

CNC PLUS

Ace Micromatic Group Newsletter

04/2016



How our
customers ACEd
the floods

Pg 04

Smart
Connected
Manufacturing

Pg 14

Ace Micromatic
Group

www.acemicromatic.net

The largest machine tool group in India

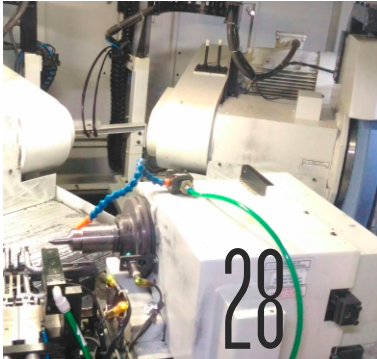


BEARING HOUSING				11:30 PM	
16	5	2	0		
1 40	H2 53	H3 53	H4 26		
0	0	6	6		
5 53	H6 53	H7 40	H8 44		
Shift-I	Shift-II	Shift-III	TOTAL	Yesterday	
5	0	0	35		

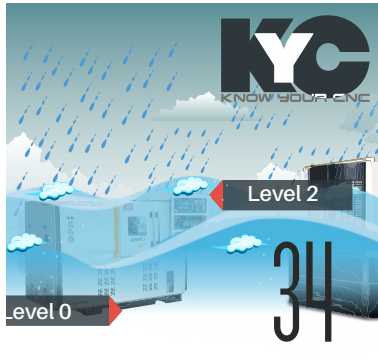
Contents



new Launch
12

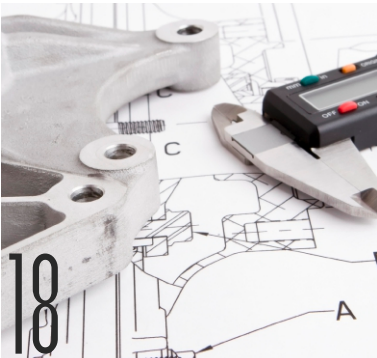


Innovative Solution



NYC
KNOW YOUR CNC
Level 0 Level 2 34

FAQs for Flood Affected CNC Machines



18


Machining Audit

Manufacturing components as per drawing at shorter lead time and reduced cost is essential to ensure competitive production cost, improved quality, performance and longevity of machines.

Mr.Kashinath M. Patnasetty,
Bangalore, Karnataka



Ace Micromatic Group
EVENT 2016
30



37

Sales and services contact details



T K Ramesh, CEO
Micromatic Machine Tools Pvt. Ltd.

Toiling today for a better tomorrow

Last year's floods turned into an unprecedented test of the city's character, and the people of Chennai did not disappoint. Our industrious customers worked overtime to get their production back on track within a short time frame. Our valuable engineers too stretched themselves to the limits to ensure complete onsite support to get the precious machinery up and running. We all suffered; we all persevered; in the end, with the spirit of hand holding and ingenuity at our disposal, we all triumphed over the ordeal.

This year, we have relaunched some of our most in-demand products with state-of-the-art modifications to help manufacturers meet the new challenges of the market. We are confident that these machines will continue to garner the same enthusiasm as they always have. I would like to take this opportunity to acknowledge the faith and support we have received from the industry. Time and again we have proven that as long as we work together we can stay ahead of our challenges and be partners in long-term success.

With this I leave you to enjoy this latest issue of our magazine. Let's keep up the Chennai spirit, and happy reading!



COVER PAGE

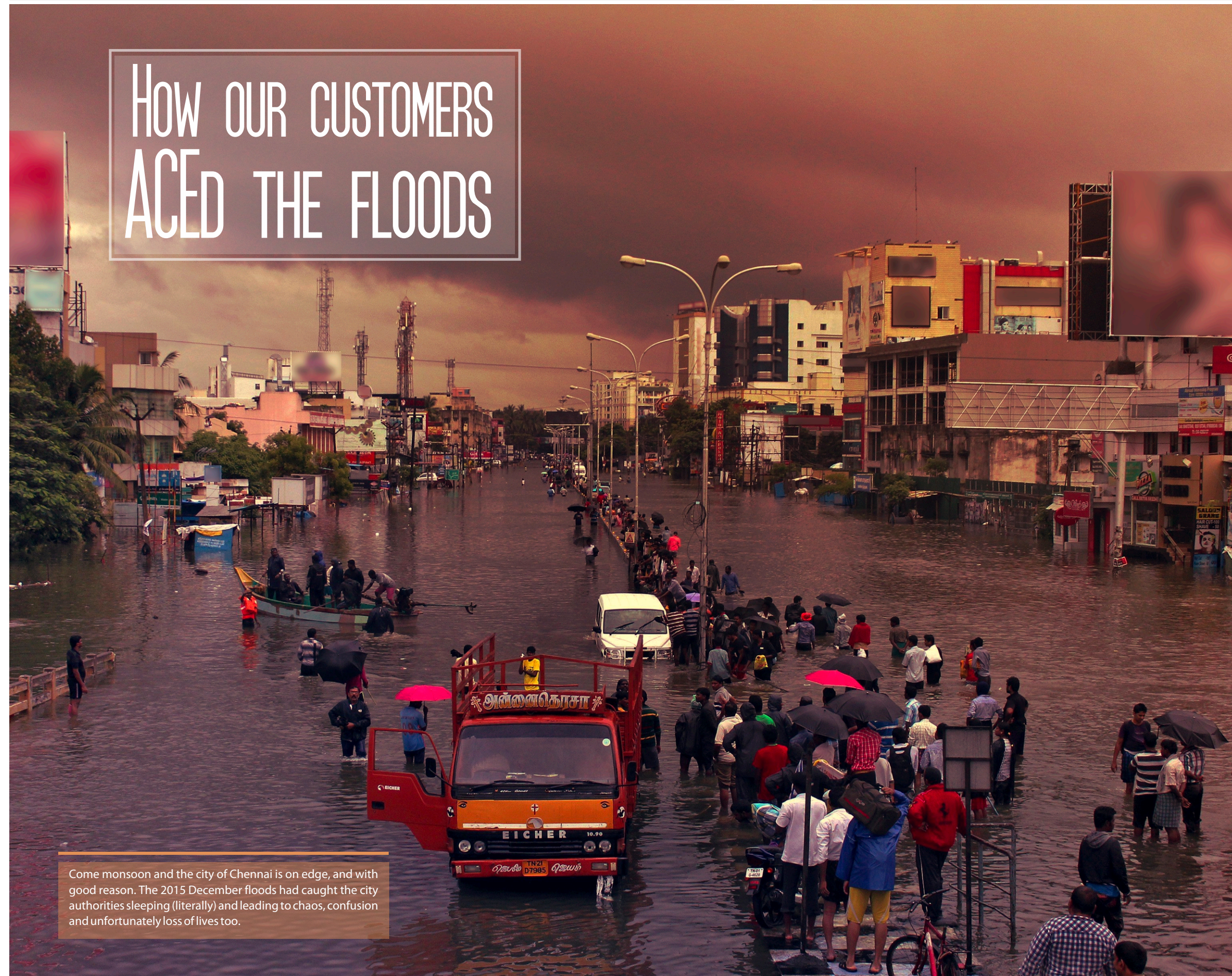
The image on the cover page depicts the insurmountable loss caused due to massive floods in Chennai during the first week of December 2015 when the city witnessed its worst rainfall in 100 years. Against this backdrop, this CNC Plus edition showcases how Ace Micromatic team went out of its way to put our customers' CNC machines back in a working condition braving all odds. At the same time the issue highlights the devastating consequences faced by our customers due to unchecked growth and lack of proper infrastructure planning.

Disclaimer: Edited, designed and printed on behalf of Ace Micromatic Group. The design, pictures and content used in this publication are intellectual property of the group unless mentioned otherwise.

No part of this publication may be reproduced or transmitted in any form without the prior written consent of the editor. Efforts have been made to keep the information in this newsletter as much correct as possible. However, the editor cannot be held responsible in case of any discrepancies found in the data. If you have any interesting story/event/contribution to be shared or any questions, please get in touch with the editor at sreekanteswar@acemicromatic.com

Editor: Sreekanteswar S.
Sub Editor : Magic Wand Media Inc
Correspondent: Mr. Pushpendar
Design & layout: Harish M
Printed at: ABCD, Bangalore

HOW OUR CUSTOMERS ACED THE FLOODS



Come monsoon and the city of Chennai is on edge, and with good reason. The 2015 December floods had caught the city authorities sleeping (literally) and leading to chaos, confusion and unfortunately loss of lives too.

