines. The new universal cylindrical grinding machines – the favorite, the S33 and the S31 – have also got off to a very successful start.

In the automotive sector in

particular, market conditions were much more challenging than in 2018. However, thanks to this broad diversification Fritz Studer AG was able to offset weaker market segments with stronger ones. For example, the aviation industry was one of the segments that flourished in 2019. "Our company has also been very well positioned in the aero-space customer segment for many years and is a preferred supplier of many component suppliers," explains Bottazzo, when reviewing the past year. STUDER sees one key to its success in its global customer-focused sales and service organization. This is also one of the reasons why the proportion of new customers was almost 40% last year.

Smaller markets, like Great Britain, also achieved a very good order intake in 2019. Finally, the market share was also increased in the company's home market of Switzerland.

For more information  
[www.studer.com](http://www.studer.com)

STATEMENT ABOUT OWNERSHIP AND OTHER PARTICULARS OF MACHINE TOOLS WORLD MAGAZINE, THANE, AS REQUIRED UNDER RULE 8 OF THE REGISTRATION OF NEWSPAPERS, (CENTRAL) RULES 1956

FORM - IV SEE RULE 8	
1. Place of publication	: 303/304, Harmony Tower, N.S.Road, Court Naka, Thane West, Thane -400601
2. Periodicity of its publication	: Monthly
3. Printer's Name	: Shirish Sunderrao Dongre
Whether citizen of India	: Yes
Address	: A3/604, Chavandal Tower, Parsik Nagar, Kalwa West Thane - 400605
4. Publisher's Name	: Shirish Sunderrao Dongre
Whether citizen of India	: Yes
Address	: A3/604, Chavandal Tower, Parsik Nagar, Kalwa West Thane -400605
5. Editor's Name	: Shilpa Shekhar Dongre
Whether citizen of India	: Yes
Address	: A2/603, Chavandal Tower, Parsik Nagar, Kalwa West Thane -400605
6. Name and Address of individual who own the	: Divya Media Publications Pvt. Ltd. 303/304, Harmony Tower, N. S. Road, Court Naka, Thane (W) 400601

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## GP Petroleums to invest Rs 100 crore in new plant in Gujarat

GP Petroleums Ltd (GPPL), an automotive and industrial lubricant player in India, and part of UAE-based GP Global Group, plans to invest Rs 100 crore in a new state-of-the-art plant in Saronda, Gujarat to process over 300,000-kilolitres of lubricants.

This will be GPPL's second blending plant in the country and will manufacture specialty value-added products, in addition to the automotive and industrial lubricants catering to the entire value chain. Apart from the homegrown IPOL brand, the plant may blend REPSOL branded automotive products as well.

"We are very bullish about the growth of the Indian lubricant industry and aim

to be one of its fastest-growing players. The new facility will accelerate our growth engine, which will be led by the automotive segment in tier two and three towns and cities. We already have a partnership with over 500 distributors across India which will be strengthened further in the next few years," said Prashanth Achar, CEO at GPPL.

Achar said the company has re-drafted its strategy globally for its lubricant business and this investment is part of the same.

"We are looking at an aggressive target of 500 million litres in five years globally with market entries in Africa, some of the Middle East countries and South Asia.

This plant should cater to India specifically and also the South Asian market. For the India strategy that we have drafted, we are talking about doubling the profit in four years and doubling in volumes in five years," added Achar.

Sudip Shyam, global head for lubricants and base oils, GP Global Group commented, "The new plant is part of our global growth strategy to produce and market 500 million litres of lubricants across the world through both organic and inorganic routes. India is a very important market for GP Global and we are confident of securing a higher market share in both automotive and industrial segments in the coming years." **MTW**

## Seco Tools India earns ISO Certification for aerospace quality standards

Seco Tools announced recently that Seco India earned AS9100D certification. This is an important milestone because it enables Seco Tools to better support the aerospace sector across India and provide customers with solutions boosting productivity and profitability. The certification is the result of a collaboration between Seco Global Quality department and Seco India the first facility within the company to receive the certification to develop aerospace-specific quality control standards.

Following customer inquiries in 2016, Seco Tools established a project for meet-

ing the aerospace certification standards in order to better serve large aircraft and defense part manufacturers. These industries typically require manufacturers to meet strict quality guidelines with frequent auditing, and the AS9100D certification demonstrates the commitment of Seco Tools to this and fostering a culture of continuous quality management.

Seco India already had ISO 9001 certification, but AS9100D supplements ISO 9001 with specific requirements tailored to meet the highly regulated and standards-driven aviation, space and defense industries. After an extensive audit of all

its processes by an accredited aerospace certification auditor, Seco Tools' Indian facility earned the ISO 9001:2015 and AS9100D, the international equivalent to EN 9100:2018 and JISQ 9100:2016.

The certification initiative was led by Seco Tools' Andreas Fritz & Nobert König. The global steering committee, consisting of Stefan Frölander, Norbert König, Atul Mohkhedkar and Adrian Cox, monitored the project. Ravindra Kohakade was the project lead.

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# In Pursuit of EXCELLENCE in WELDING: Ador Welding Limited



Mr. Satish Bhat,  
Managing Director,  
Ador Welding Ltd.

Ador Welding Limited, established in 1951, is a formidable name in welding in India. The company with a basketful of innovative products such as welding consumables, equipment & systems, automation products, CNC cutting systems, PPE & gas cutting products & accessories and turnkey project engineering solutions, is serving virtually every segment of the economy, and in effect partaking in the national endeavour. Over the decades, the company has come up with innumerable import substitutes as a result of its rigorous R & D, thus saving precious foreign exchange for the country. Exporting its products to some 40 countries, Ador also has a remarkable global presence. Its contribution to welding education and skill development in the country is also laudable, discovers P.K. Balasubramanian in an interview with managing director Satish Bhat, Ador Welding. Excerpts:

**Q. How would you present Ador Welding to a new audience?**

Ador Welding is a pioneer and a trendsetter in welding in India. Partaking in nation-building since 1951, the company has been spearheading technological developments in the welding field for over six and a half decades. Ador is a complete welding and cutting solutions provider and has a comprehensive range of consumables, equipment, Automation, Robotic systems and solutions for welding and metal cutting including CNC, with the largest production capacities when compared to other welding manu-

facturers in India. The company works closely with every industry segment of the economy with a view to providing products, and solutions, and has also made a dent in the international market by exporting its products to over forty countries across the globe. AWL has most modern and contemporary manufacturing systems coupled with digitalisation of most of the processes enabling growth.

**Q. What's your greatest legacy & what is your role in nation-building?**

Since its inception on 22nd Oct. 1951, Ador Welding Ltd. (formerly known as Advani-Oerlikon) has traversed a long journey and has served as a prime source of employment to thousands.

Ador is nothing short of a national heritage due to its premier welding products and associated services having contributed significantly to constructing some of the greatest monuments and engineering marvels in the country.

It has helped in accelerating the post-independence industrialization in the country in which welding played and has been playing a pivotal role. Its products namely welding consumables, equipment and systems, CNC cutting systems, automation products, PPE & gas cutting products & accessories cater to various sectors of the economy including automobile, wind energy, thermal and nuclear power, heavy engineering, chemical & fertilizer, oil & gas, project engineering, mining, railways, defence, infrastructure and a plethora of others.

Known for its pursuit of excellence in every sphere of its activities, the company shares the benefit of its knowhow of the domain with manufacturers, industrialists and students.

The Ador Welding Academy has churned out thousands of welding professionals who are contributing to quality manufacturing or weld fabrication and have thus become the backbone of the industry.

**Q. What are the trendsetting technologies and innovations you have showcased recently as a result of your ongoing R & D?**

Innovation is in the DNA of Ador Welding. We continuously innovate all our business processes, systems, and service offerings.

All the products and services we offer have been developed in-house with local talent in line with 'Make In India' ethos at the heart. The fact that around fifty employees are engaged in Design and R&D activities at Ador, speaks volumes about our efforts towards offering new technologies.

Aiding this endeavour is world-class infrastructure for Design and R&D activities that gives us the cutting edge in offering new technologies at highest speeds.

We have invested heavily in R&D. Our Technology Development Centre located in Pune has the latest and state-of-the-art equipment like XRF analysers, Creep testing equipment, Carbon Sulphur &



Approved By:  

Ador Welding Consumables - The best bet for welding automation and productivity

Oxygen Nitrogen Analysers, Optical spectrometer, Strip cladding equipment and many more. Our Consumables lab was accredited with the prestigious NABL certification last year which makes us the only welding company in India to have such high-quality testing and development facilities.

The only clean room for manufacturing of inverter welding equipment in the welding industry ensures that we make the most trouble-free inverters available and can offer three-year warranties.

We have a team of more than 50 research engineers working tirelessly to

wards updating existing products and adding new ones in our product portfolio to meet the customer's ever-changing needs. All the above unique initiatives enable us to offer the best-in-class quality products / solutions to our customers and have helped create a long-lasting bond of trust between us.

We have recently won an Award for Excellence in Innovation for having indigenously developed an 'Environment-Friendly Copper-Free Welding Wire' bestowed by Manufacturing Today, Aditya Birla Group.

We have also won an Award given by

CII for 'Organised and Impactful R&D Efforts' which reflect the culture of innovation and development within the company. We have also launched our own developed pulse MIG, mobile flaring system and many other types of machines in the recent past in addition to various new consumables for different strategic applications.

**Q. Please update us on your modern manufacturing facilities.**

In terms of capacities we are arguably the largest welding product manufacturer in India and most of South East Asia. Our

Manufacturing plants are strategically located to cater to the length and breadth of our country located at Pune, Silvassa, Chennai & Raipur.

While the Pune facility manufactures state-of-the-art welding equipment, welding automation solutions, Gas and CNC cutting equipment, PPEs and accessories. fabrication facilities for Project Equipment business, our training academy is located at a separate premises near our Pune plant. Our Plants in Silvassa and Raipur manufacture Welding consumables for SMAW, GTAW, GMAW SAW, ESSC & Brazing processes. We are perhaps the most digitally advanced company in our segment in the industry.

We have a smart manufacturing line like the only clean room for manufacturing of welding inverters in the country which gives not only the faster outputs but far better quality as compared to international competition and enables us to offer 3-year warranties on our welding equipment. We have state-of-the-art laboratories and testing facilities accredited by the relevant authorities which enables us to supply quality products at faster speed.

**Q. What are the industry 4.0 solutions you have implemented for enhancing productivity?**

Ador Welding has automated several of



Ador's manufacturing plants are strategically located at Pune, Silvassa, Chennai and Raipur.

its manufacturing processes; our clean room with a fully automated assembly line for the assembly of inverter welding; the only such clean room in the country; fully automated ready dry mix flux units that through a fully automated set-up, dispense very accurately the exact quantities of minerals and alloys of varying densities, giving products unmatched quality; automated spool dispensers, conveyor lines for subassemblies; automated wet drawing lines, QR codes for equipment as we move towards industry 4.0 implementation; Automated edge winding equipment; Multipoint auto greasing arrangement interlocked through PLCs and many more projects have been implemented at our plants so far. And many more are in progress.

The manufacturing processes in our



The first of its kind: Cleanroom at Ador Welding Equipment Plant in Pune

consumable plants have also been upgraded with smart layouts, automation in materials handling and on production lines, smart process equipment which facilitate predictive maintenance using innovative means, etc. These initiatives have enabled us to increase productivity considerably, while improving quality and lowering downtime. Our competitiveness in the industry is the result of these practices.

**Q. What's your role in indigenisation of welding products in the country as a glittering example of 'Make in India' mission?**

- We have, as I said earlier, the first and only clean room for the manufacture of inverter welding equipment in the country which gives our welding inverters the cutting edge quality that has resulted in an unparalleled 3-year warranty for our equipment. Our Welding equipment model Champ T400 has won the "India Design Award" for the best industrial design last year.
- The Champ Pulse 500 is India's only indigenously made pulse-MIG welding machine at par with world standards.
- We have developed welding consumables with creep data for high temperature, high strength applications for refineries, fertilizer & power plants.
- Our consumables are used extensively



Ador's performance proven, award winning Welding Equipment

in Nuclear applications too. Our association with top defence research establishments has led to the development of consumables for DMR249A and HLES grade steels for warships and submarines.

- We have designed and supplied Diesel engine driven welding sets to work at high altitudes, at sub-zero temperature for the Armed Forces.
- Our Welding equipment can now be IOT and AI enabled to ensure that we are in sync with the latest industrial revolution that is happening around the world in industry 4.0.
- Our work on high strength alloys for fabrication of complex structures to the tune of 120,000 psi and more, and development of flux-cored wires for P92 steels are path-breaking.
- We are perhaps the only Indian company to have developed consumables for the Electroslag Strip cladding process.
- Our Stainless-steel consumables are designed to meet severe impact conditions of up to -196 degrees C with excellent lateral expansion values.
- The introduction of TIG-TIP technology makes GTAW welding possible at high speeds, essentially giving TIG quality at MIG welding speeds.

The foregoing are some of our path-breaking developments. Most of these developments are also import substitutes which have helped the nation save precious foreign exchange.

**Q. Quality is a watchword at Ador. How do you walk the talk?**

We have innate quality standards. Our Comprehensive and stringent QA procedures are compliant to international standards.

We have extensive testing facilities e.g. Corrosion tests as per NACE standards, Corrosion practices for stainless steel as per ASTM A262 & ASTM A923, Fractional toughness test – CTOD, High temperature strength especially for creep resistant materials.

We have Special testing equipment like Optical Emission Spectrometers, Carbon-Sulphur Analyzers, Gas Chromatographs, Metallurgical Microscope with Image Analyzer Software and more.

We have a fully equipped in-house laboratory at our Technology Development Centre in Pune (NABL accredited) and both our Silvassa and Raipur plants with latest instruments for carrying out required tests and trials e.g. ICP, XRF.

We are the only company in this field to have a “Clean room” for the manufacture

of inverter welding equipment in India and humidity control testing equipment, Hannover analysers, etc.

We have invested heavily in R&D facilities at our Technology Development Centres for wholly indigenously manufactured products.

Our product development & design capabilities are unmatched, be it for welding consumables or for welding equipment.

**Q. You are on the cutting edge of technology. What are the approvals and accreditations you carry?**

We are ISO 9001:2015 certified for our Quality Management Systems and our products are approved by national and international approval agencies like ABS, LRS, DNV, BV, RDSO, CE and CWB. Our products are approved by top companies like NTPC, BHEL, ONGC, Reliance, L&T, PDO, NPCC, etc.

This makes our products preferred by end-users across industrial sectors on the most stringent of applications in critical applications in Nuclear Power, Refineries, Off shore rigs, Shipping industries, Naval applications, Defence establishments, Mining, Infrastructure projects, Hydel Power plants, Heavy Engineering, Automobile, Steel plants, Thermal



Power, Gas pipelines & Railway projects.

Besides having almost all third party approvals like ABS, LRS, BV, etc., our products are CE and CWB approved which makes our products preferred ones in Europe and Canada as well.

The ADNOC approval for our entire range of products will help us gain further foothold in the Middle East markets.

Our Testing Laboratory at Pune has been approved by NABL which makes us perhaps the only welding company to have such a recognition. This speaks volumes for the quality of our testing procedures and their authenticity.

Besides, we are approved by almost all Oil and Gas majors in India and abroad. Our ASME U&R stamp approval has resulted in establishing ourselves in the pressure vessel and heat exchanger market. Our PTRs for EPC contracts like Mounded bullets will go a long way in enabling us add value to our offerings.

We have recently entered into a contract with BARC for cutting edge Desalination plant Technology which has opened a new avenue to render our services towards nation building.

**Q. You play a pivotal role in skill development, empowering women in particular. Could you elaborate your knowledge base, facilities and initiatives?**

We have a separate skill development institute by the name Ador Welding Academy. Ador Welding has progressively extended its knowledge and expertise to cover specialization by catering to the most stringent and sophisticated demands of the industry. Over the years we have trained thousands of welding engineers, technicians and welders at our Academy. We have also trained over a hundred women welders who are now gainfully employed. The facility for training is most modern and can train candidates on all welding processes like

GMAW, SMAW, SAW, ESSC, GTAW, TIP-TIG & Spot Welding.

**Q. What are the challenges ahead for you?**

Looking at the present market scenario, the greatest challenge of the industry is to be able to achieve sustained growth. Another we face is availability of raw materials especially minerals for consumables in their purest form, IOT in the industry (Industry 4.0) and the challenges it provides in terms of technological advances and their integration with welding applications. The industry also faces challenge of providing low cost but modern, advanced, localised welding technologies to the backbone of manufacturing Industry such as MSMEs. Another biggest challenge is to attract talent to welding industry and retain them in the industry.

**Q. What's your vision for Ador?**

Ador Welding's vision is to provide the best-in-class, affordable, welding solutions to the world of manufacturing to enhance their efficiencies. Our goal is to cross Rs.1000 crores by the year 2025. I am sure that with the focused approach and with highly motivated Adorians, this will certainly become a reality. **MTW**



Ador Welding Academy churns out thousands of welding professionals including women welders to skill India

# THE AEROSPACE INDUSTRY OPTS FOR OTEC

## AVIATION: IFT USES OTEC TO MANUFACTURE ITS HIGH-PRECISION PARTS

O TEC customer IFT GmbH & Co. KG, based some 30 miles south of Frankfurt in Ober-Ramstadt, specialises in high-precision parts for the motorsport, medical technology and aerospace industries.

“Technical innovations and reliable process performance in the surfacing techniques and systems we use are essential because we’re constantly optimising our portfolio. We’re uncompromising in our choice of machinery and processes. They have to be absolutely right for the order and help us deliver the quality, efficiency, fast turnarounds and absolute deadline reliability that we promise our customers. We also review existing processing steps again and again to see

how we can improve them,” explains IFT Junior General Manager Robin Breitwieser.

**OTEC disc finishing machine up to 20 times more effective than trough vibration? Challenge accepted!**

“OTEC assured us that surface processing with its disc finishing machines was up to 20 times more effective than conventional trough vibration. That sparked our curiosity. Our trough vibration processing time for aerospace hydraulic control pistons was four hours, which was simply too long. With these particular workpieces it was all about deburring and smoothing – we wanted to deliver better surfaces without compromising the sharpness of

the edges. So the specifications we gave the experts at the OTEC Finishing Center were exacting down to the last micron, because precise surface roughness and edge rounding meets the quality our aerospace customers demand, and which of course we always aspire to meet,” sums up Breitwieser.

**Achieve more with  $\mu$  precisionfinish!**

OTEC accepted the challenge. At our Finishing Center in Straubenhardt on the edge of the Black Forest, we processed some samples free of charge using the CF series disc finishing machine with the gap during wet finishing set to normal. Fifteen minutes later we delivered the goods to specification – complexity and all!



## SAFETY THAT IS OUT OF THIS WORLD: OTEC SUPPORTS SPACE RESEARCH

Yes, really! Ceramic parts made by CeramTec GmbH and processed using OTEC Präzisionsfinish are flying around Earth in space. What’s the story behind the collaboration? It all began with a research project. Completely homogeneous metals cannot be produced on Earth because of various physical limitations, such as the Earth’s gravitational pull. To overcome these, a series of tests was carried out on board a crewed space station where certain physical limitations no longer come into play. In space, metal can be melted in a contactless process by suspending it in electromagnetic fields. Ceramic sleeves were used to allow researchers to observe and document the process safely from up close. The specially designed cavities in the sleeves allowed researchers to see exactly what was happening during the experiment and acted as a buffer zone and fire precaution in case hot material leaked from the melting area.

### Why use OTEC technology to process the ceramic sleeves?

Although ceramic is extremely heatresistant, flammable residue from production can sometimes remain on the surfaces of the sintered parts. OTEC was contracted to polish and clean the ceramic sleeves in order to remove all remaining residue, and with the help of the SF series machine, we did exactly that in a process time of just five minutes.



“We had to find a process that would suit the delicate surface of the ceramic components. It needed to create the necessary surface finish without damaging the intricate geometry and thin walls. This was an opportunity for OTEC to demonstrate its competence and reliability. We achieved excellent results that exceeded all expectations and went far beyond the necessary tolerances. What’s more, our working relationship with OTEC was always professional and friendly.

We won’t hesitate to choose them again in the future,” said Bibi Sevdic and

Sydney Arendt from CeramTec.

The space station crew can now carry out their research safely, all thanks to OTEC’s finishing touches.



For more information,  
[www.otec.de/en/](http://www.otec.de/en/)

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## Totally fuzzy **Union Budget** leaves industry guessing

The Union Budget 2020 has been a wishy-washy exercise to put it mildly. After delivering a two-hour-forty minute speech nobody could understand exactly what the Union Finance Minister, Mrs Nirmala Sitharaman, had tried to convey to the Parliament and the country. She spoke about green shoots being visible in the NSO report recently. She has already informed that there will be roll-backs but why present such schemes which have to be rolled back? And the NSO report has already proved Mrs Sitharaman wrong about her green shoots sighting.

**I**f Budget 2020 left you confused about whether you're better off or worse, take heart. You're not alone. If the clarifications since Budget day are anything to go by, even the finance ministry seems to be scratching its head over several announcements made by Sitharaman in India's longest ever budget speech.

Retail inflation soared in January 2020 to 7.59 per cent, the highest level since May 2014 as factory production went down by 0.3 per cent in December, darkening growth prospects further in an economy that is struggling along at its slowest pace in six years.

The latest data release by the National

Statistical Office snubbed claims about the seven green shoots of recovery that finance minister Nirmala Sitharaman spoke about in Parliament recently while trying to defend her recent budget that critics have trashed for failing to do enough to revive the faltering economy.

"Industrial activity has seen a rebound. In November 2019, the IIP numbers have registered a positive growth of 1.8 per cent as compared to the contraction of 3.4 per cent in October 2019 and by 4.3 per cent in September 2019," Sitharaman had said in the Rajya Sabha recently.

The finance minister spoke too soon: while factory output shrank once again in December, the manufacturing sector (which has a 77.63 per cent weightage in the overall Index of Industrial Production) contracted by 1.2 per cent.

**In the month of December, 16 out of the 23 industry groups in the manufacturing sector have shown negative growth as compared to the corresponding month of the previous year.**

I think the first point which is really critical is to accept the fact that the government budgets are extremely dishonest as of now. It has become so bad that even certain government departments may not be in the know of what is really happening.

Faced with the challenge of revving up India's economic slowdown, the Finance Minister took a more cautious approach presenting her second budget providing a boost to only a few select sectors which should translate to a moderate stimulus for the manufacturing sector. However, proposals for a few sectors, including electronics manufacturing, transport infrastructure and solar energy, besides increasing in certain import duties, are expected to bring some cheer.

