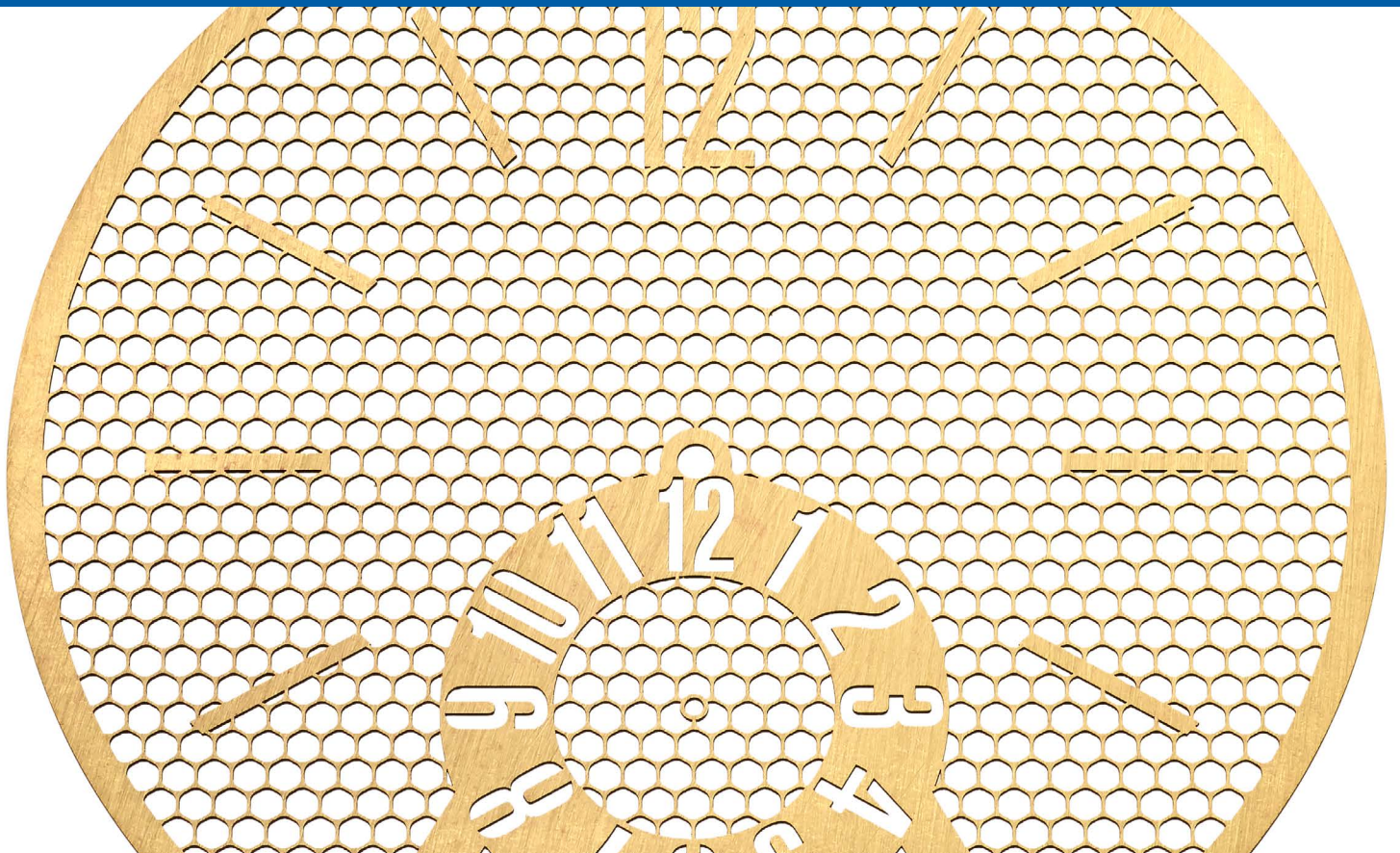


Laser Machining Delivers Superior Parts for Swiss Watches



Case Study

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Specialty contract manufacturer TechnoCut translates laser machining into a market-leading reputation for fast prototypes and excellent product quality.

