Grind Master Machines Pvt Ltd
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ROBOFINISH – Robotic Grinding Technology

for Grinding and Finishing of Ferrous and Non Ferrous Castings

Grind Master Group is a GLOBAL TECHNOLOGY LEADER in specialized TURNKEY Machines for Metal Finishing, Deburring, Microfinishing, Robotic Machines and Abrasives, providing total solutions for surface finishing requirements. With over 5500 machines across 6 continents, serving a wide range of industries, we bring a world of experience of over 35 years in machine technology & process knowledge. GM has strong IP bank of 30+ Patents, 30+ Registered designs and 3 Trademarks.

Grind Master group has 7 manufacturing facilities and 3 state-of-the-art innovation R&D centres across the globe. GM group companies in India, China, France and USA constantly strive to exceed customer expectations with Innovative & Trustworthy solutions created with Passion and Expertise. Grind Master established its Robotic Machining Technology Unit was established in 2011 to diversify the product range, and over the last 7 years we have delivered over 100 robotic milling/grinding/finishing/deburring solutions. Robotics is the fastest growing product segment today and are also being accepted internationally with a number of projects in 2018.
Robotics is one of the most sought-after technology across the Globe. The demand for Industrial Robotic Automation systems is rising exponentially.
In early 1970s the evolution started for CMC machining process like Milling, Grinding, Turning etc. This is also the time of evolution of Industrial Robots for Handling, Welding applications.
There are some limitations in CNC technology such as Flexibility, Scalability, Complexity of Motion and Cost. These factors are overcome in Robotics
From 2000 onwards These two technologies were combines and Robotic Grinding was introduced. Robotic Grinding machine consist of an Industrial Robot and controller, spindles and tool changers, tool rack, fixtures and programming software.

Modular – Flexible – Refined Generation 3 Robotic Grinding Machines

Robotic Grinding in Foundries is a major leap from Industrie 2.0 to Industrie 4.0 and towards Next Generation Manufacturing. This transformation will have a deep impact on Productivity, Enhanced and Consistent Quality, Health and Safety, Flexibility/Multitasking, reduction in cycle time, neat and clean Fettling Shops in foundries.

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(Robotic Grinding Cell)

Robotics has some key technologies that includes Application/Process Development, Tooling and Fixtures, Controls and Programming Software's. There are two approaches in Robotic Grinding. First one is Robot Moving Tools. In this approach one or multiple tools are mounted on Robot Wrist ad workpiece is clamped in the fixture. This approach is suitable for large parts with wide variety. Second approach is Robot Moving Parts. One or multiple tools are fixed in cell and workpiece is moved by Robot and gripper. This approach is suitable for small parts made in dedicated production lines.

Robotic Grinding/Fettling gives tremendous improvements in the consistency and completeness of fettling. Manual operations are subject to numerous variations through the days, weeks and months of the year where more than one operator never works in the same style. Multiple operators work on one component leading to handling damages. Cutting tools manually operated invariably causing scratch marks, dents; dig into unwanted areas, which are a major cause for rejection of castings. The Tool Selection is in Robotic Grinding is very critical because the process reliability, cycle time and running cost of the system are majorly based on the type of tools used. In certain cases, it is observed that selecting the most advantageous tool can reduce cycle time and cost running by as much as 90%. The most commonly used tools in Robotic Fettling include diamond-plated wheels for cutting and grinding.

Robotic Grinding/Fettling have various costs associated with them, which have to be considered while calculating cost per piece over the long run such as the maintenance costs (Annual Maintenance, Spares etc), energy costs, consumables costs (use of customised tools for robotic application can save significantly); retooling, reprogramming costs and labour costs (including future rise in the same). Significant improvement in quality is considered while calculating the investment returns of a robotic fettling system. A drastic reduction in rejection rate and removal of rework/checking stations also brings space savings. Correct selection of application and wise implementation can ensure a Return on Investment of Robotic Grinding Machines within 1-2 years

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(Robotic Grinding)

While working in Robotic Grinding technology, Tool selection is extremely important and critical. We must study the mentioned parameters while selecting the proper tool such as Process, Flash level, material, Material removal, estimated cycle time, running cost, reliability.
ROBOFINISH - Robotic Grinding technology is an ultra-user-friendly revolutionary technology for 21st century that will transform the Foundry world.

Mr Sameer Kelkar
CEO and R&D Head,
Grind Master Group