VOL 5, ISSUE 1 - MAY-JUNE 2021

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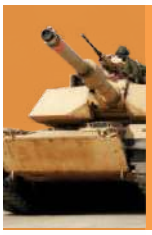

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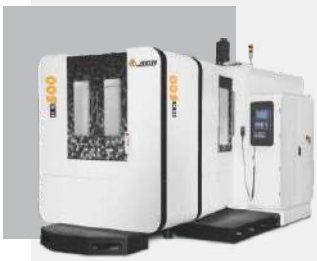

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VOL 5, ISSUE 1 – MAY–JUNE 2021








# IMPRINT


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**Published and Printed by V Anbu on behalf of Indian Machine Tool Manufacturers' Association (IMTMA). Printed at Pentaplus Printer's Pvt Ltd 20/1, 4th main, 5th cross, Industrial Town, Rajaji Nagar, Bangalore-560044, Karnataka and Published from Indian Machine Tool Manufacturers' Association; Head Office: 10th Mile, Tumkur Road, Madavara Post, Bengaluru - 562123, Karnataka. Editor: Soumi Mitra**

**Publishing frequency:** 6 times per year

**Manuscripts:** No liability is accepted for unsolicited manuscripts. They will be returned only if accompanied by sufficient return postage.

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# FACING CRISIS WITH RESILIENCE

**INDRADEV BABU**
**PRESIDENT**
**INDIAN MACHINE TOOL MANUFACTURERS' ASSOCIATION (IMTMA)**

Dear Readers,

Hope all is going well with you and your family during this tough phase.

We are finding ourselves in the midst of a second wave of the Covid pandemic. Though these are testing times, we must stay resilient and ride over this unprecedented challenge with grit and confidence as we did last year.

The Indian Machine Tool industry was returning back to normalcy with some good orders and business generation when the second wave of the virus hit India, forcing many states to impose lockdowns. Normal activities are disrupted again, including the supply chain, and it will take some time for the restrictions to be lifted completely and the activities to resume seamlessly again across India and globally.

Our industry business is primarily driven by the Auto and Automotive sector and while it continues to remain a key driver, the Machine Tool industry is also getting business from the fast-emerging sectors such as Electronics, Agriculture Machinery, Railways, Medical Equipment, Defence and Aerospace, among others.

As the prevailing market conditions limit the opportunity for good business prospects, Indian Machine Tool Manufacturers' Association (IMTMA) has rescheduled its flagship exhibition - IMTEX, the International Machine Tool and Manufacturing Technology Exhibition. The combined **'IMTEX, IMTEX FORMING, Tooltech & Digital Manufacturing 2022'** would be held at **Bangalore International Exhibition Centre (BIEC) in Bengaluru from January 20 - 26, 2022.**

With India undergoing the world's biggest vaccination drive, things are expected to be normalized by the end of 2021. This will encourage and build confidence for both exhibitors and visitors to travel within and from outside India for attending shows.

*As the prevailing market conditions limit the opportunity for good business prospects, IMTMA has rescheduled its flagship exhibition IMTEX. The combined 'IMTEX, IMTEX FORMING, Tooltech & Digital Manufacturing 2022' would be held at Bangalore International Exhibition Centre (BIEC) in Bengaluru from January 20 - 26, 2022.*

The need of the hour is to eradicate the pandemic completely to prevent negative sentiments cascading into everyday life and avert collateral damages.

In this hour of crisis, we extend our profound thanks to the country's medical fraternity who is in the forefront in fighting this pandemic.

Have a great year ahead and stay safe.

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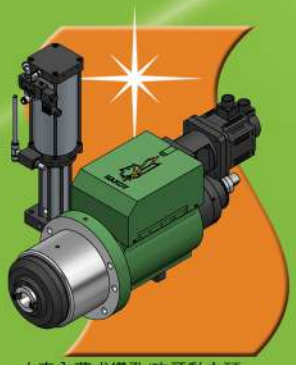
HARDY

台灣精品 TAIWAN EXCELLENCE 2017

伺服鑽孔/攻牙主軸頭
Servo Type Drilling / Tapping Spindle Head Unit

水車內藏式展刀動力頭
Built-in Motor Facing Head Unit - Flange Type



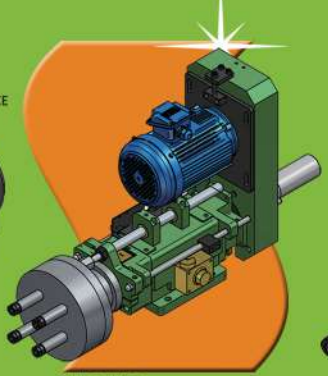
水車內藏式鑽孔/攻牙動力頭
(自動換刀+中心出水)
Built-in Motor Drilling/Tapping Spindle with ATC and Center Coolant

台灣精品 TAIWAN EXCELLENCE 2020

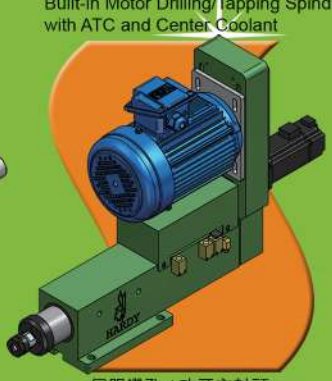
內藏式感應伺服搪銑主軸頭
Built-in Motor Spindle Unit

台灣精品 TAIWAN EXCELLENCE 2020

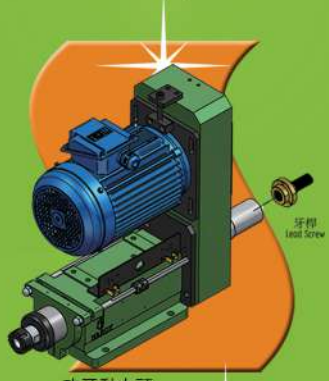
搪銑主軸頭/短型氣動換刀
Boring/Milling Head Unit with ATC



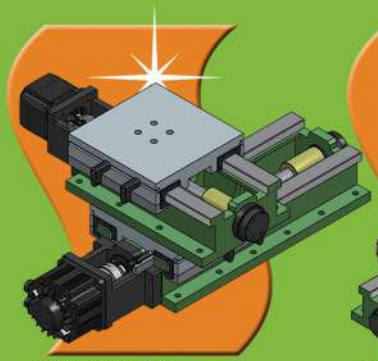
多軸主軸頭
Multi-Spindle Head



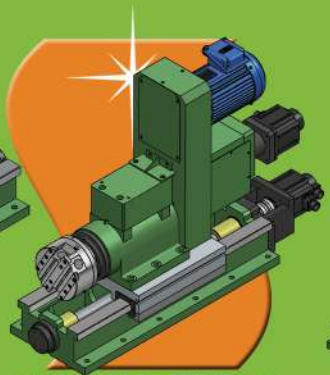
伺服鑽孔 / 攻牙主軸頭
Servo Type Dnilling / Tapping Spindle Head



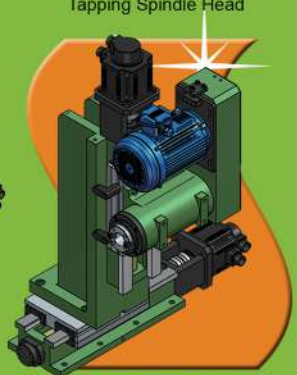

攻牙動力頭
Tapping Spindle Head



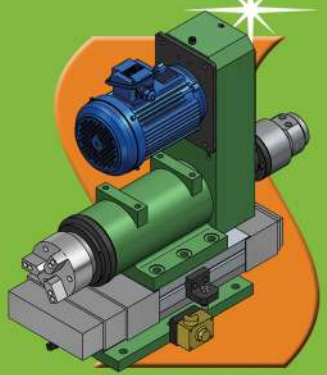
XY 伺服硬軌滑台
XY Servo Hardness Slide Unit



伺服雙向展刀頭 + 伺服滾珠滑台
Servo Facing Head +
Servo Ball Screw Slide Unit



XYZ 三軸伺服滑台 + 搪銑頭
XYZ Servo Slide Table + Milling Head



油壓夾頭 + 主軸頭 + 油壓滑台
3-Jaw Chuck Spindle + Slide Unit

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**DIRECTOR GENERAL & CEO**
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*Businesses will continue to explore digital platforms earnestly to stay connected, locally, and globally and we would be back soon with physical events once a larger chunk of the population is vaccinated and the pandemic is brought in control.*

Dear MMI Readers,

India has been caught unawares by a strong second wave of the Covid-19 pandemic. The war is not over yet as the virus has come back with more penetrating force than it did last year with more human casualties than expected.

It has been a tough time for all of us. We, at IMTMA, lost one of our most senior colleagues Mr S Balasubramanian to the virus. Bala, as we all fondly remember him, was with IMTMA for 14 years, handling the trade fairs division adroitly. His premature demise has created a void at IMTMA and the Exhibition industry that cannot be filled.

I hope that you, your family, friends, and teams are finding strength in these difficult times. Our industry also extends its appreciation to the various frontline workers who are working round-the-clock to save our lives.

Our MMI magazine stood firm in face of the series of challenges unleashed by the first wave last year. We continued to publish up-to-date information from the Manufacturing and Exhibition sectors for our readers. Let us unite once again and support each other in overcoming the challenges that come our way with determination and confidence.

Businesses will continue to explore digital platforms earnestly to stay connected, locally, and globally and we would be back soon with physical events once a larger chunk of the population is vaccinated and the pandemic is brought in control.

Well, the second wave knocked us at a time when we were expecting a turnaround in the economy, but I firmly believe that the dark clouds of uncertainty that is hovering on us will vanish, and we will see some good days ahead.

MMI, with its painstaking research and analysis, endeavors to bring valuable information for its readers. This month's edition focuses on metal cutting. The opinion piece by IMTMA offers an insight into the Machine Tool industry prospects in the face of the second wave of the pandemic.

As we continue to share inspirational stories from across the world, we also reach out for your feedback which would be highly valuable in understanding your needs.

My heartfelt thanks to each and every one of you, the readers of MMI, for your continued interest and support.

Readers can download previous issues of MMI from the IMTMA website.

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Image courtesy of McDowell Machine Tools

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# REMEMBERING 'BALA SIR' – MISSED BEYOND MEASURE

When one leads to leave a legacy, the leadership is focused on significance and not just success. Such people create the greatest impact and influence on those who look up to them.

I was privileged to have known 'Bala Sir' - S Balasubramanian Pillai, Executive Director & COO, Indian Machine Tool Manufacturers' Association (IMTMA) and Bangalore International Exhibition Centre (BIEC) - who was admired for his unique leadership style that encouraged innovation, initiative, and collaboration.

On May 10, 2021, we lost our highly regarded Bala Sir to Covid-19. We say that the hour of death cannot be forecast, but when we say this, we imagine that hour as placed in an obscure and distant future. And when the unthinkable happens without any warning or sign, the loss becomes graver.

There is an irreparable kind of loss when a mentor passes away. It is not just the person who saw our true worth is lost, but we will be forever deprived of the wealth of wisdom we would have received from them in future.

It will take a long time for us to process this grief. As lost and sad I am that he is gone, I feel truly blessed of having been a recipient of his wisdom, generosity, and humor, which will live on in me.

> *"You carve your name on hearts, not tombstones. A legacy is etched into the minds of others and the stories they share about you."*

It was an honor to have him as a phenomenal mentor who offered insightful observations and encouraged me to wear an entrepreneurial attitude.

All those who were close to him will always remember his kindness and the cheerful smile that would light up his face whenever he would meet a friend, acquaintance or stranger. An authentic leader with strong ethics and a gem of a person, he will always remain close to our heart.

We will miss 'Bala Sir' sorely, but his legacies will live on.