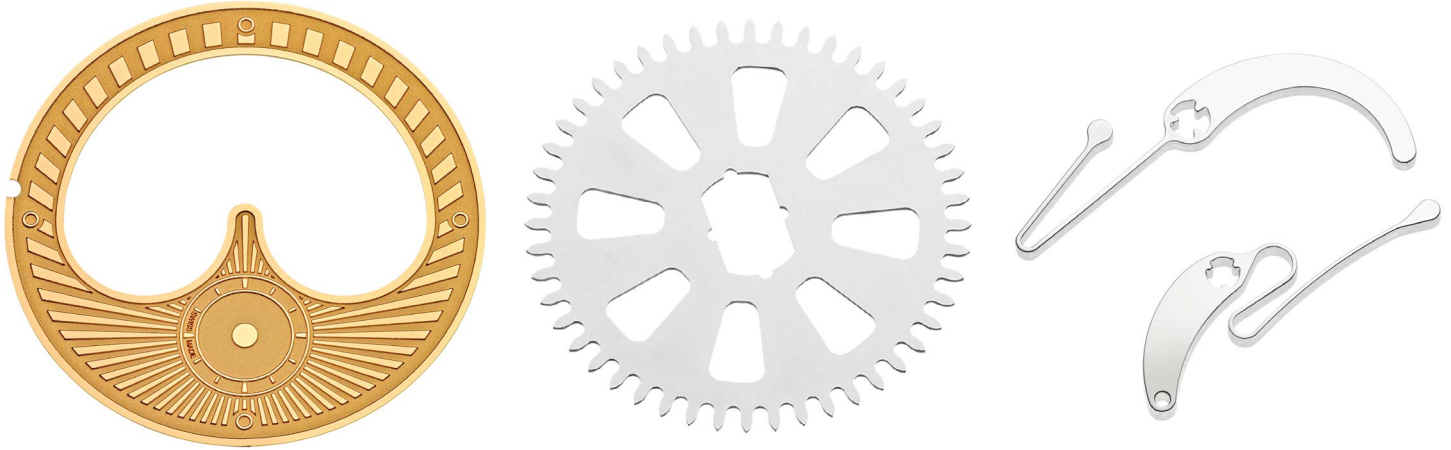
TechnoCut – specialty products and fast service

Swiss watch making has long been synonymous with precision, excellence, reliability, and high value. And within the watch-making world, TechnoCut S.A., is well-established today as a parts maker for many of the leading brands, with a reputation for delivering fast prototypes and diverse products of the highest quality and consistency. Located in the small Swiss town of Bonfol, TechnoCut was founded in 2005 with the aim of using laser technology for contract manufacturing of small parts, primarily involving laser cutting and engraving. While watch makers still constitute the lion's share of their customers, the company's reputation for fast response and high-precision products has also brought them additional contract manufacturing business in medical devices and other industries characterized by a demand for high precision, customized parts, and modest batch sizes. They use several Coherent MPS machines to perform both the micro-cutting and engraving.



TechnoCut currently uses four MPS machines from Coherent, all equipped with femtosecond lasers. Image courtesy of TechnoCut.

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TechnoCut produces both functional parts for watch mechanisms as well as decorative parts for the face and straps. Image courtesy of TechnoCut.

“We believed that there was a tremendous opportunity to bring the benefits of laser machining to the watch-making business.”

The right time for lasers

Julien Montavon is the Technical Director and one of the co-founders of TechnoCut. He explains why they formed the company, “We believed that there was a tremendous opportunity to bring the benefits of laser machining to the watch-making business. Small parts were still produced primarily by stamping or even manual cutting/engraving with occasional use of techniques like electrical discharge machining (EDM). The founders already had direct experience working with lasers for other applications and knew that they were ideal tools for low-cost customization, moreover fast customization, with none of the limitations of fixed tools like molds and stamps. At the same time, machines incorporating ultrashort pulse (USP) lasers, and particularly femtosecond lasers, were becoming available. The unique ability of femtosecond lasers to precisely cut or engrave a wide range of thin materials with no visible thermal damage and excellent edge quality makes them a perfect match for watch parts.” Montavon notes that the industry relies on incredible material diversity. Internal parts are fabricated from brass, copper alloy, and steel. But the face and hands can incorporate all kinds of metals and “exotic” non-metals to increase their aesthetic appeal and perceived brand value and exclusivity. Examples include ceramics, carbon fibers, mother of pearl, and of course various precious metals. He notes that all these are readily cut with a femtosecond laser. Sometimes the laser processing is followed by tumble polishing, but several of the soft materials like mother of pearl require no post processing whatsoever.

