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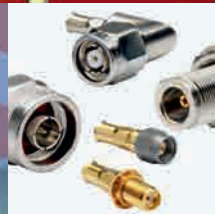
THINK PARTS THINK TORNOS



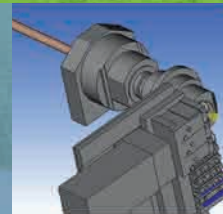
Autocam gets
performance
boost from Tornos
MultiSwiss



Petron Automation
Ready for the
US manufacturing
renaissance



San-tron – a family
operation with
Tornos connections



TiNi Aerospace turns
to Swiss ST 26 and
PartMaker for prototype
machining

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WHAT'S NEW AT IMTS?

Most of our customers are curious about what's new from the technological side at Tornos. There is no better place to see our new product offerings, than at IMTS. We invite you to visit us in booth S-8566 at our industry's largest Show. There you can study our solutions and virtually any other manufacturing product available on the market. Everyone involved in manufacturing, from CEOs to machine operators, will benefit from experiencing the vast choice of technologies available at IMTS.

We at Tornos are excited about our display at IMTS. It's a great representation of our current product line, and moreover we will proudly launch two new product lines. This will allow Tornos for the first time in the US, to compete in all price ranges and machine configurations. We are well known for high end solutions, but in September we will show what we have to offer in the entry level and middle range product line markets.

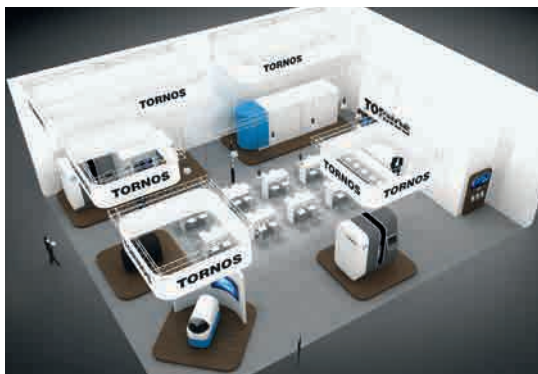
In fact, we think these two products are unique in the market. The CT 20 will compete pricewise efficiently against low end machines, and when you consider the whole package, you will receive a well equipped machine for a modest investment. The CT 20 - 5 axis model features up to 10 rotating tools, and those tools are mounted on a strong rigid base allowing for the machining of hard and exotic materials. If you look at the Swiss GT 26, you have a very capable machine, that can handle most applications. The cartridge type rotating tools allow the machine to make value added operations such as; polygon milling or thread whirling, with up to 1 inch capacity. The machine is well positioned to handle the daily requirements of most job shops.

Our booth will also showcase our new Flagship machine, the EvoDeco 32, which is simply the most powerful machine you can buy in this range. It remains also the most productive and the most flexible with 4 independent modular tools systems. The MultiSwiss 6x14 will also be on display, producing a hydraulic spool. MultiSwiss is a true revolutionary new line of products that bridges the gap between single-spindle and multi spindle lathes, it is experiencing a good success in Europe and in Asia. The MultiSwiss is equipped with 6 sliding headstock spindles that use torque motor technology for barrel indexing.

Last but not least, we will have the Tornos SwissNano and the Almac BA 1008. The SwissNano is a 4 mm high precision Swiss type lathe, that has developed strong interest in the medical implant industry and the micro precision markets. It will be presented for the first time at IMTS. We will have a special presentation regarding this machine, that will catch everyone's eye. The New Almac BA 1008, is built on the SwissNano frame, and is designed to handle prismatic parts up to 16 mm. This is a unique small multi axis milling machine, that must be seen to appreciate.

Come join us at our IMTS booth S-8566!

*Philip C. Miller
Managing Director,
Tornos Technologies
US Corporation*





SYNERGY AND THE PURSUIT OF CONTINUOUS QUALITY IMPROVEMENT

AUTOCAM GETS PERFORMANCE BOOST FROM TORNOS MULTISWISS

With 15 sophisticated lean manufacturing locations in North and South America, Europe and Asia, employing 2000 people worldwide making precision-machine components for all major OEMs and Tier 1 automotive suppliers, Autocam is an amazing success story. Celebrating its 26th anniversary this year with \$300M in sales for 2013, Autocam started out with 1 customer, \$9 million in annual sales, and 50 associates, says a recent press release issued by the company. They also began with a handful of Tornos machines.



Autocam machinist, Kirt Plude, at work on the Tornos MultiSwiss.

Today: 200+ Tornos machines globally

Mike Clay, Technical and Quality Director for Autocam, and Frank Zacsek, Manufacturing Quality Engineer, spoke to decomagazine about their experience with Tornos. Mike begins, "We have around 200 Tornos machines today. We use them globally. And Tornos is an important partner for us." In the Kentwood, Michigan headquarters Autocam manufactures ultra-precision stainless, alloy, and tool steel components for fuel systems, braking, transmission and other automotive parts on their Tornos machines.

How does Tornos fit into the Autocam equation? Like a fine leather driving glove.

"The market we're in is high precision or ultra-high precision transportation parts," Mike explains. "We're turning tolerances of ± 10 microns and below. We provide the majority of our products into advanced fuel systems such as GDI and high pressure diesel. Many of these parts have complex geometries and materials that are very challenging to machine. To maintain our leadership position in these markets, we need a machine tool supplier who can provide us

with a machine that is ultra-precise, rigid and partner with us to ensure the process runs optimally. This allows us to provide the highest quality products to our customers at a competitive cost. The relationship that we have with our machine tool suppliers is very critical to us. We know processing... we know the tooling, the materials, the part function and what's critical. We think we're pretty good at understanding the machines; but the machine builders know the machines better than we do. So we rely on our machine tool partners to play a key role in successful process development and optimizations."

Enter the Tornos MultiSwiss Team

When Autocam was looking to add 2 more CNC twin spindle machines to increase production on a direct injection gasoline engine pump component at the Kentwood facility, Frank Zacsek, and Matt Tufer, Senior Technician, convinced their Autocam colleagues to consider the new Tornos MultiSwiss machine. Frank had seen a presentation on the machine's capabilities and thought it looked like a good machine. Mike tells the story, "The interesting thing on this (direct injection gas engine pump component) program is that the volumes did not require a fully equipped Multispindle CNC. So we wanted a machine that was more suited for this type of program volume that still required high precision. Therefore, it made sense to compare the MultiSwiss to a bank of competitive model CNC twin spindle machines".

Frank and his team thought the MultiSwiss might be a more economical way to manufacture this part. The thinking was: "if we can do it on one machine for roughly the same manufacturing cost as several single spindle machines, it's a better process for us and for our customer." With high precision direct fuel injection components, surface finish damage to the part must be avoided – the less material handling and moving between machines for these parts, the better. Mike explains, "The more that we have to handle the part and go through subsequent operations, the more possible opportunities for damage there are. Our CEO's philosophy is to stay on top of technology; and if there's a better technical solution out there that improves the quality or reduces the variation to our customer, we better pursue that even if we're going to spend more money."

The purchase price of one MultiSwiss was higher than two additional twin spindle machines; but Autocam thought the ROI on the MultiSwiss looked promising. "So John Kennedy (Autocam CEO) said, 'Pursue it. Get the cycle time. Work on the processing. Let's



Frank Zacsek, Autocam Manufacturing Quality Engineer; and Matt Tufer, Senior Technician in front of the Autocam MultiSwiss.

prove it out to see if we can actually manufacture this part on the MultiSwiss. And if we can, we'll make sure we place an order."

And that's exactly what happened.

"With the MultiSwiss, we're able to develop processes that finish critical dimensions, especially surface finish or flatness," explains Mike. "And we're able to do that complete in the machine where a lot of other companies would have to do a face grinding operation." The fact that the parts don't have to travel from machine to machine to complete all the necessary operations and instead stay in the MultiSwiss where turning, drilling and milling are done in six sequential spindle stations with up to 3 tools per position means they have a leaner process with reduced chance for part damage. "The Tornos equipment allowed us to improve the process," Mike continues. "Autocam's mission is the relentless pursuit to improve quality and reduce variation... Tornos equipment allows us to be able to do that. We understand that many manufacturing companies inspect

Success Story

quality into the part, so they'll have high variation throughout the product features; however we have very tight distributions. We operate on the Taguchi Loss function."

Working together – Creating synergy

A key characteristic of a good relationship, according to Mike, is the ability to react quickly. *"We understand we're a difficult customer... we ask a lot. Tom gets a lot of calls at 5:30 on Friday telling him we have to have something on Monday."* Tom Broe, the direct sales agent for Tornos in Michigan, (who began working with Autocam as a Tornos technician back in 1987 when Autocam had just 7 Tornos machines), chuckles and then explains how the MultiSwiss program began. *"We were pushing the envelope with this part on the MultiSwiss. It's not an easy part. There are some tight tolerances and difficult material. I felt confident that the part could be done and so I had to convince Rocco (Martocchia, Tornos Product Manager), and Rocco, in turn, had to convince a few people."*

Pushing the limits of the MultiSwiss required a little fine tuning

The part required turning, drilling and milling operations on 440C material with a 7.3 mm diameter and a length of 24 mm. Tolerances on the part are ± 30 microns on length; ± 20 on ODs. The part was going to push the length-to-diameter limits of machining. Mike adds, *"I think if you talk to Rocco, I'm sure he*

was a little uncomfortable. He knew... from the tolerances and cycle time target that we had to hit... and with the material and part geometry, that it was going to be challenging. And he was very up front about that. This is where we work well together. We pushed him a little bit. And we all decided to take the risk." Tom continues the story, *"One by one people bought into the idea of pursuing the MultiSwiss for this fuel injection production part. Donato Notaro (Product Engineer for Tornos SA) did a lot to work with Autocam to develop the part. He was involved in writing the program and developing the sequencing of the operations... working with feeds and speeds to optimize the cutting operations. On the multispin-dle machines, each position is optimized because each position works independently."*

Frank adds, *"Donato's involvement was pretty critical to the success. We had 2 people in Switzerland for about 3 weeks or more. I think in developing this particular process, both organizations really worked together to make it a success."* Mike elaborates, *"When we saw some issues, neither one of us walked away. Together we solved it and developed a robust process. We got it to a point where it looked like it was going to be viable, and then transferred it over to the US. And it's been a great process for us."* Though a lot of time and effort went into proving the MultiSwiss for the direct injection pump production component, Autocam doesn't buy machines to manufacture specific parts. As Mike explains, *"We look at how we're going to use the machine in the future as well."*



What Autocam likes best about the MultiSwiss

In addition to the excellent service Tornos has provided to Autocam over the years, and the ability of the MultiSwiss to get the job done and help Autocam make money, the group has other great things to say about the machine. "One of the nice things about the MultiSwiss," begins Frank, "is you can optimize the spindles. This will allow us to hold even closer tolerances on future products. We can bring each spindle into its most capable state." Each spindle runs independently so if you need to increase or decrease the speed in each position you can do it. Frank also likes the ergonomics of the machine. "Most of the tools are a little bit higher than a standard multispindle, so you're not bending over quite as much. And when you open the door, everything is right in front of you.