Chennai Floods

If life on the street was disrupted, industrial production took a worse hit than the city had ever witnessed. The thickly concentrated automotive hub of India housing nearly 30 per cent of the country's automotive facilities came to a grinding halt. With power to auto ancillary units disrupted for weeks together, water pumps went silent and machines were submerged in water - as deep as 15 ft in some places.

In this edition of CNC, we spoke to few of our customers who were severely affected by the flood.

A two-day assignment led to insightful interactions with top auto ancillary units of Chennai who manufacture components for the auto majors across India. They shared painful memories of the ordeal, anguish of watching their employees suffer, precious machinery submerged, and production schedules go haywire. At the same breath, they proudly reminisced inspiring stories of how they teamed up against the odds, and overcame the challenges with Micromatic engineers and staff, working around the clock to bring their machines back to life after the setback.

From bad to worse

Chennai floods

Most manufacturers recall that the first deluge that washed Chennai in November was manageable. Before the second heavy spell in December, production had been going on schedule, and goods were ready to be shipped out. Then the December flood hit. The lake was breached, and large portions of Chennai went under water. Companies lost their finished products, machinery and power with facilities submerged in water and people stranded.

Protecting human lives was naturally the top priority for all businesses, and fortunately, none of the customers had to suffer casualties. Once the water receded, the manufacturers had another big issue to address - to recover their life-giving machinery.

"Two of our employees took shelter on the terrace and we had to hire a boat to rescue them," recalled, Chairman, The Southern Pressure Castings, TC Dayalan. "Even when the facility was safe to access again, there was sand, oil and water everywhere," he recounted. Established in 1981, presently the company posts a turnover of INR 300 million with its offerings of 10 products and service categories, 5 manufacturing units and 300 employees with a presence in 6 countries all over the world.



Equipped to manufacture steel forgings for the automobile, earth moving equipment, power, agri, oil and other engineering sectors with a forging capacity of 2500 MT per annum Chennai Forge Products Pvt Ltd boasts of serving customers such as Ashok Leyland, TVS (Autolec division), Greaves Cotton, Wheels India, Ormed Technologies, BHEL, Wabco TVS, Wipro and so on. Located in Ambattur -

one of the more heavily affected areas due to rapid industrialisation, dense population and surrounded by lakes - the company could have sustained severe damage but for Managing Director, Chennai Forge Products Pvt Ltd, P Dakshinamurthy immediate action the company could avoid huge loss. He recalled, "We had pumps to bail out the water which were working 24x7."

Gone in a blink

**"Our units were affected, finished product damaged, and machinery submerged under water. We are still recovering from the aftermath."
Chairman, Natesan Synchrocones Pvt Ltd,
N Balasubramanian**

A particularly tragic aspect of the flood was how within hours it disrupted the fortunes of companies that had taken decades to build. Natesan Synchrocones Pvt Ltd has carved a niche for itself among manufacturing circles as a respectable brand for synchroniser rings and other auto components. It is one of the rare companies to maintain excellent relationships with all the major auto companies in India since 1960s, raking in numerous awards for excellent quality. Managing Director, N Balasubramanian confided that the floods could not have hit at a worse time. "Our business was just picking up as the auto majors experienced good demand and wanted to increase production," he rued. Located along the heavily encroached West Canal Bank, its facility as well as commitments suffered a painful blow due to the floods. "Our units were affected, finished product damaged, and machinery submerged under water. We are still recovering from the aftermath," rejoined Balasubramanian.

It got worse when lakes breached, flooding nearby areas. The management and employees at Technics Industries, with its facility in Villivakkam Industrial Estate, had to salvage what they could. A 35-year-old company, it has the unique distinction of purchasing the fourth machine manufactured at AMS Ltd more than 20 years ago. Today, all its machines are from Ace Micromatic. A major supplier of auto components to Sundaram Clayton, (which in turn supplies components to Tata Motors), Technics was always content working with a few select customers. The equilibrium burst under the torrential rains. Revisiting the nightmare, Managing Partner, Technics Industries, Mukunda shared, "Our unit in Villivakkam Industrial Estate was flooded because the adjoining lake was breaching. We had to shift to our Ambattur Industrial Estate unit, but without much benefit as that too is a low-lying area."



Further troubles were compounded by rumours floating around social media about a crocodile being loose and further breaches.

Chennai floods

“We called Micromatic engineers to come over and help us, as soon as we saw the water level rising. Their proximity to Ambattur certainly helped as their quick response time limited the damage to our machines. It certainly saved us precious time.”
Managing Director, Chennai Forge Products Pvt Ltd,
P Dakshinamurthy



Getting back on our feet

Dakshinamurthy is one of the founding partners of Chennai Forge Products Pvt Ltd to set up one of the earliest companies in Ambattur Industrial Estate. The company was a supplier for Ashok Leyland for nearly three decades, before the partners decided to part ways in 2007. It was Dakshinamurthy who rebuilt the company and made it what it is today, with a client roster comprising the who's who in the manufacturing sector. When the floods played havoc, taking charge of the unprecedented crisis that the company faced, he lost no time reaching out to Micromatic “We called Micromatic engineers to come over and help us, as soon as we saw the water level rising. Their proximity to Ambattur certainly helped as their quick response time limited the damage to our machines. It certainly saved us precious time.”

Aligning on similar thoughts Mukunda shared that proximity to customers through offices in strategic locations, and a quick response time worked for us as Micromatic has its office in Villivakkam and are hardly five minutes away from Technics Industries. “The engineers from Ace Micromatic group swung into action immediately after receiving our call and helped us run the machines smoothly post draining of water.”

Once the rains stopped, began the tough task of cleaning up and bringing the factory back to working condition. “After draining the water, which took days, the horror of what was left to clean hit us hard. We are still cleaning up and streamlining the production and deliveries. We expect to be on schedule by end of July,” he added.



Bringing back to life

For several manufacturing plants, the major challenge was to restart their machines as most of the machinery was submerged under water during the rains. Hence, experts were called to make the machines functional again.

Sharing his experience in this backdrop Balasubramaniam elaborated, “The management of Ace Micromatic Group assured us of total cooperation and help. Within 48 hours, their response team consisting of engineers from all over the country, spares for our machineries and all necessary support required to get back to our feet was rushed to our units. We were overwhelmed seeing the quick response from Ace Micromatic. Despite the setback to our production schedule, we got back on track much sooner than expected.”

In sync shared Managing Director, Shuba Shri Tools, Srivatsan, “Once the rains ceased and water was pumped out, Ace Micromatic engineers were the first to arrive to check on the machinery. They did everything possible to make the machines run.” Based out of Perungudi Industrial Estate, another flood affected area, the company was started in 1976 as a forging unit with only five workers by Srivatsan. Today the firm has established itself as a specialized manufacturer and supplier of a wide range of engineering tools, components and measuring instruments for various commercial and industrial units with 13 CNC machines. In a span of three decades, over 1000 sets of forging dies have been made for its customers such as Lucas TVS, Axles India, Ashok Leyland, Rane, Royal Enfield, BHEL, Super Auto Forge and so on.

Alternative strategies

Some companies like Southern Pressure Castings could shift their production to another plant in less affected areas and this helped them get their production back on schedule.

“Micromatic rushed its engineers immediately at our site who commenced work right after reaching. Any spares that were needed were driven down from Bangalore to make sure no stone was left unturned in making the machines work again,” said Balasubramaniam.

Deputy Manager-Service, Micromatic, Senthil Kumar and his team could not go home for days while addressing series of crisis. He received calls day and night from his clients reporting damage to machinery due to rains or water logging. “Reaching out to our customers was the hardest part. “The roads were already flooded and power outage added further challenge to this disaster. Due to fear of electrocution the power supply was cut. However, we strived to provide the best possible service to our Chennai customers in this catastrophe,” revealed Senthil.