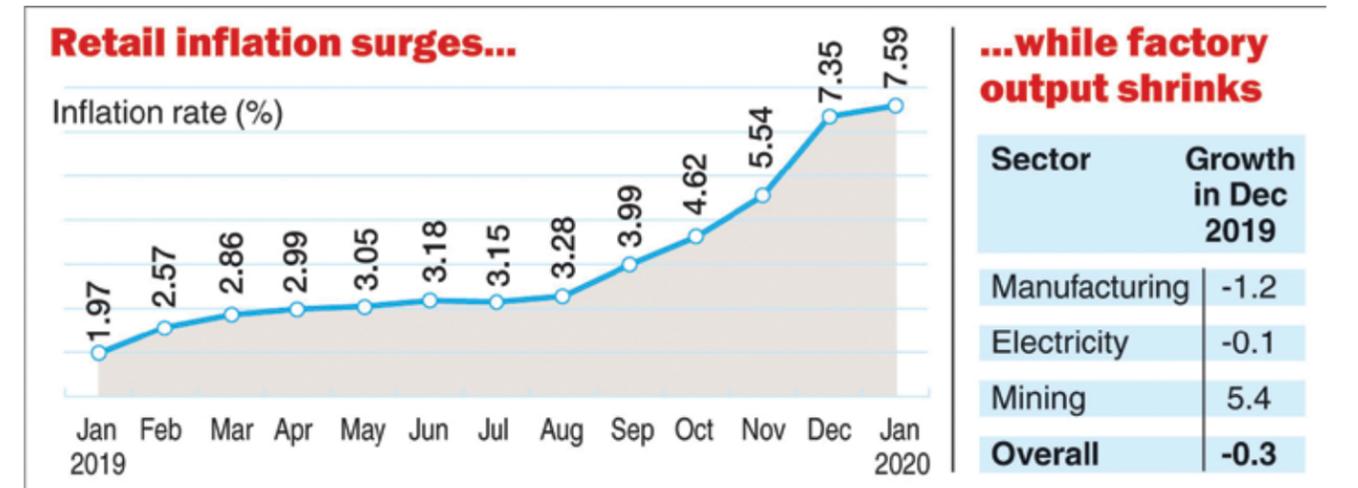
Assuaging concerns on the slowdown in the manufacturing sector, Sitharaman said industrial activity is on the rebound. But that is really not true!

Index of industrial production (IIP) turned positive for November 2019 as against a contraction in the previous months, said the FM, adding that purchasing managers index (PMI) is also steadily moving upwards and was at 55.3 in January from 51.2 in November. However, nobody knows where the Finance Minister was sourcing her figures from. But the December figures proved that November was just an aberration which could not be sustained.

In an attempt to push growth with domestically produced goods and services, the budget has made an upward revision in import prices for footwear and furniture driven by a five per cent increase in customs duty. Additionally, there has also been a levy of health cess on import of medical equipment as corresponding devices are now being domestically manufactured in India on a significant scale and can be adequately used to further health services in aspirational districts in a cost-effective manner.

**Revision in rates to support phased manufacturing plans for electric vehicles as well as mobile parts domestically is also expected to incentivise domestic manufacturers in these sectors. The push to domestic industries is also pronounced in case of technical textiles with the National Technical Textile Mission instituted to reverse the \$16 billion imports in this sector. Furthermore, the downward revision in customs duty on inputs and raw materials like fuse, chemicals and anti-plastics is expected to further drive the manufacturing sector.**

A day after the budg-



**WINNERS & LOSERS** UNION BUDGET 2020

**GAINERS** (with thumbs up icon):

- Transport infrastructure
- Electronics manufacturing
- Rural sector
- Water
- Telcos
- Online educators
- IT firms
- Pipeline & City gas suppliers

**LOSERS** (with thumbs down icon):

- Insurance
- State-run banks
- Real Estate & Construction
- Fertilizer companies
- Logistic players

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et, Sitharaman said in an interview to Deccan Herald that her ministry would issue clarifications on the new personal tax regime which has become the norm since the days of Arun Jaitley.

This time around, most newspapers had muted or negative reactions to the budget, in comparison to the hyperbole that usually describes the headlines on the day after the budget.

Economists aren't happy either with the budget. Yamini Aiyar, who heads the Centre for Policy Research, wrote in Hindustan Times that not only did the budget not have any bold ideas, it also made "baffling" choices. "The government has got both the diagnosis and the prescription of the current slowdown, completely wrong," she wrote.

Yet what the government is bargaining with its own 1.3 billion people is unfair to put it mildly. High unemployment, firms and farmers are all paying a price for the fiscal deficit, which is closer to five per cent than the 3.8 per cent that New Delhi is acknowledging for this year and a far cry from the 3.5 per cent projected for the next year. This

is another example of the government fudging the data for public consumption and this fudge comes at a price: With the government pouncing upon household savings, the cost of capital can hardly fall, even with the central bank furiously cutting its policy rate and buying longer-dated bonds.

Finally, the government is talking about manufacturing-led exports. That's the good news. However, in the same breath, it is getting increasingly protectionist on the trade front, by increasing customs duties and planning other measures. The old cliché, Be Indian Buy Indian, is making a comeback in another version. The problem is, wanting to increase exports and being increasingly protectionist at the same time work at cross purposes. And that's the bad news.

In fact, increasing customs duties goes against the grain of what has been done since 1991, which is duties have been cut all along. This boosted exports as well as growth all along.

Finance minister Nirmala Sitharaman summarised the situation perfectly in her budget speech: "India needs to man-

ufacture networked products which will make it a part of global value chains."

The Union power and renewable energy minister RK Singh asserted the government was determined to fix the shortcomings of the sector and would soon announce schemes to revive the ailing discoms, waive off discom dues and amend the Electricity Act to introduce hefty penalties on renegeing of any kind of contract. Amazingly, the government did nothing in this regard during its first five-year term.

Hailing the budget, Singh said the expanded Kusum scheme to solarise agriculture pumps would make agriculture sector diesel free and reduce the cost of irrigation of farmers to one fourth or a fifth of the present costs. He went to say that farmers can earn Rs 60,000 annually with the installation of solar plants on barren land. In the Budget the FM has announced assistance to farmers in setting up such plants.

The budget allocated Rs 22,000 crore for the power and renewable sector, close to last year's level which does not really give a lot of comfort to the sector.

With a focus on technology and innovation, Budget 2020 tries to lay the foundation for India's future. The allocation of Rs 3000 crore for skills development should help bridge a sizable technological skills gap in the country and enhance the global competitiveness of small and mid-size businesses in the country, which employ 40 per cent of India's total workforce and contribute nearly 30 per cent to India's economy. All efforts that positively drive the key levers of modern business are definitely welcome such as innovation, growth and efficiency. However, grave doubts continue to remain!

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



# SALUTING THE WOMEN ACHIEVERS

Women in India have indeed come a long way. Today, there is hardly any industry where you would not find women. Even in traditionally male-dominated industries like engineering and manufacturing, women have made a significant mark and are re-defining the rules of the industry, while setting an example for others to follow.

With International Women's Day around the corner on March 8, we at Machine Tools World, are celebrating the achievements of **Women Influencers in the Industry**. We spoke to women in the industry who have carved their own path to reach the high and mid-level positions in their organizations, to understand their unique struggles.

In our special section, we bring you **success stories and journeys of women leaders who have pushed boundaries and broken barriers.**



# Taking the path less travelled to success

**Q. Tell us about your role and job profile at your company. In your view, what are the qualities of a leader.**

I am leading a mission to build “a pride of ownership brand” for our customers, with the support of our entire team at Cosmos. I am a Visionary Leader, and have always chosen the path less travelled in my life. Leadership is an art of influencing people to a common vision, not a title or a position.

Sometimes, in life we need to focus on beautiful destruction of our old ways of working process to push the growth scales higher and unleash the champion within. Innovation, business creation, value creation, high performance are the qualities a leader should bring in to an organization, in today's rapidly changing business environment. It is like exercising your muscles to come up with innovative ways—not an idea alone, but an idea with full implementation strategy.

Navigation Vs. acceleration is the real leadership process with the uplevel concept, where the focus is on navigation for the accelerated growth by connecting people with the bigger picture and prosperity. This kind of mass uplevelling of team, is the way to build a mega brand.

**Q. What made you choose a career in the engineering/machine tools industry?**

Machines are in my blood. My father was a technocrat and a manufacturer of Special Purpose Machines. So, I had a very special attachment with machines from my childhood. My mentor told me once that challenges bring opportunities, so always look for



**Bina Khambhaita,**  
Executive Director,  
Cosmos Impex (I) Pvt. Ltd.

challenging things in life.

It's like when a diamond cutter sees a rough diamond or when a potter sees a rough clay, they see an opportunity to create something. On the other hand, if they see a polished diamond or finished pot, it does not excite them. Around 30 years ago, India was just opening its mind to technology adoption. That's when I found a chance to craft my career in the engineering field., with High Tech CNC Machine Tools.

**Q. Did you face any difficulty in coping in the industry (due to lesser women employees)? If yes, then please share anecdotes and your experiences**

In today's world, there is hardly any gender restricted field. However, 35 years ago when I had to take a decision for my life, the Indian culture, social beliefs and industry environment was totally different.

I also had to face a lot of hurdles in my career path, as 30 years back it was purely a male-dominated industry. However, I just followed my way with full conviction. I truly believed that, we can transform our future life by simply changing our mind-set.

**Q. In your opinion, why only few women manage to climb the seniority ladder? What are the key barriers affecting career progression of women?**

The biggest barrier for women is that majority of women pursue a career as a part of their interest in self-empowerment or to support family for better lifestyle. They lack a definite goal or vision. If one is 'interested' in building a career or 'committed'

to build a career, the outcome will be totally different. Interest means, you will do it with your convenience and within comfort zone. But committed to your goals or dreams means you will not be able to rest or sleep until you will have that all. We need more women who commit to their career goals.

**Q. What initiatives can we take to encourage more women to join the industry.**

The world is changing with 10X speed than couple of decades ago. So, the key point is setting up the vision for growth and then be committed 100% to it. Awareness is the first stage of growth ladder. If you are not aware about yourself, you cannot grow. As important as self-awareness is; it can sometimes be very difficult. True self-awareness requires self-honesty, the ability to see your strengths and weaknesses clearly and realistically. With self-honesty, you can see both—what you have to offer and what you need to do to become the person you want to be in any industry you are in.

Vision vs. clarity is the key point. Most people have their life vision set, but most have non-clarity on the achievement process. First, we need to realize what we want to do and then believe in it. Visualize that picture daily and work on it until it turns in to reality.

In my career, AIA theory has helped me have clarity in my vision.

**AWARENESS to do INTENTION to execute**

“

Genius is not about genetics. Genius is about your habits, devotion, relentlessness, and commitment to follow your dreams, ambitions and daily goals

”



**ACTION in small parts daily.**

**Q. What advice would you give to women to be successful in the industry?**

Genius is not about genetics. Genius is about your habits, devotion, relentlessness, and commitment to follow your dreams, ambitions and your daily goals. Women are born with an innate gift for safety, self and family protection, and are blessed with a sixth sense towards any negative energy. These inner strengths, when channelized well in to the enterprises growth synergy, can have many added advantages. Just take charge of your thought process. The only tool you have is your productive time and progressive thoughts. **MTW**

# Breaking the barriers and changing the mindset

## Q. Tell us about your role and job profile at your company.

I am leading the marketing department in Renishaw India and responsible for the development of marketing plans, preparing budget and formulation of strategies for the market and ensuring alignment with the Marketing strategies. I am completely responsible for developing effective marketing materials and maintaining a pro-active relationship with customers, employees, media and the global community to create brand awareness.

## Q. What made you choose a career in the engineering industry?

When I started my career 11 years back, I had an opportunity to start at the marketing department for my previous company (Haas Automation- Phillips Corporation). The learning curve started from there and has no end. I found it extremely interesting as there are various marketing platforms to use but not all available to us. And the challenge starts from doing the right thing to right people, at the right time.

Again, in Renishaw got an opportunity to do a lot of creative stuff and test how it works in this industry. During this journey I realized that it's second to none and decided to make a career in the industry, which Challenges me.

Engineering really isn't about hard hats and rulers any more. There's so much embedded in our culture saying engineering isn't for girls, and people still think of engineers as the men who fix your washing machine, not the people at the forefront of designing creative solutions to the world's problems.



**Samina Khalid,**  
Marketing Communications  
Manager, Renishaw India

We're at the cusp of a technology revolution, and engineering is at the forefront of that. I love the variety and excitement—having individual creativity whilst working effectively as a team. That I get to lead, I get to make decisions. I'm empowered to come up with solutions and innovate. Every day is different. We're creating the utilities of the future and I am part of it.

## Q. Did you face any difficulty in coping in the industry (due to lesser women employees)? If yes, then please share anecdotes and your experiences

Not really, there were times and even now when I am the only women on the event set up. Or may be the first one to step in the exhibition hall. Initially, people used to look at me like an alien working at odd hours and sometimes the expo heads used to come and ask me to leave for the day but now I guess they all are used to seeing me.

Still I am the only women in an event with 150 male members around, but it never bothers me. I found this industry extremely safe with good people.

As a woman in a male-dominated industry, I often get asked about how I deal with that issue. I respond that the barriers for women in business are much less today than 10 years ago. And even if being a woman in your business sector may be an issue to some potential customers, don't let it be one to you. In business, you set the tone by being a competent professional, so you establish yourself as someone qualified to get the job done and let that speak for itself. I truly believe women are natural leaders and entrepreneurs. So, grow your business based on your skill sets and your brain. As women, we have a lot of both!

## Q. In your opinion, why only few women manage to climb the seniority ladder? What are the key barriers affecting ca-

### reer progression of women?

I guess there are many reasons-

1. Excessive travel
2. Many choose to dedicate themselves to more important enterprises like family and raising of children
3. Not getting enough family support
4. Uncomfortable in the male-dominant industry
5. Not given senior positions in a company.

## Q. What initiatives can we take to encourage more women to join the industry.

First of all, hire them which many companies are reluctant. The mindset that why to hire a women employee in sales or marketing in manufacturing as they must travel a lot and then who will take care of them and their time restrictions. In fact, after 7 years in my current company one gentlemen applauded me by saying that you have broken the barrier and the mindset of many people who are reluctant to hire women in this industry. Next step should be motivating and giving them opportunity to prove themselves.

Engineering is probably one of the most creative professions you could ever choose. Try and encourage them to explore and support all options. Even if their talents don't seem to match – say, for instance, they're artistic – well, engineers are allowed to be artistic, too! Engineering isn't a 'pure' subject. It's wide and varied where everything overlaps, and it doesn't close doors to talents.

## Q. What advice would you give to women to be successful in the industry?

Be prepared to spot growth opportunities when they present themselves because they are the key learning opportunities. You'll know because they make you uncomfortable, and your initial impulse may be that you're not ready. But remember: Growth and comfort never

“

Even if being a woman in your business sector may be an issue to some customers, don't let it be one to you. In business, you set the tone by being a competent professional, so you establish yourself as someone qualified to get the job done and let that speak for itself

”

**RENISHAW**   
apply innovation™

co-exist.

Always take on new challenges even if you are not ready for it. Take criticism seriously, but not personally. If there is truth or merit in the criticism, try to learn from it. Otherwise, let it roll right off you. Continuous learning leads to continuous improvement. Commit yourself to advancing your knowledge, skills, and expertise. The business environment is quickly changing, and your understanding of the leading practices, thinking, and emerging tools will help you manage for better results. Be a lifelong student.

I can never be with 'done' attitude; I always try and go against the grain. As soon as I accomplish one thing, I just set a higher goal. That's how I've gotten to where I am. 

# Combating gender stereotypes in technology

## Q. Tell us about your role and job profile at your company.

I am currently working as a Marketing Communications professional at Delta Electronics India Pvt. Ltd. At pan-India level, I supervise and direct diversified marketing communication programs for Industrial Automation division of Delta Electronics India.

I look after all the Above the Line (ATL), Below the Line (BTL) marketing, digital marketing, events, budget management everything which can benefit the brand and increase its visibility in the industry. I have been a part of Delta family for the last 5 years and have been improvising on the way we can make the communication better in reaching our potential customers and strengthen the existing partnership with our valued associates.

## Q. What made you choose a career in the Automation industry?

With the increasing demand to automate every aspect of life, the industry has charmed the professionals not only in the engineering but in other domains too. With cut-throat competition in the industry, marketing communication becomes very crucial and important job profile here.

There was not a preplanned decision which made me choose the particular industry. I would just say as I got the opportunity, I got excited about the challenging characteristics of the profile. The spark to know more about latest technology and opportunity to develop focused, technically complex and specialized marketing strategies for a very selective segment attracted me



**Vineeta Rajput**  
Marketing Communications  
Industrial Automation Solutions,  
Delta Electronics India Pvt. Ltd.

towards the industry.

Every profile is a new horizon of opportunity if one has interest to grow. Over these years, I have learnt a lot and each day I just look to deliver something better than yesterday, which is my driving force to continue here.

I feel that even though women are under-represented in the industry, the industry gets benefitted from the diversified perspective which women brings with them. They get to play an important role, which encourages them to contribute a lot for the progressive growth.

## Q. Did you face any difficulty in coping in the industry (due to lesser women employees)? If yes, then please share anecdotes and your experiences

Yes, there are challenges. For instance, many times while organizing any expo or event, there are very few or no other female faces around. For some, it could be a very stressful work environment but for me it has always been motivating and exciting. It encourages me to push the envelope every day.

So, despite challenges, if one wants to learn and keep going, the path becomes beautiful. My superiors and colleagues have always supported me and shared their knowledge and learnings. I, on the other hand, have made the most of every opportunity and have always given my best to complete the whole ecosystem.

## Q. In your opinion, why only few women manage to climb the seniority ladder? What are the key barriers affecting career progression of women?

Certainly, the outside barriers such as gender inequality, society structure, family responsibilities are there. However, I feel the most crucial barrier is not outside but within us. The barrier which confines us to challenge ourselves and stops us from fulfilling our desires.

We have caged ourselves in a stereotype that women can't reach to the senior

levels in an organization. Despite multiple barriers, if we see around, women have achieved success in every domain, it's just we have to come forward and take the first step. We have to understand that business acumen and leadership do not come exclusively to men.

Till the time all the parameters become equal for both man and woman in the society, we as women might have to do extra efforts to get to the same level. However, I believe that the quality of handling additional responsibilities has been given to us by nature itself.

## Q. What initiatives can we take to encourage more women to join the industry.

I always believe one should realize their strengths and interests. This field is for someone who wishes to connect with technology and has a hunger to learn more. Many women might think that this industry requires some specific knowledge and skills, but all this industry requires is your passion and honesty to stay connected with evolutions and innovation of technology. Technology is all about today and progress of tomorrow, then how can it be restricted to a specific gender/ person when the future is about us all.

We should allow women to think beyond their limitations, we should encourage them to share their thoughts on how they want to shape the future with latest technologies, and once their thoughts are spoken and analyzed, half the battle is won.

I work for an industry where we talk about robots, but I am yet to meet a robot that asked my gender before taking my instructions. Thus, the thought is clear when technology never restricted its capability why should we?

## Q. What advice would you give to women to be successful in the industry?

In today's business world, Automation is the biggest game-changer. It is universal

“

Despite multiple barriers, women have achieved success in every domain. It's just we have to come forward and take the first step. We have to understand that business acumen and leadership do not come exclusively to men

”



Smarter. Greener. Together.

and can be applied in any vertical or industry.

The increasing demand of Automation has made this industry very lucrative to work. The very fact that the percentage of women employees is less in the industry, also presents an opportunity to opt the profession. Inherent women qualities like ownership, hard work, time management, commitment makes us excel in any field. Then, why not in the booming Automation sector?

The only thing one need is to be motivated enough to keep pace with such a dynamic industry. Sharpen your skills regularly and project confidence in all you do. Most importantly, always remember if a job's not challenging, it's not worth doing. MTW

# Showcasing success has no gender

## Q. Tell us about your role and job profile at your company.

I am the co-promoter and director of RR Global. I also head the Marketing Communications team and responsible for the overall branding of all our brands/companies across the world.

## Q. What made you choose a career in the wire and cable manufacturing industry?

This was not a career that I got out of choice per se. It was more out of circumstance; I am married to the co-founder and MD of the organization and was always inclined towards developing a career for myself. I could have easily sat at home and become a traditional housewife as most of my generation continue to do. But once my children were old enough and independent, I embarked on a journey that today helps me empower others. I am so happy life gave me these opportunities and I was able to grab them and make the most of it.

## Q. Did you face any difficulty in coping in the industry (due to lesser women employees)? If yes, then please share anecdotes and your experiences.

Sadly yes, but that isn't just restricted to our industry. I think that goes across borders and geographies and even affects industries where women have traditionally been part of. In my case it was particularly difficult. I came in at a higher position. A position of power and responsibility, most of our team at the time were men (both in senior and mid-level positions), many came from traditional mind sets so for them to take or accept decisions from a woman



Mrs. Kirti Kabra,  
Director, RR Global

wasn't easy. Every step, every decision was made after grave challenges. However, eventually once those decisions bore fruit, they understood that success or decision making isn't gender specific.

## Q. In your opinion, why only few women manage to climb the seniority ladder? What are the key barriers affecting career progression of women?

We often tend to blame men when we aren't able to climb the seniority ladder. Even though that is an issue and it must be addressed, I think very often we as women forget to introspect. We tend to underestimate ourselves, underestimate our capability and what we can achieve if we support each other despite the bigger hurdles we have to cross. We have so many successful women at all levels of society from politics to major corporate roles to sports and science. We need to continue to believe in ourselves.

## Q. What initiatives can we take to encourage more women to join the industry?

Our industry needs to present itself better to attract more women. We have to consider that both men and women are looking for continuous skill development throughout their career. That women want equal opportunity and pay, flexible working hours and maternity leaves and help. More female-related initiatives are required starting right from level of campus recruitment. How can women expect to work in this industry if it is not enticing enough for them? Why would

they choose a career in this field if they feel there are not enough well-paying jobs? The 'male dominated' tag that is perpetually related to this industry needs to go. We can learn from how other industries are engaging women and use similar principles here.

## Q. What advice would you give to women to be successful in the industry?

My advice is short and sweet. Three-point strategy: -

- Self Belief
- Hard Work
- Aim higher and do not settle for less.

## Q. Tell us something about your CSR initiative 'Mission RRoshni'.

RR Global and the founding family has always been focussed on giving back to the society. Mission RRoshni is only a name to give this a holistic meaning and consolidate what we have been doing for years. Through this program, we continue to educate children in the most remote parts of the country, empower women by helping them develop their skills and engaging with farmers in the most draught ridden areas to teach them in better and more effective harvesting techniques. The objective of Mission RRoshni is to enlighten people's lives by making a difference to their livelihood. We can only stay true to ourselves if we give back to the community. There is so much more that Mission RRoshni does every day, I encourage your readers to visit our website ([www.missionrroshni.com](http://www.missionrroshni.com)) to know in detail how we help. MTW

“

Often, we as women, tend to underestimate ourselves and what we can achieve if we support each other despite the bigger hurdles we have to cross. We need to continue to believe in ourselves

”



# Demonstrating how unwavering faith in oneself guarantees success

## Q. Tell us about your role and job profile at the current company.

I have been associated with Schmersal India Pvt Ltd., for the past six years. I joined in the year 2014, as a Sales-support Engineer and was offered a role in Marketing in the year 2015. Since then, I have been handling marketing-related activities single-handedly, which involves planning, advertising, public relations, event organization, participation in exhibitions, liaising with vendors, website management, lead generation, content writing, managing marketing budget, etc.

## Q. What made you choose a career in the safety/automation industry?

I was really excited to be a part of this industry since the very beginning. I found the safety/automation industry to be very rewarding. Automation in itself is very revolutionary, it has replaced life risking jobs with robots, brought the world closer. Today, we are in an era of Industry 4.0 and IIoT. And nothing can beat the satisfaction of creating a safe working environment—enabling employees to focus on work without any concerns about safety, while ensuring peace of mind for families back at home.

## Q. Did you face any difficulty in coping in the industry (due to lesser women employees)? If yes, then please share anecdotes and your experiences.