It's definitely an improvement over other machines where everything is over your head and you are taking a shower. It's much better for the machinists."

With 130 Tornos operators on staff in Kentwood alone, ease of use is also very important to Autocam. Explains Mike, "The development time – the learning curve – is generally much steeper for machinists on multispindle machines. But I like that when a machinist or engineer looks at the MultiSwiss, it's not threatening. Because of the way it's laid out, you can break it down pretty quickly in your mind and get your head around the processing and the management of it. The MultiSwiss is comparatively easier to understand and operate." Mike continues, "At Autocam, we do not have operators who merely check parts. They are true machinists. They understand machines. It's a continuous challenge to find qualified machinists. The MultiSwiss aids in developing machinists fairly quickly." "I really like the integrated coolant lines," says Mike. "With our parts, the material is very difficult to break into small chips. The MultiSwiss design means we don't have all those oil lines in there catching chips. When we look at processing a part, chip flow is a very real thing that needs to be considered. A lot of machines will have a significant amount of downtime because we have to open it up and pull chips off of oil lines and other miscellaneous components. With this machine, Tornos basically eliminated the problem. We have better uptime because of that. "Also, since the majority of our equipment is temperature controlled, the ability to integrate the MultiSwiss with our temperature control system is nice too." Frank adds, "Workplace organization and cleanliness is important to us. And this machine with its enclosed design and maintenance prompts on the control helps with that."

AUTOCAM STATS

Founded: 1988

Number of employees: 2000

Global manufacturing facilities:

15 on 4 continents. 750,000 square feet of manufacturing space.

Approximate number of parts made per year: 500 million

Tornos equipment:

~160+ > SAS 16, SAS 16DC, SAS 16.6

~25+ > BS 20, BS 20.8

5 > MultiDeco 26/6

3 > MultiDeco 20/8

1 > MultiSwiss 6x14

3 > MS 7

5 > Deco 20

Mission Statement:

Our mission is to be the worldwide leader in the manufacture of precision components for customers with whom we develop long-term business relationships. Our mission will only be met by focusing on continually improving our process, thereby improving our products and services to meet and exceed our customers' expectations.

The Future: Staying ahead of the curve

In recent years, the most significant thing that has impacted business for Autocam was the development of gasoline direct injection. Mike explains, "That was a technology shift. There was a huge learning curve for the industry on manufacturing direct injection components because the material is more difficult to machine at high volume with the extremely close tolerances. The surface condition is much more critical because injectors are going right into the cylinder. On the pump side, the clearances are smaller and the fit of the parts is substantially tighter. So any damage or nick or ding is very detrimental to the pump. That whole technology shift over the past few years has really driven the process development on



all the machines at Autocam. We expect the same results from the MultiSwiss in the future – for the next generation of components. We know that the technological development is going to continue. The drive for better emissions, better fuel economy, and reduced manufacturing cost is always going to be there. We need to be ahead of the curve. That’s a big part of my responsibility and John Kennedy pushes for it... we’re always looking at the next generation of product. When we evaluate machines we need to think about how it is going to help facilitate the next technology leap. With the MultiSwiss, we’re well positioned for the products of the future.”

In fact, it looks like the MultiSwiss may be a key Autocam “program” for the future. Autocam sees real advantages to progressive type machining operations with CNC flexibility for process development. Mike says it gets them through continuous improvement faster. *“Tom, plug your ears because we’ve got to negotiate price first. But the MultiSwiss is one of our machines that we’ll be utilizing in the future for production.”* According to Tom, that means there will be lots of brother and sister MultiSwiss machines filling the Autocam facilities in the years to come.

autocam

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CONNECTICUT SHOP BECOMES PROUD OWNER
OF THE FIRST TWO SWISSNANOS IN THE US

PETRON AUTOMATION – READY FOR THE US MANUFACTURING RENAISSANCE

Decomagazine recently caught up with Petron Automation, a successful and growing Swiss-type and CNC machine shop located on the United States’ East Coast. Participating in the discussion were two father and son teams and two other members of the Petron Automation “family”: Mike Petro Sr., President; Mike Petro Jr., Operations Manager; Gary Boehringer, Applications Engineer; Jesse Boehringer, Swiss Department Supervisor; Joe Guerrero, Plant Manager; and Luis Santolamazza, VP Sales & Marketing.



Petron’s CNC Manager and Plant Manager fixing a 7-degree angle block in one of the new SwissNanos to manufacture a customer part for the Medical and Electronics industries.

19 new machines

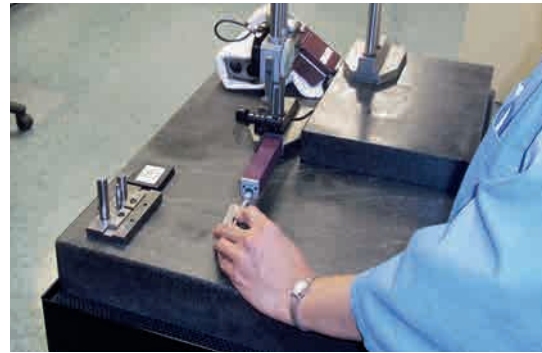
Last November, Petron Automation, Inc. held a ribbon cutting ceremony marking its facility expansion at 65 Mountain View Drive in Watertown, CT, USA. Tornos CEO, Michael Hauser, was there to witness the event. The company, established 34 years ago, added 9,000 square feet to make room for 19 new machines – more than doubling the company’s

capacity in 17,000 square feet total. Petron already owns 11 high precision Tornos machines which have been working hard for them for years – those machines will stay in their original space. The new space, which was built on a “Going Green” initiative, will be dedicated 100% to new technology. *“The addition wasn’t built to move existing machinery,”* Explains Mike Petro Jr., Operations Manager for

Success Story



Quality Control engineers using a digital micrometer to check tight tolerances for a part made in one of the SwissNanos.



Quality Control engineers using a Profilometer to check ID finish for a part made in one of the EvoDeco 16s.

Petron. *"It's a state-of-the-art addition and it will be occupied strictly by the new, state-of-the-art Tornos machines. We're making a real effort to go green with high efficiency LED lighting and centralized air filtration system. Our electrical is all underground."*

Odorless – the smell of success!

"In anticipation of moving deeper into medical and electronics, we think the green initiative will be important," Mike Jr. continues. When visitors see the new space, Joe Guerrero, Petron Plant Manager, says, *"They're awe-struck. We had a steel supplier come in yesterday and they couldn't believe how clean the facility was. They said it didn't smell like any other shop they'd been in. It was very clean from top to bottom, front to back."*

19 state-of-the-art, new Tornos machines

This year, Petron Automation has taken delivery of three of the planned 19 state-of-the-art, new Tornos machines which will occupy the new space. They purchased the first two SwissNanos to hit North America, plus an EvoDeco 32. Like a well-oiled machine (or a close-knit family), the team at Petron Automation, explains their growth plans by finishing each other's sentences. *"We are very strong within the medical, aerospace, firearms, electronics, connectors, fittings, and tooling industries,"* explains Mike Jr. *"These new machines will help us expand our operations and sales further into electronics, connectors... and micro parts, which we see as having huge growth potential,"* Luis Santolamazza, VP Sales & Marketing continues. *"We felt it was the right time to invest in nanotechnology,"* Mike Petro Sr., President, adds. *"We've got an awful lot of interest in it already. We're waiting for some tooling... before you know it, we're going to have a line of SwissNanos."* Says

Jesse Boehringer, Swiss Department Supervisor, laughing, *"All the colors... like a big rainbow!"*

Awesome colors

Petron's first and second SwissNanos are actually the most mainstream of the colors offered by Tornos: Black. But that wasn't Petron's choice – it was just the color they could get fastest. *"They look great out there,"* says Gary Boehringer, Applications Engineer. *"As a former art teacher, I think the colors are awesome,"* Gary continues. *"Color helps the mood of the company!"* The team at Petron thinks the SwissNano color palette could have important productivity benefits as well – making their future expanding line up of SwissNanos easier to differentiate. *"It makes it simple for anybody in the shop to know where they're going and which machine is which,"* explains Gary. *"We can say: 'Put it on the purple one!'"*

Big Steps. Small Machines.

But they didn't buy the SwissNanos for the color. They bought them for the precision and 4 mm diameter capability. They bought them to grow their business into the micro parts sector. Explains Gary: *"One of the SwissNanos will be running an ordnance part with critical tolerances. Another will be running a high precision stainless steel part for a customer in France. The future looks bright for the Nano."* *"Getting the first two SwissNanos in the country, shows our President's commitment for the latest technology,"* says Luis. *"That has always been part of the strategy here and having these new machines supports the point that we invest very regularly in the newest technology (we turn over our machines every 5 years). It's important to mention that these first two SwissNanos in the country were proven reliable making precision parts for the watch industry in*

Switzerland... and the purchase of these machines shows that we are trying to step ahead of technology."

Very easy to learn

"So far I enjoy the ease of use of the machine," explains Jesse. "It's a lot simpler than a standard ISO machine. The TMI Tornos Machine Interface is definitely a good point between an ISO machine and the full EVO interface. It's significantly different but everything is organized so it's very easy to learn." Joe adds: "As far as installing them, they don't take up much room out there on the floor. Originally we laid the drop down for the Deco 13/Deco 16 size machine; so we're actually going to be saving ourselves a lot of space." "The SwissNanos have great ergonomics," says Gary. "They are accessible from all sides. I could see setup times going down because of that. And I've noticed the ejection looks very efficient. I believe that that will be an advantage."

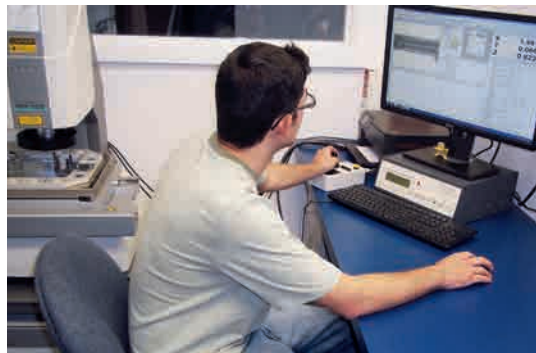
New business with SwissNanos

So, where does Petron expect new business to grow first with their SwissNanos?

