Medical/Surgical: CASE STUDIES

Medical Device Case Study Library
MTE's entire staff of engineers, project managers, CAD designers, tool and die makers, quality personnel, and manufacturing technicians stand ready to help you reach your goals. Below are examples of how the MTE team has helped customers in the medical/surgical industries achieve success.

Biopsy Jaw :: Grasping Foreceps :: Scissor Blade #1 :: Twisted Biopsy Needle :: Brachotherapy Seeds :: Hearing Aids

Biopsy Jaw

THE COMPONENT:
A miniature stainless steel biopsy jaw, less than 3mm wide.

THE PROBLEM:
Customer was purchasing the components made from the metal injection molding (MIM) process. Components were dimensionally inconsistent; often failing to mate up properly, causing functional problems. Sorting and rework costs were eroding profitability.

THE SOLUTION:
MTE converts the process to precision metalforming, which provided more precise and consistent geometry within the small space envelope. The dimensionally stable metalforming process not only reduced component costs but also eliminated the need for pre-assembly sorting and fitting that was previously necessary. Component cost savings
allowed our customers to increase their market share in the extremely competitive disposable device market.

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Grasping Forceps

THE COMPONENT:
A stainless steel surgical forceps used in grasping tissue.

THE PROBLEM:
Previously made by first taper-grinding a wire followed by a bending operation. This method is labor intensive, difficult to automate, and is prone to variation in shape.

THE SOLUTION:
MTE converted the manufacturing process to precision metalforming whereby the geometric shape is formed through a sequence of hits, allowing precise control of each critical dimension. Superior dimensional control provides improved product reliability and reduced line fall-out.

MTE was able to offer our customer less than a 1 year payback and over 100% ROI.

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Scissor Blade #1

THE COMPONENT:
A curved surgical scissors blade.

THE PROBLEM:
Current production had this part being produced using the metal injection molding (MIM) process. There were dimensional inconsistencies because of distortion occurring during MIM's hot sintering process. The blades needed to be sorted and tweaked to meet the precise curve requirement.

THE SOLUTION:
MTE converted the blade to the metalforming process using a precision progressive die. Since the tempered stainless steel raw material could be cold worked within our metalforming process, the heat distortion
problem was eliminated. The angled blade edge was coined automatically in the die, making it ready for final sharpening.

Component cost savings to the customer was 40% and the customer also improved daily throughput by reducing assembly line tweaking.

Twisted Biopsy Needle

THE COMPONENT:
A miniature Needle with a tightly tolerated hole and specific distal and proximal end angles.

THE PROBLEM:
Previously manufactured using the chemical etching process, and a secondary twisting operation to complete the part's geometry. This was a labor-intensive, two-step process involving a second set-up and unacceptable dimensional variation.

THE SOLUTION:
MTE converts the manufacturing to a single automated stamped and formed process, resulting in superior dimensional control for improved device performance.

This streamlined process saved the customer 60%, allowing them to become more competitive and profitable while increasing their share of the single-use device market.

Brachotherapy Seeds
THE COMPONENT:
The micro-sized implantable capsules, barely larger than the head of a pin, are made from medical grade titanium with an extremely thin wall thickness down to 0.05mm (.002 inch).

THE PROBLEM:
MTE was given the challenge of reliably creating the precise shape to tolerances as close as + .013mm (.0005 inch) while preventing component distortion and eliminating previous problems of micro cracking in the sidewalls.

THE SOLUTION:
Diligent analysis of the titanium material and its behavior throughout the development of each new forming step was needed in order to eliminate the previous issues. MTE's engineering and toolmaking teams applied their creativity, miniaturization techniques, and intense attention to detail to effectively develop the specialized tooling. Those have been MTE's key success factors in producing millions of these critical life-saving components defect free.

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**Hearing Aid Contact**

THE COMPONENT:
A gold plated electrical contact used in a miniature hearing aid.

THE PROBLEM:
Dimensional variation causing product reliability problems.

THE SOLUTION:
MTE converts the process from metal etching followed by a bending process. Quality and reliability are improved since all the component geometry is now controlled within a multi-staged progressive die.