No, as such I did not face any issue. Having studied in convent school and with the kind of upbringing I had, it did not matter really. However, in my previous jobs I was the only female



Priya Agarwal,  
Sr. Executive Marketing,  
Schmersal India Pvt Ltd

employee, which would feel a bit overwhelming and empowering at the same time. Also, I had complete belief in my abilities, commitment and hard work.

One fact that I would like to mention is, in Schmersal German, 34% of the employees are women, which is still a decent ratio as compared to the market and I am very proud of it. Schmersal India too, is following the footsteps of Schmersal Germany and taking conscious efforts to catch up with them in terms of increased women employee percentage.

## Q. In your opinion, why only few women manage to climb the seniority ladder? What are the key barriers affecting career progression of women?

Indeed, it is a bitter truth that only few women manage to climb the seniority ladder. In my opinion, particularly in India, key barriers affecting career progression of women are manifold: societal conditioning, limited access to rights or enough opportunities at the workplace, marriage and relocation to a new place, dearth of family support, and even self-doubt. With the societal conditioning, with time, many women in India, choose family over their professional career, maybe because they are wired like that by their families and society, since their childhood.

## Q. What initiatives can we take to encourage more women to join the industry.

- Organize awareness campaigns, strong mentorship programs, about the industry at the education level.

- Create and adopt a flexible and an inclusive culture for women

- Support and promote women employees and create role models in the organization, and 'Lead by an example.'

- Design mechanisms to make the women aware of their hidden potential and strength and help them unleash it.

## Q. What advice would you give to women to be successful in the industry?

Have an unwavering faith in yourself, believe that you are meant for greater things in life, and seek advice /support from anybody that you can confide in - your mentor, your guide or any experienced professional and espouse a strong will to success.

Break the barriers of self-doubt and traditional conditioning. Have goals, be highly clear about what you want from life, about how far you want to take your professional career, and be determined and focused to accomplish it. At the same time, strike a right work-life balance, seek support from your family, which plays a very vital role, the credit of the success of any woman goes to her own strong will and strong family support.

Change – Rise – Conquer! **MTW**

“

To be successful, women must have goals, be clear about what they want from life, and about how far they want to take their professional career. Then, they need to be determined and focused to accomplish their vision.

”

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# Committed to doing things differently

**Q. Tell us about your role and job profile at your company.**

I am the Founder of 'FutureSkills Consultants' – which is a training, mentoring and project consultancy company. I play the role of Trainer, Consultant and Mentor as a freelance professional. I am responsible for all the aspects of running my company including branding and promotion and most importantly, maintaining quality of my customized training programs and keeping abreast with the technology developments. I have developed and executed training programs in Industry 4.0, IoT, data science, Artificial Intelligence, Machine Learning, electric vehicles, CNC SPM development, leadership development, to name a few.

**Q. What made you choose a career in providing training and consultancy in technologies of tomorrow (IoT, Automation, Robotics, Industry 4.0) for manufacturing industry?**

I started my career in a machine tool manufacturing company after graduating from one of the prestigious engineering colleges. I have always dreamt of doing things differently and life gave me these opportunities! I was deeply involved in the design and development of CNC machine tools and automation systems.

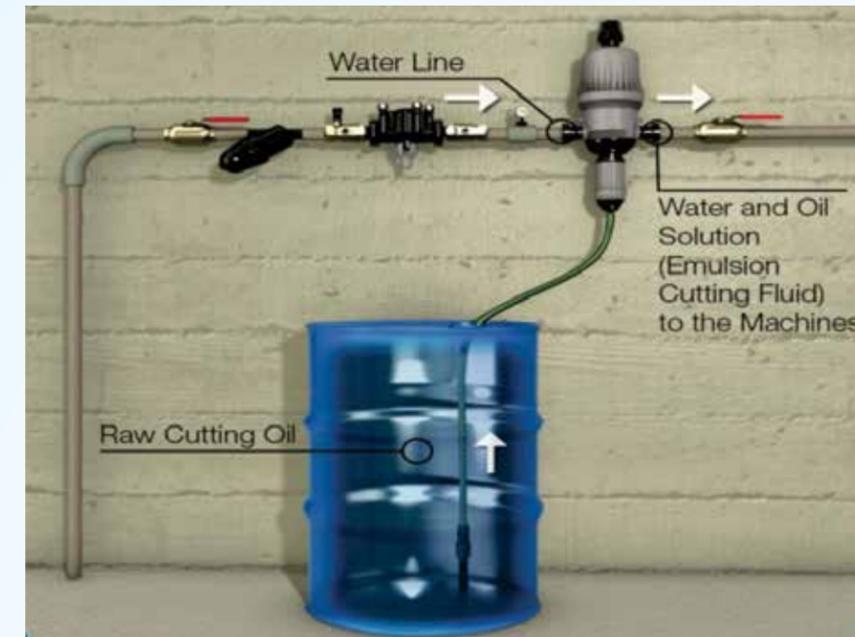
While working, I realized that education imparted in institutions needs to be complemented by several more skills, to be 'Industry ready'. Since the technology changes at a very fast pace, one needs to understand and get updated on the Future Skills required for professionals working on the shop floor right up to the top management.



**Mohini Sudumbrekar,**  
Trainer, Consultant, Mentor and Founder,  
FutureSkills Consultants

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Future skills are the blend of soft skills and the technology or hard skills. In any manufacturing set up a clear understanding of people interaction, process knowledge and product specifications are the key factors. Continuous learning and also unlearning the obsolete is a challenge. Industry 4.0 –Digital transformation has and will continue to influence every aspect of business, i.e., People, processes and products.

I also had the opportunity to work with engineering institutions where I chose to play very versatile role as a teacher and consultant to ensure industry contacts and updates. I chose this to ensure full support to my growing daughters, and proud to say that they are post graduates from reputed global universities and distinguished professionals today.

As a teacher I always remembered that I was recognized with the “Best Student of the University” award for being an all-rounder excelling in sports, vocal music, debates and elocution, while being a distinguished meritorious student. I felt responsible and also very passionate about bringing out the best out of my students, faculties and team members in industry and to influence and empower them.

While working with Institutes at undergraduate and post graduate levels and in the industry in CNC manufacturing and automation I kept the background of the slogan “Industry ready & Future ready” live, grabbed the opportunity and made the most of it. When I see my students and team members climb high, I realize that I am a King maker.

Experience of 40 years in academia, industry and international projects gave a focus on the need of training, development and mentoring. I realized the need for skills development for students, faculties and corporate professionals, and chose to lead by example.

**Q. Did you face any difficulty in coping in the industry (due to lesser women employees)? If yes, then please share anecdotes and your experiences.**

Sadly yes! I belong to the era when there were only two girls studying in engineering college out of a batch of 60. I started my career as a trainee engineer, in a very male dominated culture and used to be the only woman on the shop floor. But I must mention that I was very determined to work in manufacturing industry “as I wanted to do things differently.”

In manufacturing industry, design engineer has to be an active member of shop floor activities and processes. It was quite challenging. But I would like to mention that once you start taking decisions and start showing results, people start respecting and supporting. Although, at senior and mid-level positions, many came from traditional mind sets, so for them to take or accept decisions from a woman wasn't easy. But my dedication and efforts made them realize that success or decision making isn't gender specific. And had many good international projects opportunities as rewards.

**Q. In your opinion, why only few women manage to climb the seniority ladder? What are the key barriers affecting career progression of women?**

Attitude. The way you look at the things. I think it is about giving your 100% when the opportunity knocks your door and taking more responsibility and continuous self-development, maintaining the intellectual and emotional balance. Without any pride and prejudice! If one has a bigger goal and can introspect and believe in one's capabilities and is ready to adapt, climbing the seniority ladder is not difficult. It happens.

The mantra is believing in yourself, work hard, and don't lose the focus. Accept the challenges because those are the opportunities.

“

To be successful, women must have goals, be clear about what they want from life, and about how far they want to take their professional career. Then, they need to be determined and focused to accomplish their vision.

”

**Q. What initiatives can we take to encourage more women to join the industry?**

I think, gone are the days when candidates were rejected because you are a girl (as it happened then in my era). Many industries now declare and support women professionals in India and all over the globe. They are also promising equal opportunities, pay and growth, and also flexible working hours. Although the number of women engineers in industry is less, the industry needs to create awareness for the facilities available for women engineers, including equal opportunity, safety, growth and development, HR initiatives for maternity benefits, child development, work life balance, etc., at the campus recruitment sessions.

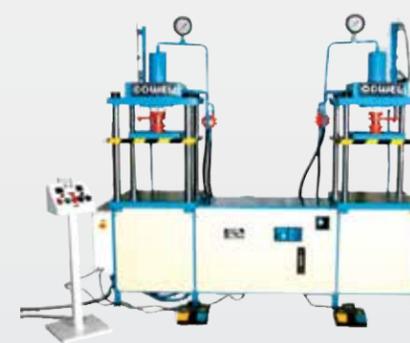
**Q. What advice would you give to women to be successful in the industry?**

Yes definitely, a very simple strategy: -

- Believe in yourself
- Develop a correct attitude
- Have a bigger goal
- Continual self-development
- Hard work
- Give your 100% with positive attitude and conviction. 



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L to R - Sandeep Srivastava, Director – India & South East Asia, Amol Arun Mane, General Manager – Technical & Marketing, India & South East Asia & Maja Foster, Global Marketing Director – Production Software, Smart Factory & Q-DAS

## Hexagon: Aiming to be the Google of manufacturing world

Given its diverse clientele and vast product portfolio, Hexagon, has established itself as a leading Manufacturing Software Solutions organization in India. As per the organization, its commitment to provide end-to-end solutions right from concept to reality—is at the heart of its success story. The organization has aggressive plans to continue this upward trajectory, with the ambition of becoming the Google of manufacturing world.

Shweta Nanda of Machine Tools World recently got an opportunity to chat with **Maja Foster**, Global Marketing Director – Production Software, Smart Factory & Q-DAS, **Sandeep Srivastava**, Director – India & South East Asia and **Amol Arun Mane**, General Manager – Technical & Marketing, India & South East Asia, to know more about the organization's future strategies. They talk about how Industry 4.0 has taken the manufacturing world by storm and how Hexagon can help customers get 'smarter' in a modular way. Edited Excerpts:

**Q. What are some of the emerging trends you are seeing in the manufacturing segment?**

There is more and more movement towards connectivity at the global level. Everything around us is getting connected and becoming 'smarter.' Connective solutions are widely being used in manufacturing too, right from design phase to preventive maintenance. That's where, we at Hexagon can prove important as we have end to end solutions us-

ing our products at each of the different stages starting from concept to reality.

**Q. When you talk about Industry 4.0, how ready do you think are Indian companies in adopting this emerging trend?**

In our impression, Indian companies have a fair idea about Industry 4.0 and its potential to revolutionize the entire manufacturing process. From our interaction with customers at IMTEX Forming 2020, we could gauge that they are

very excited about the technology and are keen to understand more and more about how it can prove beneficial to their organization and industry. They are ready to go and are quite enthusiastic about implementing it.

**Q. What according to you is complete implementation of IoT? How do Hexagon products fit in these stages?**

Full implementation is achieved when there is a complete traceability in a pro-

cess all the way from the beginning till the end. For instance, you know exactly where a part was designed, which machine was used to cut it, what vibration and temperature. You have complete visibility into the entire process till the stage you reach for the quality and inspection of the part. So, in case something goes wrong or the outcome is not as planned, you can easily trace it back, pin-point the stage, and fix it to make it better for the future.

Hexagon products fit in the majority of these stages of manufacturing. Our biggest plus is our wide portfolio that serves a variety of industries right from geospatial to mining. As an organization, we are enormous and touch a lot of elements. From the production software point of view, we have a major influence in the areas of manufacturing design, simulation, production management and tool management.

We have also started working with two different portfolios. One of them is Smart Factory - SFX, which enables smarter asset management. So, it allows you to get a full view of the equipment in your factory. You can monitor the operation and determine if they are running efficiently. The other is Q-DAS which is software for statistical process control. This is a vital tool for process evaluation and control and enables efficient and reliable application of statistical methods to monitor and control the required quality in industrial production.

**Q. What are the biggest challenges in terms of adoption of Industry 4.0, especially in the SME sector?**

The biggest challenge is in terms of mindset, as a number of SMEs think that they need to completely revamp their infrastructure to be smart. However, even a small manufacturer with one machine can be smart, even a designer in a small office can use smart solutions and smart software. So, one manufacturer can be smart in a process rather than being fully

smart. The whole idea of being smart is very scalable. Regardless of the size or the type of work they do, every manufacturer can be smart and they can do it step by step and scale it up or down, as necessary. We, at Hexagon, understand the concerns of customers, so we also emphasize upon modular approach for Industry 4.0 through various products in our portfolio.

**Q. How do you want to market your brand? How do you want Hexagon to be recognized as and what are your strengths?**

We want Hexagon to be known as an end-to-end solution provider rather than showcasing our individual products. We have observed that customers are looking more and more for total solutions and are demanding seamless integration while transferring data from CAD to CAM, and CAD to CAE. Essentially, they are looking for a solution partner and not a product selling organization.

We continually collaborate with our different divisions to understand critical business issues from vertical to vertical. As an initial step our sales and technical team together talks to the customers to gain the bird's eye view of the customers' critical business issues and challenges. We then look at our product portfolio and put up an end-to-end solution to address these issues. We, at Hexagon, aspire to become the Google of the manufacturing world.



**Q. What are the requirements of today's customers? How are you meeting these evolving customer expectations?**

Customers are demanding good quality products at optimum cost within desired delivery time. So, they are looking for tools and technology that will help them do things in a 'smarter' way. This

is where Hexagon fits the bill as we help our customers to be right first time, every time.

We, who manage the production software portfolio, cater to diverse clientele right from OEMs, tier-1 suppliers to SMEs. In fact, 70% of our opportunity comes from SMEs in India. We don't differentiate between our customers and look into all aspects to meet their unique requirements. For instance, one key customer requirement is instant technical support. To meet this, we have a Hexagon customer portal where customers can log their complaints and can get speedy resolution to any issue. However, at times we noticed that some customers from the SME segment were facing issues in operating the portal or were not able to use it due to internet downtime. To aid such customers, we now additionally offer a toll-free number which they can call and get immediate technical support. So, we are flexible while addressing our local customer requirements.

**Q. How important is the Indian market for you? Are you developing any products in India? What are your future plans?**

India is strategically very important to us. We have Hexagon Capabilities Center India (HCCI) in Hyderabad, where products of various divisions are developed. If we talk about production software, two of our products, CABINET VISION and RADAN, are being developed at HCCI. Further, we have rolled out the NCSIMUL digital twin platform, which will also be developed here for global countries. So, we are supporting various global initiatives from here in India.

We are also organizing Hexagon Live India 2020 Event later this year in New Delhi. This is the biggest event which happens across major regions, where we display our entire product portfolio. In terms of new products, we are planning to launch the FASYS tooling and shop-floor management solution, in India around the third quarter. **MTW**

# The Bettinelli advantage



Rupesh Paparaju,  
Director, Bettinelli Automation  
Components, India

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

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

CDS produces the widest range of mechanical Cam Driven Units, commonly known as rotary / indexing tables for precision motion control applications, requiring rotary or linear transfer, positioning and handling. The products range includes, cam indexing

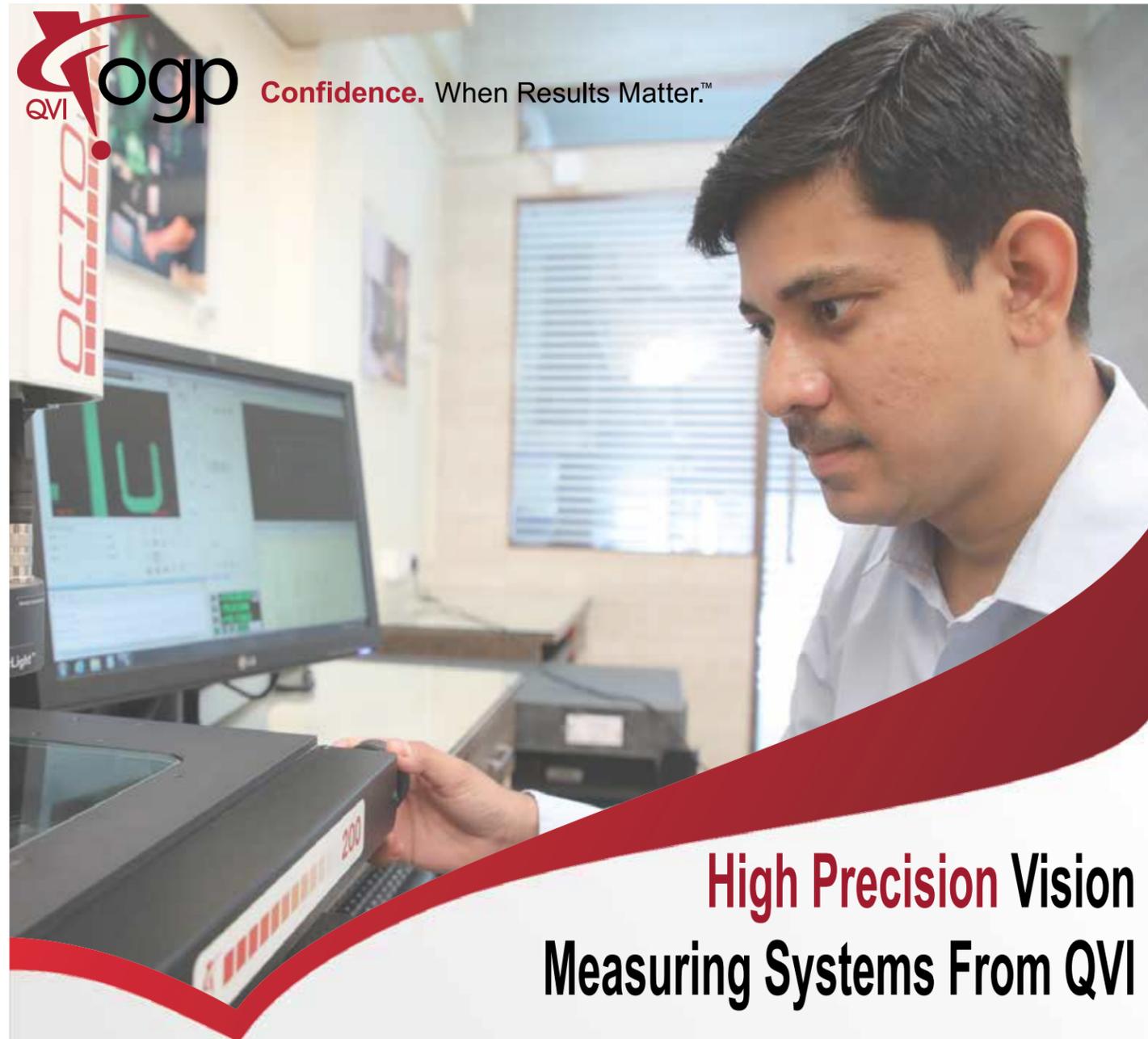
and servo-driven tables, ring positioning drives, intermittent and oscillating drives with parallel or right angle configuration, rotary & linear part handlers, precision link transfer systems, and epicycloidal servo reducers.

#### Wide ranging products

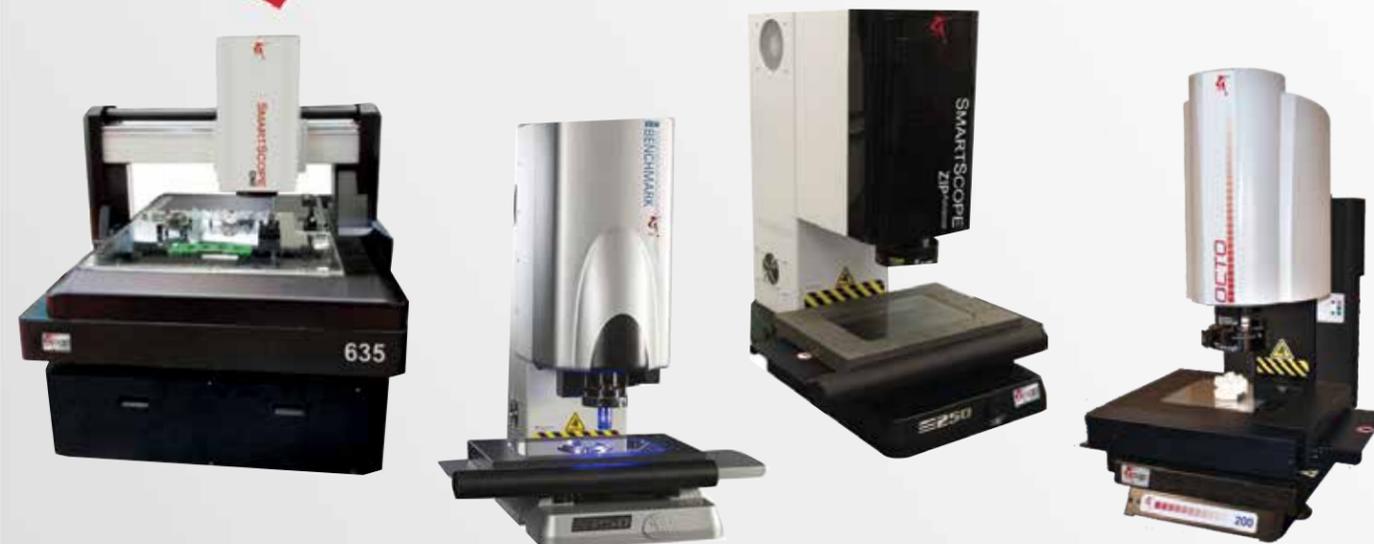
The broad product spectrum covers IP parallel shaft indexers, IT roller dial indexing tables, TR roller dial indexing tables, HP roller dial indexing tables, IG/IGA roller gear indexer, TL precision link conveyors, MHP/LHP part handlers, FT-HT open center ring tables and packages

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

The manufacturing takes place centrally in Italy. The regimen starts with design & engineering, CNC induction hardening, CNC milling, grinding, quality check and then assembly, painting and shipment. In order to ensure quality, all components are machined internally, including the cam hardening by a proprietary CNC controlled induction



## High Precision Vision Measuring Systems From QVI



hardening equipment. For better finish, the products are also subjected to chemical nickel plating, blasting and painting. The manufacturing process is constantly controlled to conform to international standards. The company's quality systems are ISO-9001-2008 certified.

**Strategic advantages**

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

The Indian subsidiary, headquartered in Pune, serves its customers in India by providing installation, commissioning, and after-sales support. It also offers technical consultation. In the pharmaceutical industry cam driven systems are used in filling, blister pack, tablet making and packaging machines. In automobile industry, they are used in pallet transfer tables, assembly machines, painting applications and test

rigs, just to mention a few. In machining industry, they are used with advantage in deburring, lapping and pressing machines and in transfer lines. In SPM & robotics, they find applications in transfer lines, station loading, sequential operations and so on. Inwelding, these indexers are inevitable in positioners, synchronous welding, robotic welding and component transfer.

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

**Closer to the customer**

The Indian arm of Bettinelli, based in Pune, Bettinelli Automation Components Pvt. Ltd., is highly customer-centric. "Our presence in India means quite something in fostering a symbiotic relationship with our customers. It helps us to match our world-class products with our eminent customer support," underlines Paparaju, Director, who has built up a team to improve Bettinelli's response time. "CDS are high-tech products which lend themselves to enhance the operational efficiency and productivity at the customer's end. We stay close to the customer to understand his needs and offer customized solutions

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

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

within the shortest possible time to ensure peak uptime of his equipment and operations", he adds.