"I think they have great potential in attracting customers in the dental industry," Gary offers. "And for small turbines, it looks proficient. I think there's great potential in that area. Micro machining is becoming more and more popular. And the SwissNanos will give us the capability to do much, much smaller work and hold extremely tight tolerances. We've got the right guys here to run the machines, program them, and set them up."

Big brother EvoDeco 32 runs lights out

The SwissNano's big brother, the Tornos EvoDeco 32, on the other hand, was purchased for its ability to run larger diameter precision parts around the clock. The Petron group estimates that 75% of the parts they manufacture are cut during the 12 hours (average) that the machines are minimally manned. "We have someone come out for an hour or two to make sure there are no issues," Jesse explains. "They might change tools, load some bars, and that's about it. So we're saving a lot of time and money by not running full crews." "The ability to run around the clock with these machines has allowed us to be competitive," adds Mike Jr. "It's opened up a lot more high volume work. These machines run so well that you don't need to have a crew during the night to watch them." "We pass that savings on to the customer and it's a win-win for both of us," adds Mike Sr.



One of Petron's 4 Quality Control engineers using a Laser Vision System to check a part's dimensions from a part made in the EvoDeco 32.

Big improvements

"I can't wait to turn in the PTOs to get a couple more EvoDeco 32s," says Joe. "It's a big improvement over previous models – more solid, quieter, vibration-free. And of course, bright, which makes it easier to work on. The LED strip inside the machine is nice. We're very pro LED." "I'd like to emphasize the quietness of the main spindles," Jesse adds. "That's a big improvement too. It was jaw-dropping how much of a difference it made. Plus they look cool. With the bigger window in the front, you can really see everything inside the machine now. And the EvoDeco 32 has a significantly improved door. It's a lot easier to get in there; so we're probably able to shave a couple minutes off setup now. These are little things but they make it more comfortable. You know once you work on these machines for a long time those little ergonomic changes really do matter."

Standard complicated part

Right now, the EvoDeco 32 is running one of Petron's standard parts. But "standard" for Petron does not mean "simple". "It's a very complicated part," Mike Jr. explains. "The QC record includes 60 different checks. It's 2" long and includes a lot of deep hole drilling, angled milling, reaming, burnishing. It's a simple part for us, but it's not a simple part." And Petron is dropping these parts complete with no secondary operations needed thanks to their highly capable Tornos equipment and their in-house expertise. Jesse and Gary were charged with eliminating secondary operations on the part back when it was still being cut on the older Tornos equipment. "For years and years and years we did secondaries on it," explains Mike Jr. "Then Jesse and Gary got their heads together and 'voila!'...they dropped it complete. They saved us a lot of time and money in not doing those secondaries and quality greatly improved too."

Success Story

Working together, side by side, ready to take on the future

Father and son dynamic duos are only part of the picture at Petron. The team has grown and thrived thanks to one-time “outsiders” too. The group explains their hiring formula, in Petron’s unified voice that unfolds as a threaded discussion. “As a supervisor,” begins Jesse. “I can say that we really have a talented group of guys. And one thing that Petron likes to do is to take guys who have never been in the industry before and train them up.” Gary adds: “What we’re looking for are employees that are capable and motivated.” “Whether they knock on the door, or it’s a friend of a friend,” Mike Jr. continues, “if they want to work and they have the willingness to learn, we can train anybody. Basically anyone who is motivated and wants to work... we can train them.” Mike Sr. adds: “Don’t get us wrong. We don’t take 100%. For every person that comes in here you have 5 or 6 that have no interest and aren’t qualified.” Gary finishes, laughing: “What Mike is saying is that we kiss a lot of frogs before we get a prince!” Then he gets serious again, “But at the same time, I believe if you set up the right environment, then you attract the right kind of people. And I believe Petron has that environment.”

Complex parts few other shops would touch

“You can have all the machinery in the world... but if you don’t have the support staff, it’s useless. So you’ve got to have a combination,” explains Gary. “We’ve gotten to the point where we’re taking parts that other companies avoid. Other companies print the part and throw it in the garbage. Those are the jobs we’re quoting and we’re running.” According to Luis, Petron is known for being reliable both for excellent and consistent quality, and also for timely delivery of intricate parts from brass, steel, bronze, aluminum, and titanium, among other materials, for everything from aircraft to medical devices. “Word of mouth” has been their main reason for growth over the years. They have the technical capabilities and resources to manufacture primary and secondary operation parts (often helping customers’ engineers optimize manufacturing processes – as their slogan says “from prototype to production”). “We do have some very complex parts that require maximum operator attention,” adds Mike Sr. “One example is a military part... an aerospace helicoil. It’s a difficult material.” Jesse continues, “It has two thread whirling operations. It’s a part that a lot of shops won’t touch. It’s also what they call a strategic metal... it’s controlled by the US government. “Usually we get



Petron's CNC Manager and one of the CNC Operators analyzing dimensions of a part for the firearms industry made in the new EvoDeco 32.

them in lots of 100 and 50. But it's a continuous thing where there's a family of parts... It might add up to 2500 pieces a year; but that's going to take all year to run. That part is actually being done on our 13 mm machine. The 13 mm Tornos is probably running our most complex part in the facility." And now the SwissNanos will be running the smallest parts in the facility.

When Petron took delivery of their SwissNanos, it was clear to them that they were going to need new equipment to measure the parts that would come off those machines. As good as their old QC equipment was at measuring the helicoil parts, the new QC equipment needed to be better.

The "Tornos" of vision systems

Mike Jr. begins, "We needed the best equipment to check the SwissNano parts... we needed state-of-the-art QC." Luis continues, "As part of this growth with the new building and new machinery, we have invested in and strengthened our quality control department to make sure that the parts coming off our machines are to our customers' expectations or better. Our QC department has its own area now which is enclosed, temperature controlled, and state-of-the-art, including our Nikon vision system." "The new QC equipment will probably do the work of a couple inspectors (and more accurately) in 1 hour where it would normally take inspectors 5 hours," says Gary. "And the Nikon is always right. We don't have to write down the results... just print them out or export into an Excel spreadsheet or whatever the QC documentation requires." "I could be wrong," says Mike Sr., "but I think we've had zero rejects since they've been here. Am I right?" The others in the room agree. He's right.

Big plans for the future

It's clear that the Petron team has big plans for the future. They are growing methodically and confidently. "Petron is on the forefront of the Renaissance in American Manufacturing," summarizes Jesse. "The American consumer is slowly getting back to the idea of American made. And manufacturers care a lot more about their branding these days; especially with the use of social media and general public opinion about outsourcing overseas. I think there's going to be a lot of work coming back here to us."

And Petron Automation will be ready to make ultra-precise parts, large and small, of superior quality. The green initiative, coupled with an expanding line up



November 25, 2013, Petron Automation, Inc. held a ribbon cutting ceremony marking its expansion to its facility at 65 Mountain View Drive, Watertown. The company added 9,000 square feet to make room for 18 new machines. The new facility triples the company's capacity and potentially adds five jobs next year and another 10 in the next 2-3 years. Left to right, Waterbury Regional Chamber Manufacturers Council Chair Rich DuPont, Vice President Pat Petro, President Mike Petro, Sr., Town of Watertown Economic Development Coordinator Joseph Seacrist, Manufacturing Engineer Chris Petro, Vice President of Sales Mike Petro, Jr., Waterbury Regional Chamber President & CEO Lynn Ward and Tornos CEO Michael Hauser.

of colorful SwissNanos, an EvoDeco 32, eleven other workhorse Tornos machines, and a united family of motivated and highly capable machinists and support staff, is sure to help this American company see green (money) for years to come!

To read more about Petron Automation, please find their first decomagazine story in the US edition #2 from 2008: http://tornos.us/newsroom/literature/pdf/decomagazine_us_2008_IV.pdf



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SAN-TRON – A FAMILY OPERATION WITH TORNOS CONNECTIONS

Just off US Route 1 (the first interstate in the country) is San-tron, Inc., a successful manufacturer of RF connectors, turned components, and cable assemblies headquartered in Massachusetts. The family-owned company was started in a cellar by Kenneth Sanders after he completed duty as a Machinist's Mate on PT boats for the Navy in World War II then ran Brown & Sharpes for the screw machine department in a local General Electric plant. The company has seen its share of ups and downs over the years – much like the pattern of waves that run through the RF connectors and cable assemblies made at San-tron today.



Ken Sanders in the 40's; his passion for technology and strong work ethic are still intensely lived every day at San-tron.



Mike - Swiss Department Supervisor, Wayne -Vice President, Rich - Swiss Setup (left to right in front of the ST 26 machines).

Kenneth Sanders and his brother Fred first had hopes of “making it big” selling Indian motorcycles in Florida near one end of Route 1 as the first distributorship in that state. They built and raced motorcycles; so this was likely a dream career for them. But the motorcycles didn't sell well; and it appeared that life had other plans for Kenneth further up the highway.

In a town named Ipswich, he built a global company beginning with loans he secured to buy a couple of starter machines. With his back against the wall, needing to support his big family of seven kids, he was able to make a go of it in his small shop, taking any jobs that came along... doing piece parts for the connector industry, soldering tips for an English company, and military parts for companies like Varian

Associates. Wayne Sanders, current Vice President at San-tron and son of Kenneth, credits a strong work ethic to his father's success.

Strong work ethic helps San-tron grow and ride the tides of business

Incredibly, they still have a lot of their customers from the early days in the 60's. But the business has definitely changed. Wayne explains, *“The screw machine industry would swing back and forth between good times and bad times. While making parts for connector companies, my father started putting pieces together, taking a chance and hoping that when things got better he would sell his customers the whole assemblies. His customers were happy to have*

him do that. And I guess that's how we started getting into connectors. He always said 'You have to have a product. You need some sort of a product.'

Today, San-tron designs and manufactures RF connectors, adapters, and complete cable assemblies – in addition to doing some precision-turned component work for a variety of industries and applications.

"My father didn't start with Swiss screw machines; but I remember him telling me in my early years when I was just a youngster that he could get this other work if he had Swiss machines. So he bought a few Petermann and later added a couple of Strohm's back then."

Wayne joined his father along with other family members at San-tron after getting his degree from Northeastern University and following a lab job at MIT. (Today Wayne has a brother that's the COO and another that's the CEO, a sister that's HR, a brother that is an assembly supervisor, his wife, son and a couple of nephews in the company – so it's a large family operation making primarily families of parts).

