Micromatic Grinding TECHNOLOGIES LTD.
In the Pursuit of Zero

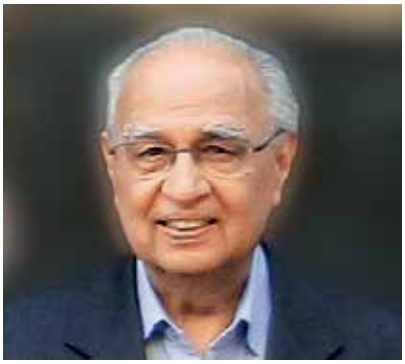
Equilibrium

VOL 61 – JULY - DECEMBER 17

CREATING AN ECOSYSTEM FOR INNOVATION

Ace Micromatic Group
www.acemicromatic.net

Great Time for Great New Beginnings



NK Dhand
Chairman
Micromatic Grinding Technologies Ltd (MGT)
nkdhand@micromaticgrinding.com

The McKinsey Quarterly's analysis predicts India's manufacturing sector to grow six-fold by 2025, to $1 trillion, creating up to 90 million domestic jobs. It's a rosy picture which can only turn true after some serious efforts.

The present reality, however, sees the manufacturing industry of the country at a crossroads. While on one hand it is flooded with a myriad opportunities to deliver manufacturing technology to rapidly developing industries. On the other, our machine tool builders still need substantial improvements in the areas of productivity, precision and reliability.

The need of the hour, therefore, is to close these technology gaps with the elements that provide performance edge to foreign machines, leaving no alternative for the Indian Industry but to expend time, resources and manpower on R&D.

On a brighter side, the situation has been acknowledged with the government and the academic institutes joining hands with the industry. This collaboration has already yielded results. **Precigrind™, is a Next Generation Precision Grinder capable of sub-micron tolerances and is now commercially available.**

The Department of Heavy Industries, GoI, is supporting one of the important technology elements, Hydrostatic Bearings through an IITM project with MGT as its industrial partner. Automation of Grinding Intelligence (AGI) is MGT's another R&D project in the Industry 4.0 genre with IITM.

The Advanced Manufacturing Technology Development Centre (AMTDC) is the new Centre of Excellence in manufacturing setup at IITM which the department supports. 11 R&D projects related to machine tool technology are being sponsored by seven machine tool companies at the Centre.

It's never too late to mend. Hence, in spite of fretting over the delay in resolving issues at the core, let's celebrate the fact that we have started taking heed of what's needed of us to become the manufacturing hub that we aim for.

On this optimistic note, I welcome the new year and wish all our customers and stakeholders constructive beginnings and a fulfilling 2018!

Cheers to a New Chapter!

Kapil Dhand
Managing Director
Micromatic Grinding Technologies Ltd (MGT)
kdhand@micromaticgrinding.com

Dear Readers,

The year 2017 was an unprecedented one in every sense of the word. While it's great to linger on the big touchstones, it's often the little things that teach us lessons and leave a lasting effect. For MGT, the past year was stupendous but the highlights, definitely, are the reforms that brought us the laurels.

It was IMTEX 2017 at Bengaluru that set the ball rolling by fetching us 9 orders during the exhibition itself. This was, by no means, a mean feat. In fact, it came as a fresh breeze of change after 4 long years of stagnant growth in the industry. The effects of the new policies brought in by the Government had started making impacts industry-wide, with MGT being no exception.

The demand peaked so fast that even Japanese suppliers of critical parts defaulted on deliveries and caused the loss of tremendous opportunities. This led us to realign our focus, question the status quo, shed old assumptions and step outside of our comfort zone.

And hence a productivity improvement team called **"Vijay-Rath"** was formed on the shop floor to cut any non-value adding work in the assembly process. A new tool, **MPP (Master Procurement Plan)** was initiated to align the supply chain with assembly requirements and centralize the planning at MGT - HO. To improve managerial effectiveness, an HR initiative for leadership development of 20 managers called **PARIVARTAN 2018** was undertaken.

All this was done while we continued creating new milestones on various domestic and international fronts.

MGT co-developed indigenous special purpose grinders with its key customer, Sriram Pistons and Rings Ltd for the latter's ring grinding applications. The export front saw us bagging the largest number of orders in history in terms of value. Our global reach continues with our newly-developed **High Precision CNC Universal Grinder - the FLEXI 400** - which will be exhibited at the GRINDTECH exhibition in Augsburg, Germany, from March 14-17, 2018.

The year passed by opening up new avenues and enlightening us on the right measures to drive in success for us and for you, our associates.

With the promise to continue with the same vigour and spirit, we, at MGT, wish you "every success in your journey of progress". Let us push ourselves to bring forth our best version possible!

CONTENTS

IMPRINT

Published by
Micromatic Grinding Technologies

Printed by
Repromen Offset Printers Pvt. Ltd., Bengaluru

Content & Design:
Magic Wand
Excellence is a habit!

Creating an Ecosystem for Innovation

MGT is working very closely with IIT – Madras, IMTMA, AMTTF and STIMS Institute, USA – entities that have a common goal – in its pursuit to build an ecosystem ideal for developing a skilled workforce, imperative for innovation and growth.

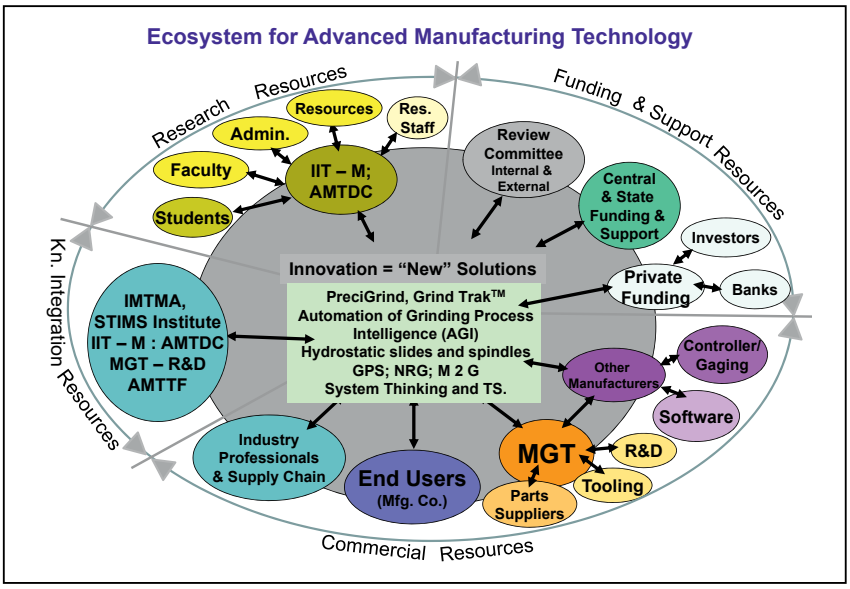
Ever wondered why some industries flourish in some countries more than others? This is not a mere coincidence; a group of companies and academic researchers are required to develop and sustain an innovation and new products and services emerge as a result. Many top universities in the world are surrounded by startup companies. They also actively support large and small established companies. If you look closely, they are connected by a set of core capabilities. We can call such a network of resources an ecosystem based on common core capabilities.