Chennai floods



Banding Together

Talking about his long association with Ace Micromatic Group, Managing Director, Shrivik Industries, V Raju based out of Ambattur Industrial Estate and President, Ambattur Industrial Estate Manufacturers' Association shared with pride, "On-time delivery, prompt complaint redressal and dependable support for our employees is the reason we choose Ace Micromatic machines time and again."

Shrivik was established in the year 1992, and has been in the forefront of manufacturing automotive components for 3 wheeler LCV, marine engines, fuel injector components and assemblies for the past 23 years. The company boasts of catering to prestigious customers such as Greaves Cotton, Continental Engines Ltd, Simpson Ltd and Delphi TVS, and has an exporting contract with Motorpal Czech Republic, Europe. At present, it houses four manufacturing units, two full-fledged die casting units and one forging unit in Chennai. Speaking proudly of the time he started off in a rented space of 100 sq ft, Raju shared how he brought the company to where it is today, with a single unit occupying over 40,000 sq ft with an annual turnover of INR 42 crore.

Harping back to the subject of the flood he narrated, "We were surrounded by water completely. As soon as we drained out the water, the (Micromatic) engineers came in and took over in no time. We are yet to witness such kind of prompt and responsive service from any other manufacturer."

In a way, the cleaning process brought the employees together. Everyone was involved in sweeping and cleaning. There was dignity of labour. This was true especially in the case of Southern Pressure Castings.

"We are blessed for having such wonderful employees. All our employees came to work after the water was drained. There was no power for almost a week after the floods. Every morning, we all would assemble and clean up the place as much as possible. Before it got dark, we would go back and continue the following day. Everyone banded together to help the company back on its feet," remarked Dayalan with pride.

What the future holds

With the floods now a not-so-distant memory, Srivatsan asserted, "We are prepared for the monsoons and would not be caught unawares".

Speaking on the blueprint of the company, Raju shared that the future plans comprise not only expanding its footprint in India, but notching up exports too. In this context, he added, "We have more than 20 plus machines from Ace Micromatic Group, and every machine is an upgrade on the previous model. It shows the company is investing heavily on technology, research and development. Incidentally, we are expecting orders from other customers and for every step we take moving forward, Micromatics helps us taking not one step but two steps."

Southern Pressure Castings have expansion on the cards as well. "We want to move out of this place and build a plant in the outskirts of the city. It may take a year or two as there are so many points to be considered. We are keeping our options open," said Dayalan.

The future also looks bright for Shuba Sri Tools. "We recently acquired a machine worth INR 1.5 crore," shares Mr Srivatsan, "We have achieved 80 percent capacity and are getting good orders too. We are focussing on bettering ourselves".

The city with an iron heart

The manufacturing industry had to work overtime to get production back on schedule. Extra hours had to be put in and extensive cleaning had to be done. Though the city was wrecked, people managed to pull themselves up from the rubble. The flood reflected the true spirit of Chennaiites, as everyone came together to help those in need.

With companies now back on track, producing and distributing goods on schedule, the floods seem to have happened a long time ago. But the memories of the flood are still fresh in everyone's mind.

With the next monsoon approaching, we know the city would not be caught napping. Instead will be well-prepared to tackle the situation by the horns. **CNC+Plus**

Chennai Forge Products Pvt Ltd
Natesan Synchrocones Pvt Ltd
Shrivik
Shubha Sri Tools
Technics Industries
The Southern Pressure Castings
Chennai, India

As told to our correspondent Mr. Pushpendar

new
Launch

Over the years, Jobber series machines from Ace Designers have become a brand in itself for CNC Turning machines just as Xerox or Coke.

J 400 LM



- FEM optimised bed with reduced foot print and efficient chip evacuation
- Ergonomic design with wider door openings and maintenance friendly features
- Best in class Spindle with ribbed polyflex belt
- Range of options for Turret and Tool clamping
- Laser calibrated axis for higher accuracies
- Smart machine features with MachineConnect™

The new developments enable
"ULTIMATE PERFORMANCE
FOR PARTS MACHINING"

Ace Designers have revamped the Jobber series machines making the "Best even Better".

The key developments in the new "J" series are

new
Launch

With many automotive components having smaller cycle time and the new entry of electronic component machining,.

DTC 400 XL

PROVIDES A COMPETITIVE
HIGH SPEED SOLUTION
TO OUR CUSTOMERS



- Low Chip to Chip time of 1.8 sec with high speed pocket tilting type ATC
- Spindle speeds of 12000 rpm with inline motor spindle
- Optimally designed structure to take care of cutting forces, cushioning high speeds and accelerations resulting in accurate High speed drilling and tapping
- Roller type LM guideways for superior performance - rapid traverses of 60/60/48 m/min
- Advanced CNC controller to achieve acceleration of 1 G

INNOVATIVE SOLUTIONS
TO REDUCE
THE NON CUTTING TIME

All CNC machines have an inbuilt non value added element – the Non Cutting time which adds to the total cycle time and reduces the output from the machine. AMS has been developing unique and innovative solutions to reduce the Non Cutting Time in its products. One such development is the New High Speed Drill Tap Center. Some of the advances features of DTC 400 XL are

SMART CONNECTED MANUFACTURING



- How to make more profits from my production shop?
- How do I increase the productivity of my machines?
- Are these the questions on the top of your mind?

It was in the late 18th and early 19th century that the first Industrial Revolution took production out of cottages and to the cities. In more than two centuries that followed, there have been many significant changes in the world of industrial production. However, only two of those transformations - the advent of mass production, and the shift to automation - were consequential enough to qualify as the second and third Industrial Revolutions.

So, pay attention when we say that Industry is now at the brink of the next Revolution. Designated as Industry 4.0, or Smart

Manufacturing, this latest epoch is marked by integration of data with process expertise to enable "data or evidence based management of manufacturing.

Productivity improvement & Profit maximisation

Data-driving manufacturing enables better decision making in the manufacturing process. Software and computer networks make it possible to gather data and turn it into actionable information to make better decisions about manufacturing processes such as optimizing machine up time, scheduling machine maintenance, etc.

All of this put together means improved productivity, which in turn leads to maximising profits. It is a simple principle that does not change, whether you are running a small family-owned workshop or a large professionally managed production firm. Productivity improvement & Profit maximisation are the two factors which are very critical to their operations and are interlinked.

History of Industrial Revolutions

Over 200 years have passed since the first industrial revolution changed manufacturing forever

Navigating the next industrial revolution

Revolution	Year	Information	Revolution	Year	Information
1 st	1784	Steam, water, mechanical production equipment	3 rd	1969	Electronics, IT, automated production
2 nd	1870	Division of labour, electricity, mass production	4 th	?	Cyber-physical system

Machine monitoring

First step for Smart Manufacturing is machine monitoring. Machine tools can be connected to other manufacturing equipment through internet-enabled network. This allows for the state of machinery to be monitored in real-time, whether onsite or remotely. In case of stoppage or malfunction, real-time factors such as absence of operator, component, drawing, tools or ongoing machine set-up are captured. Based on these inputs, better decisions and corrective actions can be taken in future to ensure better and more efficient

machine utilisation, and hence better productivity or overall equipment effectiveness(OEE).

Global manufacturing companies are currently implementing this "intelligent connectivity of smart machines" in their factories and on the shop floor. This development is predicted to lead to a sweeping change that will fundamentally reconfigure manufacturing industry. This is what they are calling the next Industrial Revolution - "Industry 4.0".

Industry 4.0 - the 'smart' revolution

The term Industry 4.0 was coined by the German government (as Industrie 4.0) and stems from a project set out to prepare German industry for the future of production. It paves the way to and for the Smart Factory. It is based on cyber-physical systems (CPS) networking machines and components with the addition of intelligent, "smart" and highly flexible software.