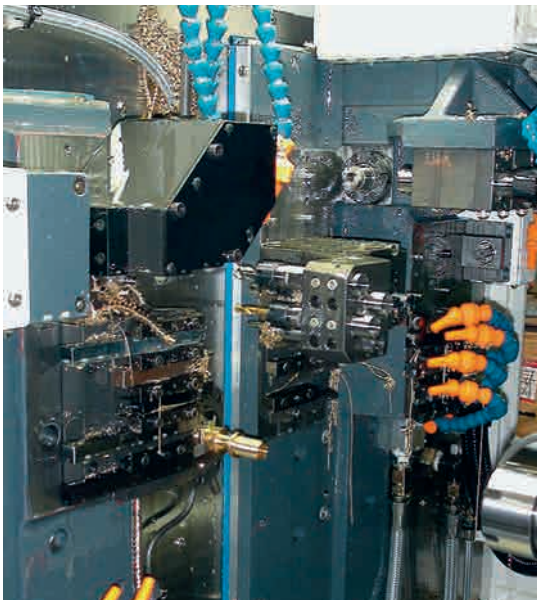
"I started working in the secondary department at San-tron where we were doing slotting and milling. And my job as a mechanical engineer was to automate the secondary operations. Then we lost a couple of Swiss setup guys and I was brought over onto the Petermann line. I think I put about 10-12 years into that department. Along the way, we learned that Tornos made the best Swiss machine. So we eventually picked up seven or eight Tornos MS 7's to

do precision parts including cross-drilling and some secondaries. We saw how nice we could do the secondary operations on the Swiss machines. That was a big plus. We became very good in secondaries and also built a number of machines specifically for connectors. So when the communication boom hit, we were ready."

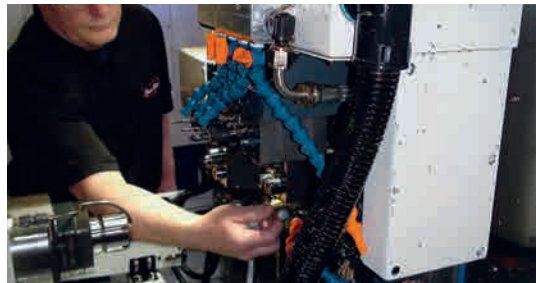
The connector business grew like crazy in the late 90's with the dotcom surge; and San-tron was so busy that at their height, they had 100 people working for them. The company expanded their rented space, bought the 7,000 square foot building, and then moved operations into a new 30,000 square foot building in 1995. That year they bought their first Citizen CNC... a year later, another; then two Star SA Swiss machines along with Imoberdorf Rotary transfer machines for secondaries. Around 1998, they bought their first Tornos Deco 10. *"We had belief in Tornos... the quality was always there from the early MS-7's. Those were Cadillacs."*



Deco 10 sawing a connector contact.



Swiss ST 26 making a connector body.



Ease of access to tooling area of the Swiss ST 26.



Jack, R&D Supervisor; Tom, Assembly Supervisor (left to right).

Success Story



Mike - Swiss Department Supervisor, Joel - Swiss Setup, Rich - Swiss Setup (left to right in front of Deco 10 machines).



Wayne and Mike in front of the Deco 26 with "the old cams of the past" in background.

With the Deco 10 they found they were able to run lights out. Says Sanders, *"We were doing lights out back around 1998. And our production went through the roof!"* The Tornos Deco 10 machine was so successful that they bought two more shortly thereafter and produced center contacts for connectors round the clock, kicking out complete parts on average every 15-20 seconds. Today, Deco 10's still make about 90% of all San-tron's center contacts.

According to Wayne, *"The Deco 10s were and still are very effective on center contacts for connectors... probably THE perfect machine. I believe the best machines in the world for slotting, crimping, back-drilling, and creating small threads on center contacts. The two opposing slides are beautiful. If you're doing small diameter and you're knurling it; you can bring a knurl in from each side. It's a tremendous way of knurling. Splitting the work between the main spindle and subspindle reduces cycle time dramatically. A lot of our center contacts are crimp-type contacts where the slots are crimped or reamed - these used to be 6, 8, 10 operations for our shop. With the Deco 10, it's kicked right down to one operation. When it drops into that container, the only thing we*

have to do is wash it and then get it into a heat-treat oven. We're done. The more times you handle the part, the more chance of something going wrong.

"The Deco 10 also gave us a lot more tools to finish the part. I think that's what we all want to do in the screw machine industry, is drop a part complete. The Deco 10's did that for us."

Ups and downs - Just part of Life

But when the dotcom bubble burst in 2000, San-tron had to rethink their game.

For the first time, San-tron began marketing and added a sales force (which they hadn't needed prior to the dotcom crash since word-of-mouth kept them so busy). They also applied for and received ISO certification. They had to spend money on things they hadn't had to spend money on before.

"As things kind of collapsed around the world with the overestimated dotcom bubble, customers basically advised us to go to China because that was where the big build out was in the RF field."

They followed their customers' advice and became a global company, opening a facility in China, and hiring employees to assemble the San-tron US-designed connectors for the growing Chinese market.

"Right after the dotcoms crashed, we were quoting hard and tight and trying to get work here in the US so we didn't have to lose any of our talented employees. We were hit pretty hard. Nothing was happening here in the states. It was slow. And our big customers, global companies who were participating in the Chinese cellular industry build out were saying to us: 'Your prices are good. We know your quality is good. But we can't give you the order because you're not here.' So we had to support our customers there.

"For a manufacturing guy like me it was very hard to go to China... very hard. Because I want to keep every bit of manufacturing I can in the states. But the work ethic in China was good, labor costs were low. And we needed to be there. It's a global world today and we realize that some of the parts come from overseas and some go out."

To keep as many jobs in the US as possible, San-tron invested in automation for their Massachusetts facility as well. *"We built some connector assembly machines; one that does 40 different computer checks for quality. It assembles our standard "Type N" connector in about 4 seconds. It takes all the different parts from bowl feeders and orients the parts the right direction, assembles and numbers the parts. You have to automate. That's the big thing. It's*



Wayne in the front lobby of San-tron.



Assembly department at San-tron.

good growth for us and keeps things stable. It was difficult being hit with the low costs of the Asian labor, but it forced us to improve our internal processes to compete and succeed in the global marketplace. We have a good engineering staff, good machinists and a family of great employees and we knew we could make the assemblies with good quality. The assembly machines and our automated turning machines keep jobs here."

Wayne points out that after the dotcom crash, they had a "bit of a problem on the manufacturing side" because they hadn't yet moved to CNC for parts over 1/2" diameter.

"It was rough getting work here during that particular downturn. We picked up some Index ABC turret machines. We went used because that was the most we could invest at that time to expand our capabilities. We took our CNC capabilities from about a 1/2 inch capacity up to 2-1/2" which is what we have today. That put us into a different realm of connectors. We were able to grab the 7/16 connector business. And we also moved down to the SMAs and smaller connectors."

Around 2004, San-tron purchased a Tornos Deco 26 machine. *"The Deco 26 has been a great machine. It's got great overlap like the Deco 10. You can split operations 50/50. The cycles on connector bodies are some of the best in our facility."*

So, with things back on track – increased automation, greater machining capacities, assembly facilities at home and overseas, and a solid work force, San-tron began to thrive again.

Last year, they placed an order for three new Tornos Swiss ST 26 machines. They needed more capacity for center contacts and smaller connector bodies between 1/2" and 1". The Swiss ST 26 fit the bill.

With San-tron's experience in China, they were open to the idea of a Swiss type machine partially made

there. Wayne says they asked Tornos many questions. And when they learned that the machine was engineered in Switzerland and key components like the spindles were Swiss, they were interested.

San-tron's experience with Tornos over the years was certainly positive. *"Tornos has a great crew in Connecticut. We're in Massachusetts, so Connecticut is who we work with most of the time. Roland Schutz is always there with the answers to our problems. Mike Callahan, Paul Cassella, and Jim Kucharski do a great job."* Knowing the Swiss ST would be backed by this same team, San-tron placed their order for three Swiss ST 26 machines. And things are going very well so far.

Adding the Swiss ST to the San-tron family

"This ST 26 has a very nice polygon unit. And it has a lot of tool capacity: 36 tools. I think Tornos has a winner there! We reviewed our first 5 jobs that came off the ST 26. We are averaging 17% faster on our cycle times over our turret machines already. We've got cycles of 60 seconds to 90 seconds and that includes threading and polygon milling, back threading, slotting and recessed bores. We do so much brass that polygoning is something we would always want on a machine now... after seeing it and using it on the Deco 26, Index, and ST 26."

"The ST 26 also has the Fanuc control which we like here. It's user-friendly and popular in the states so that makes it easier to add new people to the company. We also think it's a very stable control. We've never lost any of them in a power outage." And for San-tron, because they are on the end of the electrical service in Ipswich and get power glitches (outages and single phasing) quite often, that was important. They have noticed that their Fanuc machines will shut down properly; where some of their other controls have major problems.

Success Story

San-tron is averaging about 5 million parts a year – primarily families of parts, these days. But they do some prototypes and short runs too. Average lot sizes are 500-2,000 pieces (with production level runs of 10,000 - 50,000 pieces); so quick setups are important to their operation.

“With the ST 26, we can edit at the machine. For short runs, where we’re just trying to prove out a job – get it on and off without worrying about the cycle so much – the ST is quicker to setup. It will ask you what diameter you’re doing, and then you press 1/2” or whatever and then you bring your tool right up to it and you’re touching it off. If you want to change a speed or feed it’s a little tougher on other machines because you have to go back to your computer, make the change and load it back on the machine. We don’t have to do that with the ST 26.

“I like the double slide setup on the ST 26 – that was really a great selling feature. It’s great for knurling

from both sides or being able to overlap the work just like we do on the Deco 10s and the Deco 26. The slides are quicker than our turrets. It’s much quicker to move a slide back and forth than it is to bring a turret in, do your cut, bring it back, index it, bring the turret back in. The fact that Tornos is bringing more tools on the machine and using the slides on the machine, it’s a good plan to give you better cycle times. When I was a kid, Swiss machines were very limited. There was no revolving guide bushing, there was no front and back-end work. Usually your turret machines could beat the Swiss machines cold. Unless you had a long and narrow part – the Swiss were the only ones that could do those accurately.

“We would just love to see a 32 mm version of the ST. If they do it pretty quick, we’ll place orders. We have some other machines that we’re going to be phasing out. And I’d like to work in the direction of adding more Swiss style machines because they’re



The center contacts for these small eSeries connectors are made on San-tron's Deco 10s.



SMA 2.92 connectors.

fast and accurate. It looks like Tornos has a deep hole drilling feature on the ST too. There's a family of longer deep hole parts we're hoping to swing into the ST.

"Another thing I like about the ST is the removable bushing because it can help us cut down on some of the waste of more expensive materials – bronzes and beryllium coppers and stainless – sometimes we may not want to waste 8 or 10% of our material. It can also save us from having to grind. I've seen it happen that we get material in after we have quoted a job and the material is not round enough. If we haven't allowed enough money in the job for grinding, we can remove the bushing assembly on the ST. We don't want to forget that feature is on the machine. I think it will come in handy soon and bail us out. I can't wait to try it.