Choosing a machine vendor

TechnoCut currently operates four Coherent machines – all MPS models and all equipped with femtosecond lasers – and are about to take delivery of a fifth to support the ever-growing demand for their products. According to Montavon, “When we founded the company in 2005, we wanted to focus exclusively on laser technology for subcontracting. We looked very carefully at several potential machine suppliers and chose Coherent for several reasons. First the company was large and already well-established in laser processing with a great reputation for supporting job shops like ours. Plus we wanted a vendor with a large body of experience and know-how that we could draw on when needed. And lastly, our early dialogs convinced us that the company’s philosophy of superior performance and reliability were nicely aligned with the brand value we planned to build at TechnoCut.”

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The versatility of femtosecond lasers enables TechnoCut to perform deep engraving on synthetic sapphire which is widely used for watch glass. Image courtesy of TechnoCut.

MPS keeps things ticking at TechnoCut

Why did they choose MPS machines rather than other models? “Flexibility and options,” responds Montavon. He explains that they wanted to get machines with a very specific set of features. And in their startup phase, TechnoCut simply could not afford the luxury of machines loaded with additional features that they would never need. Montavon adds, “We were able to optimize everything about the machines, from the type of laser – we chose femtosecond lasers for reasons we just discussed – to the number and type (translation, rotary) of motion axes, even the size of the cutting box and the overall footprint. When we started with Coherent, it really was like getting a completely custom, made-to-order machine, but without the high cost. Then our experience with using the first machine in terms of its great reliability, cut quality, and throughput all convinced us to buy more of the same machines. Plus, Coherent proved to be exactly the type of dependable partner we needed and wanted. We hardly ever have unexpected downtime, but whenever we do, we always get a very fast response from Coherent.”

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This city skyline was laser cut by TechnoCut in mother of pearl which is often used for decoration of premium brand watch faces. No post-processing was required. Image courtesy of TechnoCut.

“Our customers depend on us as a high-reliability partner, just like we depend on Coherent as our reliable partner.”

Short lead times plus superior form and function

What kinds of parts does TechnoCut produce? Montavon states, “We cut components such as watch hands, and functional parts like gearwheels and small springs. Here the precision and repeatability of the MPS machines is very important as it directly impacts the final performance of the watch itself. We also do a lot of engraving on various watch components, including things like the case, face graphics/effects, plus buckles and other strap details. Here the ability of the femtosecond lasers to cut soft materials without charring or other thermal damage is key to delivering the perceived high quality that our customers’ customers expect.”

Delivering fast prototypes and other small orders in less than 2 weeks has proved to be a popular advantage with TechnoCut’s customers. Montavon explains that this fast response is possible because with multiple machines they can always adjust production schedules to accommodate new prototype orders without running out of machine bandwidth. This extra bandwidth is carefully factored in to TechnoCut’s business plan and he notes, “Obviously machine reliability is critical to having 100% confidence in our fast small order service. Our customers depend on us as a high-reliability partner, just like we depend on Coherent as our reliable partner.” But he is also quick to point out that a large part of TechnoCut’s business involves servicing large and/or recurring orders too. In fact two of their MPS machines are equipped with robotic loaders and one with a palletizer in order to automate volume production.

Summary – their timing was correct

Clearly the bold pioneering decision to bring laser processing to the watch making business has been proven correct at TechnoCut with over 15 years of growing sales and a reputation to match. Coherent is proud of our continuing role supporting this successful and innovative company.



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