MGT has been involved in the development of such an ecosystem with institutions such as IIT – Madras and organizations such as Indian Machine Tool Manufacturers' Association (IMTMA) and Advanced Machine Tool Testing Facility (AMTTF), with Dr K (Subbu) Subramanian, President, STIMS Institute, USA, acting as a catalyst. "There are many with knowledge and experience necessary for a new solution. But they remain in isolated pockets. Integrating all these bits of knowledge is essential for the ecosystem development," says Dr Subramanian.

Teaming up to innovate

STIMS Institute, along with MGT, IMTMA and IIT – M, has been offering a course on "System Approach for Grinding Processes" for several years. Engineers, trained in this manner, are today working in many industries. They can extend their knowledge, together with MGT engineers, to bring data-driven solutions using in-process signals, to address shop floor grinding process problems. This approach for knowledge integration and ecosystem development has resulted in the new MGT machine – PreciGrind™, which can achieve sub-micron level geometrical tolerances e.g. roundness, straightness, cylindricity, taper etc. Such capabilities are required as the auto manufacturers shift their engine production to meet the more stringent emission standards of the near future.

There are many new solutions evolving result of such active collaboration and ecosystem development. "Every commercially viable industrial innovation requires many players and their collaboration dedicated to a common end goal. We are pleased to see such ecosystem evolving in India with many specific identifiable outcomes. This would not have been possible without the relentless effort and commitment by NK Dhand, Chairman, MGT; Prof Ramesh Babu, Department of Mechanical Engineering, IIT – M; P Mohanram, Senior Advisor – Technology, IMTMA and others," says Dr Subramanian.



Innovation ecosystem fostered by MGT and its partners

Development of Hydrostatic Slides and Spindles

The advantages offered by hydrostatic bearings make them an essential technology required for multiple applications. Hence, the teams at MGT are striving towards developing hydrostatic slides and spindles and integrating them into a grinding machine by the end of 2019.

Hydrostatic bearings are fluid film bearings, i.e. at no point do the solid surfaces make any physical contact. This means that the thin fluid film separating the surfaces is always larger than the height of any surface irregularities, and as a result these bearings provide very low coefficient of friction and virtually no wear through the life time of operation. A schematic of hydrostatic slide is represented in Figure 1.

In machine tools it is important that the bearings are not subject to wear, which otherwise makes them impossible to maintain close machining tolerances and production rate. Wear also reduces the resistance to chatter in metal cutting.

Advantages of Hydrostatic bearings

As compared to mechanical bearings, Hydrostatic bearings have:

a. Very low friction
b. Excellent stiffness and damping properties
c. Allow high precision positioning and control
d. Virtually infinite life. No wear due to the presence of oil film between the solid surfaces
e. Quieter operation

As compared to Hydrodynamic bearings, Hydrostatic bearings are independent of spindle speed and can retain their properties of low friction as well as high load carrying capacity even at low speeds. Vis-à-vis the recent Aerostatic and Magnetic bearings, Hydrostatic bearings offer better damping properties and load carrying capacities.

Regularly being used by foreign machine builders, such bearings are yet to be commercialized by Indian machine tool builders. MGT, IITM and AMTDC (Advanced Manufacturing Technology Development Centre) are working together to develop this technology and bridge the gap of almost three decades. Since the project inception in early 2017, MGT team has designed a prototype hydrostatic slide and integrated into a grinding machine. **The IITM-MGT team is now working towards developing a test rig for evaluating different flow control technologies.** They have also started working on developing a hydrostatic spindle.

The combined advantages offered by hydrostatic bearings in terms of high load carrying capacity, low friction, and vibration damping make them an essential technology required for multiple applications from high speed machining and non-round grinding to mirror-finishing and ceramic grinding etc. Making use of them, as the end objective, the teams at MGT are striving towards integrating an indigenous hydrostatic slide and spindle into a grinding machine by the end of 2019.

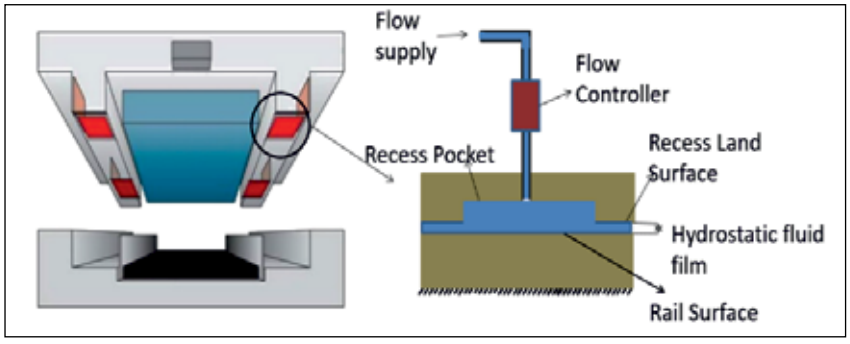


Figure 1: Schematic of a typical Hydrostatic Slide

Figure 2: Test Rig for evaluating different flow control strategy

Workforce Development: A Labor of Love

MGT has been concentrating its efforts to develop a manufacturing workforce of the future, which will be equipped to fulfill the larger needs of the present century's manufacturing. This requires a lot on the part of the workforce and also on its creators.

NK Dhand, Chairman, MGT and Dr K (Subbu) Subramanian, President, STIMS Institute, USA, with the R&D / UNS team at MGT, Bangalore.

