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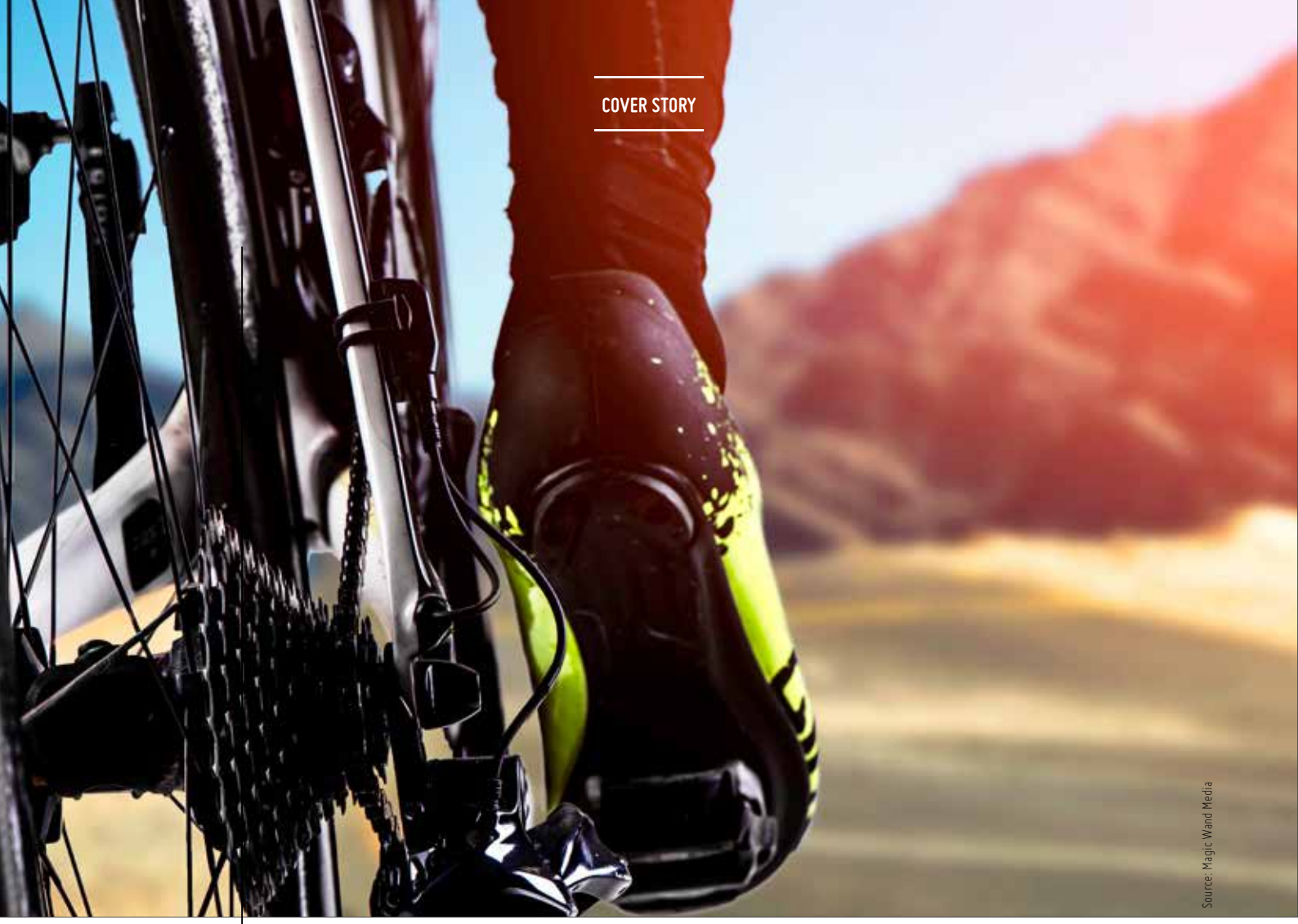
THE ROAD LESS TRAVELED



Source: Magic Wand Media

THE ROAD LESS TRAVELED

Mechanical Engineering has long been a male dominated space. But over the years, a few pioneering women have refused to conform and forayed into the machine tool industry. Here they talk of coming out of their comfort zone, choosing a path treaded less by their likes, and making a difference as role models.

There is a long history of women who have designed and built machines; a history that even predates the development of engineering as a trade. Women have made significant contributions to engineering throughout history. Hypatia of Alexandria (370 - 415 AD) invented and designed the world's first Hydrometer - an instrument used for measuring the relative density of liquids based on the concept of buoyancy, eons before the term 'Engineer' was even coined in the 11th century.

Battling stereotypes

Coming back to the present times and focusing on our country, Indian women are still to be granted equal status in various walks of life. However, the scene is fast changing with a few out there fighting it out to earn the position they truly deserve. In doing so, they are being a beacon of hope to others.

"Let not the irony of a 'Bachelor's' degree being awarded to a woman be lost," says Annu Varghese, Design Director, Forms and Gears, with a smile as she narrates how it was, studying and building a career in the machine tool industry. She has done Mechanical Engineering from PSG College of Technology, Coimbatore, and also has an MS degree in Manufacturing Systems from the University of Texas, Austin.

