

E=quilibrium

VOL 59 – JANUARY - DECEMBER 16

TECHNOLOGY CREATING VALUE

Paving the way for
India's manufacturing sector



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Dear Readers,

As we enter another year my wish for all of you is the thirst for learning and excelling in all that you do. Because only if we take pride in our intrinsic abilities we can develop homegrown technologies and achieve the goal of "Make in India". Even ex-President late Dr APJ Kalam in his book has mentioned that the machine tool industry is the key to self-sustaining development of strategic sectors like aerospace, nuclear, defence, and so on.

Against this backdrop, we present the curtain-raiser theme for EQUILIBRIUM 2017 & IMTEX 2017 – "Technology Creating Value". It is a privilege to present insightful views of our valued stakeholders, in this Annual issue. **Prof N Ramesh Babu - V Balaraman Institute Chair, Manufacturing Engineering Section, Department of Mechanical Engineering, Indian Institute of Technology Madras; P Mohanram Senior Advisor - Technology, Indian Machine Tool Manufacturers' Association; Mamoru Nagasawa, Managing Director, Toyoda Micromatic Machinery India Pvt Ltd; Sonali Kulkarni, President & CEO, FANUC India and her team; Dr S Devarajan Senior Vice President TVS Motors, and his team members and of course our own Brij Bhushan, who is currently pursuing his doctorate at MIT USA. We are thankful to each one of them for having contributed significantly during the last many years to MGT's technology development story, and are continuing to do so. Last but not the least, I am very thankful to Dr K Subramanian, STIMS Institute, USA for his impeccable mentorship of our young R&D engineers over the last five years, rising early in his part of the world to review their progress through one-to-one Skype sessions.**

I thank all of you - contributors to this issue, our valuable customers and all stakeholders for your encouragement and support on this journey towards excellence.

Without much ado, I invite your feedback on this issue packed with interesting pieces and wish all of you a successful year!



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TECHNOLOGY CREATING VALUE

Paving the way for India's manufacturing sector



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CASE STUDY

Effective Collaboration

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CUSTOMER CARE - VAS

LUCAS TVS Chennai extracts more from their machine

Me After You!

Dear Readers,

Welcome to 2017! I hope it ushers in a period of prosperity, fulfilment and growth – personally and professionally.

The last six months have been very enlightening for me as I completed the VLFM* (Visionary Leaders for Manufacturing) course for Senior Managers under the guidance of Guru Prof Shoji Shiba. Ultimately, it is all about changing your approach and mindset. It is so true that “Altitude is determined by your Attitude.”

The key takeaways on how to change your inner dialogue:

- No “Me First Attitude” – Develop “Customer First Attitude”
- No “Talk Talk Talk” – Develop “Listen Listen Listen” Habit
- No “Pass the Buck” – “The Buck Stops Here”

The path to realizing this philosophy starts with a change in **mindset** followed by **action** – and this is what ensured MGT’s success at IMTEX 2015.

Looking Back, Looking Ahead

At IMTEX 2015, MGT explained its new core philosophy “In the Pursuit of ZERO,” to achieve Zero Defects, Zero Downtime & Zero Emissions, in all our processes and products. In a historical “Customer’s” recognition, MGT received orders for three new machines displayed at IMTEX 2015. MGT is adding a new DIXI JIG Boring machine and a MAZAK Laser Cutting Machine to take its precision manufacturing capability to the next level. Lastly, I want to thank all our customers, suppliers, employees and associates for the confidence and trust reposed in us. We look forward to your continued support.

Wishing all of you a successful 2017!

*The VLFM programme aims at transforming India’s manufacturing sector, and is conducted in technical coordination with Japan International Cooperation Agency (JICA), along with active support from Government of India & Confederation of Indian Industry (CII). (<http://vlfm.org/>)



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Build Your Brand

Dear Readers,

As we usher in 2017, let’s take a hard look at how we are marketing our brand in the machine tool space. B2B marketing is paradoxically overlooked, considering it can make the difference between a hard-working company and a successful one!

We at MGT believe in helping our customers build their brand. One way we achieve this is by consistently meeting with their expectations, and engaging with them at multiple levels.

Witness our philosophy at work in the upcoming **IMTEX 2017** in Bengaluru. The **Technology & Innovation Corridor at the MGT stall in the Ace Micromatic Group Pavilion in Hall 4, Stall B106** is an extension of our branding pursuit.

Here’s hoping the new year is an exciting ride for your business!



Sidhartha Dhand
Director Marketing Strategy
& Corporate Communications,
Micromatic Grinding Technologies
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And the Winner is.....

Micromatic Grinding Technologies wins the 1st Prize in the competition conducted by AOT ABKS – CUMI 5s in the Medium Scale Category for Implementing 5S Practices in the Unit.



L to R : B.Vijay Kumar, Praveen Ganachari, Sheela NN, V.Segar, Vijay Kumar D, S.Armugam

Sharing and Caring is What MGT Believes in

"MGT is a company that treats employees as family members," is the common thread that ran through the conversations we had with the company employees. Most companies have policies and initiatives in place, but after talking to three employees who've been with MGT for a long time it is clear that first come people. While it's important to adopt leading-edge technologies, the company believes it is even more important to ensure a conducive and collaborative work environment.

Dialogue with the Employees

In a freewheeling dialogue, Engineer MGT, Harish Chand (1987); Senior Manager, Technical, MGT, R K Guleria (1988) and Engineer, MGT, Sitaram (22 years) opined that the work culture is very open and supportive and provides lots of opportunities and exposure for career growth.

When Guleria met with an accident and underwent ankle surgery, the Chairman and Managing Director, Dhand visited him – this showed how much he cared for his employees. Sitaram spoke about the training programs he was sent for to and how it helped him

learn and broaden his horizon. All three agreed that colleagues were amicable, support one another and share the work. "This company is like a family. As much as you give you get," said Chand.

Last Word

Opportunities, compassion, an atmosphere where the mind can roam free – this is what the MGT employees have experienced. When a company lives up to its values the employees feel that they belong – and this sense of family and belonging is what makes MGT a great company.



L to R : Harish, Sita Ram, R.K.Guleria

TECHNOLOGY CREATING VALUE

Paving the way for India's manufacturing sector

Historically the manufacturing sector has been conservative and slow to migrate to newer systems; but in an increasingly connected world it is mandatory to adopt new trends and technologies that are sweeping across the globe. India's manufacturing sector is the mainstay of its economy and is projected to touch \$1 trillion by 2025. The government plans to create as many as 100 million skilled jobs in the manufacturing sector by raising its share of GDP from 16 to 25 percent. If the "Make in India" vision has to become a reality organizations need to undergo major transformation across their processes, by introducing new and innovative technologies. The multiple emerging technologies are: Internet of Things; Big Data; mobility; cloud; analytics; 3D and visual simulation; and mechatronics. All these technologies are creating waves of change across all industries. These technologies result in zero downtimes, improved profitability, enhanced productivity and optimized resource utilization. By connecting machines to the internet via software, data is produced and insight into the manufacturing process is gained. These machines become part of an intelligent network that can automate information and action to optimize plant floor performance. In this context, the views of five stakeholders of Micromatic Grinding Technologies are being presented. An interesting read...