Smart, connected machines have three main elements:

- Physical components**
comprise the CNC Machines and other equipment on the shop floor
- Smart components**
comprise the sensors, embedded systems, CNC, software, enhanced user interface etc,
- Connectivity components**
comprise the ports, Ethernet cards and LAN or wireless connection

Connectivity can be

- One-to-one: An individual machine connects to a PC,
- One-to-many: A central System is connected to many machines simultaneously

Drivers for Smart Manufacturing (IIoT)

The push for Smart Manufacturing is primarily from the following factors

- Need for reduction in Machine / Asset Downtime
- More Rapid service response
- Improved Process performance
- Improved personal productivity
- Reduced machine life cycle cost
- Improved machine utilization ROI
- Ability to sell products as service

Smart Manufacturing Or Industrial Internet of Things (IIoT)

Smart Connected Manufacturing

Smart Manufacturing is currently in various stages of maturity across the globe. Also, the adaptation of the same varies from a small job shop to a large multi-location – multi plant organization. The various possible stages and their characteristics could be as shown

Maturity Levels	Asset / Machine Capability
Conventional	No Intelligence or Connectivity
Instrumented	Connectable or connected Provides data externally
Software Defined	Some local intelligence Software tunable machines Enhanced data feeds
SMART	Enhanced intelligence Active condition monitoring Self optimization Interact with ecosystem
Autonomous	Additional sensors Real time analytics Onboard execution software New business models Performance guarantees

The evolution of Smart Manufacturing will enable many additional service offerings from companies of Ace Micromatic group. With remote access to the machine data, companies of our group will be able to provide timely predictive maintenance support. We can also provide access to experts who could assist in process optimization / productivity improvements at your shop. At a higher level, performance guarantees could be signed to ensure a risk free operation of your plants.

Typical Applications

Ace Micromatic Group has taken the lead to assist SME and MSME customers benefit from this technology. Extensive work has been done to develop MachineConnect™ by AmiT and ACE Designers. The new software provides plug-and-play connectivity for machine tools by enabling machines to provide data in structured formats. Automated, real-time data collection and much greater visibility into machine operations are possible at minimal cost. AmiT – Machine Connect™

- Remotely access accurate production data and machine stoppages by connecting it over LAN
- Hourly part count - by program number or number of programs run and number of times of each part
- Down time or Machine stoppages- when a machine is not operated greater than threshold time.
- Preventive alerts
- Preventive maintenance schedule
- Daily Maintenance Check list
- User manual and electrical documentation
- Power Calculator - Calculates machine's required power based on user inputs (Material, Diameter etc.,)
- Operator, MTB & control alarms - Record of all Operator, MTB & control alarms / critical alarms time stamped for analysis
- CNC Program Transfer over LAN



The USP's of MachineConnect™ are

- Data is collected automatically in real-time from all relevant systems, by an application residing in the machine and is transferred to the connected PC / Server
- It does not need human help to verify, validate, cleanse and prepare data in the appropriate forms for analysis without demanding new people/skills.

Predictive schedule

Part indication for preventive maintenance

Alarm No.	Message	Duration	Hrs/Week	Left Time
1150	CHECK/REPLACE SPINDLE BELT	Hour	0.00	
1154	CHECK Z-SLIDE WIPER CONDITION	Hour	0.00	
1165	CLEAN/REPLACE FILT	Hour	0.00	
1166	CLEAN/REPLACE SUCTION FILTER	Hour	0.00	
1152	CHECK Z-SLIDE BACKLASH	Hour	0.00	
1155	REPLACE LUB. CARTRIDGE	Hour	0.00	
1157	CLEAN DRIVE COOLING FAN	Hour	0.00	
1161	CLEAN PANEL COOLER FILTER	Hour	0.00	
1162	REPLACE PANEL COOLER FILTER	Hour	0.00	
1163	TIME FOR TURRET SERVICING	Hour	0.00	
1164	CHANGE TURRET BOX GEAR BOX OIL	Hour	0.00	
1156	CHANGE HYDRAULIC OIL	Hour	0.00	
1180	CLEAN SPINDLE BLOWER FAN	Hour	0.00	
1151	CHECK X-SLIDE BACKLASH	Hour	0.00	
1153	CHECK X-SLIDE WIPER CONDITION	Hour	0.00	
1170	TIME FOR CHIP CLEAN	Cycle	130.00	
1171	CLEAN COOLANT FILTER	Hour	130.00	
1172	CLEAN 'Y' STAINER	Hour	130.00	
1167	TIME FOR CHUCK SERVICING	Hour	2.00	

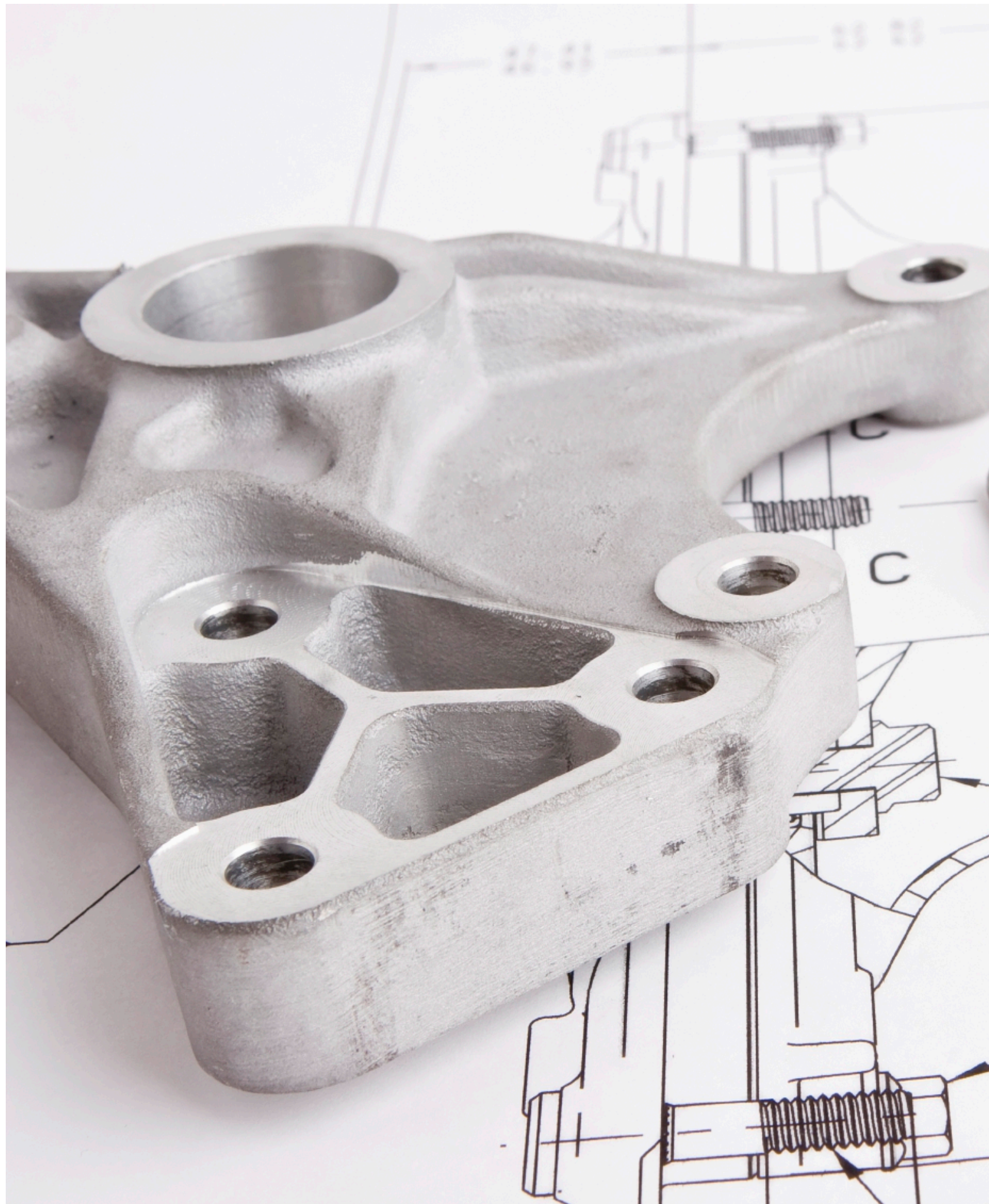
An imperative for future

The Industry 4.0 / Industrial IoT is real and taking shape here and now. Global companies have already implemented it and are getting substantial benefits at their plants. A Mature Industry 4.0/Smart Manufacturing will lead to a massive shift from the conventional Product + Service model to a 'Product as a Service' model where customers will be buying guaranteed results (Hybrid of Product & Service).