**- P.K. Balasubramanian**



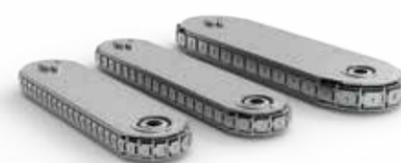
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# Dynaspede Thrives on Mechatronics

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

## Sprawling Infrastructure

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

Dynaspede has eight branch offices across India managing its sales and

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

## Ever-expanding Product Range

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



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

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

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

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

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

## Facilities Galore

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

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



Machine Building Shop

## In a Class Apart

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

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

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

# Dynaspede

- P.K. Balasubramanian



Software Programming on Test Rig



Dynaspede Engineers at the Assembly line

## Advantages of extruded aluminum seventh axis

Speaking about aluminum solutions the first word that comes to mind is lightness. But digging a little deeper, you can discover several other surprising strong points.

**ROLLON®**  
BY TIMKEN

Speaking about aluminum solutions, the first word that comes to mind is lightness. Nothing could be truer with a specific weight of 2.7 g/cm<sup>3</sup>, but if we dig a little deeper, we can discover several other strong points, such as versatility, ductility and resistance to corrosion. We can also find surprising results when we compare the load capacity to that of steel.

The anthropomorphic robot market is growing steadily year after year in several different applications, and the need to expand a robot's operating range with a seventh axis is rising too. Having the option of moving the robot along a new axis allows us to increase productivity and efficiency. For this reason, Rollon has developed a complete range of 7 models, in various sizes and with different capacities, that can work with any anthropomorphic robots, handling loads of up to 2000 kg. Rollon's

Seventh Axis solutions are all made with extruded aluminum profiles, assembled with connecting crosspieces that endow the system with maximum rigidity. They feature recirculating ball guides and drives that run either with a ground rack with inclined teeth or a toothed belt.

### ALUMINUM, STEEL AND LOAD CAPACITY

Aluminum is the distinctive material of Rollon's solutions, in a market where many solutions are made of steel. It's perfectly natural to ask: "In terms of load capacity, how do seventh axis systems with aluminum profiles compare to steel systems?". Obviously, steel offers greater mechanical resistance overall, but aluminum, being extremely malleable and flexible, can be extruded to make highly elaborate geometries, which are excellent for guaranteeing the greatest moment of inertia and the least weight possible. On the other hand, steel drawing – or steel processing in general

– does not allow the construction of sufficiently complex pieces to guarantee comparable results. This is why aluminum seventh axis systems can quickly gain ground on steel solutions with regard to load capacity, but with an important extra feature: they weigh two and a half times less. The Seventh Axis range from Rollon can manage loads of up to 2000 kg.

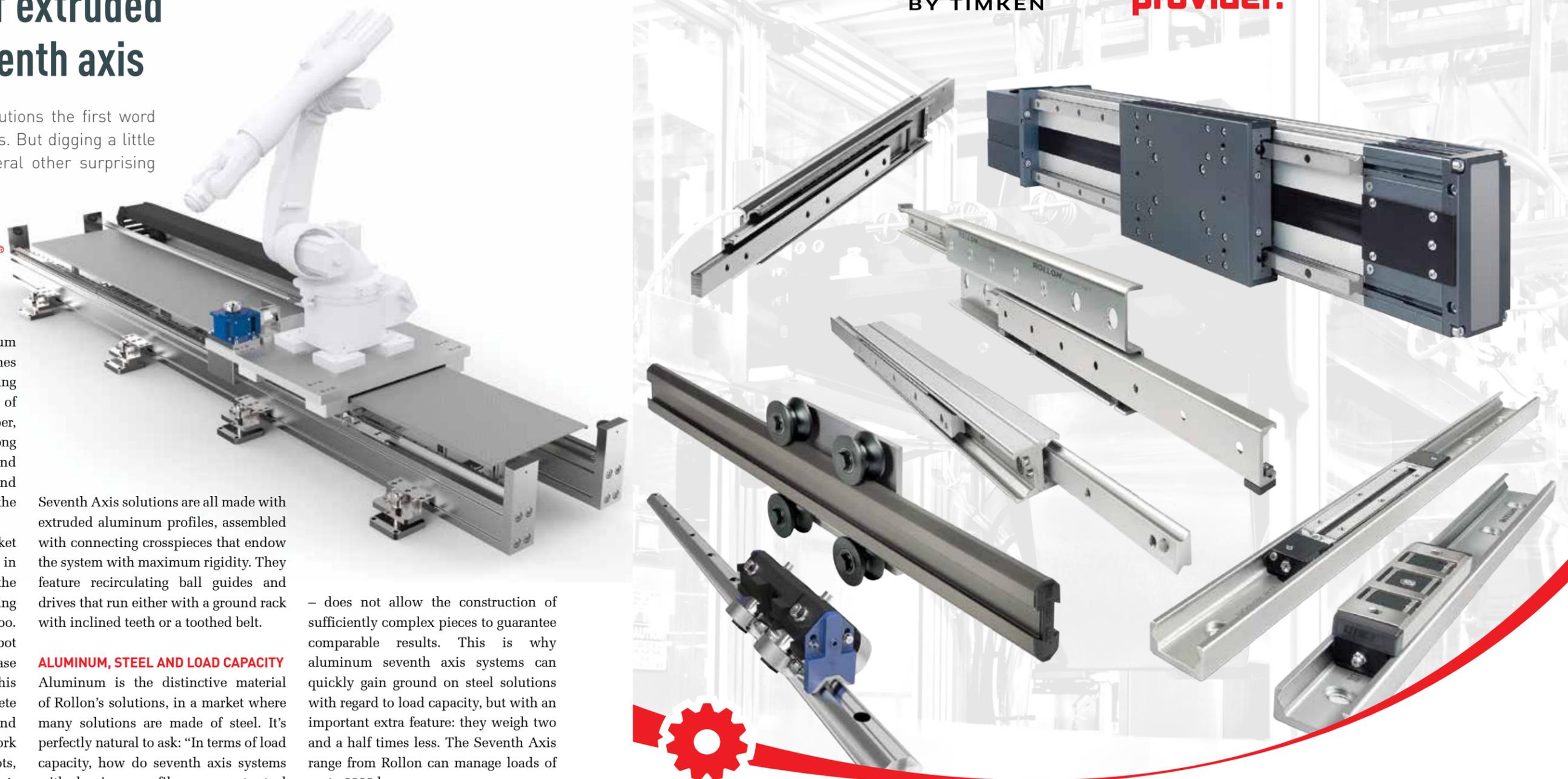
Now, let's look at the other advantages of aluminum profiles.

### LIGHTNESS

As we said before, lightness is undoubtedly the most important plus: a light seventh axis offers several application-specific advantages, starting with lower transport costs. Moreover,

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ROLLON India Pvt. Ltd. - INDIA



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

the assembly of a solution weighing almost one third less than a steel solution is inevitably faster, easier, and most importantly, safer. Lastly, lightness is an important competitive advantage in all applications that involve a ceiling or wall mounted system instead of a floor-standing seventh axis system. In these cases, it is not necessary to add a heavy seventh axis in steel to the weight of the robot. Ceiling and wall mounted configurations are very common in painting and welding applications, in the automotive industry, and in other industrial areas.



**RESISTANCE TO CORROSION**

Steel in its most common form, carbon steel, corrodes on contact with water or in a humid atmosphere. This is why steel solutions destined for harsh environments require surface treatments that make them resistant to corrosion. These treatments offer different degrees of protection and, naturally, affect the costs of the finish solution and the delivery times. Aluminum oxidizes naturally on contact with air and is not altered by humidity: it is resistant to corrosion and does not require any other treatment. A simple neutral anodizing treatment is usually done, purely for aesthetic reasons.

**SOLUTIONS WITH PROTECTED PROFILES**

The malleability of aluminum makes it possible to create different geometries through extrusion. Extremely functional is the “C-shape”, which consist in a square profile with an opening where a belt and carriage can slide so that it is possible to place the rail inside the profile. The result is a completely closed unit that contains all the elements of the system. This solution is particularly interesting when it is necessary to isolate the seventh axis from the environment (to protect it from dust, residue, liquids or other contaminants), or on the contrary, when the environment must be isolated from the seventh axis like in

**ROLLON: A Capillary Organization on a Global Scale**

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

clean rooms or anywhere it is crucial to avoid dispersing particles. Obviously, constructions of this level of complexity cannot be made with the drawing process used to make steel profiles.

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# IGUANA – Diamond tool for copper electrode machining

With the IGUANA line of diamond-coated high-end milling cutters, ZECHA Hartmetall-Werkzeugfabrikation GmbH is setting a new standard for micro-precision tools for copper machining. IGUANA ball nose end mill, end mill with corner radius, and micro end mill are multi-cutters in the small-bore sector from 0.4 mm to 3 mm and ideally suited for the machining of non-ferrous metals such as copper or high-strength copper alloys (e.g. CuBe).



## The trend towards copper electrode

The trend towards copper electrode – developments, improvements, and innovations ensure continuous process changes in the production of electrodes. In recent years the trend in the field of die-sinking EDM is in the direction of copper. Miniaturization of components and lightweight construction are leading to increasingly filigreed geometries, for which the advantages of copper outweigh graphite. In comparison to graphite, in the manufacture of electrodes not only is tool wear greatly reduced with copper, but also the surface quality and

dimensional accuracy are significantly improved.

## With the IGUANA line of diamond-coated high-end milling cutters

ZECHA Hartmetall-Werkzeugfabrikation GmbH is setting a new standard for micro-precision tools for copper machining. IGUANA ball nose end mill, end mill with corner radius, and micro end mill are multi-cutters in the small bore sector from 0.4 mm to 3 mm and ideally suited for the machining of non-ferrous metals such as copper or high-strength copper alloys (e.g. CuBe). With the help of laser processing, sharp

cutting edges like those that are already achievable with soldered CVD tools can be transferred to multi-fluted CVD-coated solid carbide tools – without affecting the hardness and strength of the diamond coating. A special benefit of this are the cutting edge radii of 1 µm that can be produced with a sealed diamond coating, which could be achieved previously only with radii above 5 µm.

Especially when machining small copper electrodes with complex free-form surfaces, it is challenging to ensure geometrical and dimensional accuracy. Any deviation is transmitted 1 to 1 to the form during die sinking and thus

directly to the end product. In the automotive industry and in medical technology, tolerances of 0.02 mm are the standard in series production. In order to guarantee the required tolerances in the end product, these must be considered and, at the same time, maintained during the preceding processes. In the case of a plastic injection-molded part with a tolerance of 20 µm, the tolerance for the electrode production decreases over the course of the process chain to only 5 µm.

## In tests of copper electrode machining with the IGUANA end mills

The surface quality was improved by more than 50% - with an average roughness of Ra= 0.035 µm and peak-to-valley roughness of Rz= 0.2 µm. The filigree webs demonstrated no feathering or chatter marks due to tool wear. Even the finest structures at the end of the webs could be produced again with process reliability. Also, the cutting efficiency of the tool is unequalled in the industry – where previously a lateral infeed of 5 µm – due to tool deflection caused by wear on the tool – was necessary, with IGUANA the target contour was achieved directly. With an optimum process design, process reliability can be accomplished thanks to a tool service life, depending on component material, of up to several hundred hours.

The high-end tool alone, however, is not a guarantee of optimum results. The determining factor is rather the interac-



The sharp and defined cutting edge with sealed diamond coating of the new IGUANA high-end milling cutters.

tion of tool, machine, and application. In addition to the continued basic abilities such as carbide selection, grinding of pre-stages, and subsequent CVD coating, laser technology opens further options along the path towards the perfect tool.

The IGUANA line of end mills, which can demonstrate a sealed diamond coating despite sharpened cutting edge, offers enormous potential for optimizing processes and eliminating inefficient post-processing operations, as well as increasing overall profitability thanks to longer service lives and therefore fewer tool changes.

## IGUANA – diamond-coated, laser-processed tools.

The potential offered by this new tool technology can also be applied to other materials. New findings combined with optimum adaptation to the requirements of component materials promise



Precision Copper Electrode milled with IGUANA.

great improvements in different areas of use. It will be exciting to see where the technology will take us in the future.

For more details please contact  
**ZECHA Precision Tools Limited**  
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A standard servo motor produces rotary torque that must be converted to linear motion generally using a ball screw. The conversion of rotary torque to linear motion results in the loss of both accuracy and precision. Drake uses linear motors with high-resolution scales on positioning axes. This allows for multi-directional stiffness and low maintenance. When ball screws wear, Drakes keep going.

### Advantages of linear motor drive system:

- Linear motors are virtually maintenance free for the life of the machine
- High speed axis travel with high acceleration & deceleration
- Fast response due to direct coupling & fast motion controller
- High accuracy and repeatability with linear glass scales
- Direct drive (no couplings or belts means no back lash, windup or lost motion)
- Efficient use of power due to little energy loss



- Simplified mechanical design
- No contact and thus no friction between the drive elements
- High dynamic stiffness

### Drake's line of precision machines includes:

- **MH Model Thread Grinders:** the economical choice in precision grinding
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- **Rack Mills:** high speed rack milling

### DISCOVER DRAKE

We are Drake Manufacturing. We are a full service, turnkey manufacturer of precision CNC machines and provider of engineered solutions. Founded in 1972, Drake is headquartered in Warren, Ohio. The premium Drake brand is known around the world for innovation and process expertise throughout the thread grinding industry.

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# The next chapter of offshore wind energy: WIND TO HYDROGEN

As the offshore competition is growing in expanding new markets, the balance between productivity and profitability has never been so aligned with being competitive in the market of renewable energy

By: *Virginio Paratico - Area Sales Manager - FACCIN S.p.A*

Great advancements have been made in the offshore wind tower industry ever since it was first installed in Denmark in the early 90s, an essential development due to the growing global demand for renewable energy which keeps increasing every year as governments are channeling investments to decrease carbon emission. This year alone, 15GW of new offshore wind capacity is expected to be added in the global offshore wind energy.

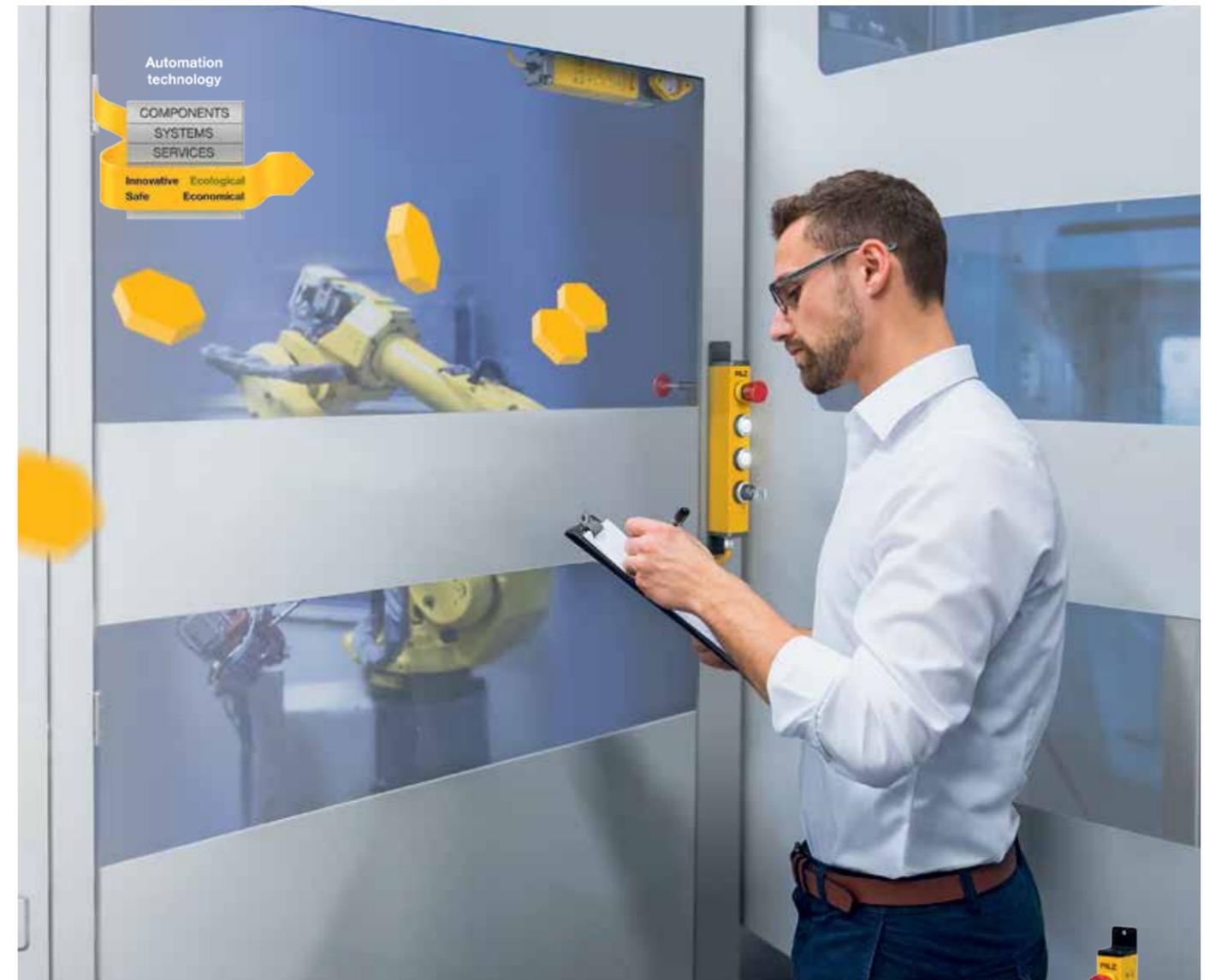
At the threshold of Offshore wind energy is the transformation of wind energy into green hydrogen at an industrial scale. Through the process of electrolysis, water is split into oxygen and hydrogen which can then be used

to power engines, gas turbines and fuel cells, not to mention it can also replace the use of CO<sub>2</sub>-neutral as a reducing agent in steel fabrication. Hydrogen produced via electrolysis can result in zero greenhouse gas emissions and criteria pollutant emissions. It is estimated that a 4GW wind farm can produce enough hydrogen to power 1.4million homes and it has also a very high potential of competing with diesel fuel.

The advantage this brings to wind farms is that hydrogen fuel and electric power generation could be integrated, thus allowing flexibility to shift production to best match resource availability with system operational needs and market factors. Also, in times

of excess electricity production from wind farms, instead of curtailing the electricity as is commonly done, it is possible to use this excess electricity to produce hydrogen through electrolysis. The floating wind-to-hydrogen turbines would be completely independent of the power grid – a major contributor to cost reduction.

The gas can then be easily stored by existing infrastructure such as gas pipelines, storage tanks, and onboard ships. These are structures that require very resistant and thick materials that can be formed by FACCIN's complete plate bending solutions. FACCIN has been entrusted with countless projects by providing high performing machines



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to roll foundation and wind tower components, giving the most complete solution on the market for bending the industry's heaviest structures. W2H2 projects are gargantuan investments that involve many industries working together, from dished heads of pressure vessels to ship frame benders making ships to transport gas onshore.

*"Our dedication in renewable energy has brought us on a path of continuous innovation and many satisfied customers around the world."*

**Tailor made cost-effective solutions**

FACCIN has always been attentive to customer's requirements, it is not a coincidence that we were the first supplier to offer a CNC controlled plate rolling machine in 1984.

FACCIN's single-operator wind tower integrated automation system is designed to maximize the productivity of rolled cans manufacturers by guaranteeing reliability, precision and a fast rolling cycle. The system also combines essential components such a robust top support, sturdy side support and self-aligning feeding table, all controlled by a state-of-the-art CNC, enhanced by our



long experience in this technology and designed to guarantee our customers' profitability.

We understand that maintenance down time or unexpected errors may occur during the manufacturing process; that is why, in order to provide a fast and professional service to all our customers around the world, we have incorporated a special function in our Faccin CNC controlled machines called RSM (Remote service management) securely connected to the FACCIN Cloud Service.

It allows the end user to receive immediate assistance directly from our customer service department using live video feed and an easy to use interface so that real-time assistance is provided whenever needed. Upon request, the

service department can also see the screen of the console which can help the user run diagnostics or trouble shoot at the spot and our experts can analyze the collected data and provide solutions for improving efficiency.

**Forming today's future**

With over 200 years of combined experience in metal forming, FACCIN Group unites the world's leading manufacturers under one roof: Boldrini, Roundo, and FACCIN.

Our Group is now a very powerful combination of well recognized brands in plate rolling, profile bending and dished head manufacturing. These brands are all united under one roof, each brand specializes in a certain type of product and we aim to deliver the best quality and technology available in the market. Our mission is to continue growing the two pillars of our success, which are thousands of machines we have installed around the world and what we consider to be our greatest achievement, the thousands of positive references from satisfied customers. Our strategic focus is to keep growing as a group, using the synergies provided by each brand not only technically but also commercially to offer customers an even wider range of options.

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# Evaluation of hot hardness and wear rate of some hardfacing alloys

M.Dharmaseelan, S.Malarvizhi, Dinesh Giri, V.Balasubramanian & Aniruddha Vilekar

Hardfacing is one of the most useful and economical ways to improve the performance of components submitted to severe wear conditions. This study examines the Hot Hardness and abrasive wear behavior of four iron based hardfacing alloys with different combinations of Chromium, Molybdenum, Tungsten, Vanadium and carbon on a mild steel substrate. These four different commercial hardfacing electrodes were employed to investigate the effect of the Hot Hardness and microstructure. The Hot hardness tests were carried out with the help of poldi hardness tester. The abrasion tests were carried out in a dry sand-rubber wheel abrasion machine according to the procedure B of ASTM G65 standard. Microstructure characterization analysis were made using optical microscopy. The results showed that the wear resistance is determined by the size, shape, distribution and chemical composition of the carbides, as well as by the matrix microstructure. The results shows the higher Hot hardness is obtained in Fe-Cr combination electrode because of their formation of complex carbides. The hardfacing layer with good cracking resistance and wear resistance could be obtained in the Fe-Mo combination electrode. The improvement of hardness and wear resistance of the hardfacing layers attributed to the solution strengthening of Mo.

## 1.INTRODUCTION

Hardfacing is a commonly employed method to improve surface properties of agricultural tools, components for

mining operation, soil preparation equipments and others [1,2]. An alloy is homogeneously deposited onto the surface of a soft material (usually low or medium carbon steels) by welding, with the purpose of increasing hardness and wear resistance without significant loss in ductility and toughness of the substrate. A Wide variety of Hardfacing alloy is commercially available for protection against wear. Deposits with a microstructure composed by disperse carbides in austenite matrix are extensively used for abrasion applications [3] and are typically classified according to the expected hardness. Nevertheless, the abrasion resistance of a hardfacing alloy depends on many other factors such as the type, shape and distribution of hard phases, as well as the toughness and strain hardening behavior of the matrix [4]. Chromium-rich electrodes are widely used due to low cost and availability; however, more expensive tungsten or vanadium-rich alloys offer better performance due to a good combination of hardness and toughness. Complex carbides electrodes are also used; especially when abrasive wear is accompanied by other wear mechanisms [5]. Several welding techniques such as oxyacetylene gas welding (OAW), gas metal arc welding (GMAW), shielded metal arc welding (SMAW) and submerged arc welding (SAW) can be used for hardfacing. The most important differences among these techniques lie in the welding efficiency, the weld plate dilution and the manufacturing cost of welding consumables [6].SMAW, for example, is

commonly used due to the low cost of electrodes and easier application. The present investigation aims to study four commercial electrodes in terms of their chemical composition, microstructure, Hot hardness and abrasive wear resistance.