Collaborative efforts
can do wonders

IIoT Creates Connectivity

Internet of Things will have a significant impact on industrial companies by providing more sensors, data, automation, and software applications, including powerful new advanced analytics that will help transform the massive amounts of data generated by intelligent, connected assets into timely, in-context information for both planning purposes and real-time decision support. There are four main parts to the IIoT: intelligent assets with sensors, processors, memory, and communications capability; data communications and infrastructure; software and analytics; and people and business entities that use the technologies for better decision making and improved business processes and models. "To manage its own shopfloor, FANUC came up with inter-connected machines," said Senior Manager-FA Sales, FANUC India, Gomtesh Ekhande. Explaining further, Manager, FA Application Vivekanand Chikale, said "FANUC developed

FOCAS - FANUC Open CNC API Specification as libraries/ drivers providing communication access to CNC data via Ethernet. To address the challenges, FANUC developed a complete solution MT-Link i. a data collection software for machine tools. MT Link i makes it possible to connect to machine tools over Ethernet, Collect data, monitor their live status, and then feed this data to the Company's ERP software easily." MT-Link i collects all data from CNC. CNC Status Signals (Cycle Running, Cycle Stopped, Emergency State, Alarm State).

FANUC's Vision for IIoT: FIELD – FANUC Intelligent Edge Link & Drive system

This is a platform which enables FANUC and MTB to create new value services using IIoT. "FIELD is both a hardware and software. It allows multiple external computing devices to be added to the plant network in a very secure manner," explained Ekhande.

FANUC is working on "Deep learning technology," which is a new wave in computing where software learns and machines reason. Soon FANUC expects this to result in intelligent robots that would understand their environment and interact with people.



Gone is the age of Internet of People which connected just people. Today we are in the age of "Internet of Things" –where anything can be connected, at any place, any point of time. As Broadband becomes more accessible and "Smart" Devices proliferate, the right platform for IIoT is emerging. It is going to transform lives and work equally."

*President & CEO, FANUC India,
Sonali Kulkarni*

Kulkarni said, "The convergence of Internet of Things and industrial manufacturing has begun. Connectivity to equipment on the factory floor is growing. This will further open the vistas to new sources of data enabling applications that can leverage this data to deliver real business value." Clearly,

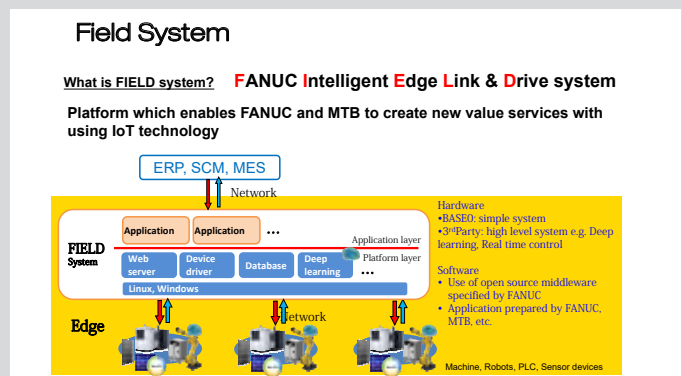
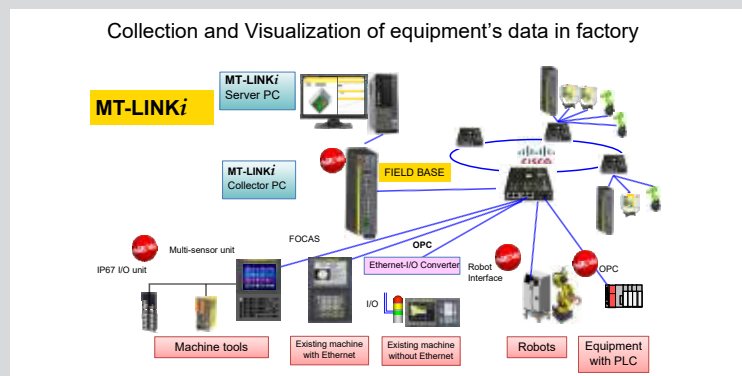
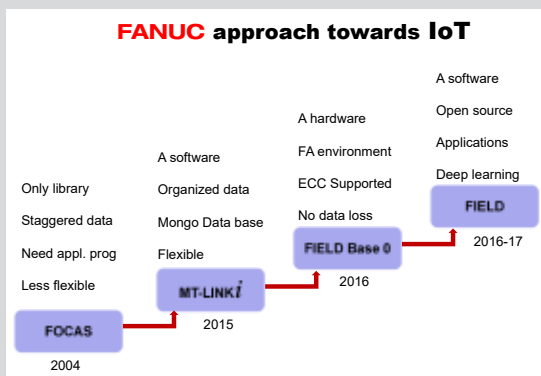
the value proposition for the IoT opportunity extends beyond simple connectivity into the ability to build new products and services and achieve competitive differentiation.

The Way Ahead is Smart

Seamless integration – between processes, technologies, best

practices and people orchestrates the entire smart manufacturing infrastructure. Standardized and well-defined business processes are a significant part of any successful and efficient business. Smart manufacturing will need to integrate all the business processes along the value chain through seamless data connection to improve productivity and ensure efficiency.

FANUC IoT ➡ **Smart Factory** ➡ **Smart Manufacturing**



Connecting Technology with the Customer

How MGT is using these latest Technologies from FANUC, Creating Value for the Customer.....

