

deco magazine



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Claude Konrad, CEO of Polydec SA and his daughter Vanina in front of a Cadillac which bears the stamp "Biel-Bienne 1958" and which represents the golden age of the automobile production in Biel/Bienne.

POLYDEC AND TORNOS

in line with a long-standing
automobile tradition

More than 50% of the world's automobiles contain parts that were manufactured in Biel/Bienne (Switzerland) by Polydec SA. Even if Biel/Bienne is primarily known as a watchmaking city with head offices of some of the great global brands, the city can also look back on a long history in the automotive sector. Cars had been manufactured here in 1889, and from the 1950s onwards, tens of thousands of vehicles for consumers all across Europe have been produced in Biel/Bienne by General Motors. Biel/Bienne continued its success story with Claude Konrad, head of Polydec SA, a manufacturer that largely relies on over thirty Deco, EvoDeco and SwissNano Tornos machines.

POLYDEC TURNED
 MICRO PARTS

engineering and manufacturing
 to fit your needs

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As a subcontractor specialized in the production of small high-precision parts, Polydec SA manufactures more than 40 million parts per month, especially for the watchmaking, medical and automobile industries. For the latter, over 20 million shafts intended for dashboards and fuel injection systems are produced in Polydec's workshops each month. To this day, the company has produced more than five and a half billion parts in Biel/Bienne.

Automobiles and Biel/Bienne? A long success story

Although the company Henriod Frères had been producing cars in Biel/Bienne since the 1880s, the golden age of this sector began some decades later. On February 5th, 1936, an 8-cylinder Buick rolled off the production line at General Motors. In the same year, 321 Chevrolet, 115 Buick, 61 Oldsmobile,

“On a regular basis, we are producing to tolerances of $\pm 2 \mu$ and, in extreme cases, we even have to go down to $\pm 1 \mu$ ”

36 La Salle, 117 Vauxhall, and 318 Opel cars were produced. When Henriod Frères closed down in 1975, as many as 329,864 vehicles had been produced in Biel/Bienne! In 1985, Polydec SA was founded and in 1998 it got the QS:9000 certification for the automobile industry. Today, the company's expertise is recognized far and wide and Polydec SA is one of the very few suppliers of parts for actuators (micro motors) that are used for dashboards.

Tornos and Polydec? A long success story

In 1999, the company decided to invest in its first Deco 10 machine. This solution turned out to be a good strategic choice, so further machines soon followed. This first Deco is still active today and is being used in a workshop equipped with a total of 15 Deco machines, one EvoDeco and twelve SwissNano machines. For the oldest machines, a revision program is under implementation. For other workpiece types, the manufacturer has an inventory of about forty Escomatic machines. “We have grown up with

With more than 100 production machines operated in a controlled environment, the working conditions of the Biel/Bienne-based company are simply excellent.



Tornos and are fully satisfied with our choice," the company's CEO explains. Just recently, Tornos delivered the 200th SwissNano to Polydec, which provided an opportunity to celebrate almost 20 years of collaboration and success.

Parts meeting extreme demands

As far as metal cutting is concerned, Polydec SA is pushing the envelope and recently, the company machined steel parts with diameters down to 0.07 mm (which corresponds to the diameter of a human hair!) and a length of 0.3 mm. The parts are then polished and quenched. Even if this may be an extreme example, Polydec SA regularly processes workpieces of 0.3 mm diameter that demand a number of machining processes such as drilling or polygon cutting. Mr. Konrad explains: "When we reach such dimensions, the mechanical system no longer reacts normally and the cutting speed is virtually zero." He adds: "On a regular basis, we are producing to tolerances of $\pm 2 \mu$ and, in extreme cases, we even

have to go down to $\pm 1 \mu$." Even if the company has high-tech production means at its disposal, it's the proficiency and skills of its operators both in terms of machining and measurement that is essential to reach such results.

12 SwissNano at the service of precision

After one year of testing, the first SwissNano was assessed as being highly efficient and the company soon ordered 11 additional machines. The CEO explains: "We are extremely happy with this small machine; not only is it equipped with state-of-the-art technologies – to name just the spindle motor – but it has also a compact design that enables it to easily fit into every workshop. Furthermore, its precision is really excellent." Asked about the contribution SwissNano makes to the company, the CEO adds: "The machine has definitely opened up new possibilities as regards the realization of small high-precision parts."





12 SwissNano at the service of precision.
"The machine has definitely opened up new possibilities as regards the realization of small high-precision parts" Claude Konrad, Polydec.