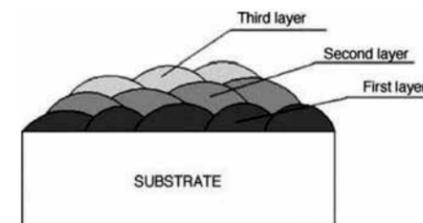


Fig 1.1 Hardfacing layers

## 2.EXPERIMENTAL PROCEDURE

### 2.1MATERIALS USED IN THE WORK

#### 2.1.1 Base Material

The base material used in the present investigation was IS 2062 grade-b plates basically low alloy carbon steel of sizes 120mm X 50mm X 20mm.

Table 2.1 Base material Chemical Composition

Single values are indicating maximum allowable

%C	%Mn	%S	%P	%Si	%C.E
0.23	1.50	0.045	0.045	0.40	0.42
max		max	max	max	

percentages

#### 2.1.2 Hardfacing Electrodes

Chemical composition of different hardfacing electrodes are extruded as per ASME Sec II Part C SFA -5.13.

### 2.2 CHEMICAL ANALYSIS OF WELD METAL

Weld pad is prepared as per the ASME sec II part C SFA-5.4/SFA-5.4M. The

Table 2.2 : Composition of Weld Metal

Hardfacing electrode	%C	%Cr	%Ni	%Mo	%Mn	%Si	%P	%S	%Cu	%V	%W	%Fe
Type -1	0.18	2.41	0.036	0.017	0.471	0.298	0.02	0.011	0.011	0.02	0.026	96.47
Type -2	0.183	1.61	4.25	4.2	1.12	1.09	0.02	0.009	0.045	0.04	<0.01	87.36
Type -3	0.486	4.35	0.054	7.2	0.325	0.61	0.02	0.013	0.072	1.16	1.09	84.48
Type-4	1.72	31.98	0.029	0.075	1.14	0.92	0.01	0.01	0.006	0.03	<0.01	63.89

surface of the base metal on which the filler metal is deposited should be clean. The pad shall be welded in the flat position, using as short an arc length as practical. Multiple layers are used to obtain undiluted weld metal. After depositing each layer, the weld pad is immersed on water (approx 30 sec). The slag is removed after each pass. The chemical compositions were measured for all the different type hardfacing electrodes. That results are shown in below table. All the four type electrodes chemistry pad is prepared for analysis as per standard. The chemistry was analysed with the help of spectroscopy.

### 2.3 DEPOSITION OF HARDFACING LAYERS USING SMAW PROCESS

Using SMAW process the hardfacing layers are welded on the base material to measuring the hot hardness and wear rate of the hardfaced layers. After hardfacing the hardness will be tested using poldi hardness tester. And the wear rate is tested using Dry Sand Abrasive Rubber Wheel Method as per ASTM G65.

### 2.4 WELDING PARAMETER

The welding parameters were given below.

### 2.5 HOT HARDNESS ANALYSIS

The poldi hardness tester is one of

the commercially available portable hardness testers. The indentation is obtained on the test surface by striking a blow on the ball which also produces indentation on the standard bar. The diameter of the indentation on the test surface and the standard bar are correlated in the manufacturer's table and the hardness number is measured in BHN.

### Plunger

MATERIAL : ALLOY STEEL EN-8 OR EN-9DIAMETER : 30 MM

LENGTH : 85 MM

Tungsten carbide ball

DIAMETER : 10 MM Poldi bar

MATERIAL : ALLOY STEEL EN-8 OR CARBON STEEL-WPS

SIZE : 12 MM × 12 MM × 150 MM.

The Hot Hardness is evaluated



Fig.2.1. Poldi Hardness Tester

Hardfacing electrode	Current(A)	Voltage(V)	Average Travel speed(mm/min)	Average Heat Input(KJ/mm)
Type -1	160-165	20-25	150-180	1.375 max
Type -2	160-165	20-25	150-180	1.375 max
Type -3	160-165	20-25	150-180	1.375 max
Type-4	160-165	20-25	150-180	1.375 max

Table 2.3 Welding parameters



(a)



(b)



(c)

Fig.2.2. (a) Hardfacing Specimen, (b) Before test, (c) After test

with the help of muffle furnace and thermocouple. The muffle furnace having the capacity of upto 1200°C. While testing the thermocouple is tack welded with the sample. The furnace is set at required temperature. The thermocouple monitor the temperature of the specimen. Once the soaking time got overed the sample was bring out and made an impression with the help of poldi instrument. In that process two indentation are made one is in standard test bar another one is in sample. With the interpretation of these two indentation with poldi hardness chart or analytical determination method the respective sample hardness is obtained. The analytical determination formula is shown in below.

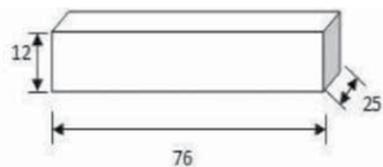
$B1 = B2 (10 - \sqrt{100 - D12}) / (10 - \sqrt{100 - D22})$   
 B1 = Indentation hardness of the part being tested,  
 B2 = Brinell hardness of the comparative bar,  
 D12 = Diameter of impression in the comparative bar,  
 D22 = Diameter of impression in the part being tested.



Fig.2.3. The Hot Hardness Testing Setup

**2.6 WEAR ANALYSIS OF HARDFACING METAL**

Wear specimen is prepared as per ASTM G65 method. The surface of the base metal on which the filler metal is deposited should be clean. The pad shall be welded in the flat position, using as short an arc length as practical. Multiple layers are used to obtain undiluted weld metal. Once weld pad is attained proper dimensions, the specimen is prepared as per dimensions mentioned in ASTM G65 using conventional or wire cut method. Here we are following Procedure B.



**2.7 METALLOGRAPHIC ANALYSIS**

ASTM E3 standard specifies the procedure for preparation of metallographic specimens. ASTM E407 standard includes the standard practice for micro etching of metals and alloys.

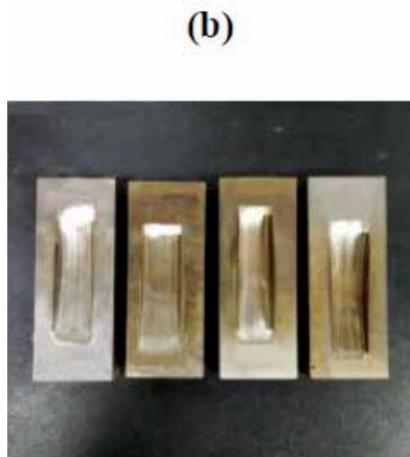
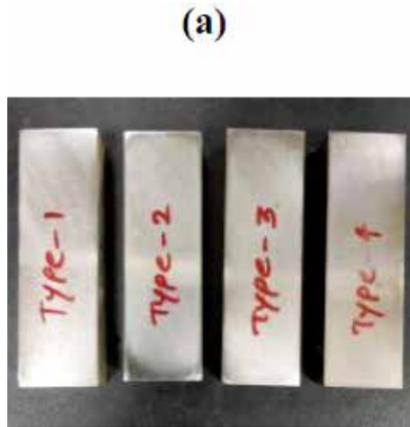


Fig .2.4 (a) Wear test Specimen , (b) Before test, (c) After test.

As per that the sample has been prepared for micro analysis.

**3.RESULT AND DISCUSSION**

**3.1 Hot Hardness For Different Hardfacing Alloys**

The Hot Hardness of Hardfacing alloys are evaluated with the help of poldi hardness tester. In this method the hot

Procedure	Load (N)	Wheel Revolution	Velocity (rpm)	Wear Distance (m)
B	130 N	2000	200	1436

Table 2.4 : Abrasive wear test parameters for dry sand – rubber wheel testing machine

Hardness of different hardfacing alloys are evaluated in different temperatures 200, 400, 600 and 800°C respectively. The hot hardness of all the products are shown in below table. All products are loss their hardness gradually while increasing temperature.

Hardfacing electrode	Room Temperature	At 200°C	At 400°C	At 600°C	At 800°C
Type-1	345 (BHNS)	310 (BHNS)	286 (BHNS)	153 (BHNS)	79 (BHNS)
Type-2	469 (BHNS)	398 (BHNS)	342 (BHNS)	200 (BHNS)	119 (BHNS)
Type-3	643 (BHNS)	540 (BHNS)	462 (BHNS)	254 (BHNS)	165 (BHNS)
Type-4	543 (BHNS)	460 (BHNS)	367 (BHNS)	336 (BHNS)	240 (BHNS)

Table 3.1: Hot Hardness of Some Hardfacing Alloy

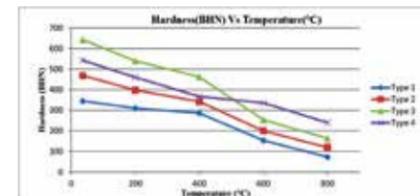


Fig 3.1 Comparison of Hardness at Higher Temperatures

The Type-3 electrode having higher hardness at room temperature but in the higher temperature the hardness is lower when compared to Type-4 electrode. The Type-4 electrode having lower hardness in room temperature but it has higher hardness at 800°C when compared to type-3 electrode. All the four type electrodes were loss their hardness gradually while increasing temperature respectively. Because all the materials were became soft while at higher temperature. Out of four electrodes the type-4 electrode having higher hardness at 800°C because of its higher chromium content. So the higher chromium and carbon form



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the chromium carbides in all over the matrix. These results were clearly shown in below graph also.

**3.2 Wear Analysis of Hardfacing Alloys**

Wear analysis is done as per ASTM G 65 Dry Abrasion Rubber Wheel Test. The samples are prepared as per standard dimensions. The silica sand is used as the abrasive material for this test as per standard. The wear rate of different hardfacing alloys are shown in the below tables. The mass loss of all the four type hardfacing electrodes are shown in below table 5.2. The type-1 electrode loss higher amount of loss compared to other types. Type-3 electrode loss their mass at lower amount because of its Mo. The Mo presented in higher amount in type-3 electrode so it resist the wear. W and V also presented in higher amount in this electrode compare to other electrodes. So these also act as a wear resistance for this electrode. The hardness also influence the wear rate of different hardfacing electrodes. From the results it can be seen that the higher hardness reduced the mass loss. The higher the hardness, the lower was the wear loss.

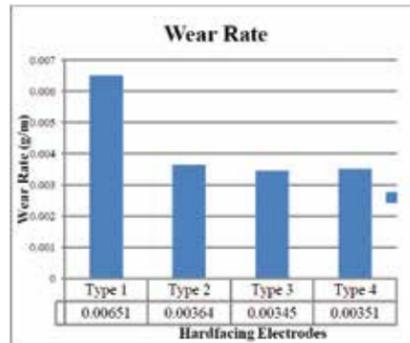
For that four different type hardfacing

Hardfacing Electrode	Initial mass (g)	Final mass (g)	Mass loss (g)
Type - 1	191.6247	182.2728	9.3519
Type - 2	191.8264	186.5958	5.2306
Type - 3	187.3355	182.3688	4.9667
Type - 4	189.2394	184.2034	5.0367

**Table 3.2 Mass loss of HF alloys**

Hardfacing Electrode	Volume loss (mm <sup>3</sup> )	Wear rate (g/m)
Type -1	1112.79	0.00651
Type -2	621.95	0.00364
Type -3	604.48	0.00345
Type -4	606.82	0.00350

**Table 3.3 Volume loss and Wear rate of Hardfacing alloys**



**Fig 3.2 Comparison of Wear rate of Different Hardfacing Alloys**

alloys the volume loss and wear rate also calculated. The linear abrasion is used to calculate the wear rate. The type-1 electrode having the higher volume loss and wear rate. The Type -3 electrode having the lower volume loss and wear rate. Because of their higher Mo,W and V compositions.

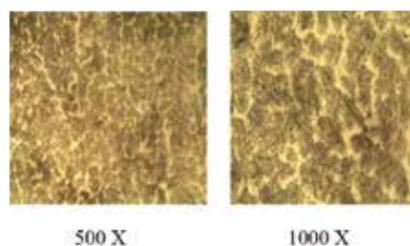
**3.3 METALLURGICAL PROPERTIES OF HARDFACING ALLOYS**

**3.3.1 Type-1 Electrode microstructure characteristics**

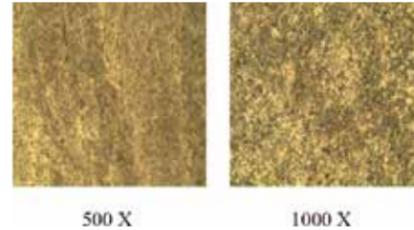
The microstructures are evaluated with the help of optical microstructures. In this type-1 electrode the martensite are presented in austenite matrix. The lath martensite are presented in austenite matrix. So this martensite gave hardness of this type electrode.

**3.3.2 Type-2 Electrode microstructure characteristics**

In this type-2 electrode microstructures were shown in above figure. The carbides



**Fig 3.3 Microstructures of Type-1 Electrode**

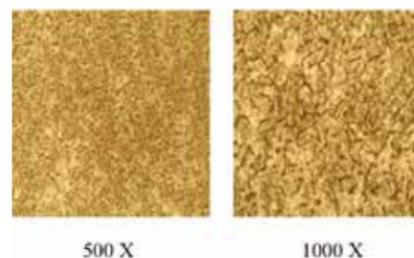


**Fig 3.4 Microstructures of Type-2 Electrode**

were dispersed in pearlite matrix which are located inside the grains. The carbides were in dark phases as per microstructure colour morphology.

**3.3.3 Type-3 Electrode microstructure characteristics**

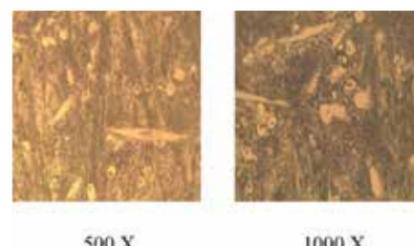
In this electrode type the carbides are precipitated along the grain boundaries in pearlite matrix. The network of carbides are present in entire grain boundaries. These carbides gave hardness for this type electrode.



**Fig 3.5 Microstructures of Type-3 Electrode**

**3.3.4 Type-4 Electrode microstructure characteristics**

In this type electrode the hexagonal shape carbides are distributed all over in martensite matrix.



**Fig 3.6 Microstructures of Type-4 Electrode**

These carbides were help to withstand their hardness in higher temperatures. Compare with all the four type electrode this electrode having the higher hardness stability over others. Because of their hexagonal type carbides.

**4. Conclusion**

- The higher hardness of 240 BHN at 800°C is obtained in type-4 hardfacing alloy. Because of its higher chromium and carbon content. The chromium have higher affinity towards carbon so it can be form chromium carbides. From its microstructure we can clearly seen that hexagonal shape carbides were dispersed in martensite matrix. From that concluded Hexagonal carbide rich phase sustain its hardness in higher Temperature.
- The hardness and wear resistance of the hardfacing layer increases with an increasing of Fe-Mo content. However, when the amount of the Fe-Mo is over 5%, cracks were appeared in the

hardfacing layer.

- Hardfacing alloy with Mo element alloy possess higher wear resistance than that of Mo-free hardfacing alloy. They exhibit relatively smooth worn surface, and posses high resistance to plastic deformation and scratch due to the effect of Mo solution strengthening.
- W- rich hardfacing alloys showed a very good abrasive wear resistance, due to their unique combination of tough carbides in a matrix.

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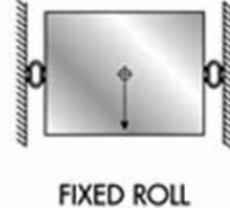
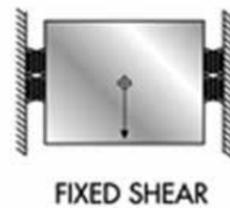
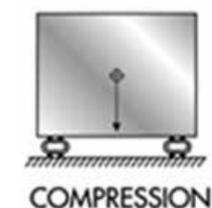
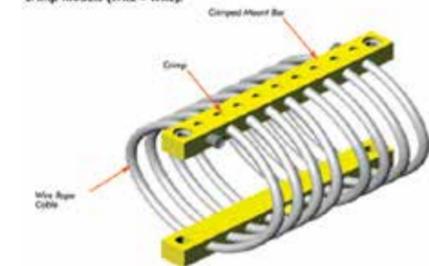
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### Applications

The scanCONTROL 29xx-10/BL is used in applications where the highest precision and resolution are required, such as precision mechanics, electronics, medicine and in the production of precision parts. For example, when checking electronic components for positional tolerances, checking the position of razor blades relative to each other, or verifying laser-welded seams for completeness, the new scanCONTROL model demonstrates its technical strengths. The entire electronics is housed in a compact sensor body, where all the signal processing takes place, which eliminates the need for an external controller.

Modern technical devices such as mobile phones and laptops require absolute precision. Therefore, reliable quality control involving the monitoring of individual production steps is necessary. This task is achieved using the innova-

tive scanCONTROL 29xx-10/BL laser profile scanner, which is specifically designed for measuring extremely small target objects. The inspection of adhesive beading in smartphone housing is a typical application. A particular challenge here is the very fine contours inside the smartphone and extremely thin, partially semi-transparent adhesive beading. Here, absolute reliability and 100% control of the completeness of the beading, the height and width of the applied adhesive are required. This also applies to the logos on tablets and laptops: grooves are milled into the aluminium housing, in which the logo elements are glued afterwards. The latter must be flush with the housing. Haptics (i.e. touch sensation) is a critical factor, as the customer would immediately feel any protruding logo or depression. Using laser line scanners, these depressions are measured in order to determine the planarity as well as the depth. The parts being glued are also measured in order to ensure a perfect fit.

Particularly in medicine, perfection is an essential requirement. The mounting process of insulin pens, for example, demands 100% reliable control. Incorrect engagement of these pens may cause incorrect dosage of the volume of insulin, which potentially could lead to life-threatening low or high blood sugar levels. In the production of insulin pens, both parts of the pen need to be inspect-

ed to check they are correctly engaged. This is an extremely challenging task for conventional measurement systems. As well as the high cycle rate, the measuring gaps are very small and the difference between engaged and not engaged is just 50µm. This demanding monitoring task is successfully achieved using laser profile sensors with a blue laser line. The extremely high resolution of the scanCONTROL 29xx-10/BL enables the reliable detection of the closed gap.

Pacemakers are required when the natural pacemakers of the heart no longer work efficiently. Pacemakers normalise everyday life for patients and increase their performance and exercise tolerance. The devices are only as large as a two-euro coin. The weld seams that connect the two halves of the pacemaker housing are much smaller. These seams have tiny pores with dimensions of just 40µm. The seams must be inspected geometrically at high precision in order to detect any leakages that may compromise the functionality of the devices. Elevations of the weld seam could lead to micro injuries in extreme cases. Here, laser profile scanners from Micro-Epsilon are also used.

Other fields of application in medical engineering include the production of needles where the exact tip angle is critical, the gap measurement of prostheses and implants, as well as the measurement of blade angles and the cutting

length of medical blades.

In addition, with modern razor blades, precision is a critical factor, focusing on achieving optimum results on smooth skin, avoiding irritations and perfect application comfort. Therefore, multi-blade razor production requires a perfect angle position of the three or five single blades in relation to the head, as this is critical for the final shaving performance. Furthermore, it must be ensured that all blade points are properly aligned and that there are no protruding blades. The special challenge of this measurement task is how small the measurement objects are, which in this case are the blade points – a small reference surface for angle measurements. Only 1mm width per blade is visible. The blade point is less than 150µm. A tiny, small surface area has to be measured during production control. In automated processes, high precision measurement is of vital importance. Laser profile sensors can perform dimensional measurements, capture measuring points much faster, and measurement data is typically available in real time in digital format. This enables the automatic correction, control and quality assurance of live processes.

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# CUTTING TOOLS THAT CUT OUT VIBRATIONS

How to say no to vibrations in machining?

Vibrations in machining are generally an unavoidable part of the metal cutting process. They have a forced or self-excited nature and always accompany a cutting action. Machining vibrations are referred to as “chatter,” highlighting their specific nature, which inheres in every processing where chips are formed. Even if cutting is considered as stable, it does not mean that vibrations do not take place. In this case, the vibrations simply remain on a level that provides the required machining results, and is considered as a “no vibration” operation.

In fact, vibrations in cutting are a damaging factor that reduces performance. Manufacturers make every effort to diminish vibration and, ideally, bring them to a level that does not affect machining results. Chatter is a subject of serious research that has already provided manufacturers with ways to model vibrations in machining which, despite their complexity, can be very effective in finding a way to reduce chatter. However, this modelling takes time and requires various input data, including sometimes additional measurements. In most cases, when manufacturers face vibrations during machining, they only have a few tools at their disposal for a real-time response to decrease the chatter. The most common practice is to vary cutting speed and feed, which usually leads to productivity reduction. Therefore, any effective method of diminishing vibrations that does not adversely affect machining operation productivity will be attractive to manufacturers.

Vibration reduction in machining

requires consideration of a manufacturing unit as a system comprising the following interrelated elements: a machine, a workpiece, a workholding device, and a cutting tool. While the influence of each element on total vibration reduction is different, improving a vibration characteristic of one element may have a significant impact on the system's overall dynamic behavior. Most efforts to protect against vibrations focus on developing more rigid machines with intelligent sensors and computer control, and advanced vibration-dampening tooling. Can a cutting tool, the smallest - and probably the simplest - system component, dramatically change the vibration strength of a manufacturing unit? Even though producers might not have great hopes for the role of cutting tools in decreasing chatter, in certain cases a correctly selected tool can simply stop vibration without any adverse effect on productivity.

## Cutting Geometry

The right tool geometry makes cutting action smooth and stable. The geometry strongly influences cutting force fluctuations, chip evacuation and other factors, which are connected directly with vibration modes. ISCAR's tool design engineers believe that the cutting geometry can considerably strengthen vibration dampening of a tool and have developed interesting solutions accordingly.

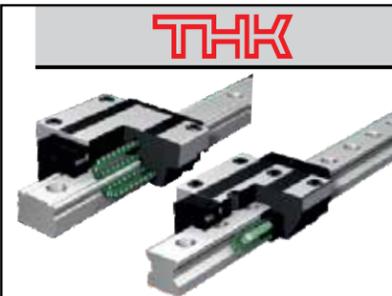
ISCAR's various indexable inserts, exchangeable heads, and solid carbide tools feature chip-splitting cutting edges. Such an edge may be serrated or have chip-splitting grooves. The chip splitting action causes a wide chip

to be divided into small segments, resulting in better dynamic behavior of a tool during machining, and vibration is stabilized. In rough machining, extended flute milling cutters remove a large material stock and work in heavy conditions. Significant cutting forces acting cyclically generate vibration problems. When using chip-splitting indexable inserts, it is possible to tackle these difficulties. Mills with round inserts, a real workhorse in machining cavities and pockets, particularly in die and mold making, are often operated at high overhang that affects rigidity and vibration resistance of a



tool. Problems with cutting stability occur when the overhang already exceeds 3 tool diameters. Applying serrated round inserts with a chip-splitting effect redresses this situation and substantially improves robustness (Fig. 1).

A skillfully defined tooth pitch is an effective way of taking the dynamic behavior of a cutting tool to the next level. ISCAR's CHATTERFREE family of solid carbide endmills (SCEM) was designed on the basis of a pitch control method. The family features a variable



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Fig. 2

angle pitch in combination with a different helix angle. This concept ensures chatter free milling in a broad range of applications.