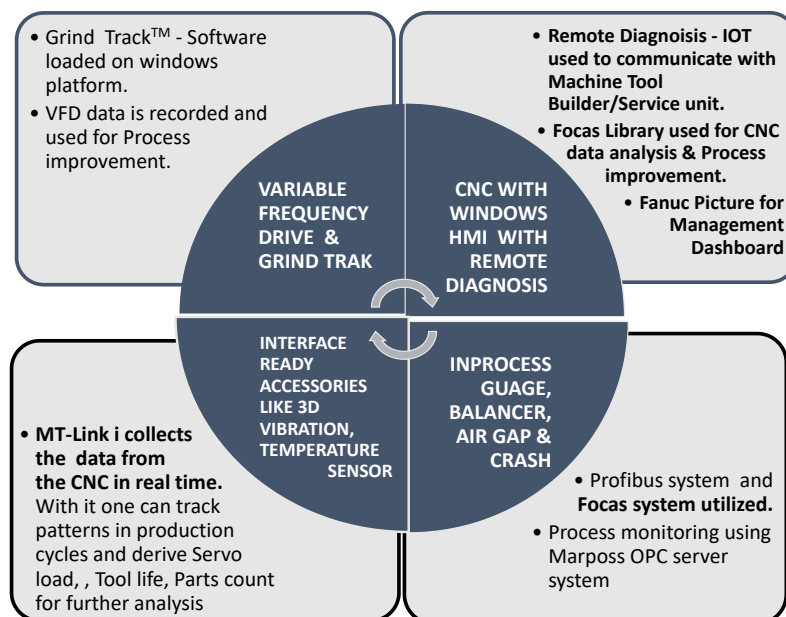
“AGI – Automation of Grinding Process Intelligence”
Project – MGT & IITM (funded by DHI-Govt of India)

The vision of this project is to gather in-process, post-process and ERP data; all the three levels of data associated with discrete parts manufacturing, and apply the principles of Manufacturing Process Science together with data science to provide a truly autonomous and intelligent solution that can optimize the efficiency and economics of the manufacturing industry. This project is mentored and guided by STIMS Institute, USA.

Mission: Industry 4.0: MGT Grinding machines should be able to help you:

- Improve part quality, reduce cost, rejection and re-work.
- Online assessment of Total cost/part specific to the machine.
- Input part quality monitoring.
- Process stability and capability improvement.
- On line calculation of wheel usage, wheel life, Dresser life, Sub-system performance - sub assemblies like wheel spindle etc.
- Predictive maintenance of machine, coolant and oil.
- Traceability of the process for critical components such as for aerospace and defence.
- Machine R&R (repeatability and reproducibility) information, MTBF and MTTR information.
- Database for performance of tooling (work holding, steady-rest, wheel, coolant) for planning of future and new processes.
- Rating of similar machines, tooling, across vendors based on line performance.
- Management dashboard

Project AGI Blue-Print



Bridging the Gap between Industry and Academia

A common complaint that one hears from employers is that “our graduates are not industry-ready.” But this scenario is definitely changing. Recently, the Indian Institute of Technology, Madras (IITM) and Micromatic Grinding Technologies, Ghaziabad jointly developed advanced grinding machine technology. The project was supported by the Office of the Principal Scientific Adviser (PSA) to the Government of India. Starting with the company’s best present product, applying a thorough scientific approach to the subject, IITM has helped the company develop a substantially improved grinding machine, with superior accuracy and productivity.

A remarkable aspect of the project, which took around three years for completion, was the close and continuous interaction between IITM faculty, technical and project staff and scholars with technical staff of the company at every stage of design, manufacturing, assembly, integration and testing. Prof N Ramesh Babu, V Balaraman Institute Chair, Manufacturing Engineering Section, Department of Mechanical Engineering, Indian Institute of Technology Madras highlighted, “Tapping the high precision machine

tool market by indigenous machine tool manufacturers mandates the incorporation of technological advancements, which would enable them to build next generation high precision grinding machine tools.” Added to this Senior Advisor - Technology, Indian Machine Tool Manufacturers’ Association, P Mohanram, “The whole program was driven by a Project Review and Monitoring Committee (PRMC) constituted by the Office of the PSA, which had renowned academic and industry members on it. This project also received guidance

and mentoring through all phases from the STIMS Institute, USA – a knowledge integration company.”

What can we learn from this?

These are the learnings, not only for MGT but for other industries as well:

Cooperative R&D is entirely possible between industry and academic/R&D institutions in India as long as everyone is focused on the same common goal i.e. advancement of academic knowledge that supports commercially viable end results.



Tapping the high precision machine tool market by indigenous machine tool manufacturers mandates the incorporation of technological advancements, which would enable them to build next generation high precision grinding machine tools.”

V Balaraman Institute Chair, Manufacturing Engineering Section, Department of Mechanical Engineering, Indian Institute of Technology Madras, Prof N Ramesh Babu



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Senior Advisor - Technology, Indian Machine Tool Manufacturers’ Association, P Mohanram

Such an approach is most appropriate for medium to long term R&D projects (3-5 years), not those requiring immediate development.

At higher reaches of technology, the scientific inputs can only be brought by academia, since industry mostly does not have the needed resources.

There are tools and resources available from facilities like AMTTF that could be deployed by the students and industry professionals. Developing such eco-system enhances efficiency and reduces the total cost and investments needed in such projects.

A structured project with System Thinking leading to clearly laid down quantified objectives stands a good chance of success.

There must be a driver each from industry and academia, who make it their personal mission to complete the project successfully.

It is essential for the industry and academic institution to continuously interact and jointly work on the project at every stage. Such collaboration also benefits from engagement of organizations such as IMTMA as well as international experts in Knowledge Integration.