Manufacturing workforce development is the often talked about subject. Generally, it is assumed that the development of workers at factory floor is possible when they have specific skills to operate machines. While that is needed, it is a far cry from the larger needs of the 21st century manufacturing. The future workforce for manufacturing must be system thinkers capable of identifying a need, developing that into a solution and implementing the same. They should be capable of diving deep with the necessary technical and scientific knowledge when required as well as of addressing the broad array of engineering and management issues as needed. **Dr Subramanian describes them as "System thinkers with Transformational Skills".**

Creating Unique New Solutions

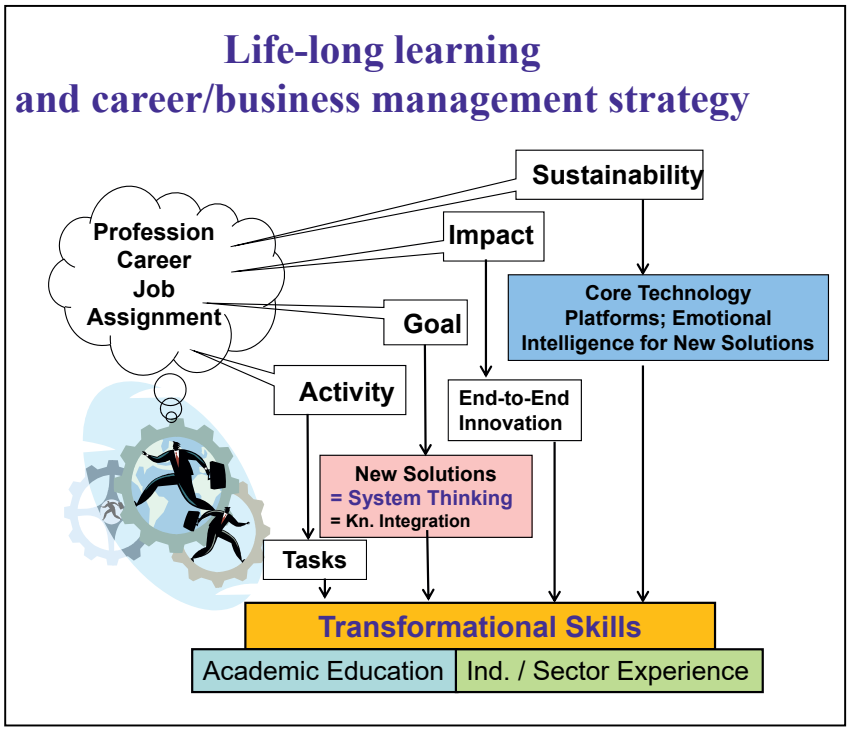
MGT has been engaged in developing such workforce of the future through a small group of young and talented engineers. This group is identified as the R&D team. In reality, each of them is

made in charge of projects to create Unique New Solutions (UNS) where they have to develop and implement commercially viable solutions. Very quickly, they learn that along with such opportunity comes the responsibility. They understand that in-depth technical knowledge is very important, like a seed. Yet, it requires so much more to grow a tree out of it and harvest fruits. They also learn the key role of data-driven analysis and decision making along with critical skills for project management. Similar efforts for project-based learning are also in progress at the Advanced Manufacturing Technology Development Center (AMTDC) at IIT – M. The R&D team at MGT works very closely with the students and engineers at AMTDC.

Prof Ramesh Babu, Department of Mechanical Engineering, IIT – M and Dr K (Subbu) Subramanian, President, STIMS Institute, USA, mentoring students and research staff at the Advanced Manufacturing Technology Development Center (AMTDC) at IIT – M.

Mentors bring out the best

To accomplish all of this also requires a deep and personal commitment by mentors with years of experience in the innovation space. Dr Subramanian and Dhand meet with the MGT team every week in person and through Skype. **These meetings or routine reviews are crucial to challenge the young minds for critical thinking and also to fine tune their strategic alignment and project management skills.** Similar on-going efforts at the AMTDC by Prof Ramesh Babu of IIT - M challenge the young researchers to develop industrially relevant solutions. "Industry relevant manufacturing research is more than computer modelling, fabricating test cells or conducting experiments. It requires constant engagement to blend science, engineering and strategic thinking as inter-disciplinary skills. Such education is possible only through real life projects, where innovation is seen as delivering commercially relevant and working solutions. Fostering such workforce is a labor of love," says Dr Subramanian.



Lifelong learning strategy for innovation and career management

Automation of Grinding Process Intelligence

MGT and STIMS Institute have been providing science-based process engineering education to improve grinding processes at factory floor as well as through new machine tool solutions offered by MGT. To further enhance it, the duo have collaborated with AMTDC for a project that is being funded by the Department of Heavy Industries, GoI.

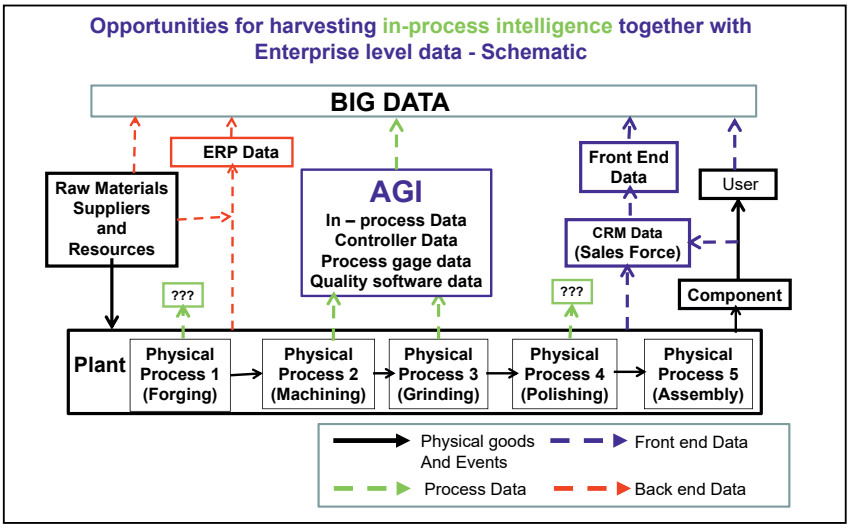
Manufacturing activities can be broadly divided into two categories: Physical Processes and Information Processes. Their organized deployment resulting in goods and services is noted in the diverse range of manufacturing activities. In the past four decades, the information processes have been heavily leveraged through many advancements and developments in IT-driven solutions. These include many supply chain solutions, ERP tools, etc. The physical processes such as grinding have been largely dealt with as a "black box" amenable for statistical solutions.

A limited number of process engineers help to keep the physical processes under control and leverage maximum value out of them. Their knowledge is largely empirical and experience-based. Recently, MGT and STIMS Institute have been providing science-based process engineering education. This is being extended to improve grinding processes at factory floor as well as through new machine tool solutions offered by MGT. While successful, these efforts are very limited compared to the larger needs of the industry. Manufacturing 4.0 and leveraging in-process signals through IoT requires further solutions. To that end, MGT, together with STIMS Institute, is working on a project titled "Automation of Grinding Process Intelligence (AGI)". The project is funded by the Department of Heavy Industries, GoI, and is being carried out in collaboration with AMTDC at IIT – M.