The FINISHRED series of solid carbide endmills features chip-splitting geometry coupled with variable pitch flutes (Fig. 2) that provide surface finish when machined according to rough machining data.

The principles of vibration-proof cutting geometry, which demonstrated their effectiveness in solid carbide endmills, have been applied to the design of exchangeable multi-flute milling heads made from cemented carbides in the MULTI-MASTER family.

#### Chatter-Free Drilling

Chatter in drilling leads to poor surface finish and accuracy problems. In ISCAR's SUMOCHAM family of assembled drills with exchangeable



Fig. 3

carbide heads, the double margin design of QCP/ICP-2M heads substantially increases tool dynamic stability.

If vibration occurs when a drill enters material, it may cause serious damage and even breakage of the drill. The SUMOCHAM-IQ family of HCP exchangeable carbide heads (Fig. 3), intended for mounting in the bodies of standard SUMOCHAM tools, can ensure reliable self-centering capabilities. The key is an unusual concave profile for the head cutting edge reminiscent of a pagoda shape. This original cutting geometry enables high-quality drilling holes of depths of up to twelve hole diameters, directly into solid material without pre-drilling a pilot hole.

The "magic pagoda" features another ISCAR innovation: the LOGIQ3CHAM family of latest-generation drills carrying exchangeable carbide heads with 3 teeth to ensure higher productivity. The steel drill bodies have 3 helical flute that weaken the body structure when compared with a 2-flute assembled drill of the same diameter. In order to improve the dynamic rigidity, the flute helix angle is variable. This design principle in combination with the pagoda-shaped cutting edge provides a durable chatter-proof solution for stable high-efficiency drilling.

#### Tool Body Material

An assembled cutting tool comprises a body with mounted cutting elements such as indexable inserts or exchangeable heads. Choosing the right body material presents an additional option for forming a chatter-free tool structure. Most tool bodies are made from high-quality tool steel grades, for which the material stress-strain behavior is similar. However, in some cases tool design engineers

have identified successful material alternatives to improve vibration strength.

The MULTI-MASTER, an ISCAR family of rotating tools with exchangeable heads, provides a range of tool bodies, referred to as shanks, produced from steel, tungsten carbide or heavy metal. A steel shank is the most versatile. Tungsten carbide with its substantial Young's modulus provides an extremely rigid design, so carbide shanks are used mainly when milling at high overhang and machining internal circumferential grooves. Heavy metal, an alloy containing around 90% tungsten, is characterized by its vibration-absorbing properties, and heavy metal shanks are most advantageous for light to medium cutting operations in unstable conditions.

#### Anti-vibration tools for deep turning

A typical tool for internal turning or boring operations comprises a boring bar with a mounted insert or a cartridge carrying an insert. The bar is the main factor in the dynamic behavior of a tool. Stiffness of a bar is the function of the bar overhang to diameter ratio, and large ratios may be a reason of tool deflection and vibrations, affecting dimensional accuracy and surface finish during machining.

ISCAR has developed three types of boring bar to cover a wide range of boring applications: two integral (from steel and solid carbide) and one assembled, having a vibration dampening system inside.

The steel bars enable stable machining with the overhang up to four diameters. Exceeding this value can induce vibrations due to steel's elasticity characteristics. Changing the bar material from steel to a more rigid solid carbide ensures efficient vibration-free boring with the overhang

of up to seven diameters. However, further increasing the boring depth is also limited by the material stress-strain behavior. In order to clear this overhang barrier, ISCAR developed the ISOTURN WHISPERLINE family of anti-vibration cylindrical bars. The bars carry interchangeable boring heads for indexable inserts of different geometries and have inner coolant supply capability. The main element of the bar design is a built-in vibration-dampening mechanism to provide "live" vibration damping during machining. This enables effective boring with the overhang from seven to fourteen diameters (Fig. 4).

A vibration-dampening unit is used also in ISCAR deep grooving and



Fig. 4

parting tools. The unit is in a tool blade under the insert pocket. Each blade is pre-calibrated by ISCAR for optimal performance for a wide range of overhangs, but end-users can complete fine tuning calibration themselves if

needed.

Cutting tool manufacturers have a limited choice of means in the abatement of machining vibrations, with only tool cutting geometry, tool body material, and maybe a cutting tool with built-in vibration-dampening device at their disposition. Considerable skill and ingenuity are required to make a chatter-free tool with these limited resources. It is feasible, however, and ISCAR's solutions highlighted in the above examples affirm the possibilities.



For more information,  
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## Achieving optimal machine lighting

There is a powerful correlation between the amount of light workers are exposed to and productivity rates at work. In order to maximize the benefits of lighting in the workplace, lamps must be optimized to suit the needs of the location

**I**n manufacturing equipment, lighting is extremely essential to the process. Machine lighting allows operators to monitor machine processes effectively and see clearly when troubleshooting, refilling material or completing other manual tasks on the machine.

Under poor lighting, operators cannot maintain standards of quality control, accuracy, or safety. Injuries are more likely to occur, resulting in liability, medical costs, work stoppage. No machine, no matter how automated or advanced, can safely and efficiently operate if employees and machinists cannot adequately monitor its functionality.

### Parameters to consider regarding Machine Lights

There is a powerful correlation between the amount of light, workers are exposed to and productivity rates at work. In order to maximize the benefits of lighting in the workplace, lamps must be optimized to suit the needs of the location. An example of optimized illumination is the use of LED lights with high colour temperature ratings inside machines that cater to night-shift workers. Study suggests that individuals exposed to colour temperature ratings above 5918K may benefit from increased attention span and cognitive function.

CNC machines specifically can utilize incandescent, fluorescent, halogen, or LED lights. Machine lights are high-quality energy efficient lamps suitable for precise visual inspection of machines and instruments. They improve visibility, providing exceptional brightness for carrying out detailed work.



Machine lights used for industrial purposes are available from a small pen-style inspection light to larger lights that have hooks, magnets or flexible and extendable arms to get light to the most awkward areas. Magnets and hooks can be secured to something enabling you to work hands-free.

Some machine lights are equipped with a long-lasting and rechargeable batteries. Some types do not require batteries and can be charged via USB or DC and AC sources. The larger machine lamps are mains powered. Certain machine lighting is waterproof, coolant-proof, & dust-proof lights and can be used in harsh environments.

These multi-purpose Machine lights are used in many industries, including manufacturing, textile, automobile,

engineering, automation, process, pharmaceutical, jewellery, electrical, electronics, packaging, etc.

Machine lights are designed and engineered to be strong, reliable, and energy-efficient for a wide-range of machining processing areas, as well as for spot lighting of work pieces.

Premium LED technology and shadow-free light output are necessary for the precision, robust, high-quality materials make products ideal for volatile machine environments where extreme conditions such as high-pressure wash downs or flying debris are present, as well as protecting against corrosion that can occur with use of coolants or lubricants.

Machine lights are ideal for virtually any type of machining application, from milling, drilling & CNC machines.



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**Machine Lamp****Types : 1. Incandescent and Halogen Lamps**

In the past century, lighting technology has come a long way. Traditionally, incandescent lights were widely used in workspaces. The characteristics of this type of light are known to be inefficient, compared to other lights on the market today. Roughly 10% of energy generated by an incandescent lamp is converted to visible light, while the rest is wasted as heat/infrared. Incandescent lights are dimmable and are associated with above-average CRI ratings – typically over 95 CRI. Colour temperature is generally in the low range (roughly 2700K), which decreases as the light is dimmed.

Additionally, incandescent lamps are prone to breakage and premature failure (estimated lamp life ranges between 1,200 hours – 3,000+ hours), due to its filament-based, loose architecture. These limiting characteristics discourage businesses to fully leverage incandescent-based lighting systems in the workplace, as it would be too costly to keep them in an “always on” state (given high-maintenance, frequent replacement and increased monthly bills).

**2. Fluorescent Lamps**

Fluorescent lamps, usually in the form linear (tube-style), are common artificial light sources found in industries, commercial offices, paint spray booths, schools and government buildings, etc. Like incandescent units, this type of light also offers accurate CRI ratings. Fluorescent light sources are offered in cool white – with a nominal colour temperature rating of 6000K – or warm white – with a nominal colour temperature rating of 3000K.

A limitation with using fluorescent lights is its reliance on mercury and other harmful substances during

illumination, as well as its fragile characteristics. Furthermore, the units are prone to flickering in the latter stages of their lifespan. The presence of a ballast may also serve as a point of failure. Because of such risks, fluorescent lamps are not suitable for dangerous work environments, wherein operators frequently come in close contact with the light. This type of light is also not recommended for portable applications at the “front lines” where rough contact is often experienced, such as confined spaces, pits, tanks and more. On the other hand, fluorescent units are highly useful for general lighting applications and spaces requiring elevated illumination. In rugged workspaces requiring fluorescent illumination, it is possible to protect the units with cages, meshes or shields.



**Surya Manufacturing Company**

**3. LED Light**

Light-emitting diodes (LEDs) were introduced to the market to address the drawbacks of traditional lighting systems. Compared to its predecessors, LEDs operate cooler, can efficiently convert energy to light with minimal wastage, come with extended lifespans up to 50,000+ hours before maintenance and provide more powerful illumination. Solid-state builds allow it to withstand rough contact and fluctuating temperatures.

LEDs are highly recommended for businesses looking to improve lighting conditions at the workplace. Below are some advantages of installing LED units at work sites:

- Wide range of colour temperature ratings (3,000K to 10,000+K) for catering to various activities and tasks
- Accurate CRI ratings for special, meticulous work
- Compact form factor for installation in tight spaces, hazardous areas
- Low maintenance/repair requirements and operating costs
- Bright and reliable
- Seamless integration with networks, smart systems, control switches, etc.

One of the quickest and most cost-effective ways to transition to LED lighting systems is through retro-fit solutions. In order to get the most out of lights at the workplace, the systems should be equipped with accessories. Examples of such components include: switches, wireless networks, motion sensors, photocells, cages, guards, etc.

Lighting accessories are designed to promote illumination when it is needed the most; and reduce (or completely turn off) illumination during periods of low activity. Lighting accessories may also help decrease delays experienced during manual activation of lamps. In some cases, the switch is out of reach or no one is available to perform the task. As a solution, sensors, timers or network-based controls can be utilized to streamline activation without reliance on human operators.

Other types of accessories are designed to improve accuracy and beam placement. For instance, light shields or guards can be used to deter light trespass or glare. When used at busy work sites, such optimized lighting conditions reduce headaches and eye strain associated with light glare. As a result, individuals are less agitated, more focused and are less prone to making errors. Moreover, with less visual stress, operators are more comfortable and could work for extended periods of time. 

## Ensure consistent grip and accurate work piece holding with high-quality BPT Diaphragm Chucks

Diaphragm chucks are increasingly becoming popular for a wide range of applications courtesy their accuracy and repeatability. Diaphragm chucks for grinding & turning centres functions similar to a human's diaphragm that contracts and retracts. They offer many advantages as compared to standard chucks.

Unlike standard chucks that rely on the wedge and master jaw linkage for clamping, a diaphragm chuck applies the principle of elastic deformation in expanding, contracting and using resistance to hold work pieces in place. Because diaphragm chucks don't have sliding components, they don't require lubrication and offer a more consistent grip force repeating to within 10 microns.

Diaphragm chucks are primarily used for secondary operations, eg., grinding, boring, facing and light turning. Preferably, the locating surface should be a pre-machines or precision cast surface. Similar chuck locating diameter tolerances should be held to a total of 0.15 mm; on the larger chucks a total of 0.38 mm can be maintained.

Standard diaphragm range is available in 160 mm, 200 mm, 250 mm, 315 mm and 400 mm sizes.

**How Diaphragm Chucks work**

Diaphragm chuck utilizes the inherent strength and accuracy of spring steel to achieve the required pressure for external and internal surfaces. When the drawbar is actuated (air introduced via the spindle and adaptor plate in the case of pneumatic version), the piston moves forward 0.45mm. The movement is transmitted to the diaphragm by a push-er sleeve.



The chuck jaws are fixed open through this movement and the component can be loaded. To chuck (i.e. to clamp the component), the drawbar is retracted (or air turned off) and the jaws move toward the clamping diameter until contact is made with the component.

**Advantages of Diaphragm Chucks**

- Accurate holding of work piece
- Error averaged out
- Two level, double diaphragm effect chucking possible with standard chuck
- Cages, locating pins and end stops are interchangeable
- Cages can be furnished for other chucks
- Easy loading & unloading of work piece / component.

**Industrial Application**

**Gear Industries:** All types of Gear Industries: To clamp the pitch circle diameter of various types of gears i.e. Spur and Bevel Gears for bore grinding applications to achieve concentricity/ runout of the bore with respect to PCD of the gear. Double Diaphragm Chuck / Two-Level Diaphragm Chuck are applied for cluster gears in automobile industries.

**Liner Industries:** For Precision bore grinding / Precision boring operation in thin wall section component with respect to O.D clamping by Diaphragm Chuck.

**Thin Wall Component:** Precision Bearing Cover, Precision Thin Section Flanges.

**Aircraft Industries:** For clamping light-weight and Thin-Walled components of Aircraft i.e. Cover, Flanges, Gears..etc.

**Application uses of Diaphragm chuck**

- To clamp external diameter
- Grinding of bore and taper
- Boring, facing and light turning
- Extremely tight axial tolerances
- Highest concentricity.

Birla Precision Technologies, the first Tool Holder manufacturer in India since 1986, is at the forefront in delivering high-quality Diaphragm Chucks. The company is empowered by a strong team of designers regularly bringing new technology and products to the market. With its world-class facility, established through its Joint Venture with Kennametal (USA), the company exports its products to more than 20 countries globally.

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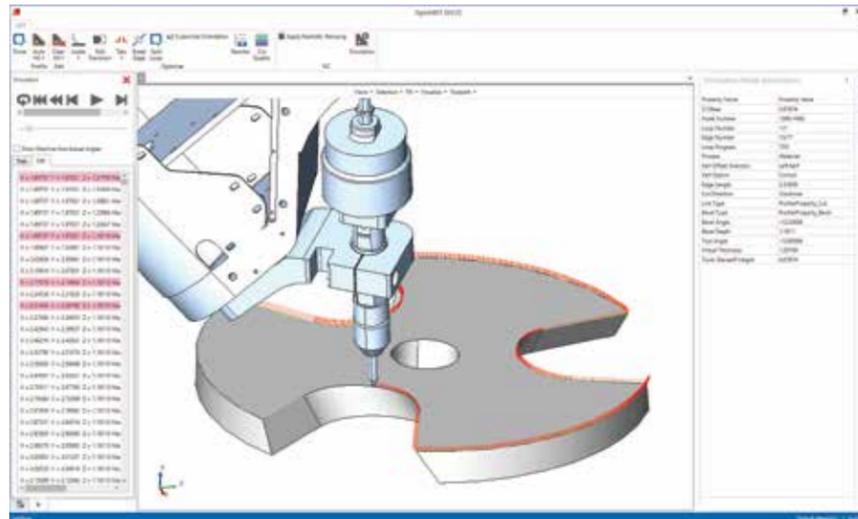
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## SigmaTEK launches Version 20 of the SigmaNEST product portfolio

SigmaTEK Systems, a leader in developing CAD/CAM software solutions for the fabrication industry is pleased to announce the latest release of the flagship SigmaNEST product portfolio. Version 20 is a substantial release introducing many new features in all areas of the product with continued emphasis on user-experience, optimizing material utilization, and data management.

A new SigmaTEK Launcher provides a common, customizable desktop platform from which users can easily access core SigmaTEK products, and eco-system applications such as license manager, database utilities, and help resources. The Launcher also displays a live social media feed to ensure users are fully up-to-date with the latest product information, trade shows, and educational webinar schedules.

SigmaNEST enhancements includes support for part priority nesting, nesting of filler parts, and nesting of “mini-sheets” or mini-nests. User efficiency



**Fig 1 : Version 20 delivers innovative bevel capabilities such as advanced toolpath generation, and rule-based corner transitioning**

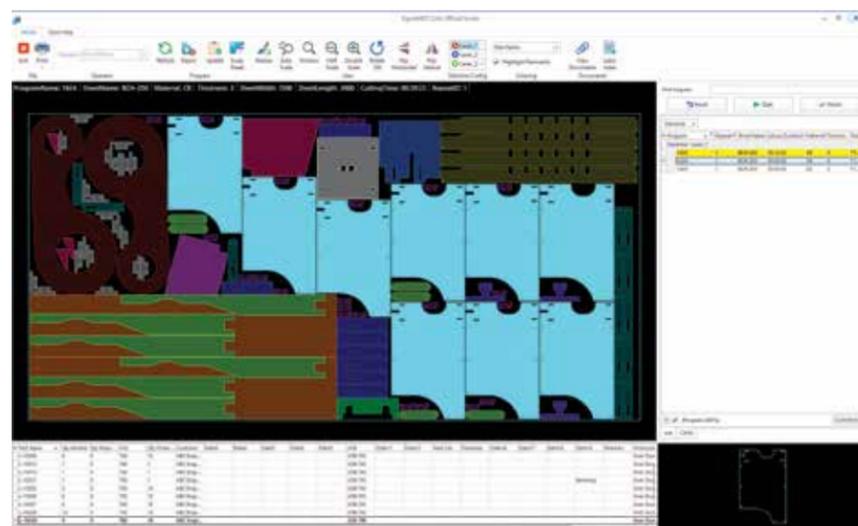
continues to be a focus and a new CAD Import Plus module is available that does not require a local CAD installation to import a variety of file formats, including SOLIDWORKS, Solid Edge, Creo, Inventor, and NX. In addition, SigmaNEST 20 adds feature recognition

(drilling, partial-depth pockets, bevel) for STEP files.

Significant profiling enhancements see the introduction of innovative bevel capabilities such as advanced toolpath generation, and rule-based corner transitioning. Users now can import part files with complex bevels and apply NC directly to the 3D model in an interactive 3D viewer to ensure a safe and accurate toolpath generation and better program verification.

Other SigmaNEST developments include expanded support for the TRUMPF TruMatic 1000 Fiber punch laser machine, laser precutting for creating complex threaded holes on combination machines, and the use of raw sheet edges as the part edge with greatly improved height detection and probe cycles near the sheet edge.

The challenge of delivering an accurate quote is fundamental to the success of a project. Version 20 delivers SigmaQUOTE, a new integrated job



**Fig 2 : Color Offload is a shopfloor tool that uses color-coding to track parts by next operation**

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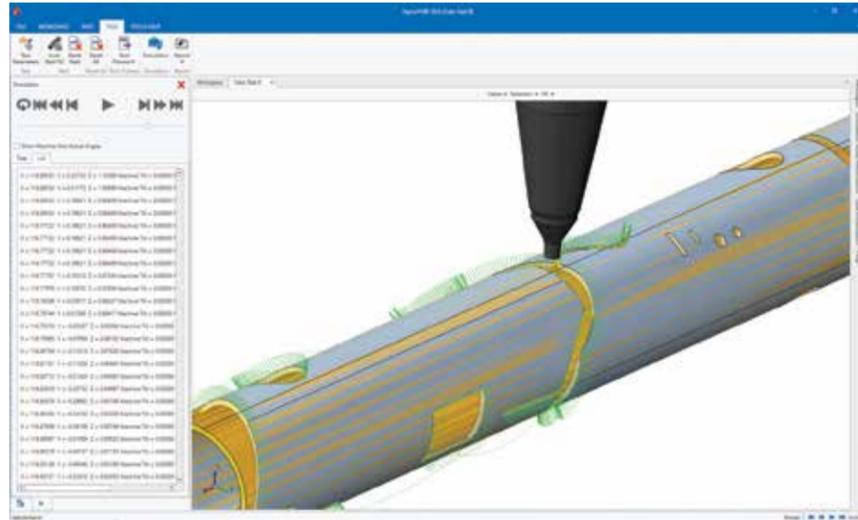
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quoting tool that replaces SigmaNEST's previous Jobs module. It is powered by SigmaMRP, so it leverages the product's robust quoting functionality, allowing users to manage companies and contacts, generate quotes for new projects, and turn quotes into work orders for production within SigmaNEST.

Further improvements to the SigmaTEK 3D suite of applications for tube, bar stock, 3D models, and sheet metal forming include the ability to convert multi-piece common line gores into a single no-kerf, common line part within SigmaDEVELOP, a 3D system for standard ducting and HVAC geometry. SigmaUNFOLD flattens the 3D patterns and allows them to be manipulated for cutting and bending operations. An automatic slit-creation option adds a slit to an otherwise solid part so it can be unfolded into a flat pattern that can be processed on either cutting or press brake machines.

For SigmaBEND, version 20 includes a unique new radial menu with dynamic shortcuts for editing the tool stations, backgauges, and the part itself, as well as improved sequencing and backgauge options. In addition, a new manual station-generation tool allows for easy manual tooling setup. SigmaTUBE



**Fig 3 : SigmaDEVELOP, a 3D system for standard ducting and HVAC geometry can convert multi-piece common line gores into a single no-kerf, common line part**

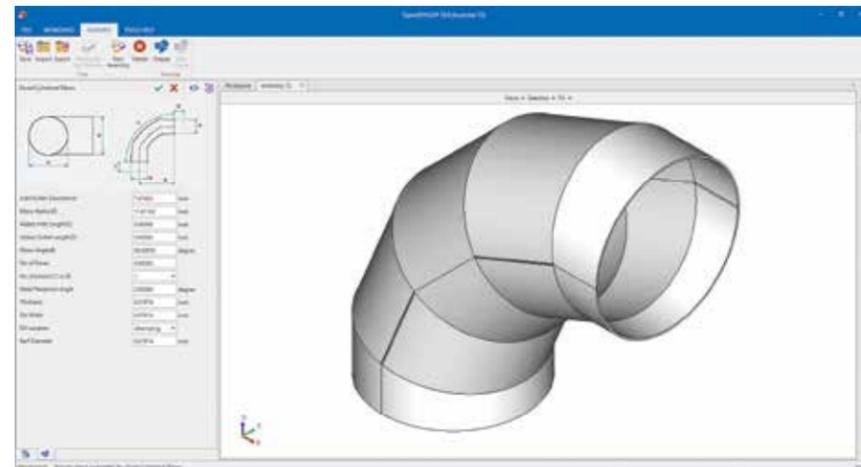
generates nests and NC code for tube and pipe cutting on laser and plasma machines, and Version 20 includes support for new inventory profiles, and tab and notch enhancements.

SigmaTEK also develop applications that drive the continuous workflow of data throughout the shopfloor. Version 20 delivers updates to Color Offload, a tool that uses color-coding to track parts by next operation, with the ability to filter by program status as well as document management capability.

SimTrans is a transaction manager which links SigmaNEST with other business systems. Users can leverage SimTrans automation to create or load parts, manipulate orders, or update inventory in real time. Version 20 adds new transactions for managing jobs and provides the ability to receive email notifications for regular status updates or invalid parts. Commenting on the latest release, Glenn Durham, Vice President, of Engineering at SigmaTEK says, "We are delighted with the new version. We fully understand the role our solutions have within the manufacturing process, and the impact of marginal gains in productivity. We have knowledgeable engineers who want to make a difference, and they have worked tirelessly to ensure we release quality product that our customers will love."