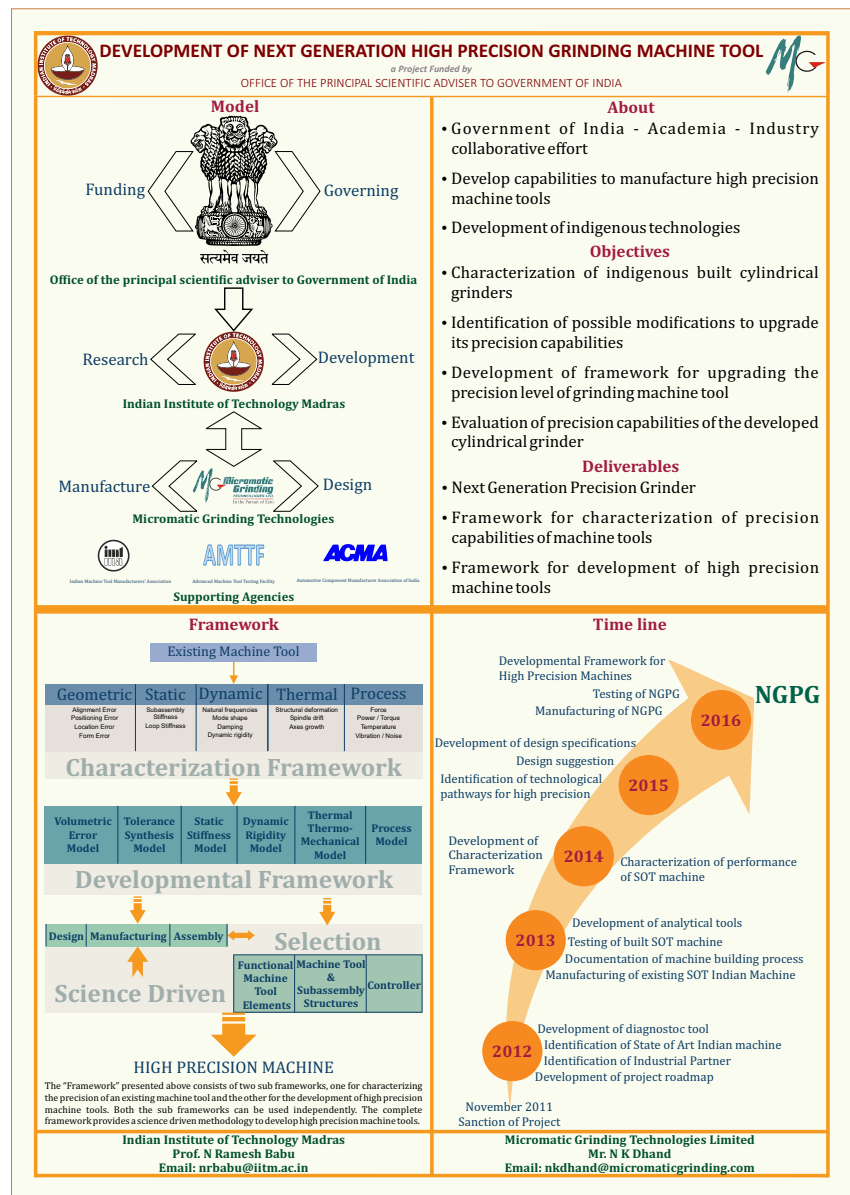
A free exchange of information and data is essential, without being worried about Intellectual Property (IP) confidentiality at every stage. This can be secured through a mutual Non-Disclosure Agreement (NDA) at the start.

If properly reviewed and

managed periodically (as by the PRMC), it is possible to complete such projects within the time and budget allotted.

It is heartening to note that the Government of India has supported 11 more such projects for the development of advanced machine tool technology at IIT Madras with the participation

of six machine tool companies. If these projects can be successfully completed and the concerned companies derive market advantage, then it can truly be said that industry-academia cooperative R&D has reached a mature stage. There is in fact no other way to develop advanced technology in India.



Herald the Latest Technology

A glimpse of unveiling Next Generation Precision Grinders (NGPG) at IIT Madras...

In June 2016, the Next Generation Precision Grinder (NGPG), an indigenous high-precision cylindrical grinder was inaugurated at the IIT Madras campus by the Principal Scientific Adviser (PSA) to the Government of India, Dr R Chidambaram. This Precision Grinder has been built made as a joint collaborative effort between industry and academia i.e Micromatic Grinding Technologies (MGT) and IITM, a project funded by PSA's office GOI. The aim was to indigenously develop the technologies to bring-out a best – in-class Hi-Precision Machine, such as Cylindrical Grinding Machine tool in the country.

There is an increasing demand for high precision equipment and components in strategic sectors like automobile, aerospace, defence, nuclear and medical. These sectors typically employ large numbers of imported grinding machines to meet their demands, due to inability of such hi-precision machines being manufactured by the Indian machine tool manufacturers. Traditionally, the development of high-precision machine tools is treated as something very complex and known only to foreign machine tool manufacturers with

specialized skills and advanced technologies. Tapping the high precision machine tool market by indigenous machine tool manufacturers mandates the incorporation of technological advancements, which would enable them to build the Next Generation high-precision machine tools.

In this project, IIT Madras generated the necessary information and knowledge to realize the precision for the grinding machine, from the existing best available from an Indian machine tool manufacturer, prepared a framework to design and analyse the existing grinding machine, and finally developed the methodology for the next generation indigenous high-precision CNC cylindrical grinder. The "Make in India" dream for the domestic and global markets is coming true.



Dr R Chidambaram Principal Scientific Advisor, Govt. of India at the Inauguration at IITM of NGPG machine, built by MGT, along with Prof Ramesh Babu, Mr N K Dhand, Dr K Subramanian & PRMC team members.



Strengthening Partnership Bonds

MGT has forged strong industrial partnerships to provide more value to the customer and JTEKT has been a partner for over a decade. JTEKT occupies a unique position being a part manufacturer that possesses the machine tool technologies and provides solutions from the customer perspective. In the words of the Managing Director, Toyoda Micromatic Machinery India Pvt Ltd, Mamoru Nagasawa "It has been 10 years since JTEKT Corporation, Japan and Micromatic Grinding Technologies (MGT) entered into a Joint Venture for manufacturing CNC Cam lobe Grinder GC20M-

25S, mainly to cater to the two-wheeler industry. The journey has been wonderful and successful; the company has manufactured and supplied Cam Grinders not only to industries in India but also to the markets in Thailand and Indonesia, keeping values and technical expertise of both JTEKT and MGT."

In continuation of the strong bond and success and as a part of "Make in India" campaign and future expansion, a new product, high-end CNC Angular Wheel Head GL4A, manufactured by MGT with JTEKT's technology is being added to cater to the industry demand for high-end

technology, enhanced quality and performance. **This new product will debut at IMTEX 2017 in Bengaluru at the Toyoda Micromatic Machinery India Pvt Ltd (TMI) stall No. I-101 in Hall No 4.**



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Managing Director, Toyoda Micromatic Machinery India Pvt Ltd, Mamoru Nagasawa



True-life Story about the Industry Academia Linkage

Students are often confused about what they would like to do or have a natural flair for and tend to have the herd mentality of following their peers. M. Brij Bhushan, while studying at IIT Madras applied to Universities in the US and was shocked to receive rejection letters. In his words, "I found that the major reason was lack of clarity of what I wanted to do, and that was clear from my application. This is when Dr K Subramanian, of the STIMS Institute, who was one of my advisors, along with Prof Ramesh Babu, for my B.Tech project - "Development of a monitoring tool for the grinding process," introduced me to Chairman and Managing Director, MGT NK Dhand, and offered me an opportunity to refine and deploy the tool in the industry with a focus on commercializing the tool and developing an application engineering team around it."

He got the opportunity to

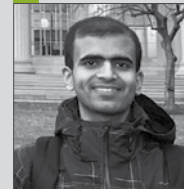
work on diverse projects, such as development of:

Grind Trak[®] and training and education of the application engineering team to effectively use this as a tool for quicker problem solving on the field; internal protocol for machine tool testing; non-round grinding algorithm and machine for grinding of non-axisymmetric parts; Grinding Process Solutions – development of a service solution offering in collaboration with STIMS Institute, USA for complete grinding system solutions. After three years of industrial experience Bhushan got admission into the prestigious MIT for his Masters in Mechanical Engineering.