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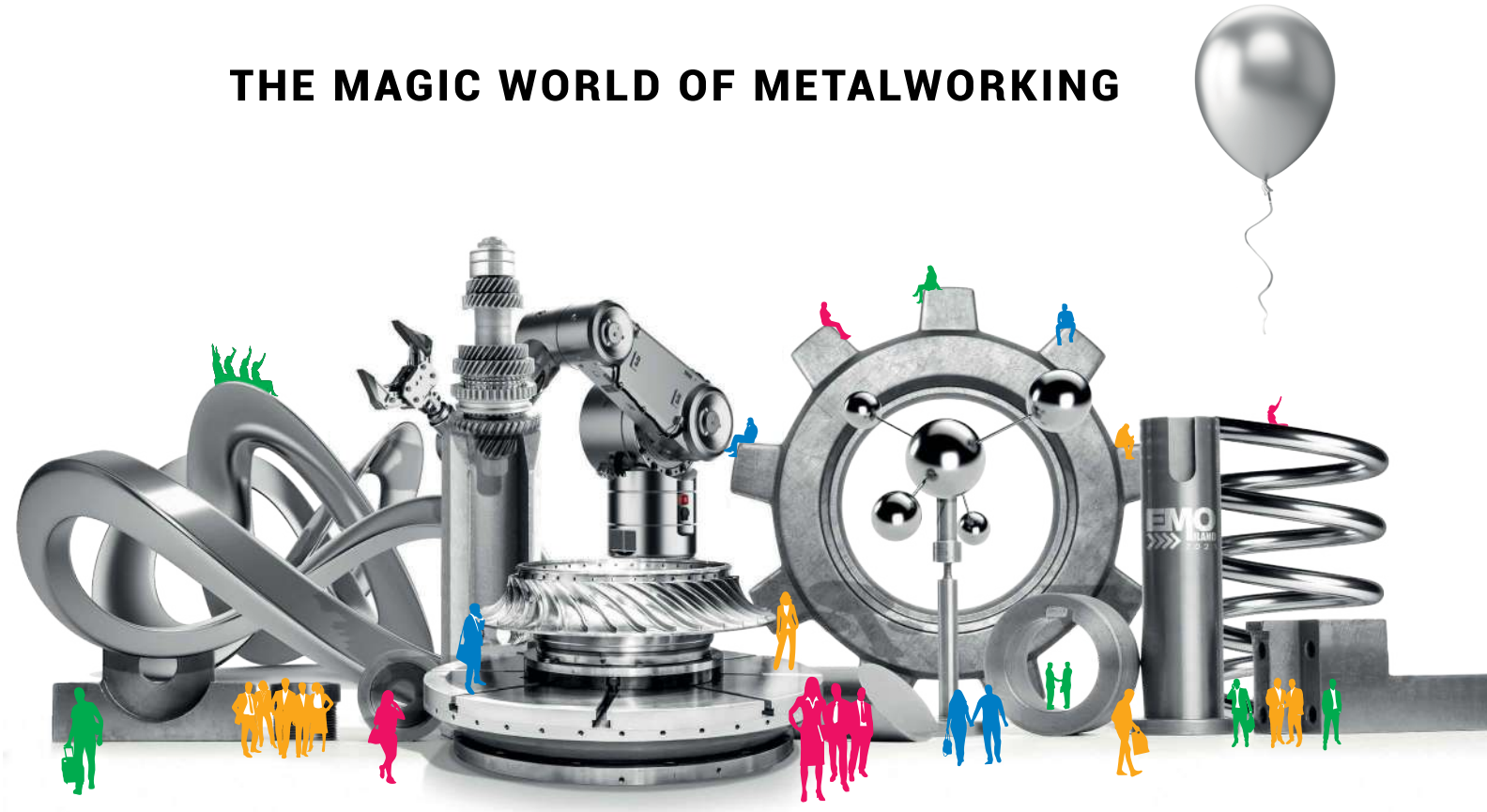

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# PINNING HOPES ON A TURNAROUND

No sooner did India get some much-needed respite from the first wave of the Covid-19 pandemic, the second wave hit us from nowhere with the threat to undo the gains we managed in the interim phase. However, the Indian manufacturing industry, as resilient it is, is taking the economic pinch in the right spirit, conforming to all norms and waiting it out to emerge all the more successful.

India is in the grip of a much stronger second wave of coronavirus, currently. As a nation, we have been caught unawares with new cases and deaths surging every day in major cities such as Delhi, Mumbai and Bengaluru. The new variants are posing serious challenges on India's existing healthcare system. However, the nation is working towards mitigating the crisis with the aid from various quarters, including foreign countries.

**Ramping up capacities**

It is important to arrest further damages to lives, secure livelihoods and keep businesses functioning seamlessly. This will be realized when India successfully ramps up its hospital facilities and increase vaccine capacities to inoculate its entire population on a war footing.

Lockdowns are not a permanent solution for curtailing the spread of Covid-19; they are a 'pause button' to offer some time for the think-tanks to implement their strategies and scale up healthcare infrastructure to defeat the spread of the virus.

Regional lockdowns will help in breaking the chain of the spread of the virus and perhaps give some breathing space for the medical fraternity to cope with the current situation and provide better healthcare for people. Policymakers should utilize the regional lockdowns to augment health infrastructure with dedicated Covid care centres, inclusive of ICU beds, installation of oxygen generator plants, oxygen supported beds, oxygen concentrators and ensure seamless supply of medicines such as Remdesivir and personal protective equipment (PPE) and masks to

Source: IMTMA

Source: Magic Wand Media

## IMTEX & Tooltech 2021 Rescheduled

Indian Machine Tool Manufacturers' Association (IMTMA) has rescheduled its flagship exhibition in the wake of surging coronavirus cases in India. IMTEX & Tooltech 2021 will be combined with IMTEX FORMING 2022 at Bangalore International Exhibition Centre (BIEC) from January 20 - 26, 2022.

protect frontline health workers and patients.

### Resilience for effective revival

The Manufacturing industry remained resilient in the first wave of the pandemic last year and it strived hard with some unprecedented measures. The industry, meanwhile, delved deep, relooked at the opportunities and strategies to innovate, enhanced technological capacities, reoriented market strategies and moved to the digital platforms wherever applicable, and was re-emerging as a strong force once again.

It supported the Government in manufacturing masks, PPE kits, ventilators, etc. to fight the Covid pandemic. It is a testing time again as the industry once again needs to demonstrate its resilience during the second wave of the pandemic.

This is another window of opportunities to serve the Healthcare industry through the production of oxygen concentrators and other medical devices needed to face future contingencies. Possibly, Pharmaceutical and Biological industries need to forcefully adopt strategies to counter future emergencies with new vaccines and medicines.

### Staying buoyant

India's Machine Tool industry gauges some immediate setbacks with the local lockdowns but is hopeful of coming through unscathed as it expects the pent-up demand to return once the restrictions are lifted.

It is also likely that the ongoing second wave of coronavirus will have a short-term economic impact, and once the vaccination drive picks up from June quarter onwards, things will change and the medium-term growth outlook will be stable.

Different Indian states would also be loosening restrictions by then, and all these will bode well for the economy.

### Manufacturing units still running

Interestingly, it hasn't been a total shutdown yet in some states. Large, medium and micro industrial units have been permitted to run with partial lockdown. As production units in some states are still running, it is believed that the negative impacts on business may be lessened.

As India beats the pandemic and pre-empts occurrence of a third wave, businesses should bounce back to growth, although it may take a while to do so.

**India's Machine Tool industry gauges some immediate setbacks with the local lockdowns but is hopeful of coming through unscathed as it expects the pent-up demand to return once the restrictions are lifted.**


Source: Magic Wand Media

# TINY CHANGES, BIG IMPACT

Leaks are notorious for causing major operating losses including energy wastage in an industrial compressed air system. Here are some sustainable actions that can be taken to address them...

Source: Atlas Copco India Pvt Ltd

CONRAD LATHAM
General Manager
Compress Technique
Atlas Copco India Pvt Ltd
conrad.latham@atlascopco.com

The leaks in the air compressors often tend to get ignored, but they can be a considerable source of energy wastage in an industrial compressed air system. A typical manufacturing facility or a plant (not properly serviced on time) will likely have a leak rate close to 20 percent of total compressed air production capacity. As per our energy managers, a 1 mm hole can lead to leakage of 3 cfm which may cost you approximately ₹22,000 in a year. Leaks can also lead to various other operating losses as they cause a drop in the overall system pressure, which can make air tools function less efficiently, adversely affecting production.

The method of leak quantification can help in formulating a strategy to take a sustainable action on the compressed air leaks. It will also help in prioritizing the actions on the leaks based on the locations and repair them effectively in the compressor room. This way, additionally, a reasonable amount of energy can be saved with lower energy consumption and by optimizing the air compressor.

## Acceptable leak percentage

Theoretically, there should be zero percent compressed air leakages in a manufacturing plant. However, as there are considerable constraints, it is not possible to eliminate 100 percent leakages from the compressed air site. Hence, efforts are made to have the lowest percentage of leaks in the plant. As a thumb rule, the energy experts always recommend having compressed air leakages less than 5 percent in a manufacturing plant.

## If not-so-ideal scenario

If the quantified air leaks are between 5 and 10 percent then it is advisable to perform a leak detection test with an air audit expert. If the quantified leaks are more than 10 percent then it should be fixed on high priority as they are draining the resources. Here, the recommendation is to take the help of air audit experts who will audit the compressed air system and provide the right solution to the issues.

However, if there are budget and time constraints, the following ways must be resorted to for addressing the compressor air leaks in-house for sustainable energy savings:

- Create and observe leak repair programs like 'Leak

detection week' once in six months with the plant employees, wherein one hour each day for 7 days could be dedicated collectively to identify and repair the leaks;
- Make people aware of the cost of leaks so that there could be a collective consciousness towards the problem.

Such engagements will not only help to repair and reduce leaks, but this will convert into a commitment to energy savings within the plant community.

However, in-house solutions work best in small and easy to fix leakages and with short-term results. Bigger fixes demand for the expertise offered by the air audit experts, which not only takes care of the problem on a long-term basis, but also offers long-term energy savings.

Source: Atlas Copco India Pvt Ltd

## Let the expert take over

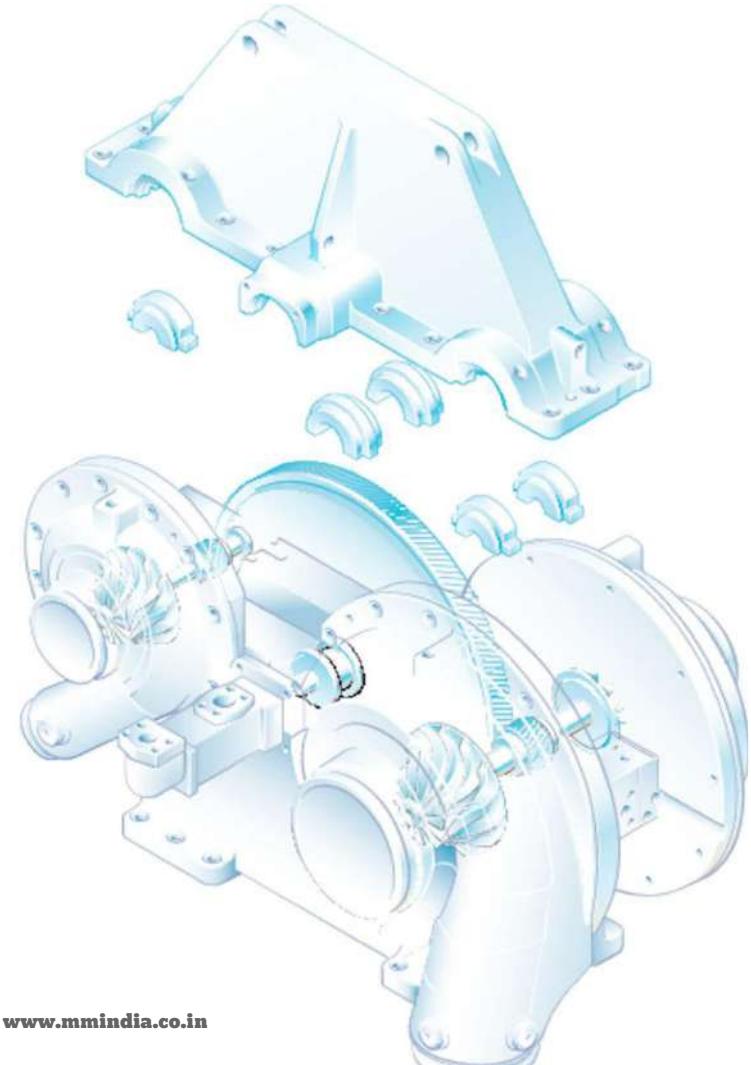
Leaks are simple to attend till the time they are visible and can be fixed internally. However, in a running factory environment, where there is a lot of movement and often commotion, it often becomes a challenge in detecting the leak of gases and fix them. Further, it is not possible to shut down the plant every time for the leak detection test.

Therefore, it is advised to call an air audit expert who will have the precise advanced tools for leak detection like acoustic sound image, which helps to accurately detect the air leak with leak value and also the location of it. The root cause analysis of the leaks will help in repairing them permanently without shutting down the network that has technological demands.

The other benefits of conducting compressed air audit under an expert guidance are:

- Clear report, which can also be used as a guide to compressed air audits;
- Energy consultants provide independent advice tailored to one's need based on the insights and innovations in air compression technology;
- Sophisticated devices like ultrasonic leak detector and photochromatic leak detector allow uninterrupted work at a plant;
- Air audit experts provide reliable, effective and sustainable energy-efficient solutions.

**As there are considerable constraints, it is not possible to eliminate 100 percent leakages from the compressed air site. As a thumb rule, the energy experts always recommend having compressed air leakages less than 5 percent in a manufacturing plant.**



Source: Atlas Copco India Pvt Ltd

# DOING THE RIGHT THING

Seco Tools has been making a strong contribution to the circular economy and has set an ambitious target that will hugely favor the environment along with the company's business.

With its origins in Fagersta, Sweden, and present in more than 75 countries, Seco Tools is a leading global solution provider of metal cutting solutions for indexable milling, solid milling, turning, holemaking, threading and tooling systems. The company is uniquely placed to make a strong contribution to the circular economy, which prioritizes separating economic activity from the consumption of finite resources and designing ways to remove waste from the system of economic activity.