"We brought one ST 26 machine in and we placed an order for three based on the fact that it would keep efficiencies up. We got through the learning curve on the first one and we just brought the second one in and it went up real quick.

"I'll tell you, we had taken another machine and moved it across the aisle, and within a couple of days we actually had the Tornos ST 26 up and going. We were probably another week to get the machine we moved back up."

San-tron in a secure position for whatever comes their way

San-tron manufactures a full catalog of RF connectors and has seen growth in security technologies in the post 9/11 era. As the telecom carriers and technologies have changed, San-tron has remained ahead of the market requirements. They recently received AS 9100C certification for aerospace (to support the

ITAR, ROHS, and DFARS compliance they already had in place); so beyond commercial communications, the company plans to continue expanding their aerospace & military production which has been part of their product mix since the beginning.

Recently San-tron achieved the great honor of having their SRX low-PIM cable assemblies installed in the 104-story Freedom Tower skyscraper that occupies the former location of the 6 World Trade Center in New York. The cable assemblies will be used for the building's wireless communications and security equipment. On May 10, 2013, the final component of the skyscraper's spire was installed, making it the tallest building in the Western hemisphere and the fourth tallest skyscraper in the world. So, for San-tron, it appears that they are back on top.

In December 2013, Wayne and his family sold the original 7,000 square foot building that San-tron had occupied from 1963 to 1995. It brought back old memories when they moved the equipment out of there and could see stains on the floor where the Petermanns had been located. When his father transitioned the business out of his cellar and into that building, he rented a mere 10% of that space. Now, they're a global manufacturer with a very bright future.

If you've got a good work ethic and you're looking to become a Swiss turn operator or programmer in the Massachusetts area, watch for the "Help Wanted" signs along old Route 1. San-tron is growing; and they've got great machines.



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TiNi AEROSPACE TURNS TO SWISS ST 26 AND PARTMAKER FOR PROTOTYPE MACHINING

Northern California-based Specialist Aerospace Manufacturer takes the plunge into Swiss.



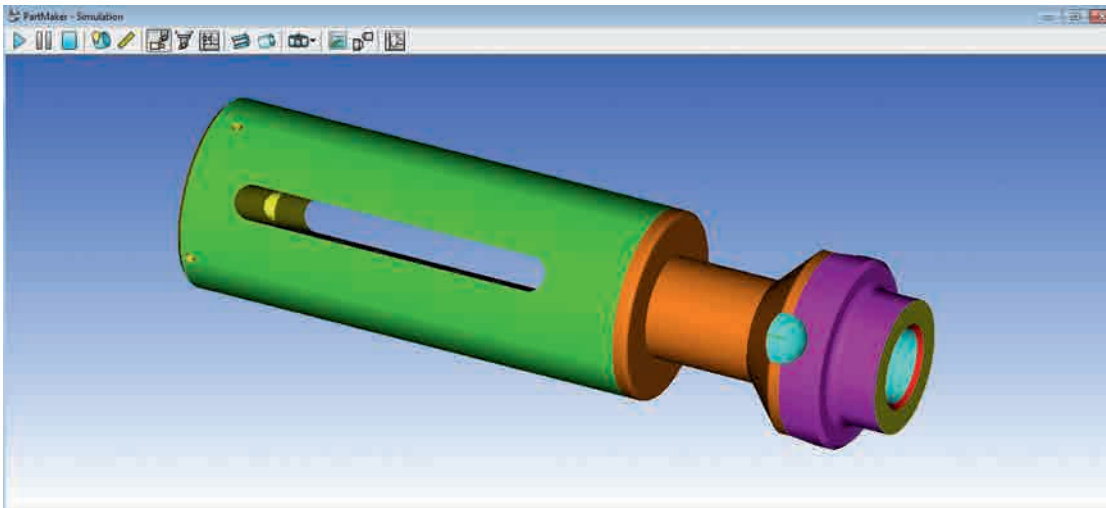
Richard Cosman, the Tornos CNC Swiss programmer at TiNi Aerospace, has had great success with PartMaker in programming parts on the company's new Swiss ST 26.

Located in the technology hub of the United States, in Northern California's Silicon Valley, TiNi Aerospace is an innovative specialty manufacturer of mechanical release devices for the aerospace industry. TiNi's products are used in a broad range of aerospace applications, but primarily for helping aerospace manufacturers test their products strength. TiNi's products can be used in place of single use pyrotechnic testing mechanisms.

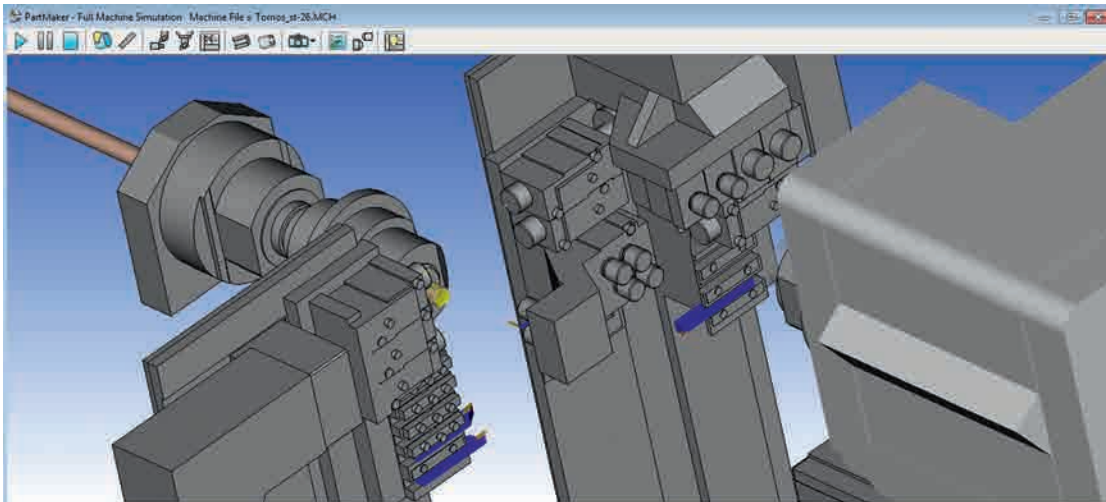
Historically, TiNi has outsourced much of its machining work to shops in the Bay Area, but more recently decided to bring some its parts appropriate for Swiss applications in house specifically for the purpose of being able to turnaround small lot sizes for use in their own internal R&D and testing efforts. TiNi chose to make their first Swiss-machine a

Swiss ST 26 based on the combination of functionality to price that it offered against other machines on the market. To better harness the power of the Swiss ST 26, TiNi chose to invest in Delcam's PartMaker SwissCAM to tackle the programming of titanium bolts it makes in small lot sizes to support its own R&D efforts.

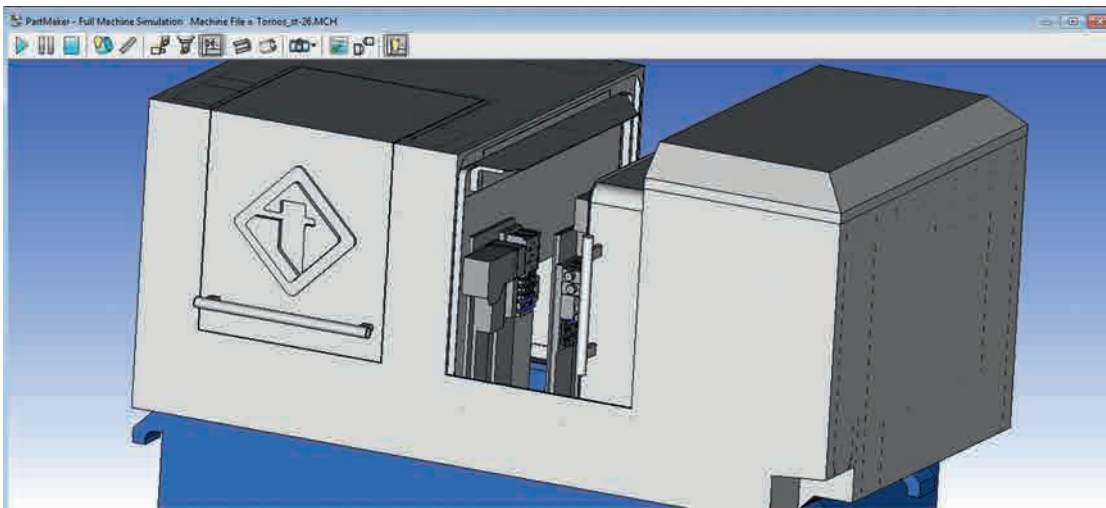
PartMaker SwissCAM is a CAD/CAM system specifically dedicated to automating the programming of Swiss-type lathes. PartMaker SwissCAM supports the full line of Tornos Swiss-type lathes, including machines programmed with the TB-Deco software and standard ISO G-code programs. The developer of PartMaker and Tornos has been partnered since 2005 when PartMaker became the first off-line CAM system to integrate with TB-Deco.



The part above is a latch part used in one of TINI Aerospace's unique mechanical release devices.



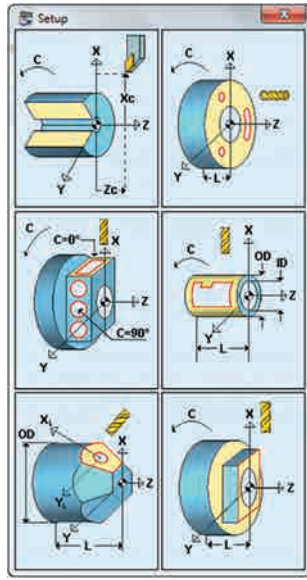
PartMaker's Full Machine Simulation is based on actual solid models of the Swiss ST 26, thus providing a photorealistic machine simulation to the user assuring his program will run error free and without collisions.



PartMaker's Full Machine Simulation allows the user to see the entire machine housing or just inside of the machine.

Success Story

PartMaker SwissCAM applies a patented Divide and Conquer programming strategy to automate the programming of parts with a number of Turned and Milled features such as the ones manufactured by TiNi Aerospace.