His advice to young professionals is to seek out opportunities to learn. "Getting a good mentor is very important and I have been very fortunate to get the trio of Dr Ramesh Babu, Dr K Subramanian and NK Dhand. Now, more than ever, there are tremendous opportunities

to apply knowledge and skill learnt across the globe. Investing in yourself is the most important investment that you can make.

Keep learning, the best people I have met are the people who have this constant desire to learn something new that is what makes them expert in their fields over time," shared Bhushan.



I received immense support from the the top level management during my tenure at MGT. One on hand I was given the liberty to experiment with new things, on the other I received guidance to address the most critical issue."

*Brij Bhushan
Asst. Manager R&D at
MGT from 2012-15 &
now M.Tech.-PhD scholar at MIT USA*



In a fast-paced world the 3Cs are vital - communication, collaboration and convergence – of ideas, best practices and technologies industries have realized the potential of communicating via the Internet and rapid developments in sensor technology combined with embedded systems development are providing options for developing intelligence in the manufacturing process solutions..

The Backdrop

Industry 4.0 is gaining momentum in India. Many industries have realized the potential of communication through the internet and rapid developments in sensor technology combined with embedded systems development bringing many options for developing intelligence in the manufacturing process solutions. The machine tool industry is striving to keep abreast with the technology revolution.

Under the guidance of President STIMS Institute, USA, Dr K Subramanian, in Systems Thinking, the GPS has been developed as a

business practice for productivity solution for grinding applications. The unique capability of the GPS is that it is a standardized methodology using process science and in-process data obtained with a portable installer kit called GrindTrak™. This unit can be installed on any grinding machine. The easy-to-use front end software enables the customer to quickly understand and interpret the reports to arrive at possible improvements.

GPS Case Study at TVS

Evaluating the GPS business practice, TVS installed the GT in their Angular wheel head grinding machine for crankshaft component at the Scooter Crankshaft Production cell at the Hosur unit. This machine has been in production for about 6 years and is maintained under TPM standards & practices to ensure consistent >85 percent OEE. With support from MGT, the Grind Trak™ was installed on the machine and through the GPS analysis tool & software, the company generated

the plot of the power consumption during the cycle with regard to the time, through the complete Grinding cycle The essence of the GPS tool is in-process measurement of the interactions in grinding process and using the data for diagnosis. The principle behind this development is the Systems Thinking (by Dr. K. Subramanian, STIMS).

Analysing the Outcome

Following were the inferences and actions:

- ▶ Power consumption was more after dressing cycle
- ▶ Wheel to dresser interaction was more of sliding rather than cutting action resulting in size variation
- ▶ Wheel Over-lap ratio (OLP) is high and varies with the wheel diameter

The above inferences analyzed using the Systems thinking generated following actions:



L to R: Senior Vice President, TVS Motors, Dr S Devarajan GM-PED, TVS Motors, Ramesh Ramachandran

Case Study

- ▶ Increase dressing feed rate to promote cutting action and space for chip release.
- ▶ Program to link dressing feed rate to Wheel diameter to maintain constant Over-lap

- ratio (OLP)
- ▶ Single pass dressing cycle

Return on ROI

Through this analysis the company optimized the cutting parameters

in grinding cycle, to significantly reduce the quality issues of size variation and taper on diameter. Also they gained a cycle time saving of 20 percent through the optimization. The company realized a productivity increase of 23 percent in the cell and with an annual power cost saving of Rs.7.5 lakh for 2 machines.

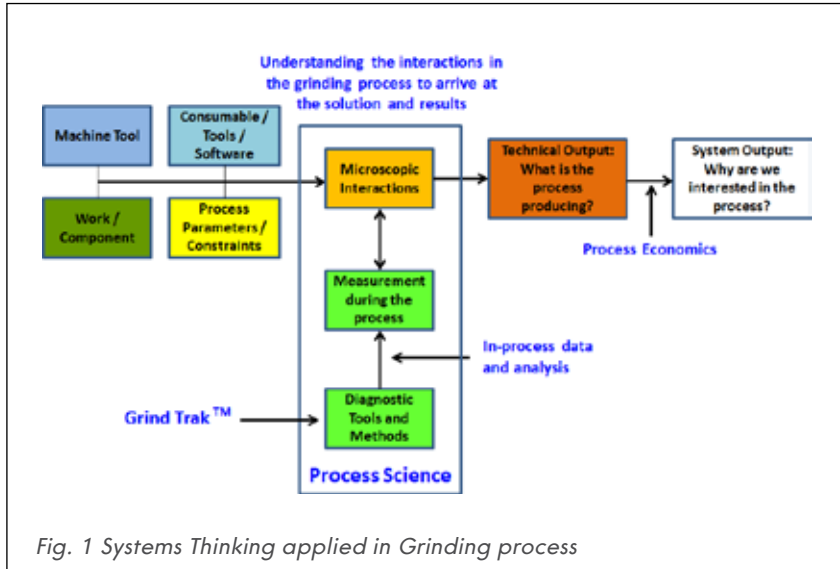


Fig. 1 Systems Thinking applied in Grinding process

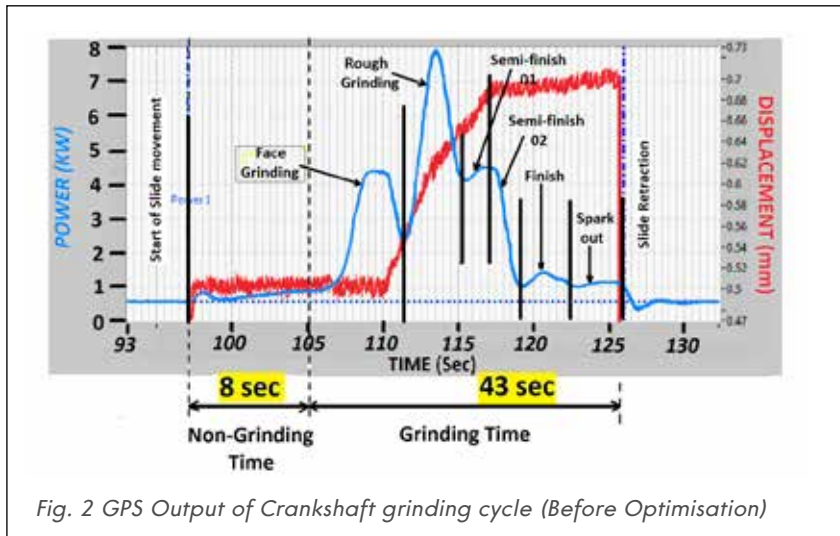


Fig. 2 GPS Output of Crankshaft grinding cycle (Before Optimisation)

