



● MACHINING



Precision stamping was used to produce this disposable stainless steel surgical scissor. Image from Metallon.

Precision stamping for disposable medical components: Here are the basics

Careful planning enables cost-effective production of high-quality products.



John Zoldy |
Metallon |

From surgical devices to one-time-use tools, disposables are increasingly important in medical applications.

Precision stamping can be an optimal choice to achieve cost, compliance and process flexibility requirements. Designers should work with their manufacturing vendor during development to ensure success.

Start with a design partnership

The cost to design and produce machining tools and stamping dies can be significant when manufacturing a new product. The concern about these expenses increases when manufacturing disposal components.

While a large-volume run can spread tool-and-die costs over many thousands of pieces, in short runs and prototyping, OEMs must partner closely with their manufacturer to ensure the right tooling is produced from the beginning.

One effective approach is to identify opportunities for standardized dies and tools. This often occurs in a product that has different configurations or options. Typically, the majority of the product's form will be the same — or similar enough to be modified during the design stage — so that all parts can use the same die set. The standardized die could be part of a first production pass, which is followed by a

second production pass with unique tools and dies. Alternatively, one production run can be performed, using the standardized die throughout and changing select tooling when quantities are met.

For example, Metallon recently developed a disposable medical scissor. The scissor's handle, shank and pivot point were all manufactured using one standardized die and a single stamping process. The scissor was available with three different blade tip options: a sharp tip, a Littauer with a hook, and a blunt tip, which could each be created with a simple tooling change. This reduced overall tooling costs as well as set-up time.

Tool & die optimizations

Optimizing material usage is critical, especially in today's volatile metals market. When designing a stamping die, engineers typically look to reduce waste and capture scrap. In disposables, where weight and durability can be important, engineers must also design products with the end user in mind.

In the case of the disposable scissor, designers tested different bend types for the scissor handle to maximize strength, comfort and resistance to deformity. Designers also performed less quantifiable testing, working to create a scissor that would be



lightweight and require reasonable forces to easily and effectively cut various materials. When the part's design was complete, the engineering team developed a stamping die that maximized material usage and ensured compliant production over a long manufacturing cycle.

The importance of material selection

When producing disposables, engineers should carefully evaluate material costs. The designer and the manufacturer should work together to identify materials with the best manufacturability, the lowest cost and the best performance for the end application.

Disposables are often subjected to a wide range of conditions before use. During production, parts are formed, cleaned, bagged and stored, experiencing chemical exposure and different handling processes. When used in the end application, they are exposed to a second set of conditions. Engineers must work to ensure the material selected will function, without issue, in a potentially critical situation.

Automation processes

High-volume production runs and projects with precision requirements can benefit from automation processes, which can lower costs and improve quality. In medical applications, this can help ensure compliant machining and stamping, while also streamlining production.

As disposable surgical instruments and medical components continue to gain market share, precision stamping can be a cost-effective solution that meets quality, performance and cost targets. Designers should work with their manufacturing partner in the early stages of development to help reduce tool and die costs, optimize material and manufacturing costs, and ultimately produce a part that meets performance goals. ☺

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CONTRIBUTORS



SPEER

JON SPEER is founder and VP of quality assurance and regulatory affairs at quality management software company Greenlight Guru (Indianapolis). A graduate of the Rose-Hulman Institute of Technology, he has more than 20 years of medical device experience, including product development, project management, quality and regulatory affairs.



FINN

DENIS FINN is a product development engineer at Guill Tool & Engineering (West Warwick, R.I.). Guill designs and manufactures extrusion tooling for various thermoplastic and elastomeric applications.



MCGUIRE

ANN MCGUIRE is product marketing manager for Arena Solutions (Foster City, Calif.). She has held consulting, sales and marketing positions in the product lifecycle management (PLM) and quality management systems (QMS) industry for the past 25 years. Prior to working in PLM, McGuire was an engineer in the semiconductor acquisition and test group for a major computer company.



ZOLDY

JOHN ZOLDY is manager of new business development at Metallon (Thomaston, Conn.), where he has worked for more than 18 years. The company has expertise in engineering, tooling, die building and automated assembly.



BETTEN

BILL BETTEN is the president of Betten Systems Solutions, a product development realization consulting organization based in Minneapolis-St. Paul. Betten utilizes his years of experience in the medical industry to advance device product developments into the medical and life sciences industries, helping clients to develop innovative medical devices and adapt to a changing environment. Betten most recently served as director of business solutions for Devicix/Nortech Systems, a contract design and manufacturing firm.

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