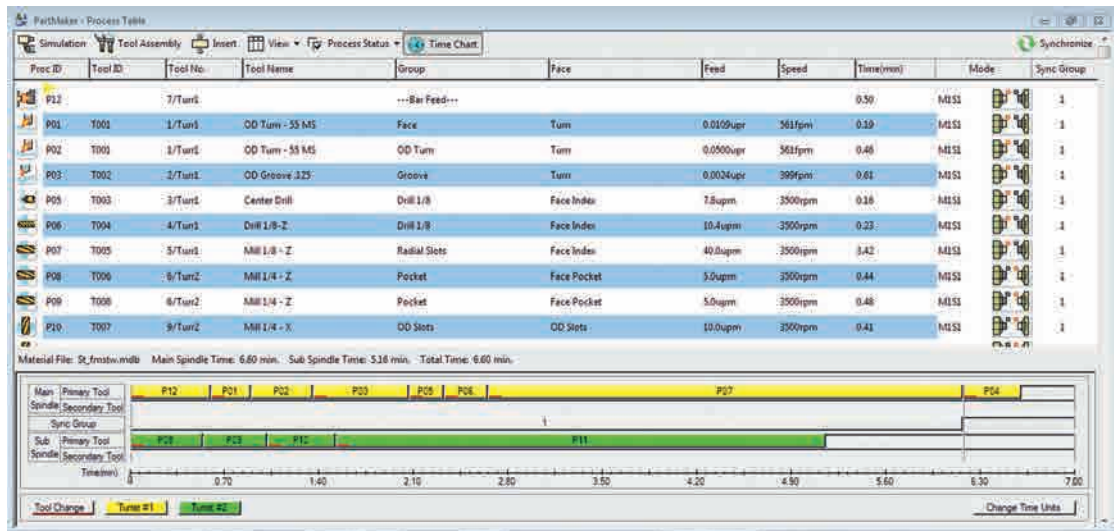
New to Swiss, Ease of Use

As the Swiss ST 26 was TiNi's first Swiss-type lathe, it was imperative that they chose a programming platform suited to the task of programming the machine productively and intuitively. PartMaker applies two patented technologies in automating the programming of the Swiss ST 26. The first of these patented technologies is called "Divide and Conquer." PartMaker's Divide and Conquer programming approach lets the user break a complex part with a number of turned and milled features down into a series of simpler operations. Once part features have been created, the user can automatically optimize the part's process using PartMaker's second patented technology, its visual synchronization approach. By using PartMaker's visual synchronization, the programmer is relieved from having to remember the synchronous machining programming syntax required by a multi-channel machine like the Swiss ST 26. Instead, the user just chooses a picture that corresponds to what they achieve and the software does the synchronization automatically. If the user tries to synchronize operations the machine cannot achieve, the software will provide a warning. Once the optimization is completed, PartMaker displays a graphical time chart indicating the degree of overlapping that has been achieved.

"The challenge we have is achieving tight tolerances at short volumes. We don't have a long production run to dial our process in. Everything is slightly different than the previous job," says company Operations Manager David Bokaie. "PartMaker has worked amazingly well in helping us manufacture our designs on the Swiss ST 26."

"Particularly being new to Swiss and given the capability of the Tornos machine, PartMaker really helps us tap into what the machine can do for us," continues Bokaie.

"PartMaker is really easy to use, the learning curve has been awesome," says Richard Cosman, TiNi's CNC programming responsible for programming the Swiss ST 26.



PartMaker's Patented Visual Synchronization approach allows TiNi Aerospace programmers to optimize the cycle time of parts being machined on their Swiss ST 26.

Faster Programming, Better Cycle Times

With introduction of the combination of the Swiss ST 26 and PartMaker into their manufacturing process, TiNi has been able to program quickly and achieve better cycles times.

"PartMaker helps us produce a good part the first time which means a lot faster turnaround. Parts we previously would have to do in two setups, we are spitting out in half the time" says Cosman.

TiNi has also been impressed with the quality of the technical support provided on PartMaker. Both Cosman and Bokaie note that PartMaker's technical is both highly responsive and expert. In business in which "failure is not an option" according to Bokaie, this superior level of responsiveness has been particularly helpful to TiNi in meeting the high demands it has of its products.

"The support I have received from PartMaker has been incredible. If I ever have problem, their support team is right there with solution," states Cosman.



Collaborating for a Solution

Much of the success TiNi has enjoyed with PartMaker can be attributed to the close cooperation between Delcam and Tornos engineers. Tornos provides the developers of PartMaker a great deal of information that helps them develop robust programming solutions for Tornos machines. This has particularly been the case of the Swiss ST 26, which is a relatively new machine in the Tornos line-up. By working together proactively, Tornos and PartMaker engineers were able to assure the PartMaker solution for the Swiss ST 26 was robust before putting it into customers hands. Additionally, Tornos supplied PartMaker actual solid models of the ST 26 which PartMaker incorporates into its Full Machine Simulation technology. Since PartMaker's Full Machine Simulation is based on actual solid models of the ST 26 provided by Tornos, PartMaker users are able to achieve an almost virtual reality-like simulation of a part cutting on the ST 26 offline at their PC before sending the CNC to the machine. This realistic level of simulation combined with a robust post processor for the ST 26, makes PartMaker SwissCAM a very powerful, reliable and easy to use programming platform help users program their Swiss ST 26 more productively. PartMaker's ease of use and strong technical support assures users they will become productive quickly.



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TORNOS SWISS ST TURNING CENTER HELPS PUNCH MANUFACTURER REDUCE OVERHEAD COSTS BY 66 %

For almost twenty years, Boise, Idaho company, Performance Design has designed and manufactured paper punching machines used by Staples, Kinkos and in-house printing departments of large corporations.



Left to right: Emmett Nixon, programmer; Randy Stewart, President; Steven Parker, engineer.

Today, they've got a 20,000 sq ft facility with 25 employees where they manufacture and sell over 20 different product lines including their Rhin-O-Tuff™ brand punches, tools, binding machines, and accessories used to bind paper with plastic combs, crimped wire, and spiral plastic coils.

Until late 2012, though, they were outsourcing a key component in their equipment... the round, oval, square and rectangular metal pins used to punch the paper. The pins are between 1/8" and 5/16" diameter and about 2" in length which includes a 1/8" head gripped by the punch machine. Approximately an inch of the pin punches through the paper. The pins fit into a punch die which is interchangeable within the punch. The shape of the pin dictates the

shape of the hole punched. As part of a company-wide "Go Lean" initiative that began in 2007, they decided that they needed to bring the pin manufacturing in-house, starting with their oval shaped pins. Steven Parker, Project Engineer for Performance Design, explains the situation: *"Before the Tornos, we were having our pins made by outside vendors. But we wanted to reduce costs and get control so we could make what we wanted when we wanted it."*

US Manufacturers feeling the pinch

A blog post on the company website reveals additional detail. *"Since Performance Design is the only remaining USA manufacturer in the paper punch*

and bindery industry, they felt a responsibility to save manufacturing jobs in the US. Most of the company's competitors are based in China, Taiwan, Vietnam, and Portugal where their labor costs and overhead are lower. The company realized that in order to remain competitive in equipment pricing, their manufacturing processes needed to be changed dramatically.

"Rather than sending our production offshore, we decided to bring in Lean manufacturing experts to totally reinvent the way we manufacture our products. This impacted a lot of things, from the way we ordered raw materials to the actual manufacturing processes of our heavy duty punches and binding equipment," said John Lugviel Vice President of Business Development for Rhin-O-Tuff. (<http://rhin-o-tuff.com/blog/rhin-o-tuffs-go-lean-initiative-led-to-dramatic-results-in-punch-binding-equipment-manufacturing/>).

In order to accomplish their Go Lean goals, they had to investigate a new type of machine tool to add to their mix of horizontal and vertical mills. They needed to investigate turning centers.

IMTS 2012... the first stop

Like many manufacturers, Performance Design began their search for their new machine tool at IMTS. "We went to IMTS and looked at four other turning machines," says Parker. "But we didn't get around to looking at the Tornos. We had a full plate and ran out of time. A big reason for us to go to IMTS was to figure out what we were looking at in person for the first time."

"Actually, we were just about ready to pull the trigger on purchasing a different machine right after the show; but then we met with our local Tornos salesman, Fred Huth, and he presented the specs on the Tornos Swiss ST 26 "Starter" machine. The Tornos looked like a great option and we were really surprised by the price that he was quoting. Comparing it to similar machines in the market, we were expecting it to be another 100K more than what he was saying. When we saw the features that the Tornos had for the price, we put the brakes on buying anything else. We had to start looking at that one real seriously."

As they investigated the Tornos capabilities, they realized they could not only make their oval pins; but that they could make their square and rectangular pins too – and make them out of the same round stock material they were going to use for the ovals.

Tornos US – the last stop

"Since we didn't get to see the machine at IMTS," explains Parker. "We wound up going to Lombard near Chicago to see the machine in person, to get a demonstration, and see the Tornos facility. They were able to run one of our rectangular pins for us so we got to see exactly what we would be getting.

"The way we used to make our square pins (and the way we were planning to make them when we decided to bring the work in-house), was with a square or rectangular raw material. We would make a couple extra features and then the final shape of the pin was based on the raw material that we got in. We had a lot of problems with out-of-tolerance dimensions due to varying raw material; but since the material had to come in such huge orders, sometimes we had to deal with it because we didn't have time to make a new order."

Once they determined that the Tornos could use round material to make rectangular pins, they were hooked. "We went back to the other manufacturers to see if they could match the Tornos and their only answer would be jumping up to a \$200,000-300,000 machine. They had nothing in the Tornos Swiss ST price range. They had a couple options with polygon turning; but for our application those weren't going to be viable."

Pinch milling was the game-changer for Performance Design

"What we had to do is take the raw material from a round shape down to a square cross-section. If you do it normally with just one end mill, by the time you get down to your third or fourth flat, you have nothing supporting the cut from the other side. It causes all sorts of problems.

"The biggest thing that drew us to the Tornos was the ability for pinch milling. Every other machine we looked at in this price range only had one tool platen. Pinch milling took what would have been about six or seven raw materials down to just two.

"With the Tornos Swiss ST, we're able to have two identical end mills pinching the material and basically supporting it against themselves. They hold it nice and straight so we're not only able to get the raw material benefits – right now we're doing all thirteen of our different pin shapes out of just two raw materials, 1/4" and 3/8" round 12L14 steel – that helped us a lot right there. But we have also eliminated manual labor on pin head assembly."



Success Story



Swiss ST 26 with parts carousel shown.

Before the Tornos, Performance Design square pins had a gripper head that required manual labor to assemble. Parker explains. *“When we were using the square material, we had to drill a cross hole and then hammer in a roll pin to act as that head. So it was additional labor for our assembly guys to have to do that on every one. Now, we actually leave a round head at the end of the square pins. It looks a lot better and it saves us a lot of labor time.”*

The new pin head required just minor design changes to the punch design; and it was worth the effort. *“The retainer is the part that directly interfaces with that head, it had to be changed up a little bit and we had to do a series of in-house tests to verify that it was going to be as strong as the old one. The new design, in all the tests, blew away the old design. It was easily twice as strong as the previous design that took a lot more labor.”*

Less raw material and less manual labor takes “Tuff” to a new level.