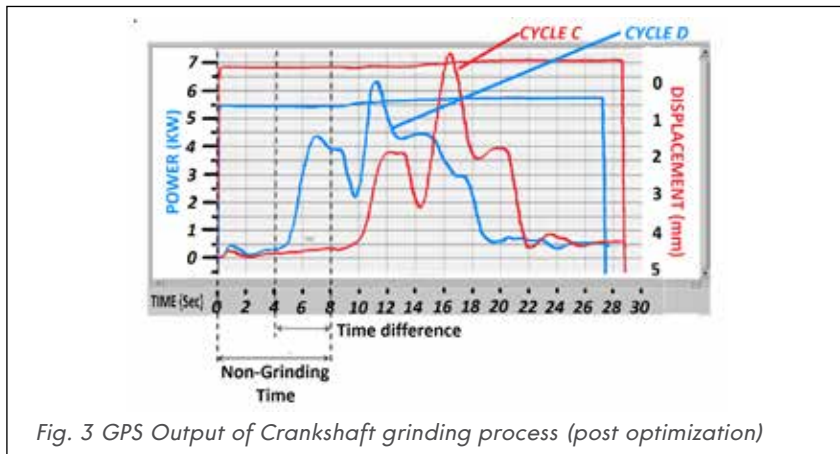


Fig. 3 GPS Output of Crankshaft grinding process (post optimization)

Collaborative Synergy

Measurement tools like GrindTrak™ and business practice like GPS will facilitate the data capturing of processes and support in problem diagnosis and solutions. Algorithms can be made to use this data and build intelligent systems for Grinding machines. This will make the machines self-diagnostic and send proactive signals & communication to maintenance & engineering teams for improvements needed in the machine to restore performance. The GPS as a business practice requires active collaboration between TVS, MGT and the STIMS Institute by bringing together the knowledge from every partner in a synergistic manner.

Work towards remote capture of in-process signals and the automated analysis of such signals is now in-progress under a project titled: Automation of Grinding Process Intelligence (AGI). This project is being carried out collaboratively between the industries and IIT – Madras. This is part of the industry / academic consortium called Next Generation Manufacturing supported by the DHI and IMTMA.

Enhancing Productivity the MGT Way

Micromatic Grinding Technologies (MGT) manufactures a wide range of External, Internal, Universal and special purpose cylindrical grinders in CNC, PLC and Hydraulic versions to the exacting requirements of its customers from its plants in Ghaziabad near New Delhi. Their customers range from Bosch, Rane, Tata Motors ...and the marquee list goes on.

CAM Profile Grinding on a MGT Standard Cylindrical Grinder

The objective was to provide CAM grinding capability in a standard cylindrical grinder, with no special configuration and development cost. This was achieved by off-line simulation of CAM profiles, special work driver to ensure exact orientation and confirmation of orientation repeatability. The results proved that the MGT approach was correct & for the first time in MGT history, CAM profile grinding capability was proven on a standard cylindrical grinder, and the profile accuracy was also fairly high!

CAM grinding in MGT Std Cylindrical grinder



Component: CAM Shaft

Machine tool	
Model	SM-120 SWH CNC
Work holding type	Between centres
Wheel head	HYDRO DYNAMIC

Grinding Output



Increasing Productivity

The target was to achieve better quality but with reduced cycle time of 35 secs (including dressing and grinding time). The same component is being produced at 55 secs on MGT's old machines. With proper tooling and optimizing the process parameters, **productivity increased by 60 percent**, quality parameters and higher surface finish were achieved, and dresser life increased.

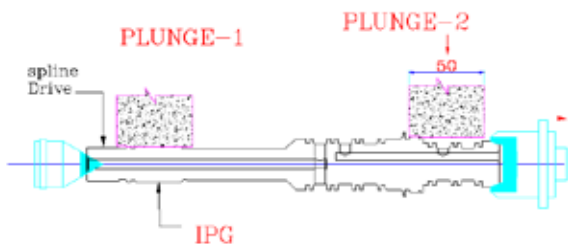
Productivity improvement



Component: Turbine Shaft

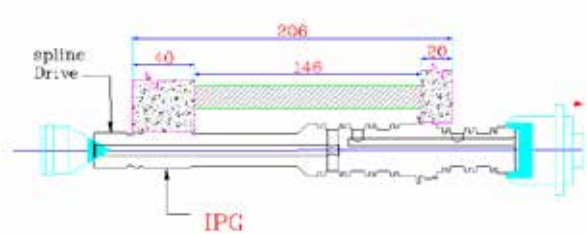
Machine tool	
Model	SH-40
Work holding type	Between centres
Wheel head	Antifriction

Earlier Grinding process



Modified Grinding process

Single Plunge - Productivity Increase by 60 %



Reducing Target Cycle Time

The goal was to achieve better quality but with reduced cycle time of 25 secs. Same component is being produced at 37 secs on machines of other brands. With proper tooling and optimizing the process parameters, **productivity increased by 35 percent** and the total parts produced per shift was 600 compared to the earlier 400.

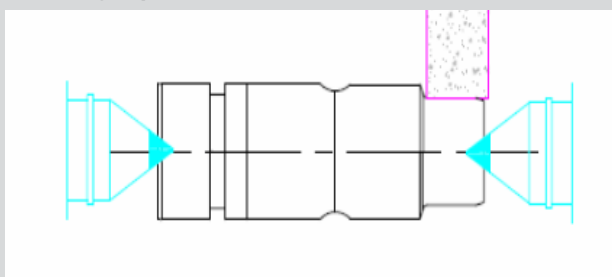
Productivity improvement



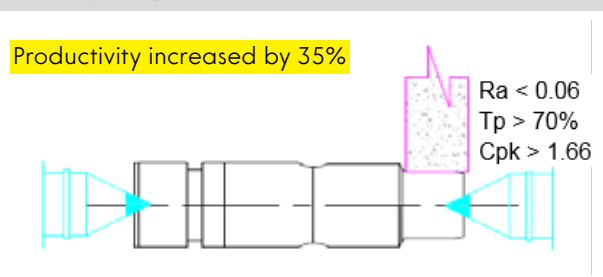
Component: Spool

Machine tool	
Model	E-Grind 200
Work holding type	Between centres
Wheel head	HYDRO

Grinding Input



Grinding Output



Understanding the Voice of Customer

EATON Ahmednagar places orders for four new centreless grinder machines



TATA Motors Pune gets Reconditioned machines from MGT



Contented with refurbishing of imported centreless grinder machine Eaton placed orders with MGT for four new machines. Valve stem grinder is a very high-precision requirement. It is mostly manufactured by top-end machine tool builders from Europe and Japan. Eaton had four such unused imported machines. Due to unsatisfactory performance, the machines were idle. **The company challenged MGT to refurbish the machines and bring at par with the new machine requirements.**

Aside from overcoming the challenge, MGT exceeded Eaton's expectations in delivering results and bagged orders for four new machines from Eaton post refurbishing.