Objective of the project

The objective of this project is to develop searchable database tools to describe each grinding process application as a system along with automated processing of signals obtained during the grinding processes and use rule-based algorithms for guidelines for problem solving and process improvement. **The intent is to bring the science of grinding actively applicable for shop floor manufacturing.**

Initial work will start with automation of signal processing, feature recognition and rule-based problem solving using grinding power as the signal source. Then the methodology will be extended to all in-process digital signals available, including those from gages and controllers. The ultimate goal is to implement analytics and Artificial Intelligence (AI) tools to gain further from process intelligence. Today, such analytics are limited only for supply chain data as well as sales or customer relations-driven data sources.

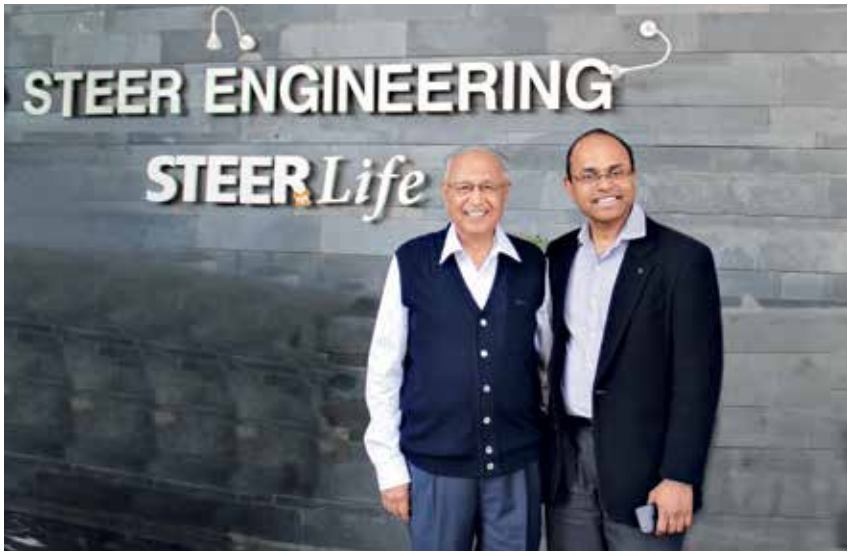


AGI Project Frame Work – Schematic.

Facing Challenges Head-On

Overcoming challenges with a panache is a skill MGT has honed in its journey spanning decades. A brief account by Dr Babu Padmanabhan, Managing Director & Chief Knowledge Officer of STEER Engineering Pvt Ltd, whose special requirements were fulfilled with great success by the company.

"The work that MGT has been doing with IIT Madras in precision grinding and the understanding that is developed by this industry-institution collaboration and the fact that a systems approach is always taken to have a comprehensive and complete solution is a major strength of MGT," says Dr Babu Padmanabhan, Managing Director and Chief Knowledge Officer of STEER Engineering Pvt Ltd.



(L-R) NK Dhand, Chairman, MGT, with Dr Babu Padmanabhan, Managing Director & Chief Knowledge Officer, STEER Engineering Pvt Ltd.

Major challenges in the STEER project

Acknowledging MGT's forte in grinding, STEER Engineering approached the company with rather special needs which could have been impenetrable barriers to others but for MGT, they were obstacles meant to be overcome with innovative solutions. The challenges in the project were:

- Implementing for the first-time machining to grinding (M2G) i.e. replacing conventional machining processes with only grinding applications;
- High stock removal almost 30 mm diametrical stock as compared to a typical stock of 0.3 – 0.8 mm;
- Achieving high material removal rate (mrr') of 8-10 $mm^3/mm/s$ as compared to typical mrr' of 3-4 $mm^3/mm/s$ used in most grinding applications;
- Tough to grind work material (tool steel with high carbide content);
- A large number of component varieties, dia mm x width mm, from 20x8 to 200x40;
- Tool path generation for complex shape of the components;
- Rapid slide movement to trace the out-of-round profile of work components;
- Creating a system or a machine which addresses all the above points.

STEER Extruder Components: Fractional Kneading Elements

Source: STEER Engineering Pvt Ltd

MGT had a solution

"In this project, MGT's experience at innovating through a thorough understanding of the process and machine building was of high value to create the necessary changes and the incorporation of elements into the machine such as linear motors, extremely special guide ways and so forth," adds Padmanabhan.

"The challenge in the Non-Round Grinding Machine was the response time for the axis to move and it was the matter of getting so many elements - the controls, the machine dynamics, the program algorithms - together and MGT's experience in creating meaningful innovation that saw the quick progress and completion of this difficult task," he concludes.

Harnessing Young Talent for Innovation

MGT has been giving fresh engineering graduates an ideal platform to unleash their potential. With the varied industrial experiences offered by the company, the young engineers not just shed their apprehensions, they blossom out with the requisite skill sets, know-how, confidence and an iron will to be the next-gen entrepreneurs.

It's immensely tough going through the grind of engineering. But rather than emerging as winners having finished a couple of gruelling years, young engineers often find themselves clueless as to what next. The recruiting companies take them in, not taking into account their core competencies, but the number and the kind of vacancies to be filled.

A few companies like MGT have taken notice of this and are doing all things possible to offer the budding engineers the right guidance and skills that they must learn and hone. MGT presents to them varied industrial experiences that require them to be in charge, handle projects in teams and take decisions independently.

The company, in return, gets benefited by their fresh spark of curiosity and inventiveness. The result is a win-win situation that ushers in a new perspective on things and innovation.

MGT's initiative

MGT has been developing the future workforce through a small group identified as the R&D team, where each of the team members is made in charge of projects to create Unique New Solutions (UNS) and develop and implement commercially viable projects. Similar efforts for project-based learning are also in progress at the Advanced Manufacturing Technology Development Center (AMTDC) at IIT – M. The R&D team at MGT works very closely with the students and engineers at AMTDC.

To accomplish all this also requires a deep and personal commitment by mentors with years of experience in

the innovation space. Dr K (Subbu) Subramanian, President, STIMS Institute Inc., USA and NK Dhand, Chairman, MGT, meet with the R&D team every week in person and through Skype. These regular meetings aid in challenging the fresh minds to think critically and in honing their strategic alignment and project management skills. In the same manner, Prof Ramesh Babu of IIT - M also engages the budding researchers in developing industrially relevant solutions.

Implementing text books in real life

The freshers have been significantly benefited by MGT's initiative and are all praises for the company for extending such support and lending a launching pad for them. "Soon after I joined, I was assigned a list that covered varied domains including mechanical, electronics and software. Dhand Sir kept trusting me with responsibilities and evolving my roles: from handling projects to minding a new machine to knowing all aspects of the process that involved the whole system," says Anant, who joined MGT in 2014. He then had to work on Hydrostatic slide. "We developed our first Non-Round grinding machine in 2014. When we compared the machine speed and response with similar European/Japanese machines, we realized that the latter were three times faster. It was deduced that this problem could be addressed by moving toward low friction slide technologies such as Hydrostatic slides. With this hypothesis I started working on hydrostatic slide," explains Anant.

