

In Silicon Valley, Automation Isn't Just for the Big Guys

Automation, specifically linear pallet systems (LPS), enables manufacturers of all sizes to achieve higher throughput, superior quality and great finishes while using a minimum of operators and technicians.

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HTPMI team (l to r) of Peter Lonero, Joe DeVargas, and Hiep Tran chose Doosan's Linear Pallet System and HP5100 HMC to position the company for growth.



Performance Sled Production Climbs on Multitask Machining

Business is all uphill for a Cannon Falls, MN shop due to the sheer climbing power of its custom-built Black Diamond Xtreme Pro-Lite sleds.

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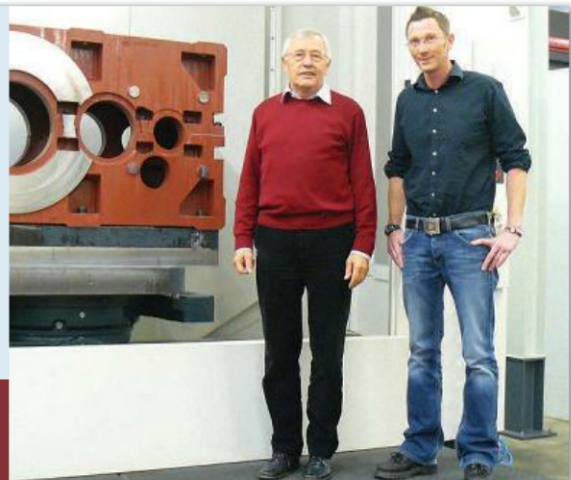
For its custom-built Pro-Lite "sled," Black Diamond Xtreme strips down a standard Arctic Cat snowmobile, changes out and/or modifies its parts, and machines them on Mazak multitasking machines.

Gearboxes Require Massive Machining Center

For producing gearboxes with torques up to 400,000 N•m and power ratings of up to 1000 kW, Knödler-Getriebe GmbH (Ostfildern, Germany) invested in a four-axis H 14000 machining center from Heller Machine Tools (Nürtingen, Germany; Troy, MI).

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Werner Knödler (left) and Markus Kirchner with a classic large component machined on the powerful Heller H 14000 machining center with pallet changer.



SHOP SOLUTIONS

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A finished sensor block machined on every side in two setups on a Doosan HP5100 heavy-duty HMC.

For Hi Tech Precision Machining Inc. (HTPMI; San Jose, CA), a 12-pallet LPS feeding a single horizontal machining center with a 14,000-rpm spindle is positioning the precision

machining company located in the heart of Silicon Valley to better serve its current and potential customers in the medical, semiconductor, and telecommunications industries.

Founded by Hiep Tran, CEO, in 1995, HTPMI has grown into a 20,000 ft² (1858 m²) plant with 15 employees, running 1½ shifts per day with annual sales in excess of \$3 million. The ISO 13485 and ISO 9001:2008-certified company is ideally located to meet Tran's strategic growth plans as a turnkey precision contract manufacturer with a Class 100,000 clean room housing multiple CMMs and complete cable and component assembly.

Over the years, HTPMI has become increasingly reliant on the CNC machine tools of Doosan Infracore America (DIA; Pine Brook, NJ) with 80% of its machines from Doosan. There are a total of nine Doosan machines, including two horizontal machining centers, four vertical machining centers, and three turning centers.

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When asked about his preference for Doosan CNC machine tools, Tran's answer is simple: "For me, it's all about price and performance. I'm sure there are other machine tools that can deliver equal performance, but can they beat Doosan

for the same performance at a Doosan price? I don't think so. Then there are simple things, little things like the commonality of controls over time. This way I don't have to train someone every time I get a new machine in, and it also means that I can

spread my workers to where they are needed most," said Tran.

"It's the same reasoning behind our purchase of the linear pallet system [LPS] from Doosan," said Tran. Doosan designs, builds, and installs its own automation (robots and/or pallet systems)—and stands behind them with factory-trained service personnel and parts. Typically, LPS installations are used by high-volume manufacturers, running large volumes of the same part or part families—a requirement that HTPMI doesn't have at least at present.