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

## Thinking outside the trash box

Recycling will play a key role in reaching Seco Tools' ambitious goal of being 90 percent circular by the year 2030, with a number of broad changes to processes and business models leading the way. "It's a challenging target, but we see this as very important for our company and our business," says Ted Forslund, Sustainability & Audit Coordinator, Seco Tools. "We already have very good recycling processes, so now it's about creating a good partnership with our clients so that they understand the value of us buying back tools, so that it becomes a closed circle where nothing goes to waste."

Source: Seco Tools GmbH

Recycling Seco Tools

Globally, only 8.6 percent of the resources we use are recycled, which means that over 90 percent of everything is used once and then disposed of. Due to the nature of the business of Seco Tools, the company is in a strong position to change that paradigm by buying back tools that have reached the end of their productive lives and recycling or repurposing them into new tools. "If we increase that kind of trade where we buy back old and get customers to understand the advantages of it, we can reduce the climate impact as we won't need to use new materials and metals. It's a win-win in many ways," says Forslund.

Source: Seco Tools GmbH


Source: Seco Tools GmbH

Recycled Carbide Seco Tools

## Taking care of the earth

There is an ever-growing awareness of environmental concerns, and suppliers and customers are keen to see initiatives that address them. "This has proved very positive so far with customers. They know that the tools we produce using recycled materials are of the same very high standard, that there is no drop-off in quality. There is now also a market for the buy-back of tools that have reached the end of their useful lives, and that is a positive thing for them too. It's about getting this into our business relationships in a positive way," Forslund explains.

In a circular economy, recycling is very important, but it is also the last thing we should do after we reduce, repair and reuse. "This is one important component, but there are other aspects to the circular economy, and we have to look at them all. One of those is the lifecycle of our products – how can we design them so that they last a little longer, and that they can be recycled when they do reach the end of their useful lives? How can we produce them using renewable energy and sustainable supply chains? The essence of the circular economy is preserving the value that we have already created," he adds.

## Daunting yet attainable

Recycling helps in terms of minimizing waste, but it is far from the only way to do so. There is a wide range of areas that can be analyzed with a view to stopping the 'leakage' of valuable resources – delivery chain logistics, sorting, warehousing, risk management, power generation, and even molecular biology and polymer chemistry. Cost-efficient and better-quality collection and treatment systems and effective segmentation of end-of-life products will enable Seco Tools to support the economics of circular design.

One of the main problems in addressing issues to do with the environment and climate change has been the sheer scale of the task, but Forslund believes that the Seco Tools' goal of 90 percent circular by 2030 is attainable. "It is essential to work with our suppliers and customers in order to take on the global challenge. If we do, we can create more value with less waste within a safe operating space for our planet—again, it's a win-win situation," he concludes.

**There is a wide range of areas that can be analyzed with a view to stopping the 'leakage' of valuable resources – delivery chain logistics, sorting, warehousing, risk management, power generation, and even molecular biology and polymer chemistry.**

# EVALUATING PANDEMIC MEASURES

Industry experts share their views on the on-going second wave of Coronavirus' impact on India's growth momentum and economic recovery, and how much of a deterrent are the lockdowns and curbs on the manufacturing activities to the ease of doing business...

Source: Addverb Technologies

**Satish Shukla**
**Co-founder & Director**
**HR & Marketing**
**Addverb Technologies**

## Bigger demand spurt for Automation

We have witnessed a phase-wise and more calibrated lockdown in the second wave compared to the sudden lockdown in the first wave. More than the lockdown, the economy will be hit by the spread of the virus as people have been affected as Covid has spread to rural parts of the country as well. As the cases are receding now and we are seeing positivity rate falling below 5 percent, the lockdowns must be lifted in a phase-wise manner to ensure the number of infections do not rise again. We might see some casualties in businesses which have stressed balance sheets. But we see a very strong revival from Q-2 in the economy. With a good chunk of population in the West being vaccinated, their economy is opening which will fuel the export-oriented sectors and the pent-up demand will drive up consumption in the domestic sector. The Government has also shown the intent to drive up infrastructure spending in the last budget and should continue the same path as the road to recovery has again been fractured due to the second wave. Also, after the first wave, there was a thought process that the worst is behind us, but the rate at which the second wave struck, it is clear now that the manufacturing and supply chain of businesses need to have the capability to absorb these shocks and still deliver the service levels. This will act as a major trigger for demand of Robotics and Automation. We saw a demand spurt last year due to this, hence expect a bigger demand spurt for Automation post the second wave.

## Lives important than livelihoods

It has turned out that lockdowns are essential to curb the chain of infection beyond a certain limit. There is no alternative, and we must accept the impact that these lockdowns have on business and the way we run business. Also, manufacturing must be seen in the perspective of a full business cycle. In this lockdown, many states did take measures to ensure that utilities and other critical sectors operate without any hindrance.

Source: AGI Glaspac

**Rrajesh Khosla**
**President & CEO**
**AGI Glaspac**

## Regaining growth momentum

When the lockdown was imposed for the first time in the country, there was a huge disruption in every sector. Industries were not able to settle with their regular work. Phase 1 of Covid-19 has dented the economy. While most industries were on the path to recovery, the second wave of the pandemic has derailed their momentum. However, it is also important to note that most Indian companies are going into this second wave with improved operating conditions and resources compared to last year. These companies had already adapted to the changes and digitalized most of the business operations.

India's Manufacturing sector is playing a crucial role in the recovery phase of the Indian economy. The sector, which was impacted by labor shortage and lockdowns in the first wave, is now better equipped through several Government policies introduced for economic recovery. Companies are adopting alternative sources of supply and ensuring that the labor force continues to operate safely.

The container glass manufacturing industry is transforming during the pandemic, with new demographic conditions and new customer demands.

The Indian economy is gaining back its growth momentum now, and I believe that a quicker

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pace of vaccination will help in fast-tracking this recovery phase.

## Opportune time for Indian Manufacturing industry

The Manufacturing industry is playing a crucial role in the economic growth of our country. The disruptions due to the pandemic in the industry are temporary. Manufacturing companies are now better prepared to tackle unexpected and sudden localised lockdowns by the states.

The Indian Manufacturing industry is also expecting huge investments as the leading international mobile phone manufacturers and automobile manufacturers have set up units in India and are also expanding production.

Source: Collins Aerospace

**Parag Wadhawan**
**Managing Director & Site Lead**
**Collins Aerospace**

## Significant drop in demand

As the Covid-19 cases continue to rise in the country, consumer sentiments have turned negative. The second wave could make matters worse if it goes on for a longer period than predicted earlier. We are on the path to recovery and each sector is doing its bit.

## Economy to recover by year end

The pandemic could pave the way for India's much-anticipated entry into the Manufacturing sector. Businesses are taking several measures to insulate themselves from similar uncertainties such as identifying alternate resources of supply, cost control, operational efficiency, and use of technology for internal and external operations. The Government of India and the state of Karnataka have given the Aerospace sector permission to operate during the lockdown. The Government is aligned that the Aerospace sector is an essential sector similar to the global mindset. This will help India to continue to be competitive and play by global rules in the Aerospace sector.

I am optimistic that the economy will recover towards the end of this year. As the vaccination coverage grows, the economy will recover accordingly in different parts of the world. In North America and parts of Europe, vaccination coverage is growing. In Asia, China has already recovered, and India's economy will depend on how soon we can get a significant level of inoculation done in the next 3-4 months.

Source: SKF India Ltd

**Manish Bhatnagar**
**Managing Director**
**SKF India Ltd**

## Focused at creating value for stakeholders

Our country is going through a ferocious second wave of Covid-19, the scale of which has not been seen before. Although, the Government is focusing on mass vaccination drives and supporting the MSMEs, small businesses and working-class at all levels, several OEMs, automakers have been shutting down their manufacturing plants to curb the daily surge in the cases. While the economic impact of this massive second wave remains uncertain, we expect spending and activity levels to gain momentum through the year as the macro environment improves.

Talking about Maharashtra only, the state contributes 15 percent to the nation's GDP. Halting the Automotive sector and Process industries is always difficult because restarting them requires a huge amount of time and energy cost. We saw a tremendous pickup in demand and consumer sentiment when industries started to pick up in the January-March quarter. At SKF, we remain focused on supporting our customers, staying disciplined on our strategic priorities, improving operating efficiencies and optimizing costs through digitalization efforts, faster execution and most importantly, investment in our people's capabilities to create long-term value for all our stakeholders.

## Manufacturing activities affected

Localized lockdowns equally impact manufacturing activities. We have six factories around the country. Many of our suppliers are based in Maharashtra. So, what happens in Maharashtra, impacts not just the SKF factory in Pune, it also impacts our factories in Ahmedabad, Haridwar, and Bangalore. Even our suppliers do not have clarity in terms of what can be opened, what is not allowed to be opened leading to increased disruption. Already 25 percent of all two-wheelers, four-wheelers, and commercial vehicles are made in this state. If you add the supply chain connections to the state, that number goes up tremendously.


# CHASING GOALS IN CRISIS

We are at such a point in time in our life when we are experiencing in flesh and blood what was until now studied as history, read as stories, or seen as movies. It never even occurred to us that we could be subject to something as calamitous. However, serious studies reveal that events happen and situations revert, what remains are the learnings so universal, they could and should be applied to all walks of life. As Voltaire said: History never repeats itself, Man does.

Times like these are the most conducive for us to take a hard look at ourselves, our goals, and the measures to attain them. As we make our plans – business or personal – the beliefs, qualities, and traits that push us onward to reach our objectives, if not reviewed and rethought at key milestones, are the same ones that can push us over.

> As we make our plans, the beliefs and traits that push us onward to reach our goals, if not reviewed at key milestones, are the same ones that can push us over.
>
> **TK Ramesh**
> **Managing Director**
> **Micromatic Machine Tools Pvt Ltd**

### Becoming and staying successful

Establishing a successful company or making a success of oneself needs optimism and determination to not take no for an answer. Long-term success in any endeavor comprises attaining a goal and keeping at it. For example: capturing a market share and keeping the market share. The skills needed for both of the above actions are contradictory and come from having pragmatic beliefs and taking appropriate actions. Getting a share needs risk-taking abilities and keeping the share needs risk managing abilities. These are akin to playing a game against different opponents or at different terrains.

Being confident and pushing oneself on, irrespective what others perceive of one's endeavors, leads to the attainment of goals. However, caution should be used to prevent getting overconfident and reading situations wrong when certain milestones are reached. A rethink is an absolute must to maintain these goals and better them in new situations and circumstances.

It takes years to realize the importance of a product or a service, but failure can happen in a jiffy. As they say, reputation is built over years and can be ruined in a second. Building on success is a slow process that gets less attention than losses, which are sudden and attract attention. The irony is that growth is more powerful and constructive but less impacting. Whereas, destruction entails failure, making a person lose his hard-earned and much-treasured confidence.

The views expressed by the author are personal and he can be contacted at rameshtkr@gmail.com


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# REAPING BENEFITS OF TECHNOLOGICAL REVOLUTION

Advanced technologies such as the internet of things, artificial intelligence, and additive manufacturing are proving to be a boon for the manufacturing industry, bringing in benefits including reduction in the cost of production, downtime, and errors, and improvement in the speed of operations. The case in point is a testimony to how IIoT-enabled metal processing machines can prove themselves crucial with their multitude of advantages.

Source: Magic Wand Media

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Industry 4.0, as many would already know is the current phase of an Industrial transformation (IX), which interconnects – through the use of the internet – people, processes, and machines.

Here an attempt is made to present a case wherein a metal processing machine such as a Cut to Length (CTL) machine fitted with Industrial IoT devices helped reduce downtime of that machine.

First, we start with understanding how much does it cost in case such a machine goes down for unplanned reasons. Then we generalize the concept to understand the impact of machine downtime in a real scenario. From the calculations deduced in the article, we arrive at an hourly downtime cost and then extrapolate the same on a real-world case to arrive at the total cost of downtime in that scenario.

CTL machines play an important role in multiple sectors including Aerospace, Automotive and Consumer Goods. In general, these machines' primary function is to take a coiled flat metal roll, decoil the roll, level it and cut it to desired lengths. These operations are performed semi-automatically or automatically. Most new machines are automatic, with complex control electronics for precision motion and hydraulic control.