Parameter achieved	Required	Achieved
Roundness	5 Micron	2 Micron
Circularity	10 Micron	2 Micron
Cycle Time	7.2Sec(Including Load & Unload)	6.5 Sec
Ra	0.2	0.15

Due to multiple issues, such as unsafe machine conditions, chattering marks on OD and face, size variation and poor surface finish the company reconditioned the equipment with MGT's GCE 350x500 CNC.

Tata Motors wanted to recondition the machine to original accuracy standards; tool it up for an additional part requiring different set of tooling; prove-out cycle time & Cpk requirements for both original as well as new part and make it safe for the new environment.

Overwhelming Results

The below results achieved post reconditioning & retooling overwhelmed the customer. (Multi-dia. Gauge & 2 sets of Active Flagging on the Wheel Head added to perform flagging of both type (LH, RH) of components)
 OD size within 5µm
 No Chattering marks on OD and face
 Ovality within 2µm
 Surface finish Ra 0.4µm
 Cp/Cpk 1.67 achieved
 Safe Guarding – complete covered enclosure

LUCAS TVS Chennai extracts more from their machine



The company's objective was to increase productivity and quality on their GCE260x400 (4093) machine through consistent dressing operation and reducing set-up time. MGT evaluated the requirements and studied the existing process to arrive at a solution. The MGT team assisted Lucas TVS with sub system fitment on site, electrical interfacing, operational trials as well as training the operators on the new system.

Thus, the customer could deskill the grinding wheel dressing operation in addition to eliminate operator fatigue - the system is easy to operate at the push of a button. It comes with a variable dressing speed option and allows for grinding wheel dressing without removing the grinding job, thus achieving reduction in set-up time by 28 percent.

Thanks to the reconditioning, the client was able to achieve a dresser longitudinal traverse rate of 160-180 mm/min, a 0.035 mm depth of cut for coarse dressing (on dia), while the same for fine dressing up to 0.015 mm with a minimum dressing infeed of 0.020.

Parameter achieved	
Dresser longitudinal traverse rate	160-180 mm/min.
Depth of cut for coarse dressing (on Dia)	0.035 mm
Depth of cut for fine dressing (on Dia)	0.015 mm
Minimum dressing infeed	0.020

Reaching Out to Help Others



While the company strives for excellence, it also shoulders civic responsibilities and helps the community. CSR is about accountability and an obligation to make a measurably positive impact on society at large; and this MGT is conscious about.

Because only if you care about overall development can the company thrive on customer goodwill. CSR is more about giving than getting – and that is the company’s maxim.

MGT Builds Awareness and Helps Chennai Flood Victims

Women and children, including those with special needs received adequate attention and encouragement through various awareness camps. An awareness generation camp was organized in Sadarpur village on the “Socio- economic Condition of Women.” An “Environmental Sanitation Rally” was organised at Rahispur and Sadarpur by the children of Balwadi and Government School.

On the MGTB Founder’s Day, sweets were distributed at a school for specially abled children in Dobaspet and an orphanage at Solur.

On the World Environment Day, employees of MGT planted trees for a greener world. Because the company realizes that only if the environment is nurtured and preserved can we lead healthy lives. Destroy nature and you destroy man.

During times of crisis, like the Chennai floods, MGT was at the forefront helping those in need. The company takes pride in sharing philanthropic activities of its members such as Senior Engineer PED, Nilanjan Deb who has been associated with a socio- cultural foundation called Prakriti and actively engaged in providing relief to Chennai flood victims.



“Socio-economic conditions of women”, Women of Village Sadarpur, Dist. Ghaziabad UP, attending an Awareness Generation program.



“Environmental Sanitation Rally” by Children of Balwadi & Govt. School Rahispur & Sadarpur villages, Ghaziabad.



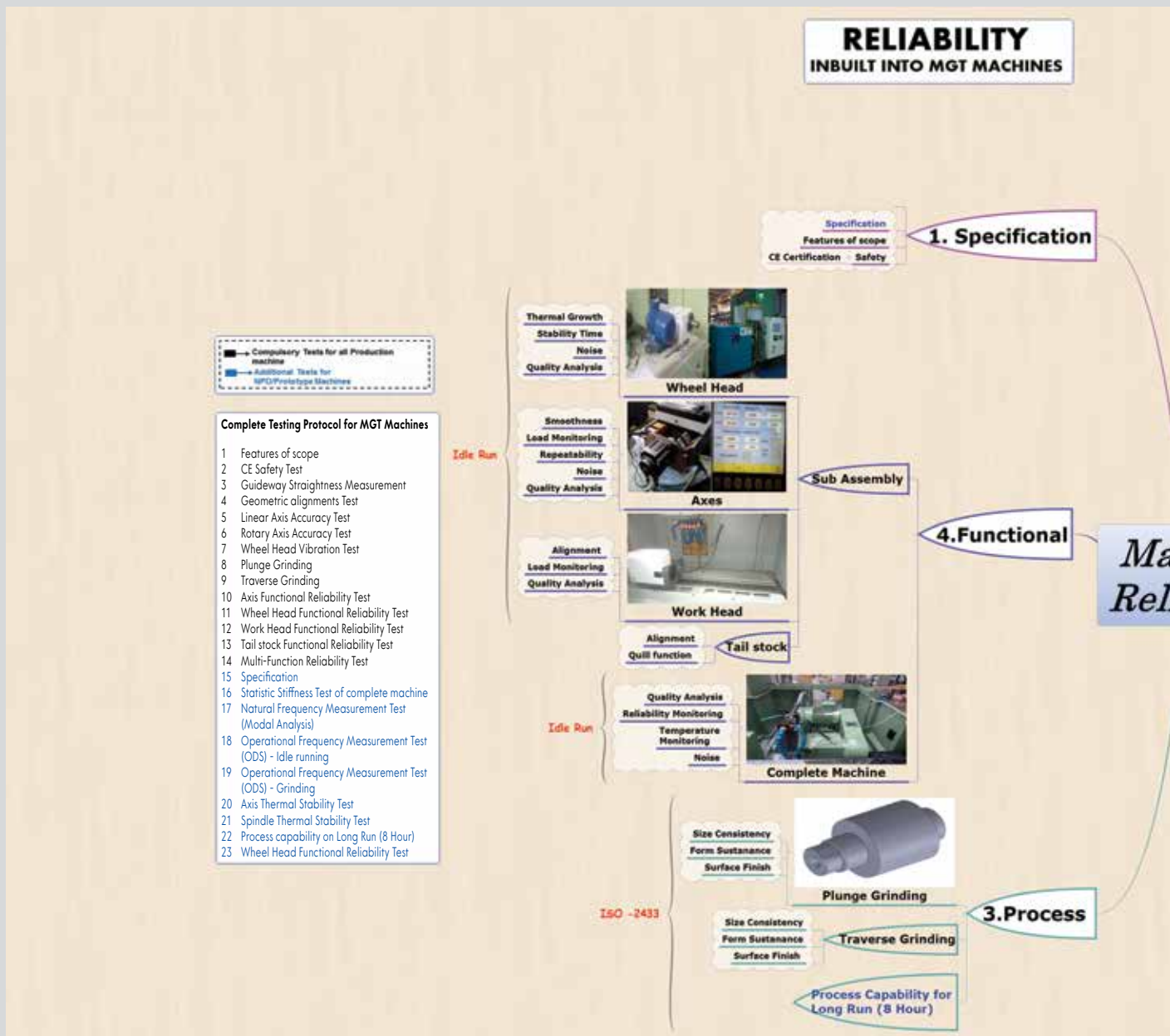
“Well-Baby Show” at Village Rahispur, Ghaziabad where general health, Immunization records etc. of 60 children in the age group 0-18 months were examined by qualified doctors. Prizes given to the Best Well-Baby’s & their mothers.



