

Machining for Medical Device Components

Dan Grosberger, Tooling Supervisor, Crescent Industries

Dan Grosberger, tooling supervisor at [Crescent Industries](#) [1], was a part of the staff written article, "[The Fine Art of Machining](#) [2]." He took time to present a full array of responses that were not able to be included in the article, so they are presented here.

Q: *What emerging materials are ideal for machining?*

Grosberger: We really have not seen an emerging material for the machining of medical products but the utilization of materials like PEEK, Titanium, 316L or medical grade stainless steel, Delrin, Cobalt Chrome etc. are most frequently used.

Q: *How does machining stand-up vs. other component fabrication techniques for medical devices?*

Grosberger: CNC machining saves upfront tooling costs and allows for shorter lead times.

Machining can accept design changes quickly and easily without the need to modify expensive tooling. This allows for rapid switching from manufacturing one part to another.

CNC Machining can complete many components with fewer setups and more efficient cycle times.

Secondary operations like drilling and tapping can be completed in-cycle on the machining center saving time.

The ability to polish, plate or anodize parts for both aesthetics and functionality issues of the component.

Accommodates parts with threads and undercuts at multiple angles.

Q: *Is machining losing ground in use for medical device manufacturing?*

Grosberger: Due to the exotic materials (metals) and complex geometries required for medical device components, machining is necessary to produce these types of parts.

Q: *What common error do design engineers make when specifying for machined parts for medical devices?*

Grosberger: Design engineers may have a tendency to call out more dimensional requirements and tighter tolerances than is actually necessary for required functionality. The way to avoid this type of mistake is partnering with your vendor in the early stages of product development and design phase for manufacturability.

Q: *What unique capabilities/functionality do machined components offer to design*

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engineers?

Grosberger: Machined components have a broader range of materials available that can withstand higher temperatures and increased strengths.

The advantage of multi-axis machining equipment allows for more complex contour shapes, narrow precision slots, and thread forming of components that maintain tight tolerances and with extreme consistency.

Q: *For what device sector (besides orthopedic implants) is machining being most often specified?*

Grosberger: In the medical industry, medical pumps and motors, instrumentation components and heat sink plates for the IVD industry. Along with the medical device industry several dental instrument components & devices also require machined components.

Medical devices for neurological, spinal fixation, soft tissue fixation, bone fixation, surgical instrumentation, implant production, dental implants and minimally invasive processes.

Q: *Where is machining for the medical device industry headed?*

Grosberger: Medical device machining is headed into a very highly skilled area. The new CNC machines and technology which can produce increasingly complex parts take a higher skilled operator and programmer to run them effectively.

With the increasing demand and advancement of 3D printing, this may start to take up the short run and prototype markets.

Q: *Any thoughts/comments on machining or another related area that you would like to share with medical device manufacturers to aid them?*

Grosberger: Customers are requiring a one stop shop with a machining company which has the capabilities to do secondary operations like laser engraving, plating, anodizing, coating etc.

Having one company to handle all of your machining requirements ensures a streamline process and is simple and much easier than dealing with several companies.

If medical device manufactures develop a partnership and align with a company that can provide machining services and secondary operations as a one stop service, they gain a competitive advantage because of increased efficiency and time saved getting their product to market.

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[1] <http://www.crescentind.com/>

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[2] <http://www.mdtmag.com/articles/2013/08/fine-art-machining#.Uo-xkZzAaQw>