Plus... Performance Design saves at least 21 hours a month on changeovers.

“With this being our first screw machine we were worried about the changeover times (changing out collets and guidebushings and everything) for each pin. But now that we only have the two raw materials, the changeover is really minimal. We’re still pretty new to it... but the changeovers probably take us a good three hours. Right now, we’re only having to do that full changeover... if we plan it right... once a month (vs. 7-8 times a month without the Tornos).”

Performance Design makes the pins one at a time and the average cycle time is around 60 seconds, unmanned. *“The simple round ones are actually quite a bit faster, right around 36 seconds. But the more complex, square ones are about 70 seconds. We accepted that the cycle times would be longer on the square pins; but it’s unmanned and it’s replacing the manual labor of pounding in the roll pins.”*

Fifteen is another magic number

On a normal book – an 8-1/2" x 11" stack of paper that requires binding – there would be between 30-40 holes along the bound length. The pins are in a series of fifteen lengths to spread out the punching force so punching is easier and the acoustics are better. Says Parker, "If you were to punch all fifteen in one shot, you would have a loud 'bang!'".

To eliminate the noise and make it easier for customers to use the punches, Rhin-O-Tuff pin sets come in a fifteen pin stagger, which is the exact same pin in fifteen lengths. The length of the shaft of the pin changes just a little bit from pin to pin in the set. The pin sets were perfect for automation; so Performance Design investigated and purchased a parts carousel with fifteen bins on it. "Our pins were already in a fifteen pin stagger and we found one that had exactly fifteen in it," remarks Parker.

"Tornos helped us set it up and they helped us out with a macro. So now we just program in how many we want of each pin; for example, we enter '200 of each length'. And it will make that length and then the macro built into each program will switch to the next length and index the carousel. It keeps the pins organized for us as it makes the different lengths.

"We're planning to be able to eventually run this lights out... get all of our pin production done during the night time and during the day we'll hopefully have some available machine time to switch to other parts that take a little more surveillance."

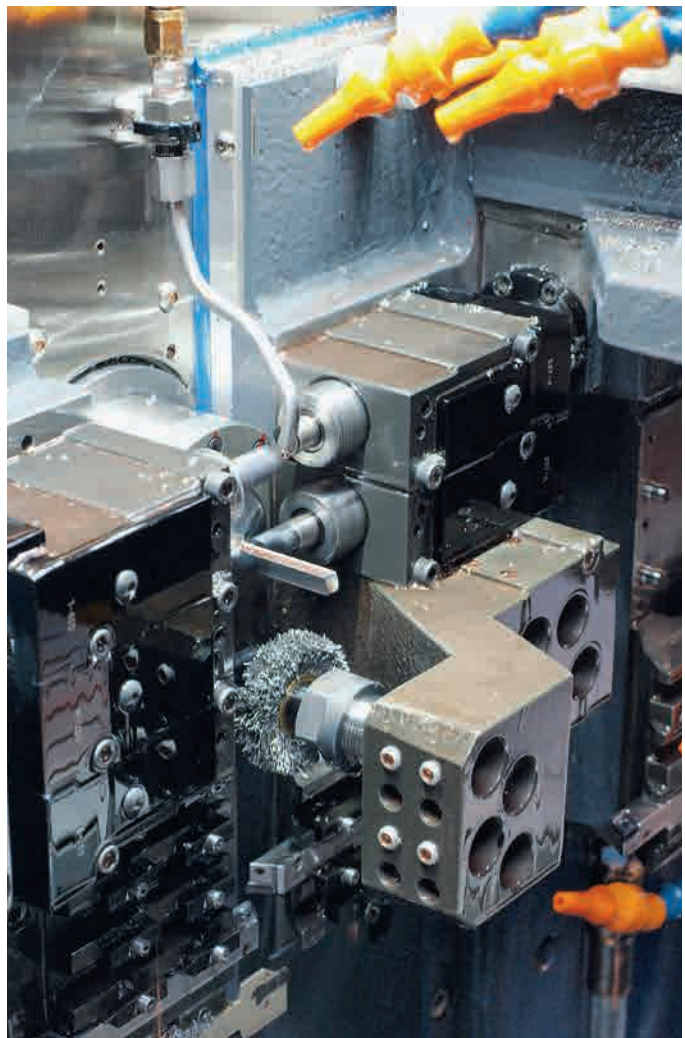
The company took delivery of their new Tornos Swiss ST 26 the last couple days of 2012 as an end of the year tax break rush. And already they project that they'll be making about 110,000 pins per year on their new machine. They are currently running 100 bars/month.

Lean on Tornos

"The accessibility of the machine was a real strong point when we were looking at it," says Parker. "We definitely noticed a difference between the other machines we were looking at during IMTS and this one. There is WAY more room to see what you're doing. During set up and tool touch off especially, having access from both sides was a big plus because certain things you just can't reach too well from the one side. And I noticed in some of the other machines it was just kind of a small hatch and you'd have to reach in and contort yourself around to be able to see anything. So that was actually a pretty big selling point for us was being able to see what was going on and to lean in there and get a good picture of everything."



Performance Design's parts carousel with fifteen bins holds a complete Rhin-o-Tuff pin set (a pin set is the same pin in fifteen lengths).



Punch pins being cut on Performance Design's Swiss ST 26.

Success Story

Another thing they liked was all the tool slots. They can fit all the tooling for all the pins made from each size raw material in the machine at once – with spots still available. *“The different pins we make use different types of tools – most use five tools. There were enough available tool slots on the Tornos that we’re able to leave pretty much all the tools in the machine for all our different pins. That means we’re just changing the program and the pickoff collet when we go from one pin to another. Very rarely will we have to change out a tool. We only have to change out the guidebushings and collets, etc. when we switch to a pin that’s a different material.”*

Room to grow on the Tornos

“We’re still new to the Swiss machine and we’re still trying to figure out how to run the simple parts we have now, but the plan is to eventually be able to do some more parts. We are still outsourcing some parts that we’re just not ready to do ourselves yet. But according to our numbers on all the runtimes, we should be able to do all the pins and only use about 70% of this machine’s runtime capabilities. So there will be some open machine time once we’re fully up to speed on running it ourselves.”



Square and rectangular Rhin-o-Tuff punch pins: old style shown left, new style shown right.

The Tornos is helping Performance Design make parts so fast and efficiently that eventually, open machine time could allow Performance Design to become an outsource partner from the other side of the table.

“We’re open to the idea of doing parts for other manufacturers someday and we’ve had a local business ask if we could build some parts for them. But at the moment, we’re only doing our own parts.”

In summary

The Tornos Swiss ST 26 Starter configuration was a linchpin for Performance Design’s Go Lean initiative. The Tornos was a great fit on price and capabilities

and helped them transform the way they manufacture a key component in their product line. The Blog from their website ticks off a few other benefits of their new lean approach:

Performance Design’s three-year process realized significant improvements in manufacturing and supply chain practices including:

- A drastic drop in the company’s inventory needs. Their finished goods and raw materials inventory saw a 60 percent decrease with work-in-progress inventory cut in half.
- Improved quality control and less reengineering work.
- Faster order fulfillment time from 10 down to 4 days.
- Manufacturing processes made to be reactive to new orders which in turn reduces the need to rework products that have already been boxed up and placed into finished goods inventory.
- Implementing the use of Single Minute Exchange Dies, reducing machine set-up time, labor hours and costs.

The final result of the changes implemented was dramatic, with an overall reduction of 66 percent lower overhead costs. Because of improved engineering, the company is now able to increase the warranty of its equipment to an unparalleled three years, up from one year.



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HK PRECISION PARTS: SWISS QUALITY, MADE IN THE USA

When Hans Kocher came to the USA in the 80s, he brought with him a great deal of expertise and experience in bar turning, together with a love for the land of boundless opportunities. By founding HK Precision Parts Inc. in 1994, this Swiss man with an obsession for quality took the first step towards independence. Specializing in the high-precision production of a multitude of different parts has enabled the company to position itself very successfully in a highly competitive market to the present day. In order to achieve this, HK Precision deliberately makes use of Swiss technology, such as Tornos machine tools and Motorex machining fluids.



Small but perfectly formed – HK Precision Parts in Ronkonkoma/NY has established itself as a precision manufacturer of bar turning parts. In addition to the high degree of expertise of its motivated staff members, one of the major factors in the company's success is their particularly innovative use of production technologies.

Hans Kocher, who came originally from Meisberg near Biel founded his company in New York State in 1994 together with his wife. Today, the firm, based in Ronkonkoma on Long Island/New York occupies around 1,115 m² of land and employs 8 members of staff. HK Precision Parts uses more than 18 different machines to manufacture turned parts made of non-ferrous metals, aluminium, a whole variety of different types of steel, titanium and even synthetic materials. The company covers the entire range of machining from demanding one-off production and small series on CNC-controlled machining centres right up to comprehensive series manufacturing on cam-controlled turning machines. One further advantage: Hans Kocher and his team can also offer

in-house metal finishing processes such as milling, thread rolling and honing. The main customers for what are mostly pre-finished parts are companies from the following sectors:

- Aerospace
- Precision gear manufacturing
- Precision instruments
- Electric motor manufacturing
- Electric component manufacturing
- Pneumatic parts manufacturing
- Special screws
- Shafts
- Dental implants and tools

Success Story



Internationality is the norm at HK Precision Parts: In this respect, people from 5 different nations work at the firm on machinery that is constructed to exactly match market requirements, and which is operated entirely with Motorex machining fluids.

The company can process bar stock with diameters from 3 to 65 mm. The company is currently working in accordance with ISO 9001:2008 and is aiming to gain certification in accordance with ISO 14001 with regard to environmental standards.

Specialising in 'Swiss-style turning'

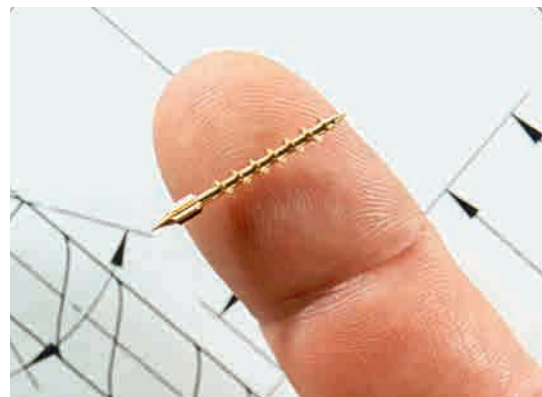
In the United States, the term 'Swiss-style turning' is understood to mean the conceptual standard design of the long turning automatic screw machine to achieve the highest degree of precision. The required tolerances are in the micrometer range; one ten-thousandth of an inch or millimetre. This is used to hold and fix the workpiece using a collet chuck and a lathe barrel. Most CNC automatic turning machines are designed as multiple axle machines today and in this way enter into the highest performance class. Often, they are equipped with so-called 'live tools', which are tools driven by a small motor. For a long time, this type of machining combined with CNC



"TECHNOLOGY PAYS FOR ITSELF"

"The knowledge I had gained in Switzerland enabled me to quickly find the ways and means of accessing the hardware I know so well in the USA. This allowed me initially to find a niche in the field of high-precision parts manufacturing. This then gave us the opportunity to make a breakthrough with various different series orders. It was the combination of perfectly matched machinery, reliable tools and particularly Motorex's universally applicable cutting oil which produced the process safety we were looking for. Combined with our knowledge and ability, our commitment is paying off from an economic standpoint."

