Case Study

Glebar GT-610 Enhances Rare Earth Magnet Manufacturing: Delivering an Automated Grinding Process to Improve Production Volume and Manufacturing Efficiency

Manufacturing Challenge

A well-known supplier of Electric Vehicle (EV) components approached MMT to assist with the **production of NdFeB -based magnets utilized in motors.** While many benefits exist with this material, there are numerous production challenges due to its highly magnetized, rigid makeup.

To meet these manufacturing challenges head-on, **the manufacturer required an intelligent, turnkey grinding system** with the ability to deliver:

- An easy-to-use system to maximize up time and production rates
- A completely automated solution with simple set-up and changeover processes
- Optimized tooling to hold tight tolerances for small diameter parts, ranging from 1/8 - 1/2 inch in diameter
- Process controls with the ability to automatically load bulk components to achieve precise lengths and corners
- Rough surface finishes for parts requiring coating and precise adhesion after the sizing process

Background

Rare Earth Elements (REEs) are essential to enhancing our modern technological landscape and are widely used in sectors such as **electronics, nuclear fuel, clean energy technologies, and advanced manufacturing.** Their impact is profound and far-reaching, especially with consideration to the automotive industry.

In recent years, **permanent magnets utilizing Neodymium-iron-boron (NdFeB) have emerged as an essential component for the automotive sector.** This is due to the material's ability to maintain magnetism without the need for an external magnetic field or electric current. As a result, NdFeB delivers strong performance due to its: 1) extremely strong magnetic fields; 2) high resistance to demagnetization; and 3) incomparable performance in compact designs.

Solution

With extensive experience in small rare earth and ceramic components, MMT delivered a customized manufacturing solution through the Glebar GT-610.

The GT-610 is utilized for applications that require in-process controls and customized, turnkey automation. **The system is ideal for components requiring extremely tight tolerances, grinding of multiple parts per cycle, and frequent changeovers.** The rigid design excels at grinding PCD Diamond and metals such as steel, carbide, titanium, and composite materials, including rare earth elements.

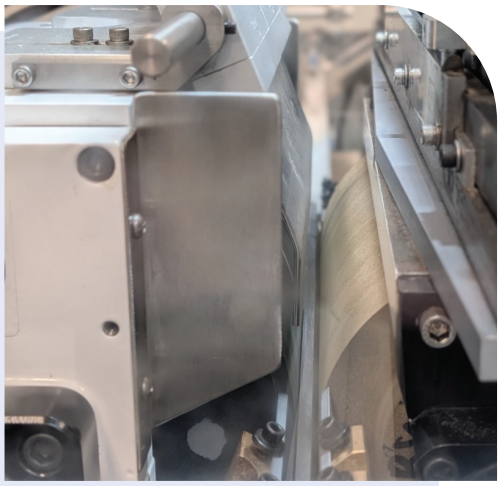


Glebar GT-610

Process

As a complete process development partner, Glebar designed a turnkey system featuring:

- A fully automated solution with custom tooling to achieve desired surface roughness without sacrificing throughput.
- An 8.125” grinding wheel to ensure efficient material removal while prolonging the wheel lifespan.
- A step feeder to automatically load bulk components into the GT-610.
- An automated stick dresser to seamlessly dress wheels to maintain wheel sharpness and reduce material loading.



8.125” Grinding Wheel

Results

Through a collaborative process, Glebar developed a turnkey solution that streamlined operations and offered several key benefits to the manufacturer:

Efficient Process

An expert process where parts are centerless ground to achieve exact size and roundness tolerances, **10x tighter than the customer's specifications.**

Increased Throughput

The system automatically produces the required surface roughness while **delivering fast throughput without compromising quality.**

Machine Predictability

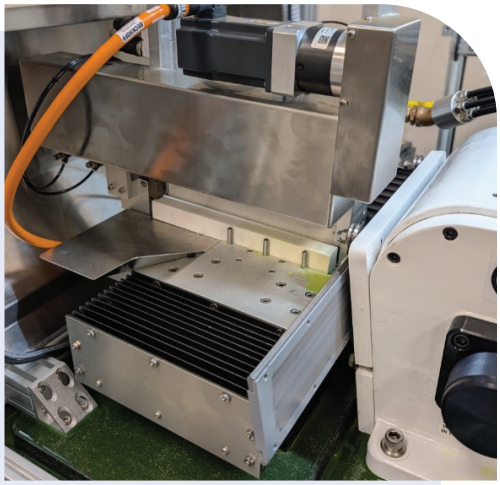
The process is **designed to maintain a rough surface finish while providing precise size grinding.** The rough finish is essential as it enhances the effectiveness of a secondary coating process applied to the parts.

Ease-of-Use

Customized software and tooling to provide **ease-of-use, operator safety, and further process efficiencies.**



Automated Step Feeder



Automated Stick Dressing System

About MMT:

Medical Manufacturing Technologies (MMT), a leading global provider of medical device and industrial manufacturing solutions, is a single-resource solution for automated process-driven manufacturing—streamlining complex systems with an emphasis on precision and finely tuned efficiency. The company offers process development, applications and equipment, technical solutions, and after-market support.

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