Whether it is machine monitoring or cloud-based CAM programming, the initial steps should be manageable, transparent and respectful of the individuals of the organisation. A better decision-making and actionable step is the main benefit of creating a connected factory in which machines and people are smarter. CNC+Plus

The CNC+ interview between our Managing Director Shrinivas G Shirgurkar & Gen. Manager Sreekanteswar on IoT

If you want to know more contact us:
T: +91 80 40200 555,
E: connect@acemicromatic.com

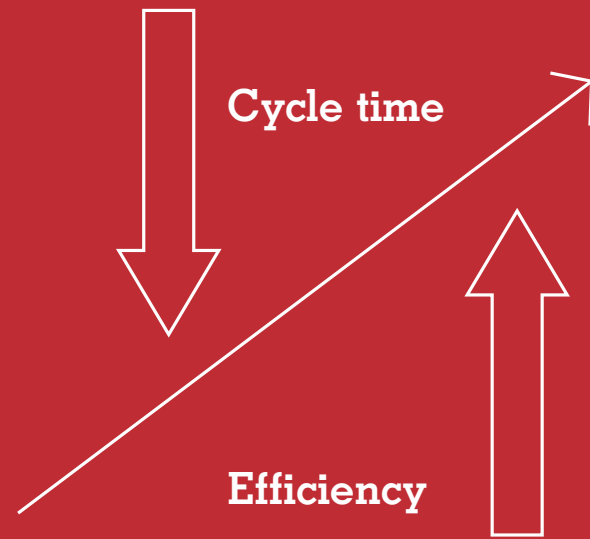


MACHINING AUDIT

Timely and regular
audit of the machine tool setup
can be of immense value in extracting the
most output from existing resource
without additional investments.

A brief overview
with focus on general turning...

Machining Audit



In mass production, small inefficiencies pull down the productivity. Only periodic reviewing and revamping of the programs and processes can eliminate the accumulated inefficiencies. These inefficiencies are no reflection on your in-house machining skills and your capability to remedy them. However, the additional investment in terms of space, accessories and additional manpower required to increase production and meet customer demands could be drain on the company's resources.

A thorough audit could be just the definitive action that helps manufacturers get the most out of their existing setup, and get closer to target production without additional investments.

Why audit

Manufacturing components as per drawing at lower cycle time and reduced cost is essential to ensure competitive production costs, on time delivery and higher profit margin. Reduction in cycle time, competitive production costs & improved quality play important role in enhancing productivity especially in large volume production and high value batch production. In a highly competitive market, customers determine the price of a product and entrepreneurs need to continuously fine tune the costs to realize profits.

Machine utilization has a major impact in reducing the manufacturing cost of components. Although it is difficult to reduce material cost, the cycle time & hence the machining cost can be substantially reduced. Increasing machine uptime and improving productivity requires adopting best machining practices. This article series will help CNC machine users to machine parts intelligently through use of simple problem solving techniques.

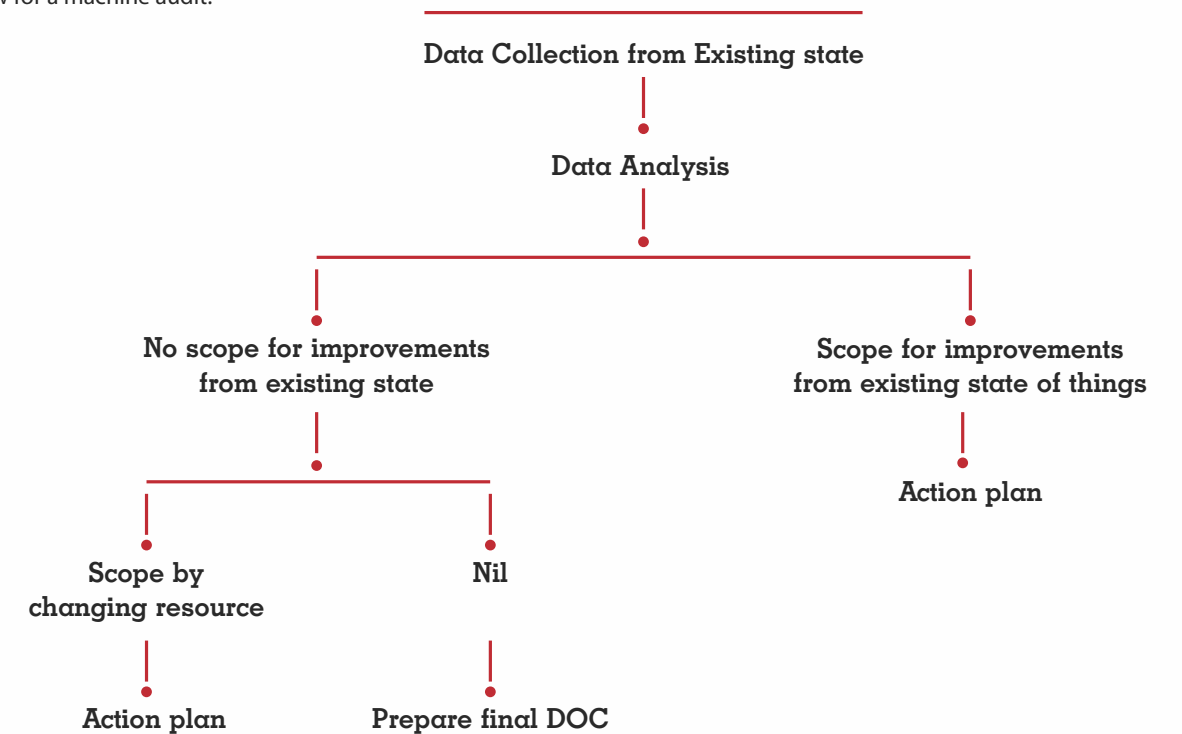
For this, the first step is to...

Find a machine in a machine

Weed out wasteful tool motions and re-sequence machining operations within the existing setup. This does not call for any investments. What it needs is a close hard look at the current workflow and a little course correction.

Basic audit workflow

The flowchart shows a simple workflow for a machine audit.



Machining Audit

Audit Purpose

Enable to visualize the

- Existing process
- Machining techniques
- Resources (cutting tools, work holding, machines)

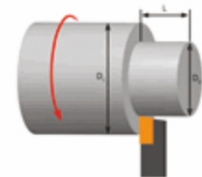
Provide inputs for improvements in

- Bench mark the cycle time
- Best utilization of cutting tools & machines
- Man power efficiency
- Machine shop capacity
- Quality of parts machined
- Safety
- On time delivery

Help prepare road map for continual improvements

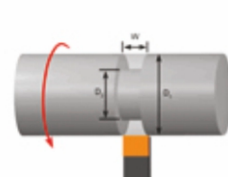
Our worksheets and method of analysing data collected from existing machining will help you to audit the existing machining method and make necessary correction if there is scope for improvements

Ace Micromatic Group would like to help you make the best use of your CNC machines. In this edition, we are taking up CNC Turning centres for our case study. Most common applications on turning centers are general turning - external and internal; grooving - OD, ID and face grooving; threading - external and internal; and drilling.



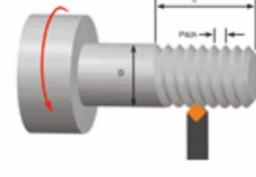
General Turning

- External
- Internal



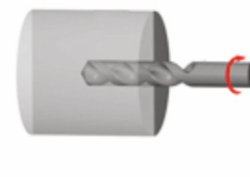
Grooving

- OD grooving
- ID grooving
- Face grooving



Threading

- External
- Internal



Drilling

In this edition, we focus on general turning and factors influencing the tool life, cycle time, part quality, operator intervention and use of machine, cutting tools and work holdings.