"It was an achievement because the whole process, right from the identification of the problem, involved going back to college textbooks and doing hands-on calculations and computer simulations based on which a solution was tried, and it worked. It was a complete circle from theory to practical," explains Anant with excitement clearly visible in his voice.

Having each other's backs

It's encouraging to note that the youth at MGT do not just learn, they help each other in learning as well. Mohamed Rizwan is a mechatronics engineer who aspired to be in mechanical and electronics field. At MGT, he was asked to create a software for a CAM tool for a machine. With no aptitude for IT, it was initially a tough nut to crack for Rizwan. "Here the software that I had to work on combined mechanical, electrical, IT and computer science. However, it was just a matter of time that I learnt the codes by myself. Anant, my colleague, helped and guided me throughout. **MGT has provided me the right atmosphere to face challenges fearlessly,"** says Rizwan.

Prakash, an automobile engineer and a post-grad in Computer Integrated Manufacturing, is also proud to have mastered technologies that are being tried for the first time in India. "The project that I was offered was hydrostatics spindle. Currently, I am making Hydrostatic slides," informs Prakash.

Providing varied experiences

Rajesh had done a design course from IMTMA, and this precisely made his selection easy in MGT. He was recruited as a graduate engineering trainee as an application engineer. In the beginning, he kept shifting to various departments and that gave him an opportunity to experience and learn a number of things other than his core expertise. "I started with learning the assembly process of the machine and got a good hang of it for the one month I stayed in that department. Then I was shifted to the design department where I learnt about conceptualizing and designing," says Rajesh.

Presently, he handles the role of an application engineer and feels more empowered to carry

out his daily activities owing to the experience gained in other departments.

Preparing entrepreneurs of tomorrow

Prathyusha has done engineering from IIT Madras with a dual degree - BTech in Mechanical Engineering and MTech specialization in manufacturing. "I was looking for anything that would give me an opportunity in robotics or automation in manufacturing so I can apply and utilize my core learning," says Prathyusha.

Her yearning to be part of the manufacturing sector in India started from IMTEX 2015, where she saw a lot of companies - not just manufacturing, but also metrological - from all over the world that export precision devices to Indian companies to complete their machines. "That intrigued me since my final goal is to have a core enterprise which deals with components that we import to India," she adds. "But for that I still need industrial experience. Dhand Sir and Dr Subbu and all the other people who are part of the recruiting community are extremely encouraging and guide us through. It's not a regular routine to do some better projects for the company. They genuinely want us to grow and evolve."

Prathyusha joined MGT in June 2017 and started with mini projects on software development and communication with CNC controller. Apart from that, she also started her research work in centerless grinding to expand its application and improve the process so as to add value to MGT's business of centerless grinding.

Praveen Ganachari
Senior Manager, Design
MGT

Collaborative ecosystem

This team of young engineers cannot thrive working in isolation and gives a lot of credit to the collaborative environment at MGT. The projects almost always require close participation from other departments. Praveen Ganachari, Head of Design Department who has worked together with this team in many projects, feels benefitted by the presence of these young engineers. He further lists the contributions of R&D as follows:

- New Product category of Non-Round Machine
- The development of in-process monitoring tool Grind-Trak™ has helped in troubleshooting process-related problems
- Development of testing protocols has helped in ensuring machine quality
- An overall change in thought process towards machine design i.e. impact of static, dynamic and thermal aspects on final part quality.

"We all joined fresh from college with little understanding of machines and industrial processes. Everyone in MGT from the technician to the senior managers have always been very patient and enthusiastic in answering our questions and explaining concepts to us," says Anant.

Exceeding the Expectations

Micromatic Grinding met Stanadyne India's requirement of a fuel pump assembly solution with stringent quality parameters by innovatively tweaking its standard offering.

Stanadyne LLC is a developer and manufacturer of fuel pumps and fuel injectors for diesel and gasoline engines. The company is based in Windsor, Connecticut, with global locations in China, India and Italy. It specializes in fuel injection equipment producing components for gasoline direct injection engines, common rail systems, electronic and mechanical governed rotary distributor pumps for diesel engines and diesel fuel injectors.

In need of a local solution

The components needed by Stanadyne India Pvt Ltd (SIPL) for fuel pumps and injectors were being sourced from its US manufacturing plant and were made on Cincinnati grinder while adhering to stringent quality parameters. The company was looking to localize the process. Its requirement, from cost management perspective, was an indigenous Centerless Grinding Machine (CLG):

- with features to set the machine up quickly independent of any operator with specialized skills;
- could deliver process capability of 1.67 min on roundness (50 UPR) and straightness of 0.635µm max, size tolerance 1.27 µm, and Ra 0.1µm max.

Challenges abound

However, there were various challenges in fulfilling the requirement:

- material variants - bearing steels and stainless steel
- a wide variety of parts - diameters 6 to 9 mm in steps of 0.5 mm

The CLG 5025 (Centerless Grinding Machine)

Plunger, Delivery Valve, Metering Valve (in that order), which basically are cylindrical rollers used in fuel pump assembly.

Customer's requirement

Stanadyne India was looking to localize its fuel pump assembly and, hence, required a grinding machine that could meet stringent quality parameters of parts produced on best-in-class imported CLG machines.

MGT's solution

The CLG 5025 (centerless grinding machine) with requisite additions to suit the customer's requirement.

- hollow valves with undercuts/ x holes/milled slots
- the machine would need multiple passes for parts and repeat set ups
- traverse at least 2 m/min
- optimized GW and CW.

MGT's 'Made in India' offer

"Since we could not get any commitment on the process capability from most of the local and global machine manufacturers who do serious business in the segment, the final plan was to work collaboratively with MGT," says TG Deenabandhu, Senior General Manager, Projects, Stanadyne LLC.

Micromatic Grinding thus took up the challenge to develop a solution to meet the required quality parameters, previously seen only on high-cost imported machines.

The company worked on its standard offering, the CLG 5025 with the below additions to suit Stanadyne's requirement:

- 6-axis CNC centerless grinder for high precision and higher productivity;
- Twin support grinding wheel head for higher rigidity;
- AC servo motor for regulating spindle drive;
- Regulating spindle with direct drive to reduce vibration level;
- Rotary disc system for grinding wheel dressing.

SIPL team of S Jayakumar, Divisional Manager, Manufacturing Engineering (ME) and R Sivakumar, Deputy Manager, ME lent an active support with the work holding, grinding process etc.

S Jayakumar
Divisional Manager
Manufacturing Engineering
SIPL

R Sivakumar
Deputy Manager
Manufacturing Engineering
SIPL

This augurs well for new fuel injection products that Stanadyne will be launching over next couple of years.