*In the context of this article, let us consider:*

*tc = total machining time for full coil*
*td = downtime in minutes*
*tl = loading time*
*ts = machine setting up time*
*lc = length of coil*
*Cd = cost of downtime*
*Rh = revenue potential per hour*
*Rc = revenue potential per coil*
*Nh = number of coils per hour*
*Mc = weight of coil in kilograms*
*Cc = cost of coil (raw material)*
*Ce = energy cost*
*Co = other costs*
*SD = surface density constant of material*
*ID = Inner Diameter (mm)*
*OD = Outer Diameter (mm)*
*T = Thickness (mm)*
*W = Width (mm)*

*From the concepts of geometry of solid bodies, we arrive at equations for the length, lc and weight, Mc*

$$length,\ lc\ (mtrs) = \frac{\pi}{4} * \left[\frac{OD^2 - ID^2}{T}\right]$$

$$Weight,\ Mc\ (kg) = lc * \frac{Wc}{1000} * T * SD$$

*Based on practical observations, we arrive at the relations between material properties and revenue as follows:*

$$Cost\ of\ coil,\ Cc = Material\ Rate * Mc$$

$$Typical\ revenue\ per\ coil,\ Rc = margin * [1 + Cc]$$

$$Typical\ revenue\ per\ hour,\ Rh = Nh * Rc$$

$$Coils\ per\ hour,\ Nh = \frac{1}{tc} * 60$$

$$Processing\ time,\ tp = \frac{lc}{speed}$$

$$Total\ machining\ time\ for\ full\ coil,\ tc = tp + tl + ts$$

$$Energy\ cost,\ Ce = Unit\ Rate * units\ consumed\ per\ hour$$

*Therefore, to estimate the cost of downtime, we arrive at the following equation:*

$$Cost\ of\ downtime,\ Cd = \frac{td}{60}\ [Rh - (N * Cc) - Ce - Co]$$

*In most metal processing applications, other costs are neglible compared to the raw material and energy costs hence are being ignored in our case study here.*

*(Note: These are not to be treated as bench marking formula; only used for rough cost benefit assessment.)*

## Real-world scenario

At a site in a remote place, the machine was down because the machine pressure wasn't building up. The machine operator needed support from the OEM to bring the machine back to operational state. Normally, this would have meant, someone from the OEM's team travels to the site and bring the machine back to the operational state. However, this being a remote site, the journey alone would take at least a day. That implies that the machine has to be down until that time.

To understand the commercial aspects of the machine's operations and downtimes in this case, let's consider the following machine and material properties (refer Table 1).

This was a unit that operated in 3 shifts. This means the machine would not have been available for at least 24 hours of the planned production time.

From the equations discussed above, we deduced that an hourly downtime cost would be approximately ₹18,306 (~US$ 250) for the machine and material properties we chose. Now, with a 24 hours downtime, the cost of the downtime would be significantly high, nearly 24 times the hourly cost in this case.

**As new technologies are being made available, MSMEs should come forward to adopt them and stay competitive in the global manufacturing landscape.**

Source: yzThings Technologies Pvt Ltd

| Inputs | | | |
|---|---|---|---|
| | Coil parameters | Value | Remarks |
| Coil parameters | ID (mm) | 508 | |
| | OD (mm) | 1600 | |
| | Thickness, T (mm) | 1.5 | |
| | Width, Wc (mm) | 1000 | |
| | Material Type | C40, steel | SD=7.85 |
| | Raw Material Cost (₹/Kg) | ₹55 | |
| Machine Parameters | Speed (mpm) | 30 | |
| | Power Consumption (Units/hr) | 250 | |
| | Typical Loading Time, tl (mins) | 20 | |
| | Typical Setting Up Time, ts (mins) | 10 | |
| Operational Parameters | Energy Rate per unit | ₹6.50 | |
| | Typical Utilization (%) | 75% | |
| | td (mins) | 1440 | 3 shifts |

Table 1

| Parameter | Without IIoT | With IIoT |
|---|---|---|
| Time | More than 24 hours of downtime | Around 15 mins |
| Cost | ~₹4.5Lakhs (~US$6000) | Nearly nothing |

Table 2

Source: worldsteel.org

**From the discussion, it is evident that in comparison to the investment made on IoT system for Remote Machine Monitoring, the returns are significantly high.**

Now that the machine had already been fitted with an IIoT System, the concerned OEM Engineer only had to login remotely and observe the machine's data. It was a matter of minutes to root cause the problem to an incorrect usage of the machine (inadequate filling of pressure in the hydraulic system's power pack). Only with the telephonic support, it was possible to bring the machine back up to full availability.

From the above discussion, it is evident that in comparison to the investment made on IoT system for Remote Machine Monitoring, the returns are significantly high.

If we extrapolate and look further, in the context of machinery driven industries, following are some of the field level leverages with deploying IIoT infrastructure:

- Optimal utilization and performance of machinery at all times;
- Remote diagnostic and customer support;
- Remote configurations or re-configurations of machines to suit production requirements;
- Advanced diagnostics for quicker (real-time on the edge) or proactive maintenance;

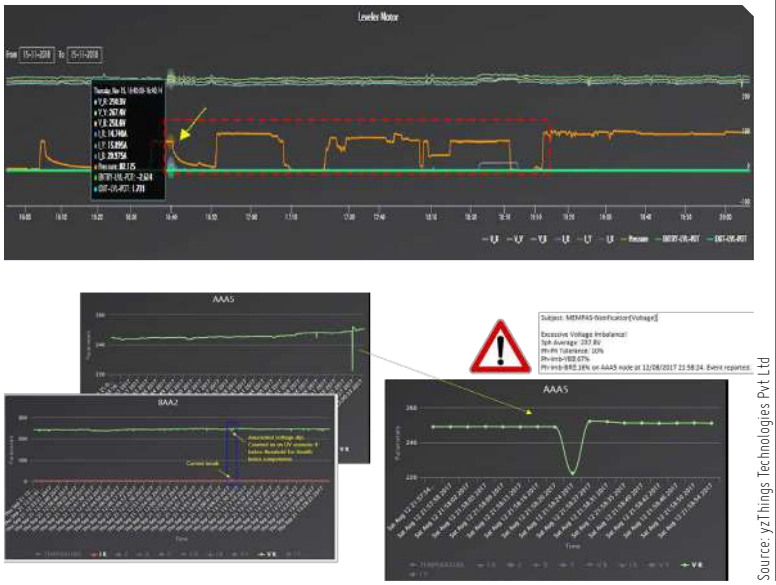
Source: worldsteel.org

Source: Cartel Engineers Pvt Ltd

- Remote machine operations;
- Automation of routine tasks; at a more advanced level entities can also benefit from complete autonomous operations with adaptive tuning of set points.

At a business level, these advantages translate into:

- **For OEMs:** Enhanced customer service, reduced machine-making cost and improvment in performance and time to ROI.
- **For manufacturers:** Utilizing machines that are IIoT-enabled or i4.0 compliant can effectively reduce maintenance, operational and labor costs, even occupied real estate cost.



Source: yzThings Technologies Pvt Ltd

## Resistance exists

Though the benefits are obvious, at the moment, it is an observation that most prospective beneficiaries of IoT in the industrial sector still feel that IIoT infrastructure is a good-to-have system rather than a need-to-have system. In general, the concept is appreciated, but some do not see it as an urgent need. It could be possible that these challenges are due to:

- Lack of awareness of the benefits of an IoT system;
- Reluctance to invest on something new that may not show immediate returns;
- A perception that implementing an IoT system could have incrementally increasing and recurring costs.

For any reason, incremental implementation such as the stages described below could be a reasonable guidance to enhance digital maturity of existing MSMEs operations:

- **Stage 1:** Understand the benefits and set up an appropriate IIoT infrastructure to

**Though the benefits are obvious, it is an observation that most prospective beneficiaries of IoT in the industrial sector still feel that IIoT infrastructure is a good-to-have system rather than a need-to-have system.**

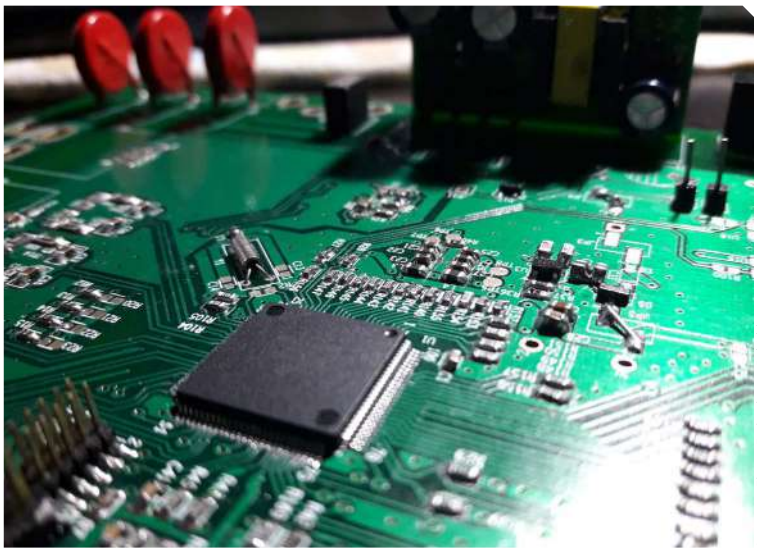
Source: Cartel Engineers Pvt Ltd

**A more stable, reliable IIoT infrastructure leads to the gathering of good quality data which, in turn, facilitates quicker information extraction.**

digitize relevant data locally or remotely;

- **Stage 2:** Pre-process the data and establish a data visualization, reporting and alerting system that is accessible securely from anywhere;
- **Stage 3:** Remotely perform basic machinery or equipment operations or set operating points in process control equipment;
- **Stage 4:** Identify and automate routine tasks;
- **Stage 5:** Advanced analytics for abnormality detection on real-time or historical data for prediction and forecasting.
- **Stage 6:** Adaptive, autonomous control and operations of complete machines and production cycles.

Note that the time taken for each stage could vary from a few days to a few months based on the end application and environment. A more stable, reliable IIoT infrastructure leads to the gathering of good quality data which, in turn, facilitates quicker information extraction. Since the process of setting up and gathering appropriate data is iterative, it is better to start early. The more it is delayed, the more time it takes to start seeing benefits or staying competitive in an increasingly disruptive environment.



Source: yzThings Technologies Pvt Ltd

With a supportive eco-system, an educated and motivated workforce and, more importantly, the fact that majority of the beneficiaries reside in this part of the world, it is only natural that the next industrial revolution will be led by India and China.

As new technologies are being made available, MSMEs should come forward to adopt them and stay competitive in the global manufacturing landscape.

*The author thanks Cartel Engineers Pvt Ltd for facilitating the case study.*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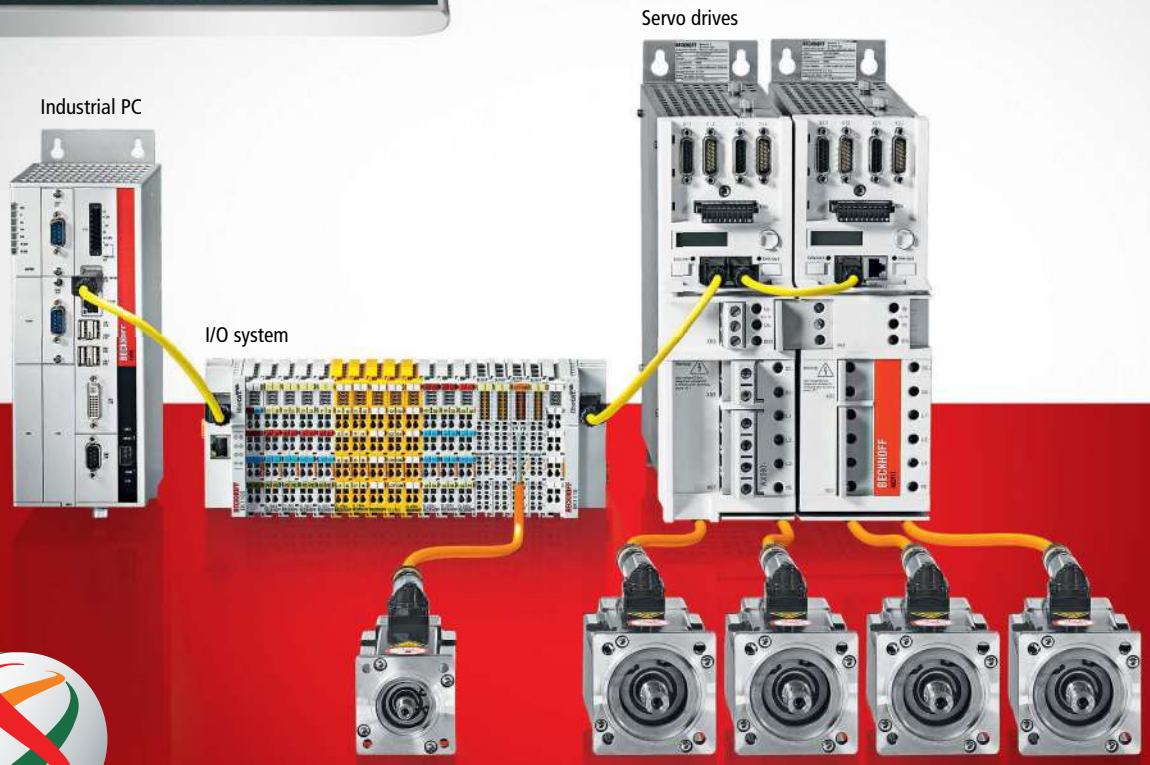


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# UNLEASHING THE WOMAN POWER

Rashmi Urdhwareshe, President, Society of Automotive Engineers India (SAE India), in this free-wheeling interview with Soumi Mitra, Editor-in-Chief, MMI, talks about how is it being a woman leader in a primarily male-occupied industry, the challenges encountered and overcome with uncommon élan, SAE India's vision, the future of green mobility in India and our machine tool players' readiness towards catering to it...

