

Case Study: Advancing from Design to High-Volume Production Through Strategic Partnership with SDP/SI

Our Certifications

ISO 9001 + AS9100

ITAR Registered

DFARS Compliant

RoHS & R.E.A.C.H. Compliant

NIST SP 800-171 Compliant



Challenge:

A well-known medical device manufacturer sought an experienced and knowledgeable manufacturing partner to transition a critical component from the design phase into prototype development and full-scale production. Given the strict quality, reliability, and regulatory requirements of medical applications, early collaboration was essential to alleviate risk and ensure manufacturability. Engaging a manufacturing partner during the design phase helps eliminate common production challenges, including wasted time, material scrap, process inefficiencies, and unnecessary cost increases.

Early Collaboration and Design Review

SDP/SI conducted a comprehensive initial review of the gearing requirements to fully understand the project objectives, performance criteria, and application constraints. This early-stage collaboration enabled proactive identification of potential manufacturing challenges and opportunities for process optimization.

Production began with small prototype quantities to support testing and validation. Feedback from these initial builds informed refinements to both the gear design and the overall manufacturing strategy, ensuring scalability for high-volume production while maintaining the precision required for medical applications.

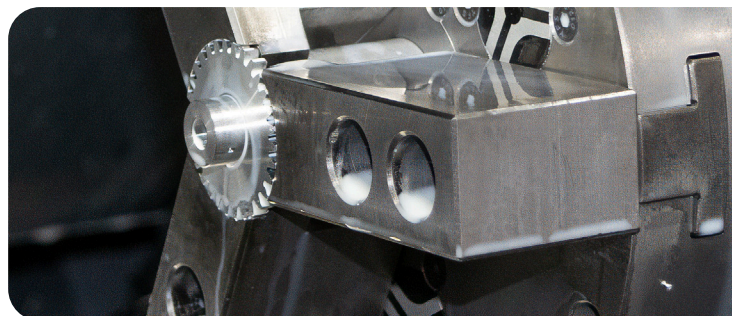
Process Optimization: Spur Gear Anodizing Strategy

A key improvement involved anodizing and determining the optimal stage at which anodizing should be performed.

Originally, the gear blanks were anodized and then cut. Through process analysis, SDP/SI recommended reversing the sequence, anodizing after gear cutting. This strategic adjustment delivered significant benefits:

- Increased production efficiency: Reduced cycle time resulted in greater overall output.
- Simplified machining: Gear cutting could now be completed in a single process rather than multiple machining steps.
- Improved process control: Streamlined operations reduced variability and enhanced consistency.
- Cost savings: Fewer machining steps and reduced handling lowered overall production costs.

This process refinement not only improved throughput but also enhanced dimensional control and surface integrity, critical factors in medical device components.



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Scaling for High-Volume Production

As the program progressed and demand increased, SDP/SI further demonstrated its commitment to partnership and long-term support. Additional CNC machines were purchased and dedicated exclusively to this project. This investment significantly expanded production capacity, increasing output by thousands of parts while maintaining strict quality standards.

Outcome

Through early design collaboration, process innovation, and strategic capacity expansion, SDP/SI successfully transitioned the project from concept and prototype to high-volume production. The partnership delivered:

- Reduced development time
- Improved manufacturing efficiency
- Lower production costs
- Increased output capacity
- Consistent, high-quality components suitable for medical applications

Closing

This case highlights the value of partnering with an experienced manufacturing expert early in the design process. By working collaboratively from concept through production, SDP/SI helped the medical device manufacturer achieve a smooth, cost-effective transition to high-volume manufacturing while meeting the rigorous standards required in the medical industry.



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