The parts produced through micro-turning may not be very complex in terms of geometry. However, their production with the required quality and precision and at the agreed price while heeding a specific deadline is a real day-to-day challenge.



The production of tiny parts may be a challenge, but it's also challenging to inspect them. Polydec SA has established a process that enabled the company to sign a quality delegation agreement with a large group. This agreement stipulates that Polydec SA provides the warranty for the parts and that the manufacturer does not carry out an incoming goods inspection anymore!

The specialist's point of view

Express interview with Cyril Soom, young specialist working with SwissNano.

decomagazine: What do you think of SwissNano's ergonomics?

Cyril Soom: *It boasts an appealing design, perfect visibility and very good accessibility. I had to get used to the machine because despite its good visibility, the available space is a bit confined for an operator who used to work with Deco machines. Of course, it's not possible even for SwissNano machines to be very compact and offer a vast machining area at the same time! Today, I enjoy working with this machine type. They are well enclosed, tight and very clean so they are pleasant to work with.*

dm: Do you carry out particular operations?

C.S.: *We performed some stamping work but this machine has not been designed for such type of operations. Apart from that, we carry out all turning and gear cutting operations on it. The asset of this machine is definitely the quality level that we can achieve. This is really remarkable for a machine with such a small footprint and offered at such an attractive price.*

dm: And what about service?

C.S.: *On a whole, we are satisfied with our relationship with Tornos and the Tornos after-sales service is efficient. However, as to SwissNano, I actually cannot comment on the service because throughout three years of use of this machine, it was not necessary to call after-sales service.*

A first-class management system...

Polydec SA is well-known for its specialist expertise. The company's know-how acquired through the realization of parts meeting extreme demands benefits all markets supplied by it, especially the automobile industry. Benefiting from the certification in accordance with ISO:9001 and the automobile standard ISO/TS 16949, the company is focusing on the realization of high value-added parts with diameters up to 4 mm. Mr. Konrad explains: "The quality processes are fully integrated and are part of our recipe for success." Even before their confirmation, the orders are analyzed by APQP (Advanced Product Quality Planning). Mr. Konrad adds: "From an external point of view, this may seem to be cumbersome but, for us, it is an important step that enables us to warrant the quality of our parts already at the time of order confirmation and to largely avoid subsequent problems."

... to offer unparalleled services

By combining its technical, people and administrative skills, Polydec SA is capable of sharing its entire know-how with all its fields of activity. Mr. Konrad explains: "The watchmaking sector, for instance, is in the process of radically changing its approach towards metal cutting. Many experts from the automobile sector are now working in the watchmaking division and, here, they introduce strict methods that may deter anyone who is not familiar with them." He adds: "In the automobile sector, there are extreme cases in which we have to deliver parts with a reject rate of zero ppm, i.e. we have to assure that not even a single part of one million supplied parts is out of tolerance. For this purpose, we have installed automatic inspection systems that enable us to subject all of the parts to an extensive inspection. In watchmaking, however, considering the appearance and high-precision issues, the ppm rate is still a dream of the future."

Where humans make the difference

The company offers its expertise gained in the electronic and automobile industries e.g. to the watchmaking and medical sectors as well, but this is not enough. Every field has its own constraints e.g. in terms of finishing and visual or dimensional inspection. "When talking about micron accuracy, the measuring devices are reaching their limits. So, we have to learn constantly to be able to adapt ourselves to the needs and requirements of our customers,"

the CEO explains. Know-how is the prerequisite for Swiss companies to stand out and to secure jobs in Switzerland. The staff reflects this pursuit of performance. "Our customers are very demanding and we know that an average performance in most cases is not sufficient; we cannot afford such mediocrity. Our challenge is to create favorable framework conditions for our colleagues to be able to support this philosophy," Mr. Konrad concludes. It is not uncommon that 'little geniuses' from Polydec find innovative solutions for customers and the customers cannot understand how it is possible to realize machining with such levels of performance.

Automobile tradition that has a bright future

Even if often forgotten, the automotive sector that has its roots in local history is rather important. This field has created jobs and has showcased the high quality of Swiss know-how far beyond the borders for more than 120 years – and it goes on! Polydec SA is a worthy successor. Based on its recognized expertise, the company can expand its activities to the fields of watchmaking and medical engineering today.

Microtechnology "made in Biel/Bienne" never ceased to astonish the whole world.

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