Source: Team MMI

"Girls in those days were not encouraged to take up Mechanical Engineering as it involved physical work too. There was just one more girl other than me in a batch of 60. For our Smithy workshops, we had to heat metal workpieces on a furnace using tongs, hold the workpiece on an anvil and forge it into different shapes using a hammer. Certainly, more physically tough than sitting on a computer and writing codes," she notes.

Her choice of venturing into Mechanical Engineering was inspired by her father who himself was a Mechanical Engineer and had a Fixture Building company, which Varghese now successfully runs along with her brother.

Her colleague K Geetha, Design Manager, Forms and Gears, shares how her sheer will has helped her to reach where she is today, "It was a surprise to find myself as the only girl in the Mechanical Engineering class. It was likewise at Macon Engineers, my first job as design apprentice. Those days, design was done manually on the drafting board. And, although it was physically taxing to stand for hours drawing lines, the vision to make it kept me motivated." As they say, easy and success do not go together.

Geetha has designed over 100 Special Purpose Machines at Macon Engineers and, along with Varghese, is now part of the team at ASM - Forms and Gears that has developed Smartfix 4.0, the world's first Industry 4.0 and IoT solution for Fixtures and Workholding.

Grounded to aim high

Mohini Kelkar, Managing Director, Grind Master Group, currently plays a role that can intimidate many a man in the field. She heads the Group that specializes in machines for Metal Finishing, Deburring, Micro-finishing, Robotic Machines and Abrasives, providing total solutions for surface finishing requirements. The Group has supplied over 5,500 machines across 6 continents and has a strong IP bank of 30+ patents, 30+ registered designs and 3 trademarks.

Source: Grind Master Group

"Born in a middle class but highly educated family, I never faced any gender bias at home and was offered equal opportunities as my brother. Encouraged to pursue my heart, I made the choice of studying Mechanical Engineering, which was pretty unusual at the time."

Mohini Kelkar
Managing Director
Grind Master Group

On what prompted her to opt for a career in the machine tool industry, Kelkar says, "I was born in a middle class but highly educated family. My brother and I both studied Mechanical Engineering at VJTI Engineering College, Mumbai. At home, we never faced any gender bias and were offered equal opportunity."

Encouraged to pursue whatever she wanted, she took up Production Engineering in 1978 and found herself to be the first girl to do so. "Electronics and Computer Science were more popular among girls back then. However, I found Mechanical and Production Engineering more interesting since it satisfied my curiosity to know how things worked, and it also offered ample opportunities," she adds.

Source: Forms and Gears

"Stereotyping of girls and boys at an early age is one of the reasons not many women enter the machine tool industry. Girls are taught to play with dolls, while the boys are encouraged to build stuff with Lego and play sports."

Annu Varghese
Design Director
Forms and Gears

After securing the degree, she took up a job at PMT (Perfect Machine Tools) in Pune as a Design Engineer. "Even though there were a lot of women in HR and Admin, I was the only female engineer in Machine Design. I was quickly hooked on to machine design and its applications and got the confidence to design machines," she shares.

Unvarnished truths be told

Rajalakshmi Hegde, Strategic Account Management - Global End Users, B&R Industrial Automation Pvt Ltd, points to certain challenges she encountered in her first job as a woman. B&R Industrial Automation is a part of ABB Group and is its global

The scene is fast changing with a few women out there fighting it out to earn the position they truly deserve and being a beacon of hope to others.

Source: Guindy Machine Tools Ltd (GMT)

"I have never felt deliberately slighted by anyone at work, or within the industry in India, on the basis of gender. I have not even faced any pay scale difference. On the contrary, I have felt obliged to live up to all the admiration."

Jayashree Mani
Vice Chairperson
Guindy Machine Tools Ltd (GMT)

Source: Jyoti CNC Automation Ltd

"For a woman to build a career in the machine tool industry is quite tough. And you fear if you are being just enough to your responsibilities at home. For this, a reliable and sturdy support system is needed to balance demands from both sides."

Mital Desai
Design Manager
Design Department
Jyoti CNC Automation Ltd

Travel means and safety have improved over the years and women have progressed since then. But the real barriers remain until today.

center for machine and factory automation.

Reflecting on the 'ugly side' of her experience, she says, "My first job at an industrial automation company was a shock to me. I was the first woman ever to be employed in the organization. And as my employment was in the core engineering field, challenges began from the very basics such as not having ladies toilets on shop floors where I worked, not being allowed to work on the shop floor, male colleagues not acknowledging the fact that I could work with machines or that I could travel long distances etc."

This kept her in the office doing documentation for a very long time. "Manufacturing industries and the industrial environment, in general, did not accept women at the time. Every step, be it programming, assembling, or commissioning or even travel for that matter, had to be proven by a woman employee before she got a decent project at work. Women were not valued the same as men in the workplace and were often paid much lesser than them," adds Hegde.

But then there were men who offered her the opportunity and provided her the support to grow and thrive. "I appreciate their contribution to my success," she notes.