**You carry a rich legacy of over 37 years in automotive research and development and are a recipient of the prestigious Nari Shakthi Puruskar 2019 at the hands of Honorable President of India, Shri Ram Nath Kovind. How has been your experience in handling various national and international leadership positions as a woman in the areas of automotive safety and emission regulations?**

I love challenges! As a student, I always dreamt of carving out a place for myself in the Research and Development field. Engineering came as a natural choice. Getting a degree in Engineering from an extremely male-dominated college was a challenge in itself.

With the humble beginning as a Trainee Engineer in 1983, I rose through the ranks to become in 2014 the first Woman Director (CEO) of ARAI, the prestigious National Institute. The journey was eventful, exciting, and highly fulfiling. During my career, I had the opportunity to work with some excellent bosses, motivated teams and world-class technologies. I was also fortunate to receive national and international assignments/ projects right from the start of my career. It helped in widening my horizon, vision and also aspirations.

During the course of career, I handled technical, management and subsequently leadership roles within the organization as well as at national/international level. I quickly learnt to overcome gender issues, biases and hurdles with my strong commitment to the organization and the roles that I handled from time to time. In troubled waters, my family became my strong anchor and my ethics and values, the beacon light.

I must also highlight that I never did allow my professional goals and direction to drift away from organizational and national goals. When I started taking technical leadership role, I influenced, to a large extent, the strategic goals of the orga-

Source: Rashmi Urdhwareshe

**Rashmi Urdhwareshe, President, Society of Automotive Engineers India (SAE India) at Rashtrapati Bhavan receiving the Nari Shakti Award**

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nization to address sustainable transportation, green mobility, and road safety.

**Please tell us about Society of Automotive Engineers (SAE) India and its goals. How do you plan to align your experience and expertise with SAE India's goals?**

SAE India is a professional body having headquarter at Chennai. We operate through four sections – North, West, South and Bengaluru – to address the needs of mobility sectors in the regions. The vision of SAE India is:

- To be the most preferred technical body for knowledge dissemination and skill development of mobility professionals, students, and faculty;
- To be the trusted think-tank advising policymakers on mobility-related matters;
- To be a self-sustaining society with mobility professionals as members.

SAE, as a professional society, has a rich pool of resources spread in small pockets across the country. My first goal is to bring them together and consolidate their expertise as part of the common platform. SAE can thus take the lead in co-developing more of the new standards, algorithms, etc. along with its cohort in the areas of autonomous driving and e-mobility.

With my strength of handling challenges, I aim to take SAE to the new heights of professional thought leadership in the automotive domain. It is important to capture the changing expectations of each of the SAE members including students, professional members, faculty, corporate members, etc. and have our action plan ready.

I also aim at creating more women SAE leaders. I am proud of my SAE experience of over 25 years, which has taught me the lessons of organizational leadership through leading and volunteering positions within regional, state, national, and international level events. Therefore, I intend to keep empowering women and enable them to take up active and challenging roles within the SAE community as well as in their own employments.

Source: Rashmi Urdhwareshe

"The Indian Machine Tool industry is undoubtedly capable of handling the EV industry's demand. It is getting ready is what can be seen through its expansion plans and investment patterns. Investments in tooling, assembly, skills, and manufacturing capacities are currently being done."

**Rashmi Urdhwareshe**
**President**
**Society of Automotive Engineers India (SAE India)**

**You are at a vantage point where you can gauge the exact readiness of Indians for green mobility. Please comment.**

Thanks to the early investment and commitment by the Indian Auto industry, we do have good access and capability of absorbing technology. Another big asset is our strong, committed, and skilled human resource. To offer cost-effective green solutions to the consumer, we need to now focus on manufacturing excellence and reap the advantage of scale. We can soon reach the critical mass so that more investments could be justified.

On the demand side, Indian consumer is very picky, cost-sensitive but also brand loyal. The market development of EVs and other green vehicles shows that consumer is interested in trying out green vehicles, provided his long-term interests are protected (in terms of battery life, replacement costs, running costs, charging facilities, etc.) and he gets the value for his money.

Government policies are currently focused on incentivizing public transportation to give boost to the green technologies and their development in India. With these favorable factors, it is a matter of a few years before we can declare ourselves as country which is committed to meet sustainability goals in transportation.

**Our Automotive industry is based on the conventional engines. For the large-scale adoption of EVs, the entire ecosystem has to be transformed. How is SAE India helping the industry to smoothly transition this change?**

SAE India has a very wide base of membership. The four strong pillars of our membership include Students, Faculty Members, Professional Members, and Industry/Corporates. With the changing focus of powertrain development, SAE India was quick in identifying the upskilling requirements of each of these stakeholders. We meticulously planned and executed Proficiency Improvement Programs on top technology areas such as Powertrain development, Battery Management, EV materials development and many more. These programs were conducted in virtual as well as hybrid mode. National and internation-

**With the government policies and other favorable factors, it is a matter of a few years before we can declare ourselves as country committed to meet sustainability goals in transportation.**

al experts came forward in this endeavor. I am very proud that a significant penetration in terms of the number of programs as well as the breadth of knowledge was achieved over the last few months, despite Covid pandemic setback in business operations.

The second aspect was to support in bringing in right technology to Indian auto companies. Through our partnership with SAE-International and other world-wide organizations like FISITA and IEEE, we hosted international conferences and expositions which were focused on green mobility. FISITA World conference, held in Chennai in the year 2018, put India on the global map of technological advancements. ITEC 2019 (International Transportation Electrification Conference), held in Bengaluru, had a very apt theme – 'e-Mobility Solutions for Community'. SIAT 2019 (Symposium on International Automotive Technology), hosted by ARAI in Pune, themed at 'Empowering Mobility the Safe and Intelligent Way' and brought in many green mobility solutions on the forefront.

The third and more significant contribution from SAE India was engineering student competitions and their engagement in developing capabilities to design electric powertrains and controls. OEMs greatly supported these events and worked closely with SAE India to become 'future-ready'.

One more strategic advantage to SAE India is that we cover all mobility sectors. Our close collaboration with Aero, Off-highway and Automotive industry brought in collaborative development across these businesses, especially in powertrain, storage, materials, manufacturing, and power electronics areas to achieve accelerated growth of EV development and localization.

**Unless consumer requirements are adequately addressed, substantial shift in the passenger car number would not come.**

Source: Rashmi Urdhwareshe

"With the focus on Renewable Energy and Non-conventional energy, it is expected that by 2030, the major electricity production would be green and that is when EV penetration would be really significant in achieving integrated environmental goals."

**Rashmi Urdhwareshe**
**President**
**Society of Automotive Engineers India**
**(SAE India)**

**How are India's existing urban transportation policies including the National Electric Mobility Mission Plan 2020 (NEMMP) for the faster adoption of EVs, the Faster Adoption and Manufacturing of Electric Vehicles in India (FAME) schemes I and II, and various state-specific policies for EVs facilitating the shift to sustainable and green transportation?**

The policies NEMMP and FAME I and II are aimed at creating demand on one side through various incentives and on the other side, supporting supply through providing technology access and local development. Creating right infrastructure for fast and slow charging, and standardizing the products, specifications, testing and approval standards, etc. are also addressed through these policies. More effective deployment of EVs would be achieved with deeper penetration of mass transportation (i.e. buses and mini-buses) and other public transport vehicles (such as taxies and autorickshaws).

The State EV policies would be able to address the local specific situations, integrating with existing infrastructure, investing in new procurements (state owned) and providing integrated transportation solution to the consumers.

When it comes to personal e-mobility solutions for city/urban use, some of the factors that would govern the customer choice are: home charging options, possibilities of battery swapping centers, charging facility at workplaces and key urban locations, etc. On the other hand, range per charge cycle and fast charging facility on highways would be the deciding factors for long-range travels. It is a very well-established matter that Indian consumer is very cost conscious, first, when it comes to the acquisition cost and then to the running cost. The government policies have excluded personal vehicles from fiscal incentives. To encourage 2-wheelers and passenger cars sales, State Governments and local authorities should come up with non-fiscal incentives, which can prove to be of immense significance in long-term transportation planning.

From the OEM's perspective, the personal mobility sector should be focused for technology introduction whereas public transportation sector should be handled appropriately for the creation of critical mass in developing local manufacturing bases.

**With Tesla's foray into the Indian EV market, there is a growing buzz for EVs in the country despite the pandemic. According to an independent study done by Council for Energy, Environment & Water**

"To encourage 2-wheelers and passenger cars sales, State Governments and local authorities should come up with non-fiscal incentives, which can prove to be of immense significance in long-term transportation planning."

**Rashmi Urdhwareshe**
**President**
**Society of Automotive Engineers India**
**(SAE India)**

Source: Rashmi Urdhwareshe

**Rashmi Urdhwareshe, President, Society of Automotive Engineers India (SAE India)**

**and Centre for Energy Finance, by 2030 cumulative EV sales in all vehicle segments could cross over 100 million units, 200 times its current market size. Please share your view.**

The Indian market does have this much potential. There are several steps to be taken and many hurdles to be crossed to reach those numbers. As stated above, the Indian consumer, especially in the passenger car segment, is picky and also grounded. Unless consumer requirements are adequately addressed, substantial shift in the passenger car number would not come.

The 2-wheeler segment is highly promising when it comes to numbers as well as positive impact on the environment. A sustained effort in displacing the ICE vehicles with EVs is very much practical especially with reduced cost parity (partially due to increase in BS VI compliant vehicle technology).

Public transportation (city buses, taxies and auto rickshaws) would be the most appropriate segment to focus on.

In my view, the year 2030 has another significance in India's energy management status. Our total electricity production is currently dominated by fossil fuels. With the focus on Renewable Energy and Non-conventional energy, it is expected that by 2030, the major electricity production would be green and that is when EV penetration would be really significant in achieving integrated environmental goals.

**Currently, India is heavily dependent on imports to meet its battery storage requirements and local manufacturing is limited. What are the measures being undertaken to localize battery manufacturing and strengthen other factors like battery storage, charging stations, battery disposal to achieve successful EV adoption?**

Yes, heavy dependency on any major component of automotive always would results in losing competitive advantage. Local manufacturing of batteries, especially the cells, would need heavy investments, which could be justified only through larger volumes. These volumes should include not just domestic consumption, but India should aim at greatly enhancing export potential.

Battery manufacturing is also closely linked with the availability and effective utilization of key raw materials, power electronics components and standardization. In order to give impetus to this industry, OEMs could work as consortium and share the responsibility and commitment of developing and absorbing the technology as well as products.

The investment by the Government in setting up charging infrastructure would be rather limited and can cover only a small portion of the total requirement. Private players can come forward for participation with the Government, only after there is assured business. The chicken and egg situation can be overcome with gradual but sustained growth in EVs rather than jumping to some numbers.

**According to you, is the Indian machine tool industry equipped enough to cater to the needs of the EV industry?**

The Machine Tool industry is undoubtedly capable of handling the EV industry's demand. It is getting ready is what can be seen through its expansion plans and investment patterns. Investments in tooling, assembly, skills, and manufacturing capacities are currently being done. There is, however, a significant gap between the status of 'getting ready' and 'is ready'. This gap can be filled up only with commitments from all the stakeholders, not just the Machine Tool industry.

**Local manufacturing of batteries, especially the cells, would need heavy investments, which could be justified only through larger volumes.**


Source: Quick Laser, China

High-performance laser cutting machine from Quick Laser

# FOR THAT PERFECT CUT

China-based Quick Laser Technology's strategic cooperation with Beckhoff has further boosted the success of its high-performance laser cutting machines. The latter's TwinCAT software as an open CNC system has had a major role in the process.

Suzhou Quick Laser Technology Co, Ltd specializes in developing, manufacturing, and distributing laser cutting machines. In 2016, it joined hands with Beckhoff to further boost success with high-performance laser cutting machines. PC-based control offers the optimum foundation for reliably high machine throughput, particularly with TwinCAT software as an open CNC system.

The company has been a recipient of numerous awards including National High-Tech Enterprise, Excellent Private Science and Technology Enterprise in Jiangsu Province, Excellent Enterprise in Jiangsu Province and Gazelle Enterprise in the South Jiangsu Science and Technology demonstration zone. As very demanding applications, high-performance laser cutting machines benefit from this strong focus on technology.

## TwinCAT CNC as an open system

High-performance systems like these – usually with a laser power exceeding 8 kW – require significantly more complicated machine processes than simpler designs with lower energy requirements. These characteristics include slow start, progressive perforation and pre-lasering. In addition, new technological functions often have to be implemented. According to Quick Laser, an open control and CNC system is, therefore, important. This enables integration of customer-specific developments with minimal effort. Zhao Jian, Head, Process Department, Quick Laser, explains, "Modular PLC programs and an open CNC system enable us to add and test new process functions quickly and easily. This greatly aids our success in the market for high-performance laser cutting machines."

TcCOM provides the TwinCAT CNC with an open interface to the numerical control system. This enables the optimum integration of customer-specific process expertise. As a consequence, standard control technology can be used while still allowing the integration of highly specific functions where required. The TcCOM modules are a valuable

Source: Beckhoff Automation Pvt Ltd, India
info@beckhoff.co.in

toolset for this purpose and offer integrated and easy-to-use intellectual property protection options for users.