TG Deenabandhu
Senior General Manager
Projects
Stanadyne LLC

Exceeding the expectations

Micromatic Grinding was thus able to deliver what Stanadyne needed from the local market. It not only successfully met the latter's expectations in terms of quality and precision, but was also able to surpass the performance of some of its international counterparts, thus strengthening the 15 year-long association. "This augurs well for new fuel injection products that Stanadyne will be launching over next couple of years," concludes Deenabandhu.

Results achieved in Plunger

Accuracies Parameter	Required	Achieved
Size Tolerance	± 2.5 Micron	± 1.5 Micron
Roundness	0.635 Micron	< 0.500 Micron
Straightness	0.635 Micron	< 0.500 Micron
Surface Roughness	0.125 Ra	0.1 Ra

With India turning into a manufacturing hub and attracting global players, there are local companies making strides into global arena due to their unmatched manufacturing prowess. MGT is proud of its accomplishment of expanding its global footprint so as to grow organically. The company's latest foray into the markets of Mexico and China has helped it gain a firm foothold in offshore markets.

The Mexican Venture

As a value-added and engineering-oriented Mexican machine tools distributor, TECNUM Service was looking for new manufacturers of Production Grinders, Machining Centers and Turning Machines to compete in the highly competitive Mexican market.

The company was searching for a partner that could offer top quality products at competitive prices, but at the same time, was also interested in a long-term relationship to allow it to develop and offer smart manufacturing solutions to its customers.

"We found in the Ace Micromatic Group of India a common language to approach the Mexican market and to form a synergy, sharing and complementing our individual expertises," said Bonilla Guillermo, Director, TECNUM Service.

In a short duration of time, the company has achieved sales results that allow it to plan a medium-term strategy with the aim to become, in the near future, an important player in the Mexican Machine Tools market that can even compete with European and Japanese manufacturers.

"We see a bright future for our partnership with the Ace Micromatic Group to accomplish our goals in the years to come."

Bonilla Guillermo, Director, TECNUM Service

The team of Arbomex, a Mexican manufacturer of Cam Shafts, is highly satisfied with the performance of MGT machines.

The team of Gühring, a Mexican manufacturer of Special Cutting Tools, with MGT machines in the background.

Export of CNC Grinders to China

MGT added another feather to its already adorned cap by successfully exporting a set of 3 CNC machines – 1 OD and 2 ID grinders – to a reputed Automotive Parts manufacturing company in China. The breakthrough was accomplished by MGT providing an economical, high-end technology solution to the customer. A complete OD/ID grinding, which was performed on 4 machines earlier, could now be done on 3 MGT machines.

With the solution, the customer could, thus, increase its productivity by reducing total grinding time by 45 percent and also saving investment on the additional internal grinding machine. The provision for gantry Automation has been built into these machines by MGT with fitment in China by the MMT China team.

Technical Output

Parameters	Required	Achieved
OD Diameter	Cpk 1.33	Cpk 2 – 2.5
OD Diameter	Cpk 1.33	Cpk 2.5 - 3
Surface Finish on OD	Ra 0.8	Ra 0.3 - 0.4
Surface Finish on ID	Ra 0.8	Ra 0.4 - 0.45
Roundness on OD	<0.002 mm	0.0009 – 0.001 mm

	Present Line from other maker	MGT supplied solution
Number of OD Grinders	1	1
Number of ID Grinders	3	2
Total Tact Time	240 sec	130 sec

The commissioning of the machines and Gantry Interfacing was done by MGT engineers - Vasudev Joshi and Kumar Swamy (L-R) and was expertly supported by the MMT China team.

MGT machines installed at the customer's plant in China.

Innovation: The MGT Way

Thoroughly professional MGT Service team extended its support to the overseas and domestic customers and resolved their issues within 2 to 3 hours with the aid of this innovative method.

Case 1: Guhring Thailand

Problem: Hydrodynamic Workhead spindle got stuck while making dead to live centre setting.

Solution: When the customer contacted MGT's service team headed by Sachin, it was asked to send a video of the problem through WhatsApp. On receiving the video, the team replicated the problem at MGT to check the possible causes and arrive at a method to resolve it. A video with a step by step instruction for the resolution of the issue was made and sent to the customer again through WhatsApp. Guhring Thailand used the instructive video and resolved the issue within 2 to 3 hours.

Case 2: Bajaj Motors Ltd, Gurgaon

Problem: Short Grinding Wheel Life, frequent Wheel Dressing and poor Surface Finish.

Solution: MGT's CSD service team asked the customer for a video of the coolant tank through WhatsApp. On analysing the root causes, it was found that the cleanliness of the coolant was a big factor. The dirty coolant particles were getting embedded in the grinding wheel, creating micro scratches on the part. This resulted in poor part finish, affecting not only the part quality, but also the wheel sharpness. This, in turn, caused frequent wheel dressing and a short wheel life. The team suggested maintaining a clean coolant by regularly checking pH value for a permanent solution.

Sachin Kumar, Service Engineer, Micromatic Grinding Technologies Ltd, supporting the customers and resolving their issues offsite.

Paying it Back

Micromatic Grinding Technologies Ltd (MGT) has always acknowledged the important role of community in its success saga and believes in doing its bit for the community's upliftment to reciprocate. A snapshot of the company's impactful CSR initiatives in the past years...

Micromatic Grinding Technologies Ltd (MGT) for years has been consistently striving towards holistic development of the individual and the society. The company through its innovative and beneficial activities endeavors to significantly improve the quality of people's life.

Reflecting back on the past

The start of the new year makes for an opportune moment for the company to take stock of the give and take that happens between it and the community it operates in, and also to reevaluate its course to touch more lives and make this world a better place to reside.

Since 2008, MGT has been proffering job-oriented training courses to both males and females for their sustainable livelihood. Its efforts have borne fruits with hundreds of people getting skilled in activities such as stitching, beauty enhancing, healthcare, mobile repair, electrical repair, and basic computer education. The imparted training now fetches them a monthly salary spanning from ₹3000 to ₹22,000.

Empowering women through SHGs

It's a sad reality that with all the modernization happening in the country, India still witnesses dependence of women on men for their most basic needs to survive. MGT is highly involved in activities towards empowering women through the formation of self-help groups (SHGs) that aim to disseminate awareness among them on various issues and train them in income-generating activities.

A total of 20 SHGs have been formed so far, comprising 200 members. With the company's consistent attempts to improve their state, the women today find themselves equipped with knowledge and skills and are able to better take care of their families. This brings in a fresh wave of change in the community. The women are engaged in activities such as stitching, Picco work, buffalo rearing, bag making, running grocery shop, and also managing cosmetic and gift shop etc. that make them financially independent.