Sturdy support system helps

Mital Desai, Design Manager, Design Department, Jyoti CNC Automation Ltd, has worked on the highest number of products at the company's R&D. "For a woman to build a career in the machine tool industry is quite tough," she states recalling that she too was the only girl in the Engineering department when she joined the company in 2001. Jyoti CNC was situated around 15 km away at METODA GIDC, which at the time was quite a distance away due to the dearth of transport options those days. "If constantly proving oneself was not enough, travel issues added to my woes. Our working hours were from 8am to 8pm and travel to and from Rajkot was difficult," she adds.

Travel means and safety have improved over the years and women have progressed since then, but other barriers still remain. For a woman there is the added pressure of keeping everyone at home happy and comfortable and there are constant sacrifices to be made. However, women tend to not talk about it and make it appear quite easy to grapple with. "For a woman to work in an industry where only men are your co-workers is a lot to deal with. On top of it, there is pressure from home too, where you fear whether you are being just to your responsibilities there. What we need is a reliable and robust support system at both places to handle this dual responsibility, and luckily for me, I have had both. A supportive family with an encouraging atmosphere at work have helped bring out the best in me," shares Desai.

Gaining accolades

Jayashree Mani, Vice Chairperson, Guindy Machine Tools Ltd (GMT), has been fortunate to have never fought for gender parity either at work or at home. "I never felt deliberately slighted by anyone at work, or within the industry in India, on the basis of gender. On the contrary, I have felt obliged to live up to all this admiration. There was no discernable discrimination at all even in my first job at Hindustan Brown Boveri (now Asea Brown Boveri Ltd). Nor were the pay scales there different for women," she notes.

Mani is a legend in her own right, heading GMT, one of the oldest and best reputed manufacturers of Chucks and

Source: B&R Industrial Automation Pvt Ltd

"The industrial environment did not accept women at the time. Be it programming, assembling, or commissioning, they had to prove before getting a decent project at work. They were not valued the same as men and were often paid much lesser than them."

Rajalakshmi Hegde
Strategic Account Management - Global End Users
B&R Industrial Automation Pvt Ltd

Source: Forms and Gears

"It was a surprise to find myself as the only girl in the Mechanical Engineering class. It was likewise at my first job as design apprentice. And, although it was physically taxing to be in the field, the vision to make it kept me motivated."

K Geetha
Design Manager
Forms and Gears

Metrology equipment. She has taken the 50 year old company from a turnover of ₹5 crore in 1995 to ₹40 crore today. She has contributed to computerization of production and business processes, new projects and web marketing.

Her first job at Hindustan Brown Boveri in Bombay gave her a broad idea of how large, professional corporations worked, as opposed to a family business. "With that experience in tow, I joined the family business GMT immediately after shifting back to Madras. It was a 23 year old company by the time I joined, with a team of dedicated engineers who had grown used to working with each other. They knew me for long as the boss' daughter and now accepted me as part of the team," she shares.

Mani was given the task of making the company ready for CNC machines. "With an Electrical Engineering background, I was eminently suited for this. Our first single axis CNC machines were already commissioned by then, to grind chuck parts," she says.

After setting up the Electronics Department, Mani interfaced the systems for the company's first CNC Surface and Creep Feed Grinders. "These machines were designed and built by our team that saved us several crore of rupees, and GMT chuck T-Slots and Jaw Serrations are still ground on them," she adds.

Later, she was assigned to develop a Co-ordinate Measuring Machine (CMM), her father's passion project. "Much later I initiated a project to increase the life of the GMT chuck, by addressing problems of fretting corrosion in the jaw and T-Slot surfaces. The project was a runaway success," apprises Mani. "I was always in product development and not in mainstream production. Given the poor connectivity and difficulties in accessing materials, and working in the constantly cash strapped, bureaucratic environment of those early years, I think that the production and sales team had their own nerve racking preoccupations, and I, with my electronics background, must have earned their regard for me. Gender certainly did not stand in the way of our heated arguments, before we eventually settled down to a productive way of working together," she adds.

"Over the years, we have had several women electrical or electronic engineers working in maintenance and interfacing of CNC machines and CMMs. They have worked on the shopfloors too, tough women, each one of them, for it could not have been easy. Our technical competence was always respected, and we received unequivocal support when we made mistakes," she recalls.

Changing the world

The above women have seldom had it easy, but they've persevered through tough times pursuing what they wanted. They had their hearts set on accomplishing goals in a world which was taken up mostly by men. Unwavering, they have marched on, not realizing at the time, they were changing the world in the process. They all, in their own way, have blazed a trail for the future generation. They acknowledge that a lot is left to be done and that gender parity needs to start at home, long before it is practised at work.

They acknowledge that male allies, both at work and at home, should chip in by shedding their outdated perceptions and offering a supportive and nurturing environment. They recognize that women in the machine tool industry must keep pushing each other for leadership positions, to make this world a little more inclusive - and the road less traveled a bit more easier for the next generation of women to follow.

Women, importantly, must keep pushing each other for leadership positions, to make this world a little more inclusive and equal.