### CNC functions and Servo Drives for fast cutting

High-performance laser cutting machines are characterized by high processing speeds. Powerful servo drive technology is essential to further improve efficiency. This must cover a wide acceleration spectrum and, at the same time, must not restrict the cutting functionality of the machine tool. AX5000 Servo Drives from Beckhoff use optimized functions such as the velocity observer and TwinCAT CNC acceleration pre-control. This ensures that the consequential error for high-speed cutting is only +/-5 µm. For complex cutting of short lines such as Chinese characters, TwinCAT CNC offers a spline curve function that serves to optimize the path, improving cutting performance.

When cutting an acute angle, excessive energy density of the laser beam can result in unwanted burning. TwinCAT CNC prevents this via a corner and edge function that interpolates the space curve or enables an appropriate reduction of the laser energy. The M function offers additional advantages for extended distance output. If the workpiece falls or the edge is distorted when cutting sheet metal, there is a risk that the cutting head will collide with projecting parts and sustain damage. To prevent this, the lift functionality of the Cutting Plus package of TwinCAT CNC is used and the cutting process is, therefore, optimally controlled.

In addition to the C6640 control cabinet Industrial PC and the AX5000 Servo Drives, numerous digital and analog EtherCAT I/Os are also in use. For example, the EL2502 2-channel pulse width output terminal controls the laser light curtain. This EtherCAT Terminal provides a basic frequency from 1 Hz to 125 kHz as well as a duty cycle from 0 to 100 percent and supports most laser products on the market. The EL6692 EtherCAT bridge terminal enables real-time data exchange with lasers that support the ultra-fast EtherCAT communication system. The EL2262 digital output terminal with eXtreme Fast Control (XFC) enables output times in the µs range via oversampling and, therefore, flying cuts.

**AX5000 Servo Drives from Beckhoff use optimized functions such as the velocity observer and TwinCAT CNC acceleration pre-control. This ensures that the consequential error for high-speed cutting is only +/-5 µm.**

Source: Beckhoff Automation

AX5000 Servo Drive from Beckhoff in the laser cutting machine control cabinet

Source: Beckhoff Automation

C6640 control cabinet Industrial PC for machine control

# FORWARD TOGETHER

The combination of Quaker Chemical and Houghton International positions Quaker Houghton as a global leader in industrial process fluids for the metal and metalworking customers. Armed with an expanded products and services portfolio, the company plans to broaden its horizons across a wide spectrum of customer segments including steel, automotive, mining, industrial parts manufacturing, aerospace, and tube and pipe.

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Quaker Chemical (1918) and Houghton International (1865) had, in their individual capacities, built reputations as technology and customer-centric companies. The combined entity Quaker Houghton has a history of 250 years and is looking for cross-selling opportunities and continued market growth. Quaker Houghton offers metal cutting and forming fluids, corrosion protection fluids, specialty hydraulic fluids, and steel and aluminum rolling oils. Houghton customers will benefit from Quaker's strength in specialty greases, high-pressure die casting, mining specialties, surface treatment and bio-based lubricants. Quaker customers, on the other hand, will have access to Houghton's quenchants, forging oils, offshore hydraulic fluids, metal finishing products, and a broader metal removal fluids portfolio. The combination of Quaker Chemical and Houghton International nearly doubles the size of either company. Together it employs around 4,000 associates serving around 15,000 customers worldwide.

## The beginning

Quaker Chemical began its journey in India in 1997 with headquarters in Kolkata and in a span of nearly 25 years established its brand presence across a wide range of industries as a provider of process fluids, chemicals, specialties, and technical expertise. Today, it has regional offices in Bengaluru, Chennai, Pune, and Gurugram to serve markets in southern, western and northern regions.

Tridib Majumder, Managing Director, Quaker Houghton India, takes us through the

Source: Quaker Chemical India Ltd.

company's revenue spinning business in India. "Our metals business unit which caters to the needs of steel and aluminum customers has been a significant contributor to our business. The merger of Quaker and Houghton has been a shot in the arm for our metalworking business. We now have a market presence in a wide gamut of segments such as heat treatment, forging, die casting, aerospace, and so on. Moreover, it is also helping us to consolidate our position in traditional segments such as transportation, industrial and tube and pipe."

## Expanding horizons

The company expanded its presence with a state-of-the-art manufacturing plant close to Dahej port in Gujarat in 2019 for producing rolling oils and metalworking fluids for steel and metalworking markets. The new manufacturing plant will augment its supplies to customers in India, Middle East and East African regions. Throwing more light on the manufacturing plant, Tridib says that the plant is built with unique features in its design such as high efficiency induction motors to reduce energy consumption, a water and condensation recovery system and waste water treatment technology for meeting environmental goals. Presently, it is operating at a capacity of 12,000 metric tonne and the company plans to increase this to 20,000 metric tonne in the second phase.

Source: Quaker Chemical India Ltd

"Following the combination, Quaker Houghton has a bigger basket of products, making it a one-stop window for customers seeking process and production fluids. Its offering of TCO (Total Cost of Ownership) accrues value to its operations."

**Tridib Majumder**
**Managing Director**
**Quaker Houghton India**

## Robust presence

Quaker Houghton India closely works with major steel manufacturing units in India, Bangladesh and Nepal. It has leading transportation OEMs as its customers and has also established its presence in the aerospace segment. The company manufactures world-class products for machine tool builders and have maximum approvals and recommendations from them, besides offering fluid care and fluid management services for its customers.

Following the combination, Quaker Houghton has a bigger basket of products, making it a one-stop window for customers seeking process and production fluids. Its offering of TCO (Total Cost of Ownership) accrues value to its operations.

Informing more on this Tridib says, "An analogy of TCO is the initial price of buying a car, running cost, repair and maintenance cost and net of the residual value at the time of disposal. All of us will agree that the TCO of different cars can be different and does not depend only on the initial cost of the car — lower running,

**The company manufactures world-class products for machine tool builders besides offering fluid care and fluid management services for its customers.**

Source: Quaker Chemical India Ltd

Source: Quaker Chemical India Ltd

**Quaker Houghton aims to be carbon neutral in its global operations by 2030. It is committed to achieve net zero emissions across the entire value chain by 2050.**

repair and maintenance cost can help in lowering the TCO. We follow a similar approach while developing our solutions and proposition for our customers through the supply of our value-added products and services."

## Mapping the future

Speaking about India's strategic importance, Tridib says that with India poised to become a $5 trillion economy in the near future, the company plans to leverage on the increased purchasing power of the burgeoning middle-class population. The company is looking for market penetration and market development strategy and aims to achieve this by increasing the depth and width of its distribution from existing customers and growing its customer base. Quaker Houghton aims to do this by following its core values — Live Safe, Drive Results and Exceed Customer Expectations.


Source: Quaker Chemical India Ltd

He further informs that the company has been executing its strategy in blocks of three years which has helped it to grow ahead of the market in the last six years and looks forward to leverage this further.

## Joint venture

Quaker Houghton has entered into an exclusive joint venture with Grindaix GmbH, a German-based, high-tech provider of coolant control and delivery systems. Tridib sees the partnership as a strategic fit for the company's business, bringing broad application potential across the entire portfolio. The investment adds high value to the firm's equipment solutions and fluid intelligence offerings. The technical advantage gained also support customer's movement towards Industry 4.0 and automation and complements its recent acquisition of Norman Hay Engineering (NHE).

Speaking further he says, "Between NHE and Grindaix, we now have significant engineering, design, fabrication and cloud-based IT capabilities embedded inside the global commercial organization. Working together, our two companies will be able to provide significant benefits and improved process applications to our customers around the world."

## Safeguarding environment

Quaker Houghton aims to be carbon neutral in its global operations by 2030. It is committed to achieve net zero emissions across the entire value chain by 2050. This it hopes to do through energy efficiency and conservation measures, purchasing green power and energy attribute certificates (for example, renewable energy certificates) and neutralize residual emissions using high-quality carbon offsets. This, it believes, will result in a better and safer world and make a positive difference in the lives and organizations it touches.

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Source: Mikronix Gauges Pvt Ltd

# THE TRUE MEASURE OF SUCCESS

Mikronix Gauges Pvt Ltd (MGPL) has long discovered that true success lies in gauging the customers' demands much ahead of time and catering to them innovatively. Keeping its customers first is its mantra that has assured that the company steadfastly stays on the path of progress.

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Mikronix Gauges Pvt Ltd (MGPL) has had quite an unconventional way to success. Established in 1995 as a small unit with only 15 team members, the company at present has three manufacturing units in Aurangabad and has 95 members in the team.

It regularly exports gauges, masters, etc. to leading industrial nations including Japan and Germany. "Our manufacturing unit is ISO9000 certified since 1998, and we also have an NABL accredited lab," shares Abhay Hanchanal, Managing Director, Mikronix Gauges Pvt Ltd, proudly.

In the last decade, MGPL forayed into a highly specialized area of multigauging solutions and gauging automation. Its major Indian and international customers include Suzuki Motors, Bajaj Auto, Hero Moto Corp, HMSI, Rico, Bharat Forge, Endurance, Varroc, NRB etc. Its present turnover is ₹19 crore with the target for the next fiscal year being ₹20 crore.

## Taking chances

The company took an unusual path to reach its current coveted position in the industry. The reason, however, was straightforward to justify. MGPL kept abreast of the latest technologies and trends. Hence, it knew what new had to be introduced in the market that could favor its customers and, eventually, be in high demand.

"Until late 80s and early 90s, only Steel Gauges were used. We started developing and offering Carbide Gauges to market. This

led to substantial intrigue in the market as well as among other makers. They had several doubts. However, we were clear that the gauges will help customers increase gauge life by 10 times on an average and, more importantly, reduce their calibration frequency and calibration work load," shares Hanchanal.

The company persisted with its development from special carbide grade procurement. "We strongly believed that the development was in the interest of the customer and continuously took efforts to educate them to remove their fear of carbide breaking etc.," he adds.

It took MGPL around five to seven years till each of its customers used carbide gauges at least once. "Then there was no looking back. Those who tested the benefits of carbide never went back to steel gauges. This, in future, also helped us to develop Carbide Air Gauges, and the market then did not wait to welcome this product," he shares with evident pride.

## Small steps

Since 2001, MGPL has been phenomenally successful in the fields of Air Gauging, Electronic Gauging, Multi Gauging, Auto Gauging etc. "The need to expand our product basket was felt in the early 2000s. We started with Go/Nogo Gauges. We can proudly say we can benchmark this range of our products with the best in the world," remarks Hanchanal.

The company started small by starting with a few off-the-shelf items like manufacturing dial snap gauges and comparators of a few types. This helped it build a design team and other process manufacturing capabilities. "We looked for areas to enter our strong carbide base, which gave us an added advantage. In and around 2000, many of our customers asked us to produce air gauges in carbide. We listened to them, and, today we have established ourselves as a leading player in carbide air gauges following the success of Carbide Limit Gauges," he reveals.

Source: Mikronix Gauges Pvt Ltd

Source: Mikronix Gauges Pvt Ltd

> "Gauge manufacturing set-up needs the culture of self-discipline, quality and the highest level of integrity. It is our company culture that helps us produce gauges reliably and consistently, day in and day out, year after year. Our experienced team members make it easy to continue to raise the bars of excellence and quality high each time."
>
> **Abhay Hanchanal**
> **Managing Director**
> **Mikronix Gauges Pvt Ltd**

MGPL continued to have a separate team for R&D and improvements and built single parameter and multi parameters inspection solutions.

Source: Mikronix Gauges Pvt Ltd

## Innovation pays off

The company's products including carbide air gauges and multi gauging solutions are the most preferred in the industry because of their ease of use and features. Hanchanal explains, "Special Carbide helped us establish first in Go/Nogo limit gauges. Now our people on the shop floor have become experts in processing carbide."

"Gauge manufacturing set-up needs the culture of self-discipline, quality and the highest level of integrity. It's our company culture that helps us produce the gauges reliably and consistently, day in and day out, year after year. Our experienced team members make it easy to continue to raise the bars of excellence and quality high each time," he adds.

This culture has helped MGPL come up with innovative solutions consistently. The latest include measuring solutions with a faster rate of inspection, automation along with integrating marking, tracing at early and later stages of making particular components etc.

"The customers know our gauges by the returns they offer in the context of their life and running costs. Hence, they say 'MGPL gauges work for ages'," he quips.

## Revenue generators

MGPL has been serving a wide range of sectors including Automobile, Auto Components, Pump & Motors, Textile/Machines makers, Defence, Automation Service Providers etc. Its major chunk of business, however, comes from the Automobile-based industries.

And then there are always challenges on the way that hamper the progress. The biggest being the competition with other domestic players in terms of product efficiency and cost-effectiveness. "There is a saying: There is

**Although MSMEs contribute the biggest chunk in terms of employment and exports, they remain the most vulnerable because of their size and the daily challenges an entrepreneur faces, particularly in their early years.**

no product in the world which cannot be made cheaper. But the more important question is: Are cheap products better? The true value of a product or ingredient of a product, processes etc. is overlooked. We believe our products offer a certain value and return on investments. We maintain a competitive pricing but are, at the same time, ready to lose customers who buy considering only the price factor," Hanchanal stresses.

