

CASE STUDY

SPECIALIZED MACHINED PART DELIVERED IN TIME FOR PRODUCT LAUNCH

Trusted precision parts supplier helps manufacturer overcome a late production challenge

OVERVIEW

When a manufacturer's complex parts proved too challenging for an overseas supplier, a late-stage design change was required.

AMP was selected as the trusted partner to provide the needed capability and responsiveness to create the critical parts within weeks.

The specialized and complex stainless-steel valve balls - parts for a thermostatic valve in a digital water mixing system - had to be redesigned and machined to tight tolerances.

AMP delivered the parts just in time, and the global water technologies company was able to launch its high-profile product on schedule.

CHALLENGE

HOW DOES A MANUFACTURER SELECT A SUPPLIER CAPABLE OF PRODUCING A HIGHLY-SPECIALIZED MACHINED PART IN ONLY A FEW WEEKS?



MACHINED PARTS

Stainless-steel slotted valve balls; in two sizes

COMPONENT IN

3-way mixing control valve assembly

FINAL PRODUCT

Digital water mixing and distribution system

CHALLENGE

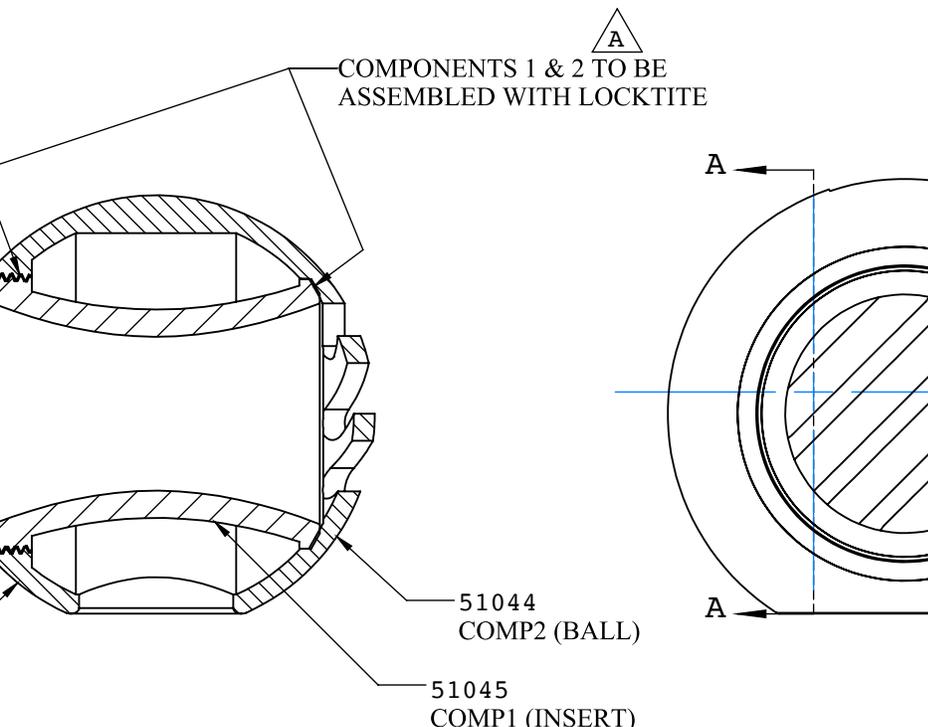
BACKGROUND

The customer - a leading water technologies company of innovative brands - had set a strict date for the launch of a new product.

Then, late in the development cycle, it was determined that the slotted valve balls were too complex to be cast by the overseas supplier, and would need to be precision machined instead. The manufacturer was suddenly left in a difficult position trying to complete production on time.

With such a shortened lead time, an experienced and advanced machining facility had to be quickly selected to produce and coordinate the technically-demanding parts.

Fortunately, Automatic Machine Products / AMP was already a trusted and valuable partner, having worked with the customer on other precision machining applications for potable water systems. AMP was an easy choice as the preferred supplier for this contract, based on our past ability to successfully complete equally challenging projects.



WHAT CAPABILITIES WERE REQUIRED OF THE MACHINED PARTS SUPPLIER?

- 1 Specialty materials experience, including stainless-steel and Eco-brass, or lead-free brass
- 2 Advanced machining processes, using the latest CNC technology
- 3 Detailed engineering review - to meet the customer's stringent quality requirements
- 4 Success in the design and production of precision and high-tolerance parts
- 5 ISO 9000:2015 certified
- 6 A team of experts: responsive, reliable, and able to coordinate and meet a demanding deadline

CHALLENGE



THE PARTS AND FINAL PRODUCT

Two intricate stainless-steel balls - for a control valve within a digital water temperature mixing system

The parts requested by the manufacturer involved two intricate and high-grade metal spheres - in two different sizes - to be produced in stainless-steel for a 3-way mixing control valve.

