EXECUTIVE SUMMARY

Many machine tool users have a knee-jerk reaction when they hear the term horizontal machining center: “that’s too expensive for me.” While it’s true that typical horizontal machining centers (HMCs) are more expensive (at the time of purchase) than vertical machining centers (VMCs), the high level of productivity you can achieve with an HMC can deliver a larger and speedier return on your investment. There are compelling productivity, cost and quality reasons to at least consider an HMC where you might have initially thought a VMC would be the machine of choice.

SPINDLE UTILIZATION: TURN “COSTS” INTO PROFITS

Surveys done by American Machinist and the University of Michigan have demonstrated that the average spindle utilization of a horizontal machining center (HMC) is 85%, while the average for a vertical machining center (VMC) is 25%. Translated to an 8-hour shift, this means the HMC cuts for 6.8 hours while the VMC cuts for merely 2 hours. If you look at these numbers for a week’s worth of production (based on one 8-hour shift for 5 days), the HMC delivers 24 additional hours per week in productivity. Over the course of one year that’s approximately 1,248 more hours of uptime. Using the average shop rate of $125 per hour, this could mean $156,000 more in revenues per year for one HMC (more if you operate more than one shift per day).
MAXIMIZE UPTIME WHILE MINIMIZING QUALITY PROBLEMS

Let's compare the operator intervention needed for a 6-sided part (see Figure 1). When producing this part on a VMC, the operator is required to move the part a minimum of 7 times. This often means the spindle is not cutting while the part is being moved. On an HMC, the maximum number of times the part needs to be moved is 3. And because HMCs typically have a pallet changer, the refixturing can be completed while the spindle is cutting a second part. Not only does the decreased operator intervention for a horizontal machining center increase spindle utilization (productivity), there is reduced opportunity for quality problems resulting from part handling.

REDUCE OVERALL MANUFACTURING COSTS

Because part movement is reduced and spindle utilization is greatly increased with a horizontal machining center versus a vertical machining center, one HMC can perform the work of multiple VMCS. This reduces the number of machines required, thereby reducing the amount of floor space needed to house those machines. This also reduces the number of operators needed to run machines and reduces the amount of work-in-process (WIP) necessary to keep the operation running. All these factors reduce overall manufacturing costs and capital investment necessary for ongoing operation, thus increasing profitability.

TURNING ON A HORIZONTAL MACHINE CENTER

With an Okuma horizontal machining center you can perform Turn-Cut operations – something vertical machining centers are not capable of doing. Turn-Cut is a technology function that allows the part to remain fixed (on a tombstone) while the spindle performs turning operations such as threading and ID/OD cutting (see Figure 2). This is possible without the additional investment of special tooling, chucks and fixtures. With a vertical machining center, the part would need to be moved to a lathe to perform turning operations, again, increasing part movement, operator intervention and the possibility of quality problems.

SUMMARY

While a horizontal machining center might not be the right choice for every part, there are compelling productivity, cost and quality reasons to at least consider an HMC where you might have initially thought a VMC would be the machine of choice.

• HMC spindle utilization averages are considerably higher than VMC spindle utilization averages
• Operator intervention is reduced on an HMC, contributing to higher spindle utilization and reducing quality problems
• One HMC can often perform the same amount of work as multiple VMCs
• HMC capabilities now include milling and turning

With a thorough review of your options, you may discover that a horizontal machining center will allow you to achieve significant increases in quality and productivity and a higher return on your investment.