Tool life

- Less than recommended
- Frequent Insert breakage / Chip off
- Abnormal wear

Cycle time

- Run time for a given component, cycle start to M30
- Average cycle time of a batch may not be actual cycle time a single part
- Need to look into those factors which are leading to drop in efficiency and take action to eliminate / improve

Operators interventions

- Operator's interventions in production is the major cause of reducing productivity and morale of operators
 - insert breakages
 - chip breaking issues
 - frequent/unscheduled insert change
 - GD & T repeatability problems
 - accidents due to improper cutting methods
- Need to identify process/method which can eliminate operator's intervention in production activities

Machine, cutting tool and work hold abuse

- Improper tool entry / exit
- Input material stock / size variations
- Use of improper cutting tools

Quality and aesthetic of part produced

- Machining part as per drawing dimensions
- Even though dimensions are within limit but parts may not be aesthetically good
- Need to look into those factors which are affecting the quality and aesthetic of part and take action to eliminate / improve

Machining Audit

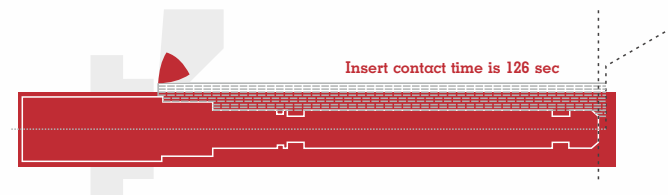
Auditing data collected from existing process

Tool life in turning applications

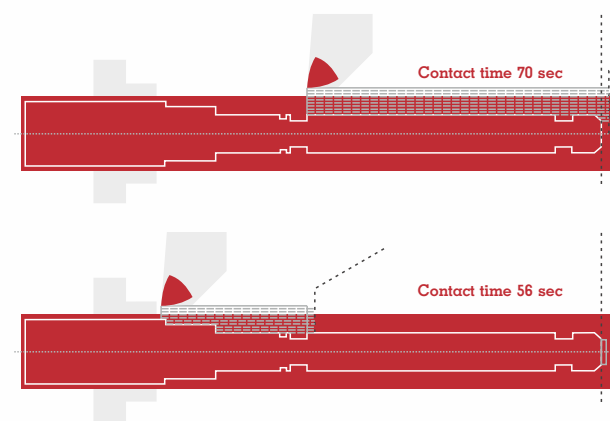
Under ideal conditions, the life of turning inserts is determined by contact time and cutting parameters used. However, in our practical life, majority of components used in mass production are either forging or castings. Parting line, metal flow, size variations, uneven surface, hard surface, intermittent cuts, etc. are the most common issues which play a major influence on the tool life. Unnoticed small inefficiencies will further pull down production and increase cost per part due to higher machine down time and increase in tool consumption. Proper machining technique will avoid many of the above ills and will also improve the tool life.

Case 1: Longer contact time

If the contact time for a particular tool is more than two minutes (120 sec), it would lead to higher heat generation and would reduce the tool life. The machine down time will increase due to frequent insert changes. Modifying the process by using two similar tools would increase tool life and avoid frequent insert change. This may call for an additional tool holder and an extra turret index, but ultimately it would avoid frequent insert changes and minimize operator intervention. The only limitation is the number of tool stations available. The advantages of this approach are reduced tool contact time, increased tool life, reduced cycle time and minimum operator intervention. The lower L/D ratio would result in reduction in cycle time by using higher cutting parameters while machining the stock closer to the chuck.



Improved process

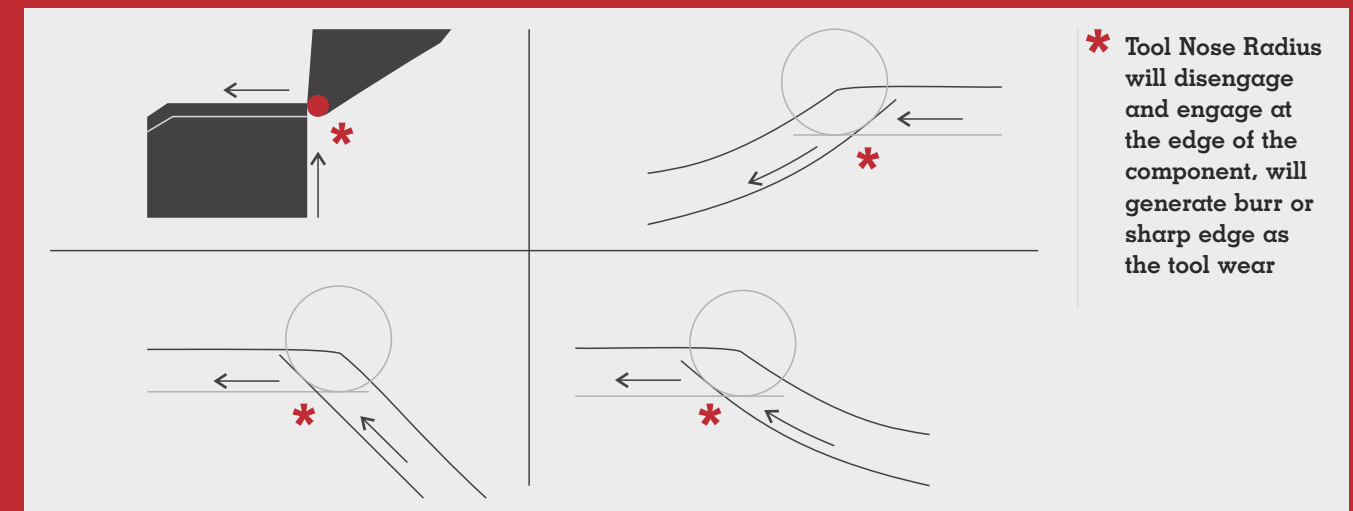
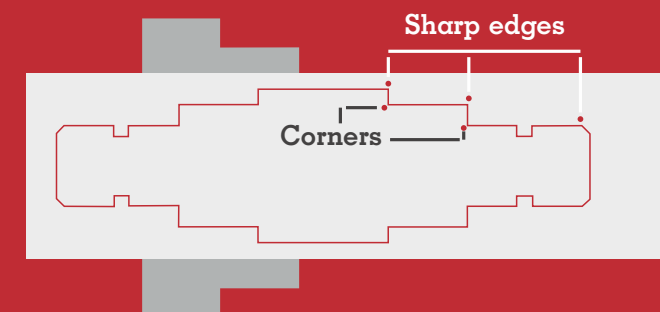


Advantage

- Less tool contact time
- Increased tool life
- Subsequent steps toward head stock can be machines higher parameters, because of less L/Dration advantage.
- Reduced cycle time
- Less operator intervention

Case 2: Edge & Corner management

In smaller size components that are less than 30 mm diameter and have many steps, managing edges can become difficult with regular program format using Tool Nose Radius Compensation (TNRC). Since components are smaller in size, sharp edges or those with burr will be difficult to handle and inspect. It is generally assumed that sharp edge and burr on machined component indicates end of tool life and would call for insert replacement. In reality, as much as 20-30 percent extra life can be extracted from an insert if used right. Using a corner rounding program with zero radius can help avoid burr and sharp edges and enable maximum life of an insert, as demonstrated in the example below.



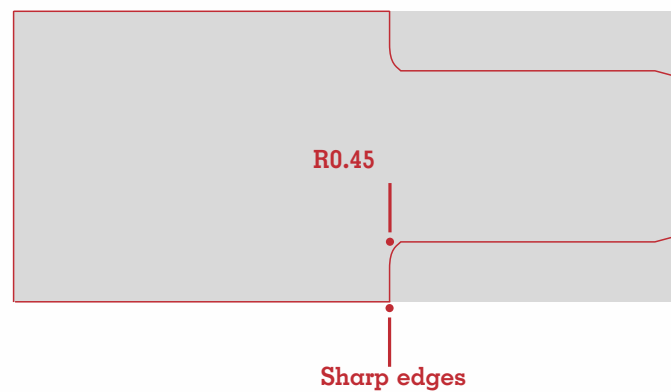
Machining Audit

Example

without G41/G42
(compensated coordinates)