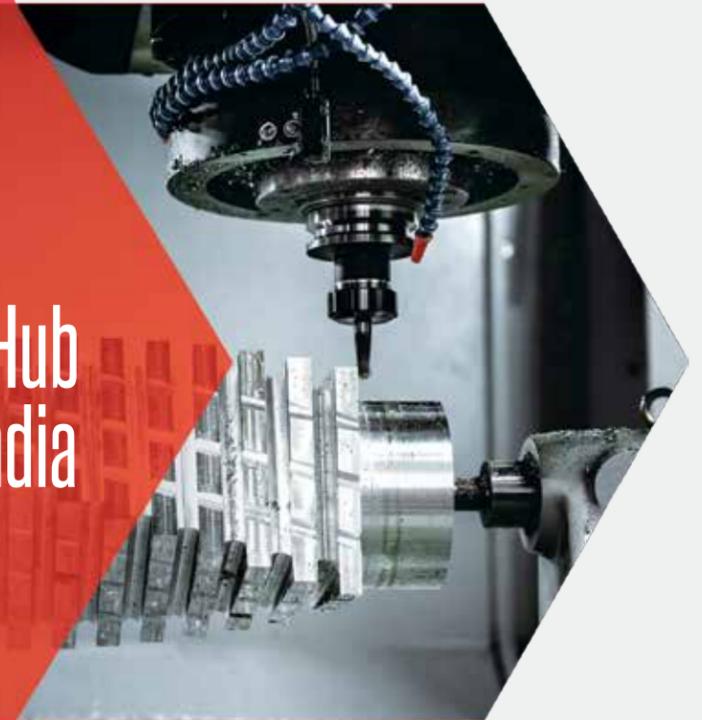
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**Fig 3 : SigmaDEVELOP, a 3D system for standard ducting and HVAC geometry can convert multi-piece common line gores into a single no-kerf, common line part**

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## SAFE AND 'SMART': En route to integrated production

Modularisation and distribution of control intelligence are two important demands on automation systems that meet the requirements of Industry 4.0.

Industry 4.0 aims to secure competitiveness in industry through the use of Internet technologies in production processes, enabling more flexible and efficient production environments. The interaction between safety and security and the distribution of control intelligence are major factors for the success of Industry 4.0.

The terms Industry 4.0, Internet of Things or SmartFactory describe the increasing trend for networking plant and machinery. Information technology and automation are closely interlinked, meaning that in future, a highly networked industry can increase the company's added value whilst simultaneously reducing costs.

As companies develop their

automation landscape to embody industry 4.0, new safety challenges are emerging: The desired production systems are highly networked structures involving a variety of people, IT systems, automatic components and machines. There is a lively and often time-critical exchange of data and information between the technical system components, which act autonomously in some cases, while

at the same time considerably more actors are involved across the added value chain.

### Safety as a factor that is critical to success

Two worlds collide here with regard to the topic of safety: The world of automation merges with the IT world. The respective views toward the topic of safety differ significantly: The

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internationally used terms are “Safety” for machinery safety and “Security” for IT and data security; this helps with the basic differentiation. However, the challenges in standardizing the needs of both worlds to form appropriate, practical solutions. The new safety objectives include, for example, the protection of production data, product and plagiarism protection, know-how protection, access protection, integrity protection and remote maintenance.

One principle for sustained market acceptance is to create standardized mechanisms in communication between machines and within the machine. Practical solutions – that are acceptable to users – will only arise if the requirements of both worlds are considered.

#### Automation following the mechatronic approach

Additional challenges in the initiative Industry 4.0 arise in terms of modularization, networking and distribution of control functions into small and ever smaller subfunctions.

In order to be able to respond to changing requirements in production flexibly and quickly, a modular structure of plant and machinery is increasingly important. With this, engineering processes can also be simplified and the reusability of the individual units can be increased. To do so requires automation systems that are able to control the intelligence distributed in the mechatronic units in a centralized, user-friendly way. Plants can then be broken down into manageable, independently functioning units.

With the centrally configured PLC controllers that are used today, the advantages of modularization cannot be fully exhausted:

Changes in individual plant sections have disproportionately

far-reaching effects at control level because all program structures and the communication relationships between the modules at central points in the control system then need to be modified.

That's why the automation of the future demands solutions that are able to both distribute control intelligence and at the same time guarantee that the necessary networking of several control systems remains easy for the user to handle. With the automation system PSS 4000 and the real-time Ethernet SafetyNET p, Pilz is pursuing a consistently modular and distributable approach that already enables you to reap the benefits of a decentralized control structure

#### Distributed intelligence

In future, intelligent sensors and actuators in distributed systems will take over more and more functions from control units. The goal is better interaction between individual machine modules and between man and machine. Safe motion controllers that are linked synchronously by real-time Ethernet already incorporate local control and evaluation functions. Pilz is also paving the way in this direction with intelligent camera systems for three-dimensional safe zone monitoring and a camera-based protection and measuring system.

#### Industry 4.0 in Pilz production

Production at Pilz is integrated with the upstream and downstream processes and procedures in the spirit of Industry 4.0. The legacy production operations already featured IT-based production processes, such as an intelligent RFID-supported workpiece carrier. These processes have been adopted and now gradually supplemented: In the new Peter Pilz Production and Logistics

Centre in Ostfildern, Pilz is using the deliberate gathering and processing of machine data to optimise the production control. That avoids disruptions or downtime. Work documentation will in future be stored in a Pilz cloud to always make it available up to date and in real-time on mobile devices. Other firm moves to bring about IT and production convergence are taking shape in the “Pilz Think Tank 4.0”: This makes the resources for implementing Industry 4.0 at Pilz available to IT and production technology experts.

For more information,  
Website: [www.pilz.com](http://www.pilz.com)



“Safety is a critical success factor for Industry 4.0” says  
Susanne Kunschert, Managing  
Partner of Pilz GmbH & Co. KG.

**PILZ**  
THE SPIRIT OF SAFETY



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# STAINLESS STEEL BALLSREWS

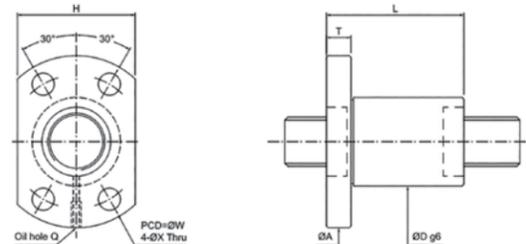
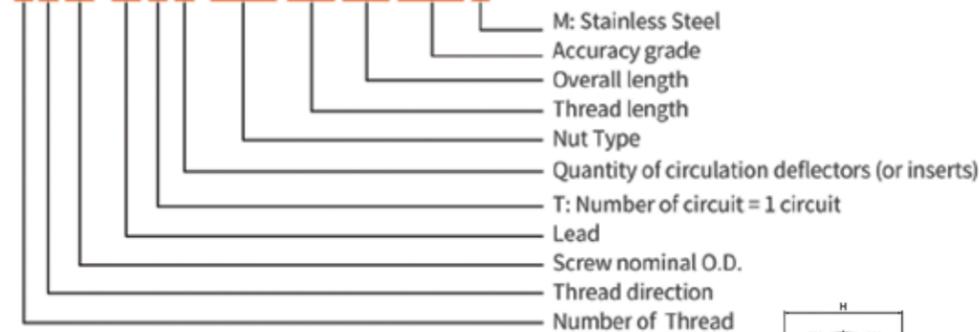
## Feature

PMI uses martensitic stainless steel and after a special heat treatment process, the ball groove has a high hardness and the screw has a high wear resistant, which is suitable for mild corrosive environment.

- **Application:** Semiconductor Manufacturing, Food equipment, Medical equipment...etc.
- **Nomenclature:**



1 R 20 -05 B 2 -FSWC -750 -900 -0.008 M



## Production limit length of Stainless Steel Ballscrews

- Screw shaft O.D. : Ø8~Ø20
- Lead : 2mm ~ 20mm
- Ball diameter: Ø0.8, Ø1.588, Ø2.381, Ø3.175

SCREW SIZE		BALL DIA.	EFFECTIVE TURNS	MODIFIED LOAD CAPACITY (kgf)		NUT		FLANGE				OIL HOLE	BOLT
O.D.	LEAD			Dynamic (1×10 <sup>4</sup> REV.) Cam	Static Coam	Dg6	L	A	T	W	H	Q	
8	1	0.8	2.5	52.8	98	14	16	27	4	21	18	-	3.4
8	2	1.588	2.5	152	203	16	26	29	4	23	20	-	3.4
10	2	1.588	2.5	176	259	18	28	35	5	27	22	-	4.5
12	2	1.588	2.5	190	315	20	28	37	5	29	24	-	4.5
12	5	2.381	2.5	300	440	30	40	50	10	40	32	M6×1P	4.5
12	10	2.381	2.5	330	500	30	50	50	10	40	32	M6×1P	4.5
16	5	3.175	2.5×2	550	880	40	56	63	11	51	40	M6×1P	5.5
16	10	3.175	2.5	1000	1770	40	56	63	11	51	42	M6×1P	5.5
20	5	3.175	2.5×2	1208	2420	44	56	67	11	55	52	M6×1P	5.5
20	10	3.969	2.5	880	1480	46	54	73.5	13	59	54	M6×1P	6.6

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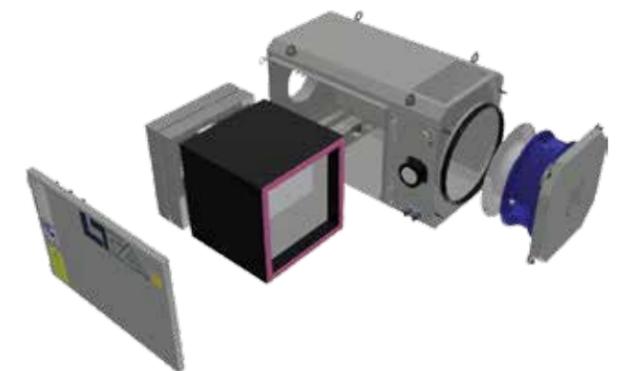
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# Discover efficient & sustainable filtration systems for coolants



LTA coolant filters for oil and emulsion mist are low-maintenance and budget-friendly for industry and trade. These filtration systems efficiently and sustainably provide clean air in production plants

LTA mechanical systems increased its product range with the addition of M 60-CMP, M 150-CMP, M 250-CMP, and M 400-CMP with 230V or 400V options. The new systems with pre- and main filters offer extraction capacity from 600 to 4000 m<sup>3</sup>/h for both oil and emulsion applications. Using inertial separation, the prefilter removes solid, aerosol, and coarse particles from the air. The main filter then captures emulsion or oil aerosols. Clean air exits the air filter blower via the post-filter.



The filtration systems impress with their modular design adaptable to any industrial application's requirements. Fast and simple replacement of the filter inserts also ensures low-cost servicing. Flow-optimized air filters increase process reliability while minimizing downtimes. The coolant filters have a routinely high collection efficiency while reducing energy costs and permanently increasing operational reliability.

A separate control cabinet and a post filter-box with HEPA cartridge enable continuous monitoring of exhaust emissions. The main filter element with coalescing cartridges separates

either oil or emulsion.

With standardized filtration systems and numerous custom solutions, LTA Lufttechnik GmbH has the ideal concept for any ambient condition. Whether large or small scale production – all LTA systems adapt flexibly to a wide range of applications.

For more information,  
Website: www.junker-group.de





BU: Swamy Magod (left) invests in the advanced training of his employees.

## Out of the comfort zone

Indian family-run company Magod Laser has joined forces with TRUMPF to promote 3D printing in the subcontinent.

Enthusiasm is the key of pioneering any new technology – and Swamy Magod and his brother Rajendra Magod had plenty to go around. They have spent past 23 years using their expertise to benefit Indian society by offering cutting-edge technologies to the country's manufacturing industry. They are now one of the India's most successful players in this field, in large part due to their own remarkable openness and keenness to try out new technologies. When they founded Magod Laser in Bengaluru in 1997, there was only one company in South India that was using lasers to cut sheet metal. Today, Magod Laser has a grand total of 25 TRUMPF machines – and the company is now leading the way in India's adoption of additive manufacturing. This continued

legacy of adopting high end technology makes company like Magod Laser... Profitable, Successful and Sustainable in their business.

### Inspiration from the U.S.

The story began in 1991 in the U.S., where Swamy Magod was doing his Master's degree in industrial engineering. He stayed on to work for a few years after graduating – and that's where he first came across laser technology and heard the name TRUMPF. Once he had acquired plenty of laser cutting experience, he returned to India with a clear goal in mind. "Sheet metal cutting was completely dominated by conventional methods back then. But I knew that laser cutting was faster and more economical and that customers



BU: With offering additive manufacturing, Magod Laser aims at new customers.

could be saving money. There was clearly a market opportunity!" says Magod. And the family joined in.

### Early ambition

Magod decided to purchase the equipment he needed. "We knew that TRUMPF was the best partner to have on our team," he says. They started out with a TruMatic Laser 2503 and vowed to remain positive and take a long view, because they knew it would be tough to persuade customers to try out such unfamiliar technology. "We worked really hard to get customers on board and build ourselves a market," he recalls. Their efforts paid off, with more and more companies requesting the company's services as word spread that laser technology was the way forward. Magod's business grew and they decided to expand their portfolio: "We began by introducing laser cutting, then 5-axis cutting, then tube cutting and finally laser welding," Magod says.

### Taking the plunge into additive manufacturing

When Magod sees an opportunity, he grabs it with both hands – and 3D printing was no exception. "Two of our customers were already using 3D



BU: Most of Magod's employees are well-versed in laser cutting.

printing and they asked us to laser-weld the parts together," he says. With his usual entrepreneurial boldness, Magod realized the time had come to print metal parts himself. TRUMPF supplied the necessary equipment in the form of a TruPrint 1000, and Magod introduced a combined process that fully exploited the company's expertise: "With 3D printing, there's a limit to how big the parts can be, so we offer a combination of additive manufacturing and laser welding. To make bigger parts, we simply weld several small parts together," he says. Additive manufacturing is still relatively

unknown in India, so Magod once again faces an uphill struggle to get customers on board. But that doesn't discourage him in the least. "We're confident that we'll get the customers," he says, noting that numerous companies have expressed an interest in trying out the technology, spanning sectors from aviation to medical devices.

### 3D printing opens up extraordinary possibilities

There are certainly plenty of good reasons to adopt additive manufacturing. The technology opens up previously



BU: At Magod Laser, 25 TRUMPF machines are in use.



BU: "Many would like to try this new technology," says Swamy Magod about 3D printing.

impossible geometries, paving the way for users to improve and enhance their parts. The production of implants for medical purposes is just one example: 3D-printed implants are more durable and fuse more successfully with healthy bone tissue. Another benefit of additive manufacturing is that it only deposits material where it is actually needed, so 3D-printed parts are lighter. What's more, any excess powder can simply be reprocessed and reused – a far more economical and sustainable approach than conventional processes such as milling, 70 where up to 80 percent of the material ends up being wasted.



**BU: Swamy Magod and his brother Rajendra share a passion for technology and entrepreneurship.**

**Practical experiments are key**

Magod Laser's attitude to 3D printing could be summed up as "you don't know if you haven't tried." Magod and his colleagues experiment with the powder and try out different new materials, both for their own purposes and on behalf of various research institutes. Magod engineers also make prototypes for companies that are considering 3D printing their own spare parts. The enthusiasm for experimenting with different geometries and materials and developing new parts is shared by Magod's customers.

**Seize the initiative!**

Educating potential customers and promoting 3D printing in India is an important step – and Magod Laser has seized the initiative. "Some companies look at the parts they produce and know that some of them are suitable for additive manufacturing, but they're not sure which ones. That's where we can help," he says. From prospective customers to long-standing partners, Magod is always happy for people to visit their production plant to see 3D printing technology in action. In all his entrepreneurial endeavors, Magod

benefits from having a workforce that is open-minded and willing to learn.

"We're always on the lookout for new technologies to add to our portfolio, because learning new things is a key part of our corporate ethos," says Magod. "We take our employees' professional development seriously. By giving them the opportunity to acquire skills in new processes such as 3D printing, we pave the way for them to move into more responsible positions," he says, emphasizing how this pays off for both sides. "There's a learning curve in any new technology. At the end of the day, it's better for us to develop our own team instead of bringing in experts from outside, and our employees feel more valued if we invest in their development and gradually give them more responsibility." Undoubtedly, Magod Laser will continue to play a vital role in Indian industry in the future.

**Author**

**RAMONA HÖNL**  
CHIEF EDITOR  
TRUMPF ONLINE  
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SPOKESPERSON  
ADDITIVE  
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**BU: Magod Laser's headquarters in Bengaluru.**

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# PRODUCT SHOWCASE

## Edge protection seal profiles with corner

Elesa+Ganter always thinks a step ahead and is now completing its edge protection profile product range with seal profiles with premade 90° corners.

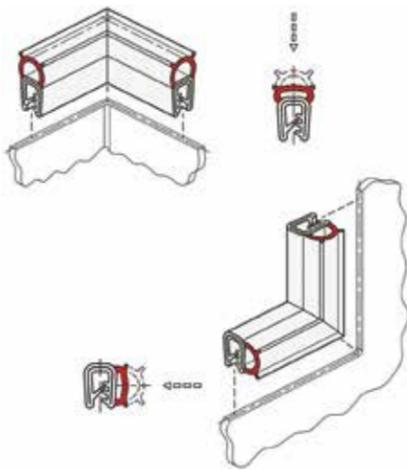
The standard parts specialist Elesa+Ganter offers a comprehensive portfolio of edge protection profiles for softening and rounding edges as well as preventing injuries on flaps, doors, access holes and sheet metal edges of all kinds.

The edge protection seal profiles with an additional seal profile from Elesa+Ganter provide both protection and sealing alike. With corresponding contact pressure, they also offer protection against splash water, dust and steam while also reducing noise emissions. Depending on the application, edge protection seal profiles can be installed on either cut or bent workpiece edges. The orientation of the seal profile can be selected based on the type, situated on the top or side. The edge protection seal profiles are made of UL-compliant EPDM or of NBR, and the material NBR is particularly well suited for applications in contact with fuels or lubricants.

To also enable right-angled seal contours without the minimum installation radius that is typically necessary, Elesa+Ganter has now expanded its selection with the GN 2181 with premade 90° corners. This eliminates the need for manually cutting the profile free, and the corner joint is tight and durable thanks to the vulcanization. The edge protection seal profile corners can be ordered with various leg lengths and shortened as necessary or extended with the corresponding profile of GN 2180. To ensure a consistent seal, the profiles are installed slightly oversized and "compressed".

As a result, the joints are tightly closed and do not require an adhesive.

As a special service, Elesa+Ganter supplies all edge protection seal profile corners even as single parts, which is particularly useful for special solutions or applications requiring only a small number of parts. Elesa+Ganter also produces edge protection seal profile segments on request, such as in a U or Z shape. Even round or rectangular edge protection seal profile frames in custom dimensions, vulcanised and closed off, can be supplied to meet all the needs of customers with regard to the respective size and shape. 



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- Light metal fabrication
- Assembling and finishing
- handling in Oily Surfaces
- General maintenance, Painting,
- Other automotive application, Mechanical Industries Parameters 



## Nexgen Refrigerated Air Dryers

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

The rugged electronic panels display both inlet and dew point temperatures. They incorporate a Tripper module with alarm for compressed high discharge pressure, compressed low suction pressure, expansion valve malfunction, auto drain valve function and fan motor cycling. Introduction of speed control is one of the major developments towards the optimization of refrigeration systems based on average load.

For periods of high cooling demand, the compressor speed can be increased which results in a higher refrigerant flow and thus higher cooling capacity and vice versa during periods of low cooling demand. Compressed air purification equipment must deliver uncompromising performance and reliability while providing the right balance of air quality with the lowest cost of operation. As a quality-centric group, Gem ensures that its dryers are tested at each stage of assembly as per ISO 7183 or relevant standards.

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## BR90: Borescope Inspection Camera



Compact, portable, and easy to use, the Extech BR90 features a waterproof, flexible 8 mm camera probe on a goose-neck cable and a large color LCD display – fully loaded with everything you need for convenient inspections in the palm of your hand. The borescope features a unique compartment to coil the camera probe for easy storage. Its 640 x 480 pixel resolution, 2x digital zoom, and built-in bright LED lamps help project viewed objects clearly on the large 4.3" (109 mm) color LCD display. The monitor has adjustable brightness, 180° image rotation and mirror-flip feature, and video output. It's a fully loaded inspection camera at an affordable price!

### Features:

- Waterproof (IP67) 8 mm diameter camera probe with 2.5 ft (77 cm) flexible goose-neck cable retains configured shape
- 640 x 480 pixel resolution camera with four built-in bright LED lamps and dimmer function
- Glare-free close-up field of view
- Large 4.3" (109 mm) color TFT LCD monitor for viewing detailed images
- 180° image rotation and mirror flip feature
- Adjustable display brightness and 2x digital zoom
- Video output for real-time viewing on a monitor (video cable not included)
- Low battery indicator
- Complete with built-in camera probe, extension tools (mirror, hook, magnet, and fixture), 4 AA batteries, and soft carrying case **MTW**

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Dynaspede has long established its name as solution engineers in the paper, film, foil, and converting industries. Dynaspede's market offerings include Pneumatic & Powder Brakes and Clutches with loadcells and tension indicators for printing, coating, laminating, slitting, sheeting, corrugating and other industries. The company also provides stock solutions for speed control of industrial machines and processes. These include:

- Magnetic Particle Brakes & clutches
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- Electronic Control Panels
- Loadcells and Tachos
- Electronic Controllers

Dynaspede's solutions include analogue / digital AC/ DC or eddy current drives, DC injection brakes, planetary gear units / gear boxes and electronics to match. **MTW**

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**Reducing cost of coolants, lubricants and quenchants by automatic proportioning with water**

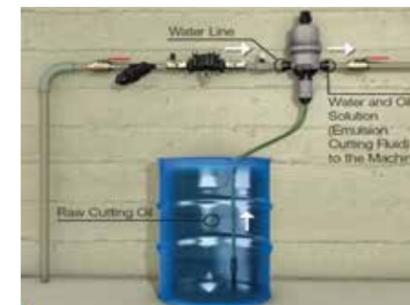


Huge losses due to improper mixing of coolants / quenchants / lubricants with water are experienced throughout industries. These include coolant spillage losses of up to 5%, high evaporation losses of coolants from sump, failure of heat treated parts due to improper quenchant mixing, low die life or excessive lubricant consumption in die casting, hot forging operations and low tool life in CNC/ VMC operations due to improper coolant mixing with water.

Manual mixing methods followed in the industry are always subjected to human error. Maintaining consistent, correct dilution ratio of concentrates with water is a challenge faced by metal-forming industry.

Steel Plant Specialities LLP, Mumbai, offers Accurate Proportioner for correct mixing of coolants / lubricants / quenchants with water, consistently and automatically. Mixing in correct dilution ratios with water enables a number of benefits in important operations like:

- CNC / VMC operations: Correct mix of CNC coolant with water enables reduced evaporation losses, increased sump life of coolant, preventing bad odour from sump and increased tool life due to better lubricity
- Polymer quenching: Correct mix of polymer quenchant with water enables uniform heat treatment of parts at all locations of quenching tank and desired heat treatment characteristics of induction hardened parts
- Die casting and hot forging lubrication: Correct mix of die lubricants with water enable optimal die life and ease of operations, without job sticking



Accurate Proportioner automatically sucks pre-set quantity of coolant directly from coolant drum. It emulsifies (mixes) the coolant with water and delivers the diluted solution through the outlet.

The Accurate Proportioner operates only on water connection. No electricity connection and no complex softwares or settings are required. As it works on water pressure, the proportion will always be accurate, as per the inlet of water quantity.