“Blood donation--37 members donated 37 units of Blood on MGT Bangalore Unit’s Founders Day on 1st Nov. 2016”

Reliability is the corner stone

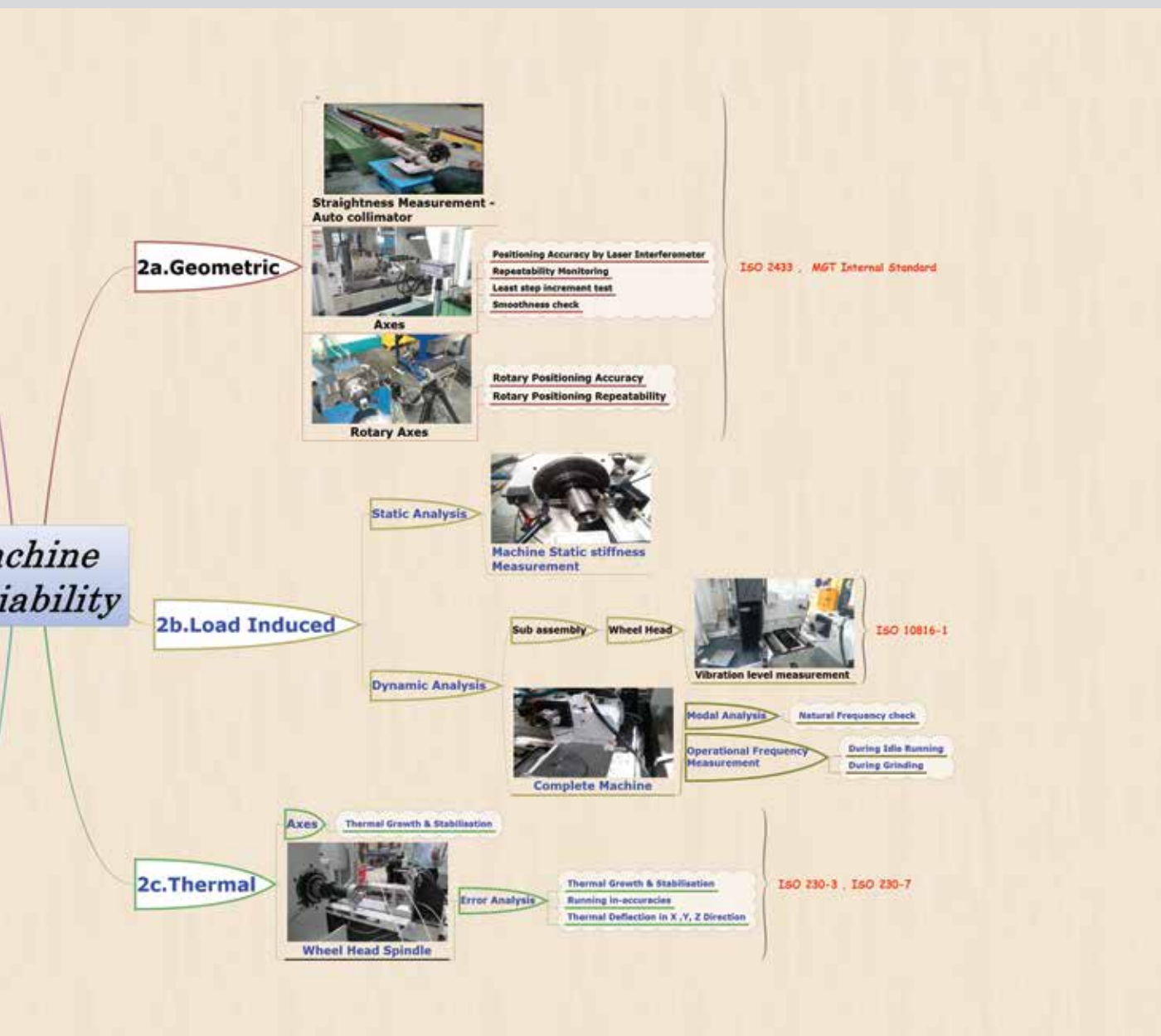
In the last edition of IMTEX, MGT committed itself to the philosophy of, "In the pursuit of zero" - zero defects, zero downtime, and zero emissions. Following this philosophy MGT has adopted new Reliability Test to enhance productivity and deliver error free results. This philosophy has been guiding all its endeavours, including product innovation. The newly launched high precision grinding machine in collaboration with IIT Madras bears testimony to this.



Micromatic Grinding Technologies & IIT Madras jointly developed the Next Generation High Precision grinding machine NGPG in 2016. Testing at every stage was carried out by an independent agency, Advanced Machine Tool Testing Facility (AMTTF).

A very valuable bi-product has been learning a systematic way of "Qualifying a Precision Machine Tool", which has resulted in MGT's new "Machine Testing Protocol". All MGT machines are characterised mainly into four modules (refer chart) and all these tests are being done according to ISO-International standards.

Whenever we build a new machine model now, the prototype passes through all the tests shown below to ensure that the physical prototype adheres to the design intent and high reliability standards expected. Equally, now all our production machines also undergo 14 compulsory tests to achieve the Zero downtime through the new, "MGT Reliability Test standard".





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