"We have customers who do not calibrate our gauges and ask us to just send them to their work area. This is the kind of reputation that we have built over the years," he adds.

**Many MSMEs have transformed themselves in Covid-19 by reinventing their process and business and emerging successful.**

## Coping with unforeseen challenges

Covid-19 and its subsequent lockdowns posed a gamut of challenges for all. Hanchanal speaks of the ones MGPL faced in its way. "The pandemic threw unprecedented challenges in the last year; the company stopped its operations for almost two months. We took a conscious decision of ensuring all our team members, including the ones on probation or contract (which is 10 percent of our total strength), stuck together in the tough times. It is because of our team and customers that we exist. We took care of each one of our family members and our smaller associates (suppliers), ensuring that the cash flow remains least impacted for us to sail through. However, it is not over; there will be many more challenges thrown up in the years to come.

Source: Mikronix Gauges Pvt Ltd


Source: Mikronix Gauges Pvt Ltd

We need to stay together to face and survive them and bounce back when things begin to normalize," he shares.

## SME woes

Although MSMEs contribute the biggest chunk in terms of employment and exports, they remain the most vulnerable because of their size and the daily challenges an entrepreneur faces, particularly in their early years, says Hanchanal. "The biggest worry for them is the cashflow. Unfortunately, in India, most do not pay MSMEs in the agreed time frame of around 30/60 days. It's a struggle running the show with no steady stream of cash," he notes, adding that the same has been suffered by MGPL. "What any MSME must do is to follow the highest level of financial discipline to address this issue," he suggests.


Source: Mikronix Gauges Pvt Ltd

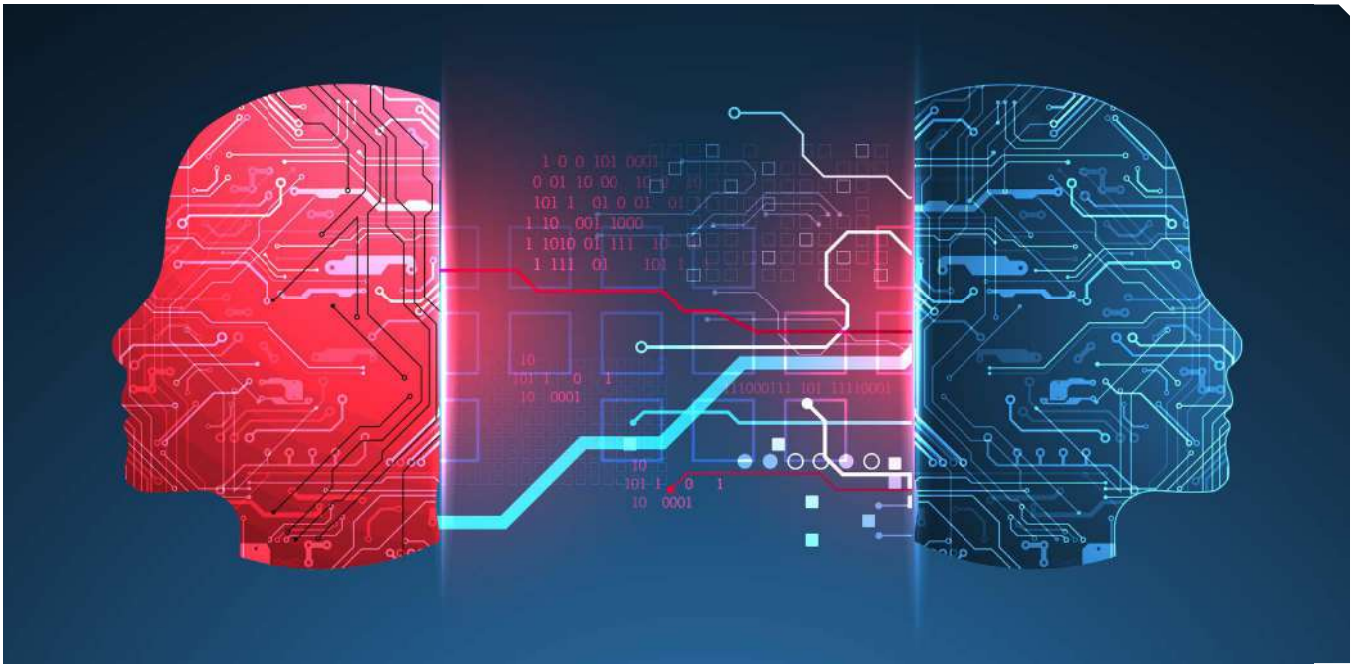
Another big challenge faced by MSMEs is recruiting and retaining skilled human resources. "In their early days, most MSMEs do not have the capacity to offer a generous pay to their skilled workers, which is a handicap. To overcome this, training of human resources is especially important. This also remains an unattended issue by many MSMEs. At MGPL, we ensure to regularly conduct trainings for technical and soft skills to upskill our personnel," he shares.

## Government intervention

To help MSMEs overcome a few obstacles in their way, the Union Cabinet has approved funding of up to ₹3 lakh crore to MSMEs as part of the ₹20 lakh crore economic package announced by Finance Minister Nirmala Sitharaman earlier with 100 percent guarantee coverage provided by National Credit Guarantee Trustee Company Limited (NCGTC).

"It is a good scheme that have benefitted many MSMEs already. It helped them a great deal to come out of their immediate financial burden. However, there is still a big number of small units that are yet to be benefitted as they have some issues related to its execution," he points out.

The industry, according to him, expected a little more from the funds parked in ESIC (Employees' State Insurance). "If you see their balance sheet, there are funds available. It was expected that they will come forward in this pandemic and share the funds with the industry or directly pay some portion of salary in the account of employees registered on ESIC," he states, summing up with an insider's view.



Source: Magic Wand Media

# OF HUMAN CONNECTION

As industrial operations become increasingly autonomous, 'connected workers' are vital for digital business success.

KIM CUSTEAU
Vice President
APM Business
AVEVA

Business drivers have evolved dramatically over the first year of the coronavirus pandemic. With heightened volatility on both the supply and demand side, energy companies are more focused than ever on leveraging Cloud, Internet of Things (IoT), Artificial Intelligence (AI) and analytics to drive real-time flexibility, efficiency, availability and sustainability.

But it's not only technology that will herald a new frontier in industrial productivity. Just as important is the growing level of human interaction with connected AI and data-driven software.

## Four new key business drivers

Post-pandemic, four key areas have emerged as business imperatives for the new normal.

As capital investments shrink, companies need to re-evaluate projects for viability, ROI and to reduce total installed cost. Consequently, operators must revisit traditional work processes and information exchange to enable an entirely new modus operandi of engineering.

With remote teams requiring better context and deeper data access to supervise operations, collaborate and make decisions, there is a heightened need for better visualization and contextual analysis of operating information across the enterprise.

As operations start to become increasingly autonomous, ensuring the reliability and safe operation of critical assets with minimal supervision becomes vital. Personnel on the shop floor and in the field will increasingly require work-task enablers and aids, as deep operating expertise becomes scarce.

And finally, in an environment of heightened unpredictability, companies will need to drive high levels of agility and responsiveness across value chains to minimize value leaks, optimize production and maximize profit opportunities.

## Rise of the Connected Worker

The 'connected worker' represents digital transformation through the eyes of the employee. To attain the true value potential of any digital transformation program, companies must give genuine focus to the needs of human staff behind the 'working asset'.

Over the next decade, AI could contribute up to $15.7 trillion to the global economy, but it is connected workers that will be the real agents of change in this scenario. According to Harvard Busi-

ness Review, 80 percent of global workers have no desk and much of their work is mobile. These first-line workforces are the new focus of digital transformation.

Empowering these connected workers is imperative if companies are to help drive operational improvements in productivity, safety and collaboration as businesses become more automated. AI will also have a critical role to play in monitoring and improving remote working, team working, decision-making, well-being and job satisfaction for workers.

By carefully mapping personnel needs, companies can cultivate an engaged workforce that works in harmony with the firm's digital infrastructure and goals.

**To attain the true value potential of any digital transformation program, companies must give genuine focus to the needs of human staff behind the 'working asset'.**

## Digital Twins for dynamic conditions

As companies begin to turn to AI across every operational task and process, organizations will require additional capabilities for inference, prediction, guidance and adaptation to dynamic conditions. Today, these capabilities are combining to create a 'Digital Twin' for the company. The technology maps the comprehensive physical and behavioral attributes of all assets to simulate, evaluate, predict and prescribe.

## Advanced visualization

Amid a landscape of increasingly autonomous operations, the connected worker will interact with the Digital Twin of an asset, using advanced visualization tools and work-task enablers to guide activities, ensuring efficiency and consistency.

AVEVA's Digital Twin solution provides data discovery and navigation through an intuitive web-based user interface with built in 1D, 2D and 3D visualization. The technology, which leverages Microsoft cloud services and Microsoft Azure's infrastructure, data and AI services, provides in-depth asset information that greatly enhances decision-making. It allows anyone across the business to view data about the asset in the context of the physical asset itself and its connectivity in the plant.

The Digital Twin must interact effectively with workers, especially field workers. AVEVA customers consistently show significant improvements in training acceleration, skills development, and operations safety management.

In one exciting example, AVEVA is working with Thai petrochemicals giant SCG to unify its data into a holistic Digital Reliability Platform, using workforce enhancement tools to improve efficiency throughout its complex petrochemical value chain. Together, we have created a set of multi-dimensional digital transformation capabilities that can bring benefits to the whole sector.

## Unprecedented data, connected assets

Industrial IOT has created the opportunity to access unprecedented amounts of data from connected assets. With improvements in connectivity and data security, historical barriers are being lowered and the advantages of cloud deployments are being realized.

In a rapidly digitalizing world, companies will need to drive high levels of agility and responsiveness across value chains to minimize value leaks, optimize production and maximize profit opportunities. But it is the visual and human aspects of AI that will drive the real industrial software revolution.

With Microsoft's end-to-end solutions in the cloud, and AVEVA's deep industry expertise, the Digital Twin and connected workers will accelerate time-to-value, and allow the significant benefits of Cloud and AI to become a reality.


Source: Magic Wand Media

# REACHING FOR THE SKY

Space data company Pixxel is a result of a strong desire to explore what's beyond our planet. The founders shared love for space and space technology has shaped many an innovation that aims at bringing a lasting impact in areas like agriculture and pollution monitoring.

Source: Pixxel

The idea as unique as founding a space data company can only emerge out of a deep passion for the subject and a desire to further delve into it. "Both of us have always been interested in space and have grown up listening to and reading about the heroics of ISRO in the early 2000s," confirms Kshitij Khandelwal, Co-Founder & CTO, Pixxel, referring to his Co-Founder Awais Ahmed.

The duo met at BITS (Birla Institute of Technology and Science) Pilani and soon after worked together as part of the Hyperloop India team where Ahmed was a founding team member. As a finalist of the SpaceX Hyperloop pod competition in 2017, they built a hyperloop pod prototype, took it to the SpaceX HQ in LA and presented it to Elon Musk. "After the competition ended, we were looking at other challenges to solve and doing something in space and decided to take a shot at IBM Watson AI XPRIZE," he shares.

Their goal was to build space technology with AI tools that could be used to bring about a lasting impact in areas like agriculture and pollution monitoring. They started with building AI models that could take in terabytes of satellite imagery and extract actionable insights and patterns from that data to help tackle problems in agriculture, predict yields and track the spread of certain crop pests and diseases, detect illegal mining, predict, and monitor natural disasters and forest fires among other pressing problems.

## Invention out of necessity

The satellite imagery of the earth that was freely available for analysis in most cases was years old. That was important because the team could not fix what it could not see. "To validate whether this was an actual problem faced by people worldwide, we reached out to many companies in Europe and the US that analyzed satellite

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**ANAND is Pixxel's first technology demonstrator mission and flies up with a visible and near-infrared hyperspectral camera. The idea behind the mission is to validate the startup's satellite and camera technology and get sample image data that it can use to validate different use cases for hyperspectral imagery.**

imagery to provide insights. With an almost unanimous response that there was indeed a lack of information-rich space imagery, and that they would be willing to pay for the data, we realized that there was an emerging market for the new kind of satellite imagery," Khandelwal reveals.

This was the idea behind founding Pixxel, the journey of which commenced in early 2018, with the aim to build a constellation of microsatellites that would do hyperspectral imaging. "The idea is to monitor any place on the planet every day and provide imagery and the tools to work with that imagery that would enable organizations across the world to detect, monitor, and predict global phenomena in real-time," he explains.

"We've had different motivations towards building Pixxel but the common theme here is love for space and space technology. For me, it was the sheer thrill of working on some of the most challenging engineering problems that no one else was working on and being able to send technology to space. For Awais, visiting the SpaceX factory in LA was a defining moment where he realized that he wants to do something for the Space industry. Either way, we wanted to build something of the likes of SpaceX, Airbus, Boeing because nothing like that existed here in India. Building an earth observation constellation is a means to that end," he says sharing the founders' motivation behind their innovative endeavor.

