



Benefits of Horizontal Machining

By Patrick Mayne, Kevin Farmer & Thomas Miller

Horizontal machining certainly requires a higher financial investment to get started as compared to vertical machining, but the long-term effects of this milling approach can be extremely positive for both CNC machining companies and their customers. That has been the result at Quality Products & Machine, LLC over the last several years.



Also commonly referred to as horizontal milling, horizontal machining is the process of removing metal from a workpiece with rotary cutters oriented horizontally. Unlike its more popular cousin vertical machining, horizontal machining has the spindle parallel to the ground floor with the tool sticking out and cutting across the side of the workpiece.

While the downside of horizontal machining is its initial equipment cost, there are numerous benefits to this type of milling. The biggest is the time efficiency it offers businesses in the CNC industry. Despite a higher shop rate with horizontal machining and the necessary computer design setup, a horizontal machining center

(HMC) lowers prices to customers because it can cut production time by more than half.

The horizontal machining process does this in many ways. First, these types of machines allow for the ability to swap pallets, which means the setup time, including the part loading into the unit, occurs while the machine is cutting something else. Effectively, horizontal machining allows for work to be completed on multiple different parts, perhaps for even different customers, at the same time.

There's also inherently less setup required with horizontal machining centers that have a B-axis. With the additional axis, HMC can reach three faces of the workpiece in one setup unlike in vertical machining. This means less labor and material is required with horizontal machining versus using a vertical machining center (VMC), again, another way in which HMC is more efficient, thus lowering cost to the customer.

The actual cutting in horizontal machining is also typically done at high speeds. It usually takes a shorter amount of time to perform the same tasks with HMC as it does with VMC.

If that alone isn't enough for customers to inquire about the horizontal machining offered at Quality Products, there are even more advantages from HMC's to consider. Because there are fewer setups needed in horizontal machining, the process enables extra complex parts to be produced more quickly and with higher quality (fewer setups equals greater repeatability). Also due to its higher efficiency rate, horizontal machining allows manufacturing companies to sell their products in smaller batches.

Since multiple setups are reduced or eliminated, customers have the ability to purchase fewer parts if they so choose. But horizontal machining can also tackle large orders, and it especially excels in complex projects and large orders of any material.

Quality Products possesses two multi-pallet horizontal machining centers, both of which have a B-axis and four-sided tombstones. Together, they help the company serve just about their entire customer base.

Specifically, Quality Products utilizes its horizontal machining centers as part of its lights-out production philosophy and when fulfilling larger run quantities. After the initial CAM development, the horizontal machines run unmanned and overnight in order to save Quality Products time and their customers money.

The lights-out manufacturing Quality Products offers is one of the ways that makes the company unique. Older horizontal machining centers don't have automatic pallet changers, which means they can't run completely unattended and overnight. Even other CNC machine shops that own HMC's might not necessarily have lights-out production because typically only newer horizontal machines have the capability.

The newer of the two horizontal machine centers at Quality Products is about five years old while the other one arrived on the company factory floor in 2012. Both are well maintained and can compete effectively with brand new, similarly configured HMC's.

Adding both units during the 2010s has helped achieve the exact goal they were intended to, which was to help reduce lead times and allow Quality Products to either bring in more customers or produce more parts for the same customer at a faster pace.

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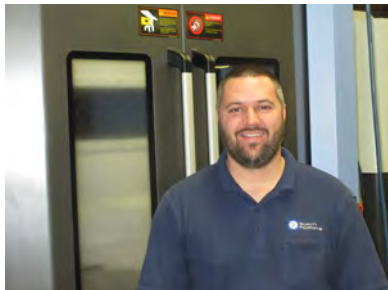
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One recent example of this was on display when Quality Products fulfilled an order of more than 2,000 parts for one of its customers, a power generation manufacturer. With the vertical machining technique, Quality Products was able to create eight of the parts at the same time. However, with HMC, that production rose to 100 at one time, utilizing lights-out (unmanned) machining.

With that type of enhanced flexibility for producing multiple part numbers in low volumes, it's easy to see how lead times decline by *at least half* due to the cutting-edge horizontal machining offered at Quality Products, helping the company serve its customers in the industries such as power generation, aerospace, defense and medical.

About the Authors



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Patrick joined Quality Products in 2013, was promoted to Machining Manager in 2018, then to Operations Manager in 2020. He leads the company's lean manufacturing initiatives.



Kevin Farmer

Kevin has been with Quality Products for 37 years. He has held nearly every position within the company and became President in 2019.



Thomas Miller

Thomas started with Quality Products in 2018 and has quickly assumed increasing responsibility. He was promoted to Machining Manager in 2020.