The detailed design of the slotted metal valve balls would require advanced machining and coding skills. AMP's finished product would ultimately represent the most critical component of the ball valve, to be integrated within the manufacturer's brand of digital water mixing and recirculation systems.

The final smart technology product - designed to control water temperature and flow - worked with

sensors that provided data to a digital controller and triggered a fast-action actuator. The precision of the finished valve balls produced by AMP would be essential to the accuracy and predictability of the building system's water temperature when it reached the end-user.

The manufacturer's advanced digital water system was being developed for applications in industries such as hospitality and healthcare, including for the more sensitive needs in hospitals and nursing homes. The digital control valve assembly was designed to help prevent bacterial growth and scalding in the delivery of domestic hot water.

**PRECISION OF THE
FINISHED VALVE BALLS
WOULD BE ESSENTIAL TO THE
ACCURACY OF THE PRODUCT**

SOLUTION

AMP BEGINS THE MACHINED PARTS PROJECT BY CONFIRMING THAT KEY REQUIREMENTS ARE CLEARLY UNDERSTOOD

Once engaged, AMP developed a detailed plan for managing the quality production of the parts. The focus was on these initial objectives:



Support redesign of the parts for optimal machining

After the manufacturer had redesigned the part in-house (from the original casting process to machining), AMP's pre-engineering team completed a thorough review of the drawings and details prior to prototyping and production.

The highest quality results would be achieved by leveraging the team's collective expertise, as well as the full capabilities of Automatic Machine Products' advanced CNC facility.



Define a measurement strategy to meet the tolerances of Critical-To-Quality dimensions

The design drawings of the slotted spherical valve balls - provided by the customer - included several dimensions that were impossible to measure. AMP collaborated with the manufacturer's engineers to decide on an appropriate measurement strategy - to ensure that key Critical-To-Quality/CTQ dimensions would be accurate within the final water mixing product.

AMP's tight-tolerance methodology for measuring was essential for efficient manufacturing and quality control of the complex stainless-steel parts.



Meet protocols for quality control and performance standards

Quality assurance was coordinated with the manufacturer's QC department. A diligent review process was followed through final inspections, based on ISO 9001:2015 standards.

SUCH A COMPLEX SPHERICAL PART REQUIRED RESOLUTION OF SEVERAL CRITICAL ISSUES





SOLUTION

DESIGN REFINEMENT AND THE PRODUCTION PARTS APPROVAL PROCESS (PPAP)

AMP's experienced programmers and machine operators used sophisticated modeling software to simulate the optimal tool paths. These were applied to create the initial samples that were submitted with the Initial Sample Inspection Report (ISIR).

After approval from the customer, additional parts were machined and submitted with the complete Part Submission Warrant (PSW) documentation package, as part of the Production Part Approval Process (PPAP).

Following final approval, the remainder of the production order was completed on schedule.

HOW THE COMPLEX SPHERICAL METAL PARTS WERE MADE

Production by Automatic Machined Products of the stainless-steel valve balls involved:

- High-precision machining processes, using the latest advanced technology. The parts production required a EuroTech 11-axis, twin-turret CNC milling center
- Extensive programming of CNC equipment, requiring 6,000 lines of code to create the final complex components
- Application of proven techniques to reduce risks in working with specialized materials, such as stainless-steel and lead-free brass (LF Brass) or Eco Brass
- Continuous quality control to achieve tolerances within a small band - to 0.0005 of an inch
- Outstanding surface finish - of better than 16 Ra - achieved directly in the machining process, eliminating additional polishing steps and reducing costs and lead time
- Consistent skill, dedication, and quality standards of an experienced team of craft technicians

RESULTS



KEY FACTS

8

NUMBER OF
MACHINING AXES REQUIRED

6,000

LINES OF COMPUTER CODING

DELIVERY IN

4 WEEKS

AUTOMATIC MACHINE PRODUCTS MEETS THE PRODUCTION TARGET, AND HIGH PROJECT DEMANDS, AS THE SPECIALIZED PARTS SUPPLIER

A leading global water technologies company had contracted AMP as its quality supplier in this project, with confidence in our ability to meet the project goals and strict deadline. And in the end, AMP delivered.

The order that had been placed was for two very demanding machined parts - even for completion within a normal production schedule. Yet, Automatic Machine Products was able to accelerate development to meet the short timeframe.

Our customer successfully launched its new digital water systems product as planned, with no delays in the company's marketing strategy.

Manufacturer's outcomes for having selected the right machined parts supplier:

1. Met critical dates for both product production deadline and market launch
2. Were supplied with precision and durable parts able to match the final product's expected high-performance
3. Continued to be served by Automatic Machine Products as a valuable partner and dependable quality parts supplier

Faced with a similar challenge?

CONTACT AMP TO ASSESS HOW WE CAN MEET YOUR NEEDS

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