So, then why the LPS at HTPMI?

"For us, an integrated LPS for our horizontal machining centers makes perfect sense when you look at the reduced labor requirements and faster setup times, greater throughput and superior part quality. Further, I can operate this sophisticated 12-pallet system with a single operator," Tran said.

Peter Lonero, vice president and general manager of HTPMI, said the Doosan machines have helped the company solve problems for its customers. "An example of some medical work done at HTPMI is that of a casting for fluidics chassis for Lasik Eye Surgery equipment. This part used to be a casting, but they were having trouble with O-rings. As a casting, it required machining a groove to properly place a seal. The difficulty stemmed from the fact that castings are very inconsistent. So, when our customer originally brought the part to us to see if we could remachine that critical portion of the chassis, we said sure," said Lonero.

"However, given today's feeds and speeds on these new Doosan machines,

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specifically the horizontal HP5100, we discovered that we could hog the features from an aluminum block instead, resulting in a cheaper process. In the end, we literally redesigned the part with better results, rather than simply re-machining one critical feature in a casting.”

For a telecommunications company, HTPMI machined a complex part 24" (608 mm) in diameter from ABS plastic. “The part is rather complex with a lot of angles, pockets, grooves and required considerable 3-D machining. Utilizing one of our Doosan HP 5100 horizontal machining centers, we were able to turn the part around before the customer had time to get a quote for doing the job via injection molding,” said Lonero.

“A larger volume part that has benefited from our LPS is a family of sensor blocks used in air quality machines,” said Joe DeVargas, HTPMI production manager. The sensor block is 2 x 1¼ x 1¼" (50.8 x 31.7 x 31.7 mm) with a lot of holes and pockets. “Doing the part on the HP5100 gives us a much more precisely finished part. We’ve actually run thousands of these parts. It’s a part that is machined on every side, and to put that part on a vertical machine would require six different setups.

“On the HP 5100 with LPS, it’s machined complete in just two setups. Best of all, when parts go through design changes by the customer, we are able to turn that around and start making the new configuration within a day, because the part is all set up and the tooling is in the machine. To make similar adjustments on a vertical machine would take weeks,” said DeVargas.

“When I bring customers or potential customers into the plant, and they see all the Doosans running, they’re amazed that the entire system runs continually and only requires a single operator,” said Lonero.

“This typically leads to a discussion about the foolhardiness of outsourcing jobs half way around the world in an attempt to save costs through cheap labor. Here, we’ve reduced the labor content, guaranteed consistent part quality

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and have consistently high throughput. Plus, we have complete process control. Anyone considering offshoring, regardless of their size, should take a look at automation, including linear pallet systems,” said Lonero.

The Doosan LPS at HTPMI consists of 12 pallets arranged in a two-story configuration, six pallets per story, integrated with a Doosan HP 5100 horizontal machining center. Depending on the workload, HTPMI is able to program all 12 of the pallets, and each one will go to the machine in-turn, based on the order desired, while material continues to be set up at the loading station. Time for pallet removal and a new pallet cycling into the machine is about 15 seconds. When the parts are finished, the shuttle picks up the pallet and takes it to the loading station, where finished parts are unloaded from the fixtures and fresh material is then loaded onto the pallet. ➤

For more information from Doosan Infracore Machine Tools, go to www.doosanmachinetoolsusa.com, or phone 973-618-2500.

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Performance Sled Production Climbs on Multitask Machining

Business is all uphill for a Cannon Falls, MN, shop due to the sheer climbing power of its custom-built Black Diamond Xtreme Pro-Lite sleds. The shop manufactures high-performance aftermarket components that transform average snowmobiles into aggressive, supercharged and lightweight extreme mountain machines.

For its custom-built Pro-Lite sled line, Black Diamond Xtreme strips down a standard Arctic Cat snowmobile and then changes out and/or modifies the seat, gas tank, hood, rear skid, front suspension, motor, air intake system, and chain case. The result is a 212-hp (158-kW), 940-cc extreme machine that weighs only 420 lb (190 kg), which is 67 lb (30



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