The team has a good mix of people equipped with thorough knowledge of the industry along with talented young engineers excited about solving problems and bringing in agile hardware-software development processes to the otherwise slow-moving traditional Space industry. "We are nearly 50 people now who come from different backgrounds and many of them are from top schools like the IITs, IIST, and BITS as well as a few people who have worked in organizations like ISRO, Team Indus, and others before," adds Khandelwal.

Source: Pixxel

"The hyperspectral imaging that we have built at Pixxel will be accurate, precise and in real-time, giving the advantage of targeted monitoring, localized problem detection, and hyper optimized solutions in every sector globally."

**Kshitij Khandelwal**
**Co-Founder & CTO**
**Pixxel**

## Tackling issues with technology

Since Pixxel is a space data company, there are two important aspects to what it does: building the right kind of infrastructure in space and on the ground by deploying its satellite constellation and building tools for people to seamlessly work with the satellite data. "We are currently aiming at deploying a microsatellite constellation of satellites sized around as much as a mini-refrigerator with hyperspectral cameras that allow you to identify phenomena on earth in dozens of spectral bands rather than the usual 4 – 12 band optical imagery that is available currently at a high resolution. Once the data has been beamed down, our platform and on-ground tools allow our customers to access and analyze this satellite imagery where they can extract insights for applications in sectors like Agriculture, Environment Conservation, Energy, Forestry, and Pollution Monitoring and tackle problems like crop disease identification and forest health and biodiversity monitoring at scale," he explains.

## Understanding Hyperspectral Imaging (HSI)

The fundamental principle behind hyperspectral imaging is that of imaging spectroscopy, says Khandelwal, helping us gain insight into the technology. "When we use a phone camera that images in red-green-blue (RGB) wavelengths, the bands that we capture are wide bands, and it is difficult to identify information beyond what is visually understandable. With hyperspectral imaging, we capture light in multiple narrow wavelengths which allows us to dabble into the chemistry of the image that we're capturing. So instead of telling you whether a piece of the farm is green or not, we can identify what type of crop grows there, the chlorophyll content in the leaves, the moisture in the soil, the stage of growth, and a whole host of other insights," he adds.

Hyperspectral imaging from space has the power to help with pressing issues that are invisible to today's satellites. When the team started out it would analyze satellite imagery from existing sources to find solutions to these problems, primarily pest infestation

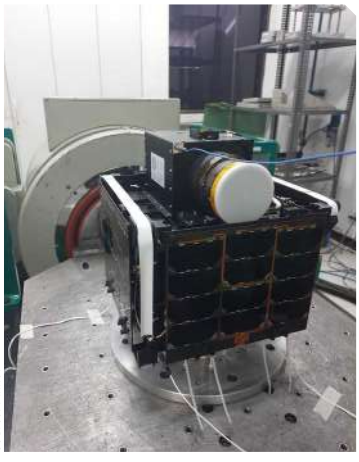
and disease detection in crops and pollution of air, land, and water bodies. "We realized that most satellite data that is available today is expensive, infrequent, and does not allow you to go beyond a certain point in a quest to finding solutions to these issues. If it is available for free or for very cheap, it's not good enough to even start looking at these solutions. This is where we felt that there was an opportunity for Pixxel to step in and build this technology," he reveals.

ANAND is Pixxel's first technology demonstrator mission and flies up with a visible and near-infrared hyperspectral camera. The idea behind the mission is to validate the start-up's satellite and camera technology and get sample image data that it can use to validate different use cases for hyperspectral imagery.

## HSI to benefit most sectors

"The hyperspectral imaging that we have built at Pixxel will be accurate, precise and in real-time, giving the advantage of targeted monitoring, localized problem detection, and hyper optimized solutions in every sector globally," claims Khandelwal.

To help the environment thrive with sustainable practices, Pixxel's hyperspectral imaging can help in mapping and monitoring forest cover; measuring and reversing deforestation; measuring climate risks such as flooding, famine and wildfire; tracking natural capital utilization and impact on future economic and ecological sustainability; detecting hazardous material and taking timely measures to curb the danger; and monitoring water resources and managing in a sustainable manner.



Source: Pixxel

Source: Pixxel

"For the Government, we see a potential of the satellite imaging in military resources and troop movement to aid with relief efforts, detect chemical seepages across land classes, monitor inland waterway health, rail-road conditions at regional and national levels," he shares.

## Overcoming hurdles

Space is an expensive field and requires access to funds. As of now, Pixxel has raised around $7.3 million in funding. Last year, it raised the largest seed funding of $5 million from established institutional venture capital firms Lightspeed India and Blume Ventures. "The funding has helped us to further execute our vision of putting up the constellation of 30 satellites in space by 2023. We are looking forward to launching the ANAND satellite by the end of this year, and are utilizing the funds that we raised to further expedite the process of R&D for our future missions. We are also upgrading our infrastructure and have recently inaugurated our facility in Bangalore," shares Khandelwal.

Pixxel is one of the first companies in the world that is looking at building commercial hyperspectral satellites. Since 2019, it has been working with customers that have the need for satellite imagery across multiple geographies. "I think where we stand out the most is in terms of accessibility and the speed with which we want to deploy our solutions. We intend to make the data through our hyperspectral imagery easily accessible and put to use in an easy manner. Finally, the growing impetus by the Government in the space tech sector is enabling private players like us to enter the market and enable change. We are quite hopeful that this is the turning point for private space in India. Liberalized regulation will play a key role in enabling innovation and allow Indian startups to compete globally," he adds.

The regulatory regime in India has also cleared up considerably since the announcement of IN-SPACe, and Pixxel has been a beneficiary of this as well when ISRO's testing facilities at URSC opened up to it for testing the ANAND satellite, shares Khandelwal. "ISRO and the team at IN-SPACe, in particular, have been extremely supportive and swift in the way they have done things, and with the new SatCom and Remote Sensing policy drafts that were out, we are optimistic about the future," he says, concluding on a positive note.

**Space is an expensive field and requires access to funds. As of now, Pixxel has raised around $7.3 million in funding. Last year, it raised the largest seed funding of $5 million from established institutional venture capital firms Lightspeed India and Blume Ventures.**


Source: Magic Wand Media

# GROOMING ENGINEERS OF TOMORROW

Umesh Pai, Managing Director, EPLAN India, offers an insight into the company's endeavor to bridge the ever-growing gap between the industry and the academia...

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Part of the owner-operated Friedhelm Loh Group, EPLAN provides software and service solutions in the fields of electrical, automation and mechatronic engineering. The company develops one of the world's leading design software solutions for machine and panel builders. EPLAN is also being acknowledged as the ideal partner to streamline challenging engineering processes.

## Working together

EPLAN is committed to developing specialist engineering knowledge right from the start. Its belief that the industry must closely work in tandem with academic institutions is based on the great rewards that have been reaped through such fruitful collaboration.

Umesh Pai, Managing Director, EPLAN India, elaborates on the company's pursuit to beef this bond, "EPLAN is closely associated with academic institutions with twin end goals. First is to bridge the gap between the industry and the academia. That the engineers coming out of academic institutions need additional training for them to be ready to serve the industry has been one of the major concerns of the industry."

The company, however, acknowledges that academic institutions work under the constraint of imparting fundamental skills needed by the industry as well as keeping abreast with the latest trends. "Hence, it's our endeavor to be that link which connects the industry and the academia," he emphasizes.

The second goal, he reveals, is assisting research students in their work by providing our tools so that they help them in their research.

## Getting students industry-ready

EPLAN's aim behind the reaching out to the academia is to help it become abreast with the latest requirements of the industry. "Our tool EPLAN has become an industry practice, which has become critical for the students to learn. We know what the industry is looking forward to and we work with the institutions to incorporate that in the curriculum," adds Pai.

EPLAN is used where Electrical Engineering expertise is in demand, ranging from the Energy, Automotive, Machine Building through to Process industries. "EPLAN is used wherever integrated processes from engineering to manufacturing are in demand. We are, hereby, making an

important contribution to implement current trends such as digitization and Industry 4.0. It's yet another reason why it's worthwhile for upcoming engineers to become familiar with EPLAN before starting career in electrical engineering," he informs.

## EPLAN Education

Developed for schools and colleges, EPLAN Education is a training concept that includes software solutions for electrical, fluid power, instrumentation, control and automation (ICA), and control cabinet engineering.

"EPLAN Education gives prospective engineers, schools and universities access to our EPLAN software solutions. Lesson plans, exercises, and written exams supplement the training concept, which is now being used at more than a thousand institutions worldwide as a training tool. You can close the gap between theory and practice and secure your progress through knowledge," Pai explains.

EPLAN Education includes a range of functions in a wide variety of disciplines and integrated data. Instructors can refer to structured lesson plans, relevant practical assignments, handouts for students and sample exam questions, including answers. Students and trainees using the EPLAN program receive a free download license for the duration of their training. The license's duration has just been increased to three years and can also be used at home for assignments, tutorials and term papers. Integrated machine and plant design ideally prepares students for starting their engineering careers.

Source: EPLAN India

"Our tool EPLAN has become an industry practice, which has become critical for the students to learn. We know what the industry is looking forward to and we work with the institutions to incorporate that in the curriculum."

**Umesh Pai**
**Managing Director**
**EPLAN India**

## EPLAN-PSG collab

PSG, in Coimbatore, is one among the foremost of institutes of national importance in higher technological education, engineering, basic and applied research. The college has established 48 Centers of Excellence in the campus in association with various leading industries. EPLAN works closely with its department of Robotics & Automation.

The program trains students on how to program and operate the latest robotic automation. The students work on EPLAN to design the automation schemes. These programs significantly enhance student learning and provide them training for real-world applications with real-world industrial robots. "As more companies are incorporating automation & robotics into their operations, the demand for high-paying careers related to design and program of automation & industrial robots is increasing," Pai points out.

The coming together of EPLAN and PSG will only pave way for the industry to join hands with the academia to help it understand its requirements and open up avenues for students in their pursuit of becoming engineers of tomorrow.

**Developed for schools and colleges, EPLAN Education is a training concept that includes software solutions for electrical, fluid power, instrumentation, control and automation (ICA), and control cabinet engineering.**

Source: Magic Wand Media


# TIMTOS 2021 ONLINE: A PARADIGM SHIFT FOR MACHINERY INDUSTRY

Organized by TAITRA and TAMI from March 15-20, TIMTOS 2021 aimed at breaking time and space constraints by seamlessly connecting exhibitors with global buyers and helping them showcase their new products through unique digital technology user experience.

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Drawing the attention of the global Metal Processing and Machinery industry, TIMTOS 2021 Online gained over 1,20,000 visits in its six-day exhibition period, with visitors from 58 countries, the top five among them were India, Japan, Vietnam, China, and Turkey. Fair Friend Group, Yeong Chin, Tong-Tai, Leadwell, Equiptop, Kao Fong, and Victor Taichung received an overwhelming response from the attendees. Five-axis vertical machine tools, CNC lathes, turning & milling composite lathes, collaborative robots, rotary tables, and automatic sanding belt grinders were of particular interest to the visitors. Organized by the Taiwan External Trade Development Council (TAITRA) and Taiwan Association of Machinery Industry (TAMI), the event gathered a positive feedback from the visitors and the exhibitors with over hundred business meetings held and set up a new paradigm for the global Machinery industry to follow in holding online exhibitions.

## New approach receiving applauds

The General Manager of Turkey-based Haksan Machine confirmed TIMTOS Online as a clear and easy-to-operate interface to view exhibitors' product information and identify potential suppliers based on the fair price and high qual-

Source: TAITRA

ity of Taiwan's machine tool products. On similar lines, the CEO of APM Trade, as a visitor, also praised the event interface, and added that he was successful in interacting with suppliers for business considerations. Other Italian visitors such as Faustino Pittori & C. srl and Duplomatic Motion Solutions affirmed the success of the exhibition as well.

## TIMTOS Glimpse and more

A highly popular series of events launched in August last year, TIMTOS Glimpse was relaunched with the theme of 'Smart Manufacturing Factory Tour' during the online exhibition period. Additional events including TIMTOS Studio for new product launches, TIMTOS Factory Live for showcasing the factories of suppliers and the 'Smart Manufacturing Summit' were also aired to help the buyers grab industry trends first-hand amid the pandemic. With the accumulated video content, a total number of viewers exceeding 10,000 will continue to spread their popularity online through the browse mode.

Fair Friend Group (FFG), a high-profile exhibitor, asserted that as global economic activities shift gears to online development, the transmission of information has turned out to be more comprehensive in terms of speed, depth and breadth. The online platform not only helps the company promote its technology and image but also helps support the FFG agents to promote its businesses in markets that have been less explored due to time and geographical limits, including Central and South America.

## Looking forward

The event provided the much-needed positive impetus and an increased boost of conference to Taiwan's Machine Tool industry while it is on its road to recovery. From March 21 - April 15, 2021, the online exhibition switched to the display and browse mode, during which the visitors could communicate with the exhibitors through text messaging function and check the Show Weekly in the online media center on a weekly basis. It is expected that the global buyers will be following TIMTOS Online and the next TIMTOS will be presented in a hybrid format merging the real with the virtual.

**It is expected that the global buyers will be following TIMTOS Online and the next TIMTOS will be presented in a hybrid format merging the real with the virtual.**

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