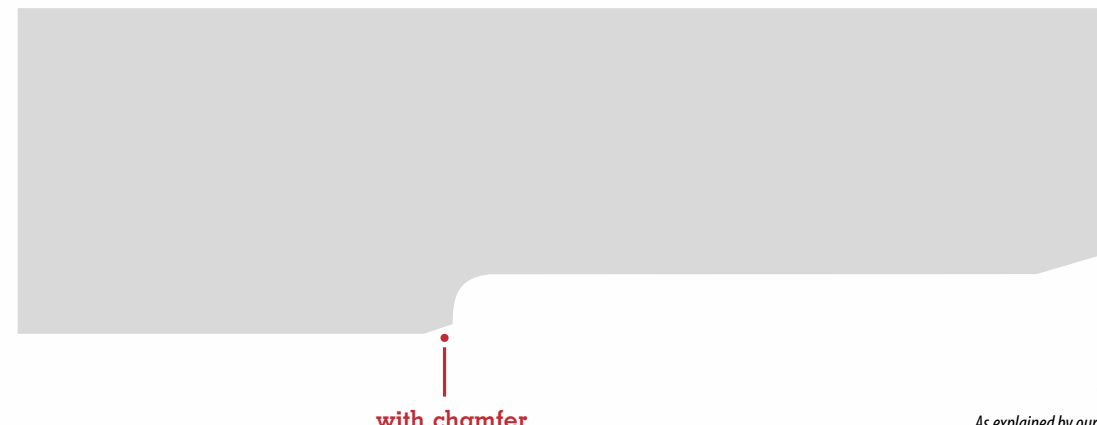
Without chamfer

X26.0Z1.0	G1 X13.408
G1 Z0F0.2	G2 X12.608 Z-7.6 R0.4
X15.147F0.08	G1 Z-28.5
G2 X14.374 Z-0.296 R0.4 F0.06	X12.208
G1 X13.972 Z-1.047	G0 Z5.0
G2 X13.945 Z-1.15 R0.4	
G1 Z-7.15	
G3 X13.845 Z-7.2 R0.05	



With chamfer

X26.0Z1.0	G1 X13.608
G1 Z0F0.2	G2 X12.835 Z-7.497 R0.4
X15.147F0.08	G1 X12.635 Z-7.87
G2 X14.374 Z-0.296 R0.4 F0.06	G2 X12.608 Z-7.973 R0.4
G1 X13.972 Z-1.047	G1 Z-28.5
G2 X13.945 Z-1.15 R0.4	X12.208
G1 Z-7.15	G0 Z5.0
G3 X13.845 Z-7.2 R0.05	

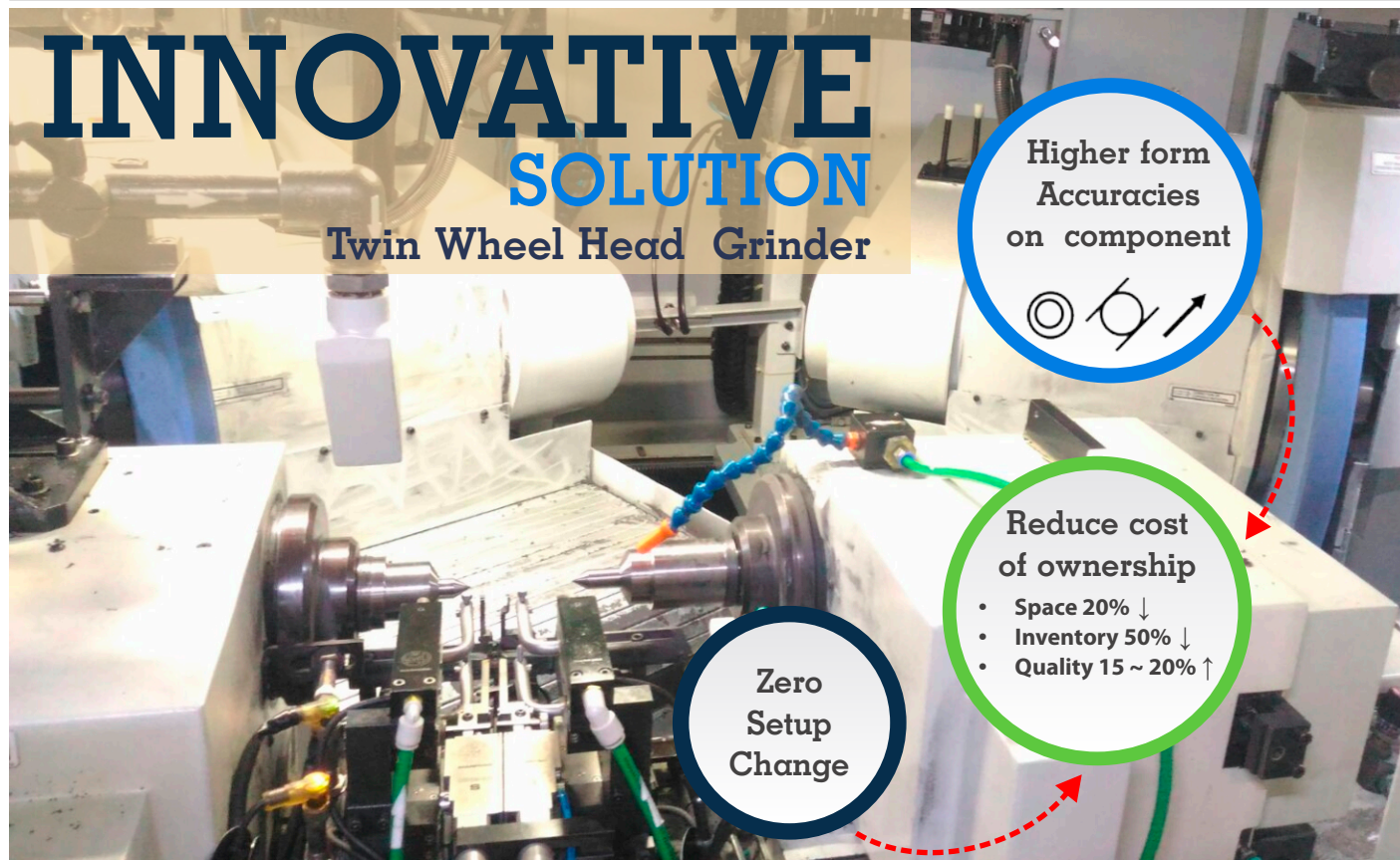


with chamfer

CNC+Plus

As explained by our
Technical Expert Mr.Kashinath M. Patnasetty

If you want to know more contact us:
T: +91 80 40200 555,
E: connect@acemicromatic.com



INNOVATIVE SOLUTION

Twin Wheel Head Grinder

Higher form Accuracies on component

Zero Setup Change

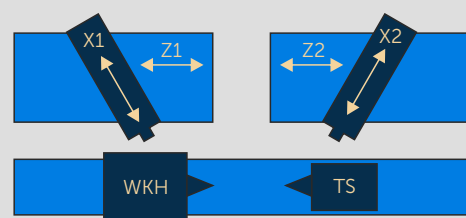
Reduce cost of ownership

- Space 20% ↓
- Inventory 50% ↓
- Quality 15 ~ 20% ↑

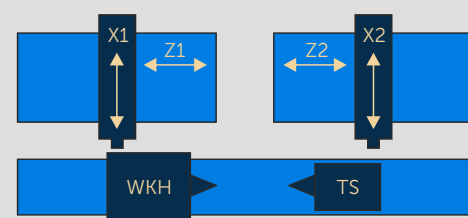
Land being a scarce resource, manufacturing industries are always looking out for ways to increase the output from the available infrastructure. Micromatic Grinding Technologies has developed an innovative product to cater to this need of the Industry. The "Twin Wheel Head Grinder" has two external grinding

slides fixed on the same machine. These slides can be configured based on the customer component as shown in the image below. In addition to using less resource; Man, Money, Time and Space, this configuration also yields better accuracy as the component is finished in a single setup.

