CENTER FOR MANUFACTURING SUPPORT
JACKSONVILLE STATE UNIVERSITY

Success Story: Extending the Life of Legacy Equipment with Reverse Engineering and Hybrid Manufacturing

Customer Challenge

A regional manufacturer faced downtime due to broken acrylic discs in a critical machine. These discs had a lifespan of about one year, but the original equipment manufacturer (OEM) was out of business. The machine used hundreds of discs, and without a reliable replacement, production efficiency and profitability were at risk.

This is a common issue in manufacturing, companies must keep legacy equipment running even when OEM support is no longer available, and some do not have the in-house capabilities or the time required to locate and qualify a new source for obsolete machine parts.

CMS Solution

The company turned to the Jax State- Center for Manufacturing Support (CMS) for help. Using our in-house reverse engineering and additive/subtractive manufacturing capabilities, we developed a sustainable, long-term solution:

- **Reverse Engineering:** The broken part was recreated using advanced metrology tools and software.
- **Redesign for Durability:** The main body of the disc was manufactured from **6061 aluminum,** eliminating the failure point of acrylic.
- **Hybrid Manufacturing Approach:** Mounting geometry was produced using additive manufacturing with a biodegradable thermoplastic.
- **Digital Inventory:** The thermoplastic component was stored as a digital model, enabling the customer to reproduce a new part in less than two hours if needed.

Results & Impact

- **Increased Lifespan:** The aluminum base is effectively permanent, eliminating recurring failures.
- **Rapid Repair Capability:** If the thermoplastic portion wears out, replacements can be produced on demand.
- **Supply Chain Control:** No reliance on external vendors, everything was designed, tested, and manufactured in-house at the CMS.
- **Sustainability:** By combining durable metals with biodegradable plastics, the solution was both environmentally and operationally efficient.

Why It Matters

This project demonstrates how CMS helps regional manufacturers:

- Extending the lifespan of legacy systems, when OEMs are no longer available
- Providing rapid, cost-effective part replacements
- Leveraging reverse engineering, additive, and subtractive technologies in one ecosystem

Student Engagement

Every CMS project integrates student workers from JSU's Department of Applied Engineering. For this project, students assisted with:

- Reverse Engineering of the broken part
- Operating Advanced Manufacturing equipment to produce the new part

By working directly alongside CMS engineers, students gain real-world problem-solving experience, while companies benefit from fresh perspectives and highly motivated talent. Many industry partners later hire these students, making each project a pipeline for workforce-ready engineers.

Customer Feedback

“The CMS team provided a solution that not only fixed our immediate issue but also gave us long-term confidence in our equipment’s reliability. Their ability to redesign and manufacture everything in-house saved us time and money, and the involvement of students shows the kind of forward-thinking workforce pipeline our industry needs.” – *[Manufacturer Representative]*

Ready to Solve Your Manufacturing Challenge?

If your company is facing similar issues with obsolete parts, equipment reliability, or process improvement, the JSU Center for Manufacturing Support can help.

Scan the QR code below to learn more or to start a project with us

visit: www.jsu.edu/cms