NGOs and corporates team up

Corporates rope in NGOs in their CSR activities for basically two reasons: with same interests and a common goal, they find a perfect partner in them and secondly, this ensures them of the

"We just do not get the financial assistance from MGT, but also the conceptual and academic support that help us transform our ideas into action."

Dr Sutapa Mukherjee
Director
Gram Niyojan Kendra

Economic benefits from the vocational training imparted as part of MGT's CSR initiatives during 2008 to 2017

Year	No. of trainees			Nature of training	Income derived out of training (PM per person in ₹)
	M	F	Total		
2009 to 2017		320	320	Stitching and Tailoring	3000 to 8000
2009 to 2017		244	244	Beauty Culture Training	4000 to 10,000
2008 to 2017	29	123	152	Health Attendant	8000 to 22,000
2010 to 2012	21		21	Mobile Repairing training	8000 to 12,000
2013 to 2016	15		15	Electrical Repairing	6000 to 9000
2012 to 2016	6	5	11	Basic Computer Training	6000 to 8000

sustainability of their initiatives. To ensure that its various CSR projects see the light of day and bear the expected fruits, MGT has joined hands with Gram Niyojan Kendra whose Dr Sutapa Mukherjee holds the company and its Chairman, NK Dhand in high esteem. MGT, she believes, is one company that 'truly cares'. "We just do not get the financial assistance from MGT, but also the conceptual and academic support that help us transform our ideas into action," she says.

According to Mukherjee, this symbiotic association has helped the NGO in various ways. It has helped the organization gain acceptance in different industrial groups in Ghaziabad. The financial assistance from the company has helped it secure education of girls in Roopwas, Rajasthan. The Kendra's 'Health Attendants Training Programme' is the brain child of NK Dhand, which has helped nearly 150 youths (female and male) gain employment.

Numbers that motivate

The period from January to December 2017 had the company engaged in the Social Development Program at Rahispur and Sadarpur villages of Ghaziabad. The program had a total of up to 650 families who were home visited for their participation in different activities.

With the belief that women empowerment is the first step towards progress, MGT's initiatives mostly focus on the well-being of women and children, encompassing their health, education, awareness building and skill training. In this regard, four child care centers were started that now take care of 152 children. 70 children were enrolled in Government and other schools and 30 in coaching classes.

12 awareness generation camps were organized that covered 328 women; 34 mother meetings were held that had 20 to 26 mothers per meeting. Immunization and vaccination of children and pregnant women was organized for a total of 1632 children up to 5 years and adolescent girls up to 16 years. Around 50 girls have been trained in sewing, embroidery and beauty culture and for being health attendants. They are now employed and earn a decent income, with a few offering door to door services.

During the year, 4 new groups were formed making 20 SHGs covering 200 women members who together collected ₹3,83,400 that will go towards their further progress.

12 youth group meetings were organized in the year that helped in raising awareness of 384 women. Computer and electrical trainings were imparted to youth. Teacher training was conducted too that would aid in picking teachers from the local community.

Balwadi Children celebrating Independence Day

Awareness Programmes for Women's rights

Material prepared by SHG Members

Cleanliness campaign organized

Our Environment is Our Life

Given its commitment to improving the quality of people's life, MGT has been working on projects that ensure environmental sustainability and economic use of valuable resources that we so essentially need to exist.

Water scarcity is one of India's prime problems. Excess population and agriculture as the primary source of occupation constitute as reasons, but what makes it worse is the mismanagement of the water resources and the continuing use of obsolete irrigation techniques. Hence, MGT, in its capacity, has extended its support for the various projects to ensure preservation of the precious commodity in rural areas.

Water Conservation at MGT Ghaziabad

MGT aims to promote sustainable environment through initiatives that address the root causes of the environmental problems. Lack of water being among the main issues inflicting rural India, the company has undertaken a water conservation project at its Ghaziabad plant.

The company had earlier aimed for zero water consumption with the help of just rain water harvesting. However, Ghaziabad being Ground Water Critical Zone, the latest CWGA guidelines ask that total water conservation should be 200% of the water consumed.

After having discussed with its stakeholders, the company zeroed in on two major initiatives to conserve and reduce water consumption to exceed the CGWA guidelines:

1. To Conserve: By adopting a pond in a nearby village to conserve water.
2. To Reduce: By installing a Sewage Water Treatment (STP) plant.

The pond adopted by MGT can store rain water which can be used for charging the underground aquifer (vide an agreement with Village Panchayat, Stamp paper no. 35AD-664980 dated 24/11/17). This initiative, the company believes, will lead to a better interaction with the village, and along with the conservation will aid in developing areas such as pisciculture etc.

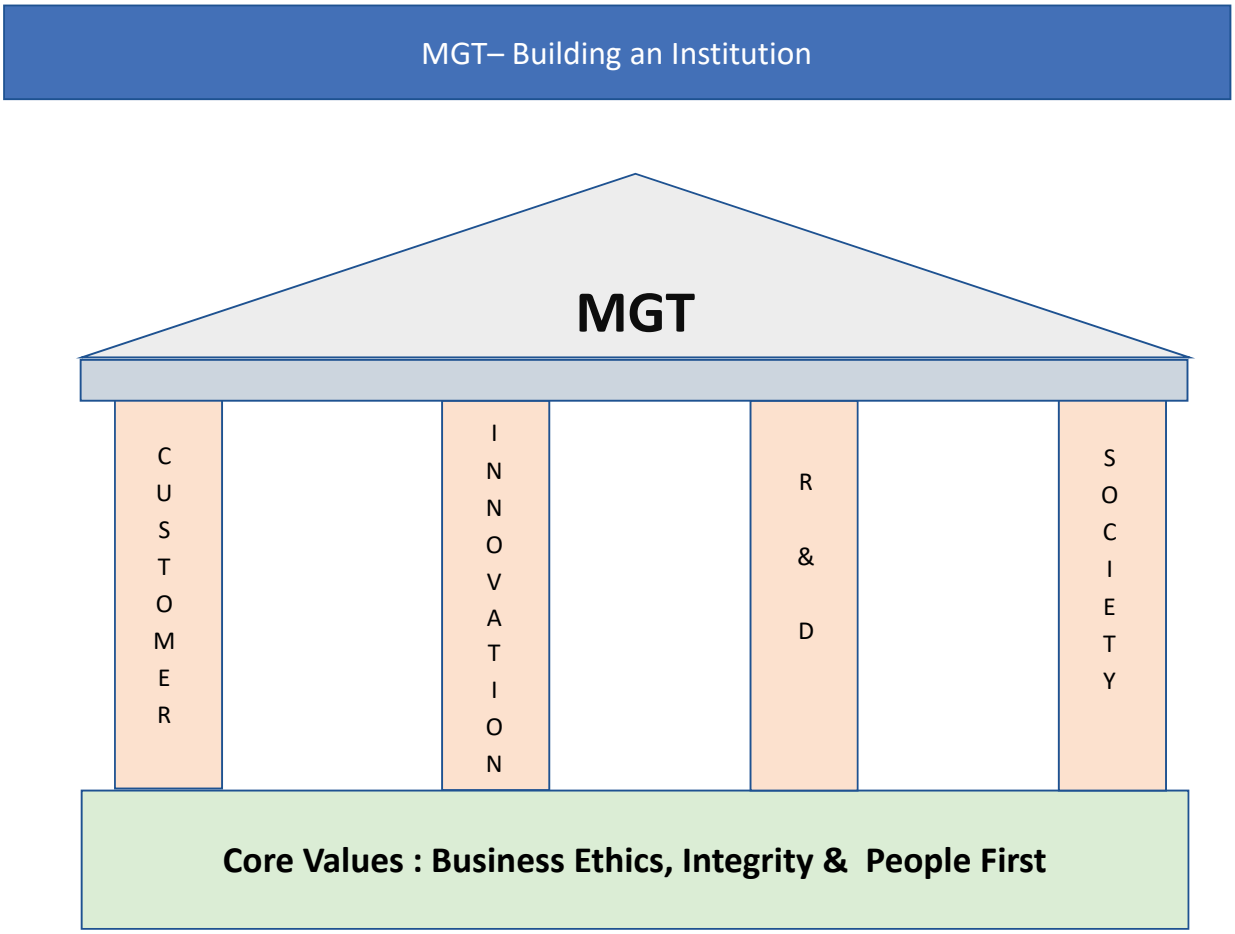
The STP unit has been selected on Moving Bed Biofilm Reactor (MBBR) technology and will be functional in two months. This will reduce MGT's water consumption by around 10,000 liters per day.