Hans Kocher, Owner
HK Precisions Parts Inc.,
Ronkonkoma/New York, USA



This approx. 1.5 cm long high-precision atomizer shaft made of brass for a textile machine was manufactured on a Tornos Deco 2000 shortly after a series of stainless steel parts using the same cutting oil (Ortho NF-X).



At innovative companies, cutting oil is no longer seen as a 'low interest' product and today it accomplishes top performance work between the cutting edge of a tool and the workpiece itself. You just have to know how to make use of the right technology!

control was seen as quite exotic and the industry continued to work in the USA for many years with traditional turning machines (fixed head lathe). By his use of Tornos machining centres (13 machines, including a Deco 20A, 2000, ENC-167, Delta 20/5 and MS-7), Hans Kocher put his faith in high-tech machines and was thus able to produce parts that other companies had great difficulties with.

HK Precision Parts meets Euroline Inc.

While searching for qualitative and high-value performance machining fluids, Hans Kocher got to know Peter Feller in 1998, the owner of Euroline Inc. from New Milford. The company also has Swiss roots and

has been importing Motorex products into the USA for more than 25 years. With a core competency in industrial applications, Peter Feller knows what many clients want in terms of modern cutting oils and cooling lubricants: universal application with high performance and easy handling. By means of comparison tests with traditional lubricants, Peter Feller was able to convince his clients in nine out of ten cases of the product advantages of industrial lubricants made by Motorex Swissline. The same is also true for the team at HK Precision Parts, who have been successfully using the universal high-performance cutting oil Motorex Ortho NF-X for many years, as well as the groundbreaking Magnum UX 200 cooling lubricant in the field of applications with emulsion.



A selection from the HK product palette: The universal high-performance cutting oil Swisscut Ortho NF-X is equally convincing in terms of processing high-alloy steels as well as non-ferrous metals, aluminium and plastics.

Success Story

Breakthrough with Motorex Ortho NF-X

Every operator of a bar turning business understands the fundamental significance of the type of cutting oil used. Motorex was able to use Ortho NF-X, with its vast range of applications, to convince not only Hans Kocher, but several firms in the USA straight away. The universal character of its applications and the high degree of quality have a direct effect on convenience and economy. In this way, Ortho NF-X can be used to process stainless steel, aluminium and brass without the need for a fluid change. In addition, the cost of logistics (-60%) and recycling costs (-96%) could be reduced considerably. The latter is also true, since the cutting oil is periodically filtered and quantities that have been removed are supplemented with fresh Ortho NF-X. In doing so, a great deal of care is taken to ensure that no mixing with other lubricants takes place. This saves on having to dispose of even the tiniest amount of oil, which incidentally costs more in the USA than the new product itself! Using this tried and tested procedure, HK Precision Parts has been saving on costs for years and was therefore able to increase process safety and productivity sustainably in the face of tough competition. Workplace quality has also been improved by the use of the chlorine, zinc and heavy metal-free Swisscut Ortho NF-X.

Cutting costs – protecting the environment

Motorex Swisscut Ortho NF-X is an innovation in production technology - one single cutting oil is suitable for all machining processes. The removal of various complex procedures resulting from several types of

cutting oil means that production lines can be utilised to capacity, even with mixed machining. The result is a considerable cost optimization. The current generation of Swisscut Ortho products is also harmless to people and the environment.

We would be delighted to provide you with information about the range of Motorex machining fluids and the options for optimisation within your area of application:



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Assured quality: Quality control has always been of fundamental importance at HK. Each part the client receives must conform 100% to the strict quality regulations.



A MORE COMPETITIVE EDGE WITH TORNOS

When we think about the Bronx in New York, Swiss CNC screw machines are not the first thing to come to mind. It is therefore quite surprising to find Supreme Screw Products, Inc. there, only a few blocks from the Yankee Stadium. But skills can be found everywhere, and oh, what a high level of skill we discovered there. Over the past few years, when the rest of the market was slowing down, this company tripled its number of employees and its results skyrocketed. How?



Ralph Lauro, Vice-President of Sales (on the left) and Misha Migdal, President, discussing a quotation for a very complex part.

The company manufactures high-end components for the Defense and Medical industries. It is hard to believe that the parts they produce are finished on automatic lathes. The components look like they were manufactured using several machines with a series of set-ups. However, one Deco, if used efficiently, will eliminate the need for several machines and operators. The result: Better machined parts, higher quality, and at a lower price for the customer.

A never-ending challenge

"Customers always want better prices and the parts are becoming increasingly more complicated. The challenge is to find clever ways to produce the parts and thus, to be able to make the parts ahead of the

competition," says Misha Migdal, the company's President. To be one step ahead, Supreme Screw Products, Inc. relies on three elements: Its team of dedicated professionals, its machine pool, and its vision of the business. *"I never say no,"* says the President. He adds: *"We try to offer our customers the best solution time and time again."*

The best people

"I have to train my employees to make them see and think like me in terms of customer orientation and ways of dealing with our business," says Misha Migdal. New York may not have the largest set of skills to draw on for screw machining, but, the company's employees are nonetheless highly skilled

Success Story

and motivated. *"It is never easy to find well-trained people, so we have developed in-house training to make people achieve the different skill levels that are needed to help our customers,"* explains Paul Zherebtsov, Production Manager. Paul himself is a "graduate" from the training provided in-house at Supreme Screw Products. The first stage, continues Paul, involves the operators. They are responsible for keeping the machines running. They feed and check the machines, as well as maintain them. In the second stage, the operators are able to set-up the machines and edit existing programs. Finally, in the third stage, they can produce the parts, set-up and program the machines; basically, they can do it all. When asked about hiring skilled people, the boss is very clear: *"That's impossible. I hire very ambitious people that are willing to be trained and help the company grow. They are working with Supreme Screw Products by choice."*

The best machines

"We're familiar with the different kinds of Swiss turning machines on the market. Before choosing Tornos, we had carefully considered all our alternatives. We chose the Deco machine because it's the only one that can put 4 tools in the material simultaneously. It may be tricky to use it at full capacity, but it clearly gives us a competitive edge," states Mr. Migdal, when speaking about the machines. And the boss is also impressed by TB-Deco: *"The clarity of the manufacturing process is just perfect. We can see directly how any change in the balance of operations affects cycle time. The real-time visual tools and the wizards are well done. The software helps us save money."*

The more complex the part, the more Supreme Screw Products' customers benefit from the company's technology and experience.

Where skills make the difference

Paul Cassella, a Tornos engineer says: *"When some people from Tornos Moutier, unaccustomed to Supreme Screw Products' creative work, saw the parts SSP produce using their Decos, they had difficulty believing it."* It is what clearly distinguishes the company from others. But the President is very clear: *"We are not the market's only company to make outstanding parts. Somewhere, there are people as good as us, and we are motivated to always strive for excellence."* The company also invests a lot in its quality system (ISO 9001:2008 and ISO 13485:2003 certified), as well as the people using it. Communication within the company is crystal clear and brief production and quality meetings are held daily. Mr. Migdal says: *"We always offer our customers in-depth knowledge and expertise at the best price and on time, without compromising on quality."* The company's growth clearly points to the management's vision of business.

The best service

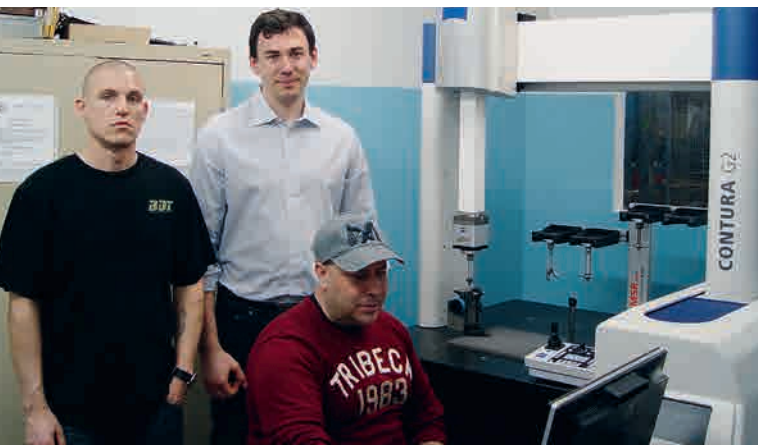
"We are well supported by Tornos, we have a good relationship with both the US subsidiary and the headquarters in Moutier," says Mr. Migdal. He continues: *"We are very lucky in the US as we have Paul Cassella, as well as Roland Schutz, who is in charge of service. These guys are amazing; they help us solve*



David Rubin, Quality Assurance (on the left) and Paul Zherebtsov, Production Manager in front of the "most advanced machine".



Misha Migdal and Boris Shimunov, Shift Supervisor



To guarantee a perfect quality, the company also invested massively in the quality control department. From left to right: Paul Zherebtsov, David Rubin and Hacene Boudebaba, Quality Control Manager.



our problems quickly and efficiently.” Roland says: “We know that we cannot leave our customers with a machine that doesn’t work, it’s bad for them, but it’s also bad for us.” Tornos USA is also committed to the Swiss quality of Tornos products.

“The parts are only limited if they have not yet found a way to machine them.”

A partner for the future

To offer even more to its customers, Supreme Screw Products offers prototype capabilities, component design services, as well as assembly possibilities. With its skills and machine pool, the company aims to machine any part (even the most complex ones) at the best possible price, quality, service and delivery.



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SUPREME SCREW PRODUCTS, INC. IN A FEW WORDS

Founded:	1963
Current management:	Misha Migdal, took over the company in 2008.
History with Deco:	First machine acquired in 2003. In 2013, the company now owns 15 machines and has just ordered two more. Deco 10, 13, 20 and 26.
Employees:	40
Markets:	Medical, defense and aerospace.
Batches sizes:	From prototypes through to large series.
Main asset:	In-depth knowledge of screw machining for difficult parts.

endless flexibility



Next challenge, please!

Versatile, high-performance, capable of operating with or without a guide bush and performing operations with high added value, the Swiss GT 26 is a machining solution that offers standard equipment at a competitive price.