Difference in water inlet water pressure will not affect accuracy of proportioner. Capacity of Accurate Proportioner is up to 350 litres per hour (concentrate + water) Successful case studies and certificates of appreciation from reputed Organisations are available on request. Complete support in installation of equipment and training is offered by Steel Plant Specialities LLP. **MTW**

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## ADVERTISERS INDEX

COMPANY NAME	PG. NO.
<b>A</b>	
ACCUSHARP CUTTING TOOLS PVT. LTD.	43
ACE MANUFACTURING SYSTEMS LTD.	BACK PAGE
ADOR WELDING LIMITED	93
ANCA MACHINE TOOLS PRIVATE LTD	5
APEX PRECISION MECHATRONIX PVT. LTD.	103
<b>B</b>	
BETTINELLI AUTOMATION COMPONENTS PVT. LTD.	81
BIRLA PRECISION TECHNOLOGIES LIMITED	41
<b>C</b>	
CLEANOIL	42
<b>D</b>	
DOWEL ENGINEERING WORKS	69
DRAKE	29
DVS TECHNOLOGY GROUP	20 - 21
DYNASPEDE INTEFRATED SYSTEMS (P) LIMITED	75
<b>E</b>	
ELECTROTHERM (INDIA) LTD.	13
ELGI EQUIPMENTS LTD.	25
EPPINGER TOOLING ASIA PVT. LTD.	100 - 101
<b>F</b>	
FACCIN S. P. A.	23

COMPANY NAME	PG. NO.
FLIR SYSTEMS INDIA PVT. LTD.	35
<b>G</b>	
GLOBE-TECH ENGINEERING EXPO - 2020	27
GP PETROLEUMS LTD.	33
<b>I</b>	
INDIA MANUFACTURING TECHNOLOGY SHOW - 2020	117
ISCAR INDIA LIMITED	INNER INSIDE FRONT COVER
<b>J</b>	
JYOTI CNC AUTOMATION LTD.	31
<b>L</b>	
LAKSHMI ELECTRO CONTROLS & AUTOMATION	17
<b>M</b>	
MARVEL GLOVES INDUSTRIES	107
MASTERCAM INDIA	INSIDE BACK COVER
METAL + WORKING EXPO 2020	39
MGM-VARVEL POWER TRANSMISSION PVT LTD	111
MILLENIA TECHNOLOGIES (I) LLP	50 - 51
MILLUTENSIL	9
MMC HARDMETAL INDIA PVT. LTD.	INSIDE FRONT COVER

COMPANY NAME	PG. NO.
<b>O</b>	
OKUMA INDIA PVT LTD	11
<b>P</b>	
PARAGON MACHINERY CO. LTD.	19
PILZ INDIA PVT. LTD.	87
PRECISION MOTION INDUSTRIES, INC. ( PMI )	85
PUNE MACHINE TOOLS SHOW - 2020	115
<b>Q</b>	
QVI INDIA PVT. LTD.	73
<b>R</b>	
RAJKOT MACHINE TOOLS SHOW - 2020	113
RENISHAW PLC	37
ROLLON INDIA PVT. LTD. - INDIA	79
RR KABEL LIMITED	15
<b>S</b>	
SHAVO TECHNOLOGIES PVT. LTD.	97
STEEL PLANT SPECIALITIES LLP	67
<b>T</b>	
TRUCUT PRECISION TOOLS PVT. LTD.	FALSE COVER
<b>V</b>	
V M TRADERS	89
<b>Z</b>	
ZECHA PRECISION TOOLS LIMITED	7



7 Y.628 Z-5.1475 A-48.0715 B  
 3 Y.6251 Z-5.1103 A-48.5782  
 B Y.6222 Z-5.0731 A-49.0828  
 Y.6193 Z-5.0358 A-49.5848 B  
 Y.6165 Z-4.9985 A-50.0835 B  
 Y.6138 Z-4.9611 A-50.5784 B  
 Y.611 Z-4.9236 A-51.0688 B  
 Y.6084 Z-4.8861 A-51.5539 B28.4544 F686.13  
 Y.6058 Z-4.8486 A-52.0331 B27.3917 F710.23  
 Y.6033 Z-4.811 A-52.5057 B26.2988 F734.35  
 Y.6008 Z-4.7733 A-52.9708 B25.1754 F758.19  
 Y.5984 Z-4.7356 A-53.4276 B24.0211 F781.51  
 Y.5961 Z-4.6978 A-53.8755 B22.8357 F803.99  
 Y.5939 Z-4.66 A-54.3227 B21.7406 F825.37  
 Y.5917 Z-4.622 A-54.7701 B20.6455 F845.28  
 Y.5896 Z-4.5841 A-55.2175 B19.5504 F863.38  
 Y.5876 Z-4.5461 A-55.6649 B18.4553 F879.41  
 Y.5857 Z-4.5081 A-56.1123 B17.3602 F893.1  
 Y.5838 Z-4.4701 A-56.5597 B16.2651 F903.1  
 Y.5819 Z-4.4321 A-57.0071 B15.1700 F913.1  
 Y.5800 Z-4.3941 A-57.4545 B14.0749 F923.1  
 Y.5781 Z-4.3561 A-57.9019 B12.9798 F933.1  
 Y.5762 Z-4.3181 A-58.3493 B11.8847 F943.1  
 Y.5743 Z-4.2801 A-58.7967 B10.7896 F953.1  
 Y.5724 Z-4.2421 A-59.2441 B9.6945 F963.1  
 Y.5705 Z-4.2041 A-59.6915 B8.5994 F973.1  
 Y.5686 Z-4.1661 A-60.1389 B7.5043 F983.1  
 Y.5667 Z-4.1281 A-60.5863 B6.4092 F993.1  
 Y.5648 Z-4.0901 A-61.0337 B5.3141 F1003.1  
 Y.5629 Z-4.0521 A-61.4811 B4.2190 F1013.1  
 Y.5610 Z-4.0141 A-61.9285 B3.1239 F1023.1  
 Y.5591 Z-3.9761 A-62.3759 B2.0288 F1033.1  
 Y.5572 Z-3.9381 A-62.8233 B0.9337 F1043.1  
 Y.5553 Z-3.9001 A-63.2707 B-0.1714 F1053.1  
 Y.5534 Z-3.8621 A-63.7181 B-1.2763 F1063.1  
 Y.5515 Z-3.8241 A-64.1655 B-2.3812 F1073.1  
 Y.5496 Z-3.7861 A-64.6129 B-3.4861 F1083.1  
 Y.5477 Z-3.7481 A-65.0603 B-4.5910 F1093.1  
 Y.5458 Z-3.7101 A-65.5077 B-5.6959 F1103.1  
 Y.5439 Z-3.6721 A-65.9551 B-6.8008 F1113.1  
 Y.5420 Z-3.6341 A-66.4025 B-7.9057 F1123.1  
 Y.5401 Z-3.5961 A-66.8499 B-9.0106 F1133.1  
 Y.5382 Z-3.5581 A-67.2973 B-10.1155 F1143.1  
 Y.5363 Z-3.5201 A-67.7447 B-11.2204 F1153.1  
 Y.5344 Z-3.4821 A-68.1921 B-12.3253 F1163.1  
 Y.5325 Z-3.4441 A-68.6395 B-13.4302 F1173.1  
 Y.5306 Z-3.4061 A-69.0869 B-14.5351 F1183.1  
 Y.5287 Z-3.3681 A-69.5343 B-15.6400 F1193.1  
 Y.5268 Z-3.3301 A-69.9817 B-16.7449 F1203.1  
 Y.5249 Z-3.2921 A-70.4291 B-17.8498 F1213.1  
 Y.5230 Z-3.2541 A-70.8765 B-18.9547 F1223.1  
 Y.5211 Z-3.2161 A-71.3239 B-20.0596 F1233.1  
 Y.5192 Z-3.1781 A-71.7713 B-21.1645 F1243.1  
 Y.5173 Z-3.1401 A-72.2187 B-22.2694 F1253.1  
 Y.5154 Z-3.1021 A-72.6661 B-23.3743 F1263.1  
 Y.5135 Z-3.0641 A-73.1135 B-24.4792 F1273.1  
 Y.5116 Z-3.0261 A-73.5609 B-25.5841 F1283.1  
 Y.5097 Z-2.9881 A-74.0083 B-26.6890 F1293.1  
 Y.5078 Z-2.9501 A-74.4557 B-27.7939 F1303.1  
 Y.5059 Z-2.9121 A-74.9031 B-28.8988 F1313.1  
 Y.5040 Z-2.8741 A-75.3505 B-30.0037 F1323.1  
 Y.5021 Z-2.8361 A-75.7979 B-31.1086 F1333.1  
 Y.5002 Z-2.7981 A-76.2453 B-32.2135 F1343.1  
 Y.4983 Z-2.7601 A-76.6927 B-33.3184 F1353.1  
 Y.4964 Z-2.7221 A-77.1401 B-34.4233 F1363.1  
 Y.4945 Z-2.6841 A-77.5875 B-35.5282 F1373.1  
 Y.4926 Z-2.6461 A-78.0349 B-36.6331 F1383.1  
 Y.4907 Z-2.6081 A-78.4823 B-37.7380 F1393.1  
 Y.4888 Z-2.5701 A-78.9297 B-38.8429 F1403.1  
 Y.4869 Z-2.5321 A-79.3771 B-39.9478 F1413.1  
 Y.4850 Z-2.4941 A-79.8245 B-41.0527 F1423.1  
 Y.4831 Z-2.4561 A-80.2719 B-42.1576 F1433.1  
 Y.4812 Z-2.4181 A-80.7193 B-43.2625 F1443.1  
 Y.4793 Z-2.3801 A-81.1667 B-44.3674 F1453.1  
 Y.4774 Z-2.3421 A-81.6141 B-45.4723 F1463.1  
 Y.4755 Z-2.3041 A-82.0615 B-46.5772 F1473.1  
 Y.4736 Z-2.2661 A-82.5089 B-47.6821 F1483.1  
 Y.4717 Z-2.2281 A-82.9563 B-48.7870 F1493.1  
 Y.4698 Z-2.1901 A-83.4037 B-49.8919 F1503.1  
 Y.4679 Z-2.1521 A-83.8511 B-50.9968 F1513.1  
 Y.4660 Z-2.1141 A-84.2985 B-52.1017 F1523.1  
 Y.4641 Z-2.0761 A-84.7459 B-53.2066 F1533.1  
 Y.4622 Z-2.0381 A-85.1933 B-54.3115 F1543.1  
 Y.4603 Z-2.0001 A-85.6407 B-55.4164 F1553.1  
 Y.4584 Z-1.9621 A-86.0881 B-56.5213 F1563.1  
 Y.4565 Z-1.9241 A-86.5355 B-57.6262 F1573.1  
 Y.4546 Z-1.8861 A-86.9829 B-58.7311 F1583.1  
 Y.4527 Z-1.8481 A-87.4303 B-59.8360 F1593.1  
 Y.4508 Z-1.8101 A-87.8777 B-60.9409 F1603.1  
 Y.4489 Z-1.7721 A-88.3251 B-62.0458 F1613.1  
 Y.4470 Z-1.7341 A-88.7725 B-63.1507 F1623.1  
 Y.4451 Z-1.6961 A-89.2199 B-64.2556 F1633.1  
 Y.4432 Z-1.6581 A-89.6673 B-65.3605 F1643.1  
 Y.4413 Z-1.6201 A-90.1147 B-66.4654 F1653.1  
 Y.4394 Z-1.5821 A-90.5621 B-67.5703 F1663.1  
 Y.4375 Z-1.5441 A-91.0095 B-68.6752 F1673.1  
 Y.4356 Z-1.5061 A-91.4569 B-69.7801 F1683.1  
 Y.4337 Z-1.4681 A-91.9043 B-70.8850 F1693.1  
 Y.4318 Z-1.4301 A-92.3517 B-71.9899 F1703.1  
 Y.4299 Z-1.3921 A-92.7991 B-73.0948 F1713.1  
 Y.4280 Z-1.3541 A-93.2465 B-74.1997 F1723.1  
 Y.4261 Z-1.3161 A-93.6939 B-75.3046 F1733.1  
 Y.4242 Z-1.2781 A-94.1413 B-76.4095 F1743.1  
 Y.4223 Z-1.2401 A-94.5887 B-77.5144 F1753.1  
 Y.4204 Z-1.2021 A-95.0361 B-78.6193 F1763.1  
 Y.4185 Z-1.1641 A-95.4835 B-79.7242 F1773.1  
 Y.4166 Z-1.1261 A-95.9309 B-80.8291 F1783.1  
 Y.4147 Z-1.0881 A-96.3783 B-81.9340 F1793.1  
 Y.4128 Z-1.0501 A-96.8257 B-83.0389 F1803.1  
 Y.4109 Z-1.0121 A-97.2731 B-84.1438 F1813.1  
 Y.4090 Z-0.9741 A-97.7205 B-85.2487 F1823.1  
 Y.4071 Z-0.9361 A-98.1679 B-86.3536 F1833.1  
 Y.4052 Z-0.8981 A-98.6153 B-87.4585 F1843.1  
 Y.4033 Z-0.8601 A-99.0627 B-88.5634 F1853.1  
 Y.4014 Z-0.8221 A-99.5101 B-89.6683 F1863.1  
 Y.3995 Z-0.7841 A-99.9575 B-90.7732 F1873.1  
 Y.3976 Z-0.7461 A-100.4049 B-91.8781 F1883.1  
 Y.3957 Z-0.7081 A-100.8523 B-92.9830 F1893.1  
 Y.3938 Z-0.6701 A-101.2997 B-94.0879 F1903.1  
 Y.3919 Z-0.6321 A-101.7471 B-95.1928 F1913.1  
 Y.3900 Z-0.5941 A-102.1945 B-96.2977 F1923.1  
 Y.3881 Z-0.5561 A-102.6419 B-97.4026 F1933.1  
 Y.3862 Z-0.5181 A-103.0893 B-98.5075 F1943.1  
 Y.3843 Z-0.4801 A-103.5367 B-99.6124 F1953.1  
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 Y.3767 Z-0.3281 A-105.3263 B-104.0320 F1993.1  
 Y.3748 Z-0.2901 A-105.7737 B-105.1369 F2003.1  
 Y.3729 Z-0.2521 A-106.2211 B-106.2418 F2013.1  
 Y.3710 Z-0.2141 A-106.6685 B-107.3467 F2023.1  
 Y.3691 Z-0.1761 A-107.1159 B-108.4516 F2033.1  
 Y.3672 Z-0.1381 A-107.5633 B-109.5565 F2043.1  
 Y.3653 Z-0.1001 A-108.0107 B-110.6614 F2053.1  
 Y.3634 Z-0.0621 A-108.4581 B-111.7663 F2063.1  
 Y.3615 Z-0.0241 A-108.9055 B-112.8712 F2073.1  
 Y.3596 Z-0.0000 A-109.3529 B-113.9761 F2083.1  
 Y.3577 Z-0.0000 A-109.8003 B-115.0810 F2093.1  
 Y.3558 Z-0.0000 A-110.2477 B-116.1859 F2103.1  
 Y.3539 Z-0.0000 A-110.6951 B-117.2908 F2113.1  
 Y.3520 Z-0.0000 A-111.1425 B-118.3957 F2123.1  
 Y.3501 Z-0.0000 A-111.5899 B-119.5006 F2133.1  
 Y.3482 Z-0.0000 A-112.0373 B-120.6055 F2143.1  
 Y.3463 Z-0.0000 A-112.4847 B-121.7104 F2153.1  
 Y.3444 Z-0.0000 A-112.9321 B-122.8153 F2163.1  
 Y.3425 Z-0.0000 A-113.3795 B-123.9202 F2173.1  
 Y.3406 Z-0.0000 A-113.8269 B-125.0251 F2183.1  
 Y.3387 Z-0.0000 A-114.2743 B-126.1300 F2193.1  
 Y.3368 Z-0.0000 A-114.7217 B-127.2349 F2203.1  
 Y.3349 Z-0.0000 A-115.1691 B-128.3398 F2213.1  
 Y.3330 Z-0.0000 A-115.6165 B-129.4447 F2223.1  
 Y.3311 Z-0.0000 A-116.0639 B-130.5496 F2233.1  
 Y.3292 Z-0.0000 A-116.5113 B-131.6545 F2243.1  
 Y.3273 Z-0.0000 A-116.9587 B-132.7594 F2253.1  
 Y.3254 Z-0.0000 A-117.4061 B-133.8643 F2263.1  
 Y.3235 Z-0.0000 A-117.8535 B-134.9692 F2273.1  
 Y.3216 Z-0.0000 A-118.3009 B-136.0741 F2283.1  
 Y.3197 Z-0.0000 A-118.7483 B-137.1790 F2293.1  
 Y.3178 Z-0.0000 A-119.1957 B-138.2839 F2303.1  
 Y.3159 Z-0.0000 A-119.6431 B-139.3888 F2313.1  
 Y.3140 Z-0.0000 A-120.0905 B-140.4937 F2323.1  
 Y.3121 Z-0.0000 A-120.5379 B-141.5986 F2333.1  
 Y.3102 Z-0.0000 A-120.9853 B-142.7035 F2343.1  
 Y.3083 Z-0.0000 A-121.4327 B-143.8084 F2353.1  
 Y.3064 Z-0.0000 A-121.8801 B-144.9133 F2363.1  
 Y.3045 Z-0.0000 A-122.3275 B-146.0182 F2373.1  
 Y.3026 Z-0.0000 A-122.7749 B-147.1231 F2383.1  
 Y.3007 Z-0.0000 A-123.2223 B-148.2280 F2393.1  
 Y.2988 Z-0.0000 A-123.6697 B-149.3329 F2403.1  
 Y.2969 Z-0.0000 A-124.1171 B-150.4378 F2413.1  
 Y.2950 Z-0.0000 A-124.5645 B-151.5427 F2423.1  
 Y.2931 Z-0.0000 A-125.0119 B-152.6476 F2433.1  
 Y.2912 Z-0.0000 A-125.4593 B-153.7525 F2443.1  
 Y.2893 Z-0.0000 A-125.9067 B-154.8574 F2453.1  
 Y.2874 Z-0.0000 A-126.3541 B-155.9623 F2463.1  
 Y.2855 Z-0.0000 A-126.8015 B-157.0672 F2473.1  
 Y.2836 Z-0.0000 A-127.2489 B-158.1721 F2483.1  
 Y.2817 Z-0.0000 A-127.6963 B-159.2770 F2493.1  
 Y.2798 Z-0.0000 A-128.1437 B-160.3819 F2503.1  
 Y.2779 Z-0.0000 A-128.5911 B-161.4868 F2513.1  
 Y.2760 Z-0.0000 A-129.0385 B-162.5917 F2523.1  
 Y.2741 Z-0.0000 A-129.4859 B-163.6966 F2533.1  
 Y.2722 Z-0.0000 A-129.9333 B-164.8015 F2543.1  
 Y.2703 Z-0.0000 A-130.3807 B-165.9064 F2553.1  
 Y.2684 Z-0.0000 A-130.8281 B-167.0113 F2563.1  
 Y.2665 Z-0.0000 A-131.2755 B-168.1162 F2573.1  
 Y.2646 Z-0.0000 A-131.7229 B-169.2211 F2583.1  
 Y.2627 Z-0.0000 A-132.1703 B-170.3260 F2593.1  
 Y.2608 Z-0.0000 A-132.6177 B-171.4309 F2603.1  
 Y.2589 Z-0.0000 A-133.0651 B-172.5358 F2613.1  
 Y.2570 Z-0.0000 A-133.5125 B-173.6407 F2623.1  
 Y.2551 Z-0.0000 A-133.9599 B-174.7456 F2633.1  
 Y.2532 Z-0.0000 A-134.4073 B-175.8505 F2643.1  
 Y.2513 Z-0.0000 A-134.8547 B-176.9554 F2653.1  
 Y.2494 Z-0.0000 A-135.3021 B-178.0603 F2663.1  
 Y.2475 Z-0.0000 A-135.7495 B-179.1652 F2673.1  
 Y.2456 Z-0.0000 A-136.1969 B-180.2701 F2683.1  
 Y.2437 Z-0.0000 A-136.6443 B-181.3750 F2693.1  
 Y.2418 Z-0.0000 A-137.0917 B-182.4799 F2703.1  
 Y.2399 Z-0.0000 A-137.5391 B-183.5848 F2713.1  
 Y.2380 Z-0.0000 A-137.9865 B-184.6897 F2723.1  
 Y.2361 Z-0.0000 A-138.4339 B-185.7946 F2733.1  
 Y.2342 Z-0.0000 A-138.8813 B-186.8995 F2743.1  
 Y.2323 Z-0.0000 A-139.3287 B-188.0044 F2753.1  
 Y.2304 Z-0.0000 A-139.7761 B-189.1093 F2763.1  
 Y.2285 Z-0.0000 A-140.2235 B-190.2142 F2773.1  
 Y.2266 Z-0.0000 A-140.6709 B-191.3191 F2783.1  
 Y.2247 Z-0.0000 A-141.1183 B-192.4240 F2793.1  
 Y.2228 Z-0.0000 A-141.5657 B-193.5289 F2803.1  
 Y.2209 Z-0.0000 A-142.0131 B-194.6338 F2813.1  
 Y.2190 Z-0.0000 A-142.4605 B-195.7387 F2823.1  
 Y.2171 Z-0.0000 A-142.9079 B-196.8436 F2833.1  
 Y.2152 Z-0.0000 A-143.3553 B-197.9485 F2843.1  
 Y.2133 Z-0.0000 A-143.8027 B-199.0534 F2853.1  
 Y.2114 Z-0.0000 A-144.2501 B-200.1583 F2863.1  
 Y.2095 Z-0.0000 A-144.6975 B-201.2632 F2873.1  
 Y.2076 Z-0.0000 A-145.1449 B-202.3681 F2883.1  
 Y.2057 Z-0.0000 A-145.5923 B-203.4730 F2893.1  
 Y.2038 Z-0.0000 A-146.0397 B-204.5779 F2903.1  
 Y.2019 Z-0.0000 A-146.4871 B-205.6828 F2913.1  
 Y.2000 Z-0.0000 A-146.9345 B-206.7877 F2923.1  
 Y.1981 Z-0.0000 A-147.3819 B-207.8926 F2933.1  
 Y.1962 Z-0.0000 A-147.8293 B-208.9975 F2943.1  
 Y.1943 Z-0.0000 A-148.2767 B-210.1024 F2953.1  
 Y.1924 Z-0.0000 A-148.7241 B-211.2073 F2963.1  
 Y.1905 Z-0.0000 A-149.1715 B-212.3122 F2973.1  
 Y.1886 Z-0.0000 A-149.6189 B-213.4171 F2983.1  
 Y.1867 Z-0.0000 A-150.0663 B-214.5220 F2993.1  
 Y.1848 Z-0.0000 A-150.5137 B-215.6269 F3003.1  
 Y.1829 Z-0.0000 A-150.9611 B-216.7318 F3013.1  
 Y.1810 Z-0.0000 A-151.4085 B-217.8367 F3023.1  
 Y.1791 Z-0.0000 A-151.8559 B-218.9416 F3033.1  
 Y.1772 Z-0.0000 A-152.3033 B-220.0465 F3043.1  
 Y.1753 Z-0.0000 A-152.7507 B-221.1514 F3053.1  
 Y.1734 Z-0.0000 A-153.1981 B-222.2563 F3063.1  
 Y.1715 Z-0.0000 A-153.6455 B-223.3612 F3073.1  
 Y.169

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