Pond adopted by MGT in Miswapur village

Proposed STP at MGT Ghaziabad

MGT: Building an Institution

Organizations, with the aim to attain their vision, zero in on certain practices that serve to translate it into reality. MGT, in doing so, has been working in accordance with its values and belief system that seep into everything it undertakes.



It has been more than two decades of our association with MGT and the journey has been worth cherishing. The years in between have been witness to the rise and fall of many organizations. Those flourishing during 2005-07 no longer exist today. Some had to struggle real hard to sustain and survive. MGT did not just pull through those times but rather achieved a new growth curve during that period. The mantra to which was building an institution with a firm gaze on its long-term vision.

Keeping pace with time

In its journey of 45 years, MGT has gone through the ebb and flow of times and has emerged as a winner. The turbulent phases were where the company further consolidated its efforts to successfully overcome them. The business baton has been passed on to the second generation and the business is growing with each passing year. Under the dynamic leadership of young Managing Director, Kapil Dhand, the organization is taking a new leap. The manufacturing units at Ghaziabad and Bengaluru are getting technological makeovers with a target to grow at a faster rate to cater to a wider customer base with a broader product range. This is a strategic move to keep pace with the changing times and to equip itself to face future challenges.

Leading by example
The Founder & Chairman of MGT, NK Dhand has built up an institution with a set of values that are echoed in all the aspects of the company. Following are the key elements that have set the company apart and been an aid in sailing through the troubled waters.

Values-based organization
Values form the basis of any organization, attract people that share them and govern its working environment. MGT has always been focusing on business ethics and integrity as its core values. The company has been ceaselessly striving to build an institution that stays true to its word and which people can have complete trust on. Working to the maximum of its potential, MGT ensures that the needs of its stakeholders are met successfully and that it consistently delivers what is required of it to the individuals and their families associated with the company, to the society that it operates in and to the nation.

The way MGT carries out its operations reflects its commitment to business integrity. **Serving the best and with utmost honesty is the philosophy adhered to by all employees and at every level.** This spirit makes everyone engaged with the company take pride in their association.

Customer-first approach
MGT acknowledges the fact that the true measure of success lies in the number of loyal customers. Hence, the company remains attuned to its customers' dynamic needs and ensures that they are fulfilled timely, cost-effectively and with complete assurance of the quality of MGT's products. This is the sole way to earn customers' faith, which paves the way for building long-term relationships with them.

Continuous improvement process
MGT has been consistently making technological advancements in its products, processes and services. **Its unwavering focus to keep making improvements in the grinding technology reflects in the company offering state-of-the-art products to its clients and emerging as a total solution provider.**

People-centric organization
Happy employees lead to happy customers. To bring in a win-win situation of this nature, where the best of talent is retained to continue serving a company's loyal customers, it's important that it invests in its biggest asset that is its human capital. MGT, being aware of the fact, has built a culture where people are given their due credit and are respected for their valuable contribution to the company's success. Hence, the employees who joined the organization in the 80s are still continuing with the same enthusiasm. Their families are also considered a part of the organization and their concerns are paid heed to. Recently, the company held a career-building program for the employees' children, which conveys the message that the company cares for their well-being and is together with them to share their concerns.

"The way MGT carries out its operations reflects its commitment to business integrity. Serving the best and with utmost honesty is the philosophy adhered to by all employees and at every level."

Sanjay Kumar
Founder & CEO
TPP World

Working for the society
MGT has always believed in giving back to the society it operates in. Its initiatives for the welfare of children and women are especially commendable. The company imparts skill-based education in areas with acute dearth of employment, helping residents start income-generating projects. One of the examples is CARTE, a Ghaziabad-based educational institution run by the trustees that offers technical courses. The company has been working tirelessly to help provide quality education to students and prepare them for challenging careers.

MGT's values are a representation of its priorities and driving forces. With such value system, that resonates with everyone concerned with it, it's only natural that the company has attracted success of such magnitude.

Micromatic Grinding
TECHNOLOGIES LTD.
In the Pursuit of Zero

Head office & North India Plant
Micromatic Grinding Technologies Ltd.
C-27 & 28, Industrial Area, Meerut Road,
Ghaziabad, Uttar Pradesh - 201 003, INDIA
T: +91 120 2712137/69/79, 2723216
E: sales@micromaticgrinding.com

Bengaluru – South India Plant
Micromatic Grinding Technologies Ltd.
5/A, Servey No.74, 103, 106, 107,
KIADB, Industrial Area, Dobaspet,
Nelamangala Taluk, Bangalore,
Karnataka - 562 111, INDIA
T: +91 080 27735383/85/86/87, 27702449
E: sales@micromaticgrinding.com

/micromaticgrindingtech //tinyurl.com/z7264wo micromaticgrinding.com

Ace Micromatic Group
www.acemicromatic.net