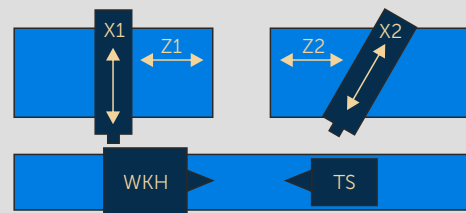
Flexible Machine Configuration



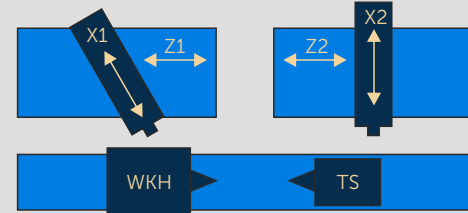
Both Wheel heads with 30° approach



Both Wheel heads with 0° approach



Right Wheel head with 0° approach and Left Wheel Head with 30° approach



Right Wheel head with 30° approach and Left Wheel Head with 0° approach

* Based on component type simultaneous grinding is also possible

Single Wheel head

VS

Twin Wheel head

	Grinder	Grinder
Number of Setup's	Setup - 1 → Setup - 1	Single Setup
Number of machines required	2 Machines	1 Machine
Automation cost	₹ ₹ ₹ ₹ ₹ ₹ ₹ ₹ ₹	₹ ₹ ₹ ₹ ₹ ₹ ₹ ₹ ₹ Less by 30%
Space	2 Machines	Less by 20%
Form Error (Run out, Concentricity)		15 ~ 20% better as component is made in single setup
Inventory of components	M/c 1 → M/c 2	Less by 50%
Operator fatigue	One operator needs to work between 2 machines	Less by 50%

If you want to know more contact us:
T: +91 80 40200 555,
E: connect@acemicromatic.com



EVENT 2016



Live cutting on 1060V at Die & Mould India 2016



Die & Mould India 2016, Bangalore, India



Demonstration of Graphite machining



Discussion with customer



Die & Mould component being appreciated by customer



P Ramadas MD AMS Ltd launching the event directory at Acme 2016



J 300 LM display at Acme 2016



Launch of J 300 LM by P Ramadas (MD) AMS Ltd & Hidehiro Ishiura, Director General, JETRO



Discussion at the stall



MMT Team at Acme 2016

Events 2016



Speakers at conference on Smart & Sustainable Manufacturing at Amtex 2016



House Show inauguration at Aurangabad Tech Center by Avinash A Kalkundri, General Manager, Bajaj Auto Ltd



J 400H display at Amtex 2016



Launch of J 400H at Amtex by Deepak Jain, MD, Jain Industrial Products, Rothak



MCV 450 machine being explained to the chief guest



Seminar on Industry 4.0



MMT team with event organizer Cyril Pereira, Triune Exhibitors Pvt Ltd



MMT Delhi team at Amtex 2016



Customers at the House show



MMT Aurangabad team at House Show

FAQS FOR FLOOD AFFECTED CNC MACHINES



My CNC shop floor is wet due to flooding up to Level 0. What precautions should I take for safeguarding my CNC capital equipment?

- Do not switch on the machine
- Dry the floor completely
- Use a halogen/high voltage bulb for four hours to remove moisture in electronic cabinet, voltage stabilizer and operator panel
- Check the incoming cable from mains to stabilizer and from stabilizer to machine for damage and water entry. If damaged, do not switch on the machine - immediately replace the cable
- Check the presence and also connectivity of the machine earthing
- Call the authorized CNC service engineer for the final check before switching the machine on

My CNC machine is flooded up to Level 1. What additional precautions should I take?

- Repeat all the points listed earlier [from (a) to (d)]
- Call a Micromatic engineer for the removal of transformer, spindle motor, lubrication motor, hydraulic motor, power supply unit etc.
- Coordinate with Micromatic engineer for sending the above items to CNC system manufacturer for drying and repairs
- Completely drain the hydraulic tank, lubrication tank, coolant tank and replace them with fresh oil and coolant. Do not reuse the contaminated oil. Wait until it is cleaned and verified by an authorized representative.
- Check the presence and also connectivity of the machine earthing
- Call the authorized CNC Service engineer for the re-fitment of all parts and for final check before switching on power to the m/c

My CNC machine is flooded up to Level 2. What additional precautions should I take?

- At this level, the spindle, axes motors, hardened or LM guideways, ball screws, part of electrical cabinet etc. are likely to be under water. The repairs or likely replacement for the above equipment needs to be done by authorized Micromatic engineers only
- The spindle needs to be removed and sent to the machine manufacturer for replacement of bearings, greasing, assembly and testing
- Depending upon the machine model, it is likely that the complete CNC package needs to be sent to the CNC system manufacturer for washing, cleaning, drying and checking
- Check the presence and also connectivity of the machine earthing
- Call the authorized CNC Service engineer for the re-fitment of all parts and for final check before switching the machine on

My CNC machine is completely flooded above Level 2. What should I do to salvage the machine?

- At this level of flooding, the damage to the machine will be quite severe. The damage will be higher if the machine has been under water for a long time
- Drain the water in the shortest possible time
- Call the authorized service engineer who will recommend and estimate if the machine can be salvaged

General Recommendations

Call the insurance company representative as soon as possible and lodge a formal claim

Take plenty of photos of the damaged equipment

Do not send the damaged mechanical or electronic parts, CNC system, drives etc. to any unauthorized personnel. It could lead to irreparable damage to the machine

CNC+Plus

Kindly register all your flood relief service calls to our dedicated
helpline numbers

T: +91 9840785520 and +91 9840785523. E: connect@acemicromatic.com

Sales and services contact details

INDIA

NORTH

Delhi
T: +91 11 22414232
E: mmtdel@acemicromatic.com

Gurgaon
T: +91 124 4745500
E: mmtdel@acemicromatic.com

Rohtak
T: +91 99966 91055
E: mmtdel@acemicromatic.com

Faridabad
T: +91 129 4047000
E: mmtdel@acemicromatic.com

Ludhiana
T: +91 97791 28296
E: mmtdel@acemicromatic.com

Rudrapur
T: +91 95570 30224
E: mmtukd@acemicromatic.com

SOUTH

Bangalore
T: +91 80 40200555
E: mmtblr@acemicromatic.com

Chennai - Sriperumbudur
T: +91 44 40440700
E: mmtche@acemicromatic.com

Ranipet
T: +91 4172 272732
E: mmtrpt@acemicromatic.com

Bangalore - Bommasandra
T: +91 80 27834836
E: mmtbms@acemicromatic.com

Chennai - Tambaram
T: +91 044 22265531
E: mmtche@acemicromatic.com

Trichy
T: +91 431 2483066
E: mmtry@acemicromatic.com

Belgaum
T: +91 99800 02597
E: mmtbgm@acemicromatic.com

Coimbatore
T: +91 422 4506183, 6588595
E: mmtcbe@acemicromatic.com

Chennai - Ambattur
T: +91 44 40440700
E: mmtche@acemicromatic.com

Hyderabad
T: +91 40 23070496
E: mmthyd@acemicromatic.com

EAST

Jamshedpur
T: +91 657 6539931
E: mmtcal@acemicromatic.com

Kolkata
T: +91 33 23648781
E: mmtcal@acemicromatic.com

WEST

Ahmedabad
T: +91 99242 89892
E: mmtbom@acemicromatic.com

Pune - Chakan
T: +91 21 35322002
E: mmpune@acemicromatic.com

Mumbai - Thane
T: +91 22 25829062
E: mmtbom@acemicromatic.com

Aurangabad
T: +91 240 2552309
E: mmtaur@acemicromatic.com

Pune - Chinchwad
T: +91 20 40712111
E: mmpune@acemicromatic.com

Pune - Shirur
T: +91 98906 23217
E: mmpune@acemicromatic.com

Indore
T: +91 73899 39190
E: mmtindr@acemicromatic.com

Kolhapur
T: +91 230 2460444
E: mmtkop@acemicromatic.com

Rajkot
T: +91 281 6548369
E: mmtraj@acemicromatic.com

Nasik
T: +91 253 6610254
E: mmtbom@acemicromatic.com

Mumbai
T: +91 22 26861009
E: mmtbom@acemicromatic.com

INTERNATIONAL

Germany
T: +49 1722316688
E: debjoyr@acemicromatic.com

China (Shanghai)
T: +86 (21) 5866 5031/32
E: raguramachandranc@acemicromatic.com

Our Network



Micromatic Machine Tools Pvt. Ltd.,
#240/241, 11th Main, 3rd Phase, Peenya
Industrial Area, Bangalore – 560 058
Tel: +91 80 4020 0555
Email: connect@acemicromatic.com

 www.acemicromatic.net

 [/acemicromaticgroup](https://www.facebook.com/acemicromaticgroup)

 [/user/acemicromatic](https://www.youtube.com/user/acemicromatic)

 [/goo.gl/TlPMQT](https://www.linkedin.com/company/acemicromatic)

