EASY TO USE solution

10X Feedrate for performance

The Business Challenge

The Business
Tooling provider

The Client
Intertech in TAIWAN (Taichung & Taipei)

Toolpath
STN™ STN Toolpaths

Intertech is a leading tooling provider in Taiwan for aerospace, automotive, agriculture, and recreation industries, was looking for ways to decrease forces on the material during cutting, increase tool life, and reduce cycle time.

Intertech offers include, blank, form, and progressive stamping dies; press brake tooling; tube bend tooling; and weld mold and die manufacturing and machine fixturing.

"Because we are in a tool room set up, every block we do is different from the last. We are not able to do block-specific fixturing, so most components are held in a vice. With a five-axis vertical mill, the block-holding problem becomes magnified since we are trying to mill more features on the block than would normally be done in a three-axis machine. Blocks are often left hanging out of the vice or fixture farther than normal, which is a less than optimal situation with respect to cutting pressure." said Jake Lee CNC programmer at Intertech.

OKK MCV1060 CAT50
13K spindle machine

The need to reduce pressure and cycle times, led Intertech management to evaluate the toolpath product suggested by STN Tools Ltd, Taiwan.

STN

The Business Solution

STN Tools helps you to offer you tool paths which are integrated in most of the plugins, used in most CAM softwares. This new genre technology generates toolpaths with smooth motions and low force on the spindle and cutting tool. The toolpaths dramatically reduce cycle times and significantly extend the life of cutting tools.

"Our customers were seeing tremendous gains," Jake Lee said. "We were very skeptical of the advertised time reduction and extended tool life, but after using it for a short time we found it to be a real deal."

Almost immediately, INTERTECH was running at feeds 10 times faster than before. In some cases, INTERTECH experienced even greater savings. Running a large pedestal punch made out of A2 tool steel used to take 22:36 minutes to run with a 75 mm inserted shell mill. With STN Tool paths the same process took only 7 minutes :20 seconds with a 12 mm solid-carbide ball end mill, delivering a 208% increase in efficiency.

"The benefits exceeded our expectations," Jake lee explained.

"Our traditional method of rough milling pocket in a plate or block would be to take passes of 2.5 to 3.80 depths of cut and 50% cutter diameter peripheral cut. By doing this, we used the bottom 2.5 to 3.8 of flutes over and over again—causing them to wear while the rest of the cutter was virtually untouched.

"Now, we drop the cutter all the way into the block for full flute engagement and, depending on the cutter, take 0.5 to 2.0 peripheral cuts," Jake Lee continued. "Because the STN Tool paths keeps a consistent peripheral cut amount, we can push our cutting tools to the maximum capacity without having to worry about heavier cuts in sharp corners in the toolpath. This has extended our cutting tool life significantly."

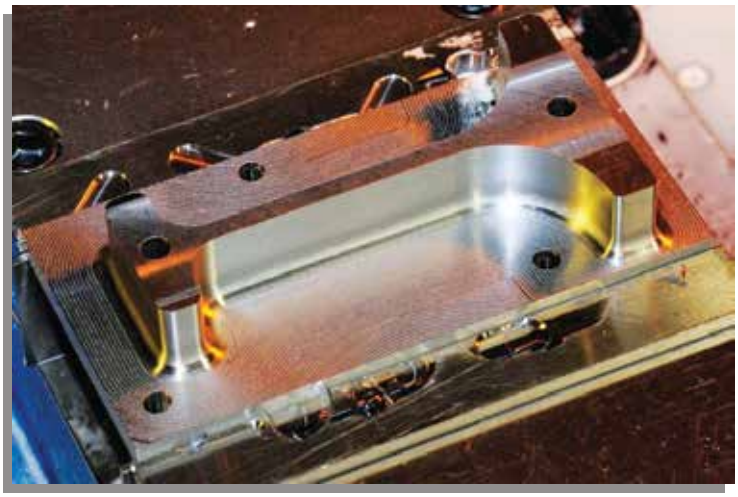
More importantly, INTERTECH found that machining with toolpaths from STN produced less cutting pressure on the part than when cutting with traditional toolpaths, which eliminated the block holding issues they were experiencing.

APPLICATION PARAMETERS

	Old Parameters	New parameters
Material	A2 Steel	A2 steel
Toolpath	Dry with air blast	Dry with air blast
Cutter	50 Iscar Helido Shell AT coated helix 4 flute ball end mill	12 mm STN helix carbide 4 flute ball end mill
Cutter Dimensions	50 x .062 corner radii/ 12 X 30 x 75	12 x 30 x 75
Machine	OKK MCV 1060 CAT50 13K spindle	OKK MCV 1060 CAT50 13K spindle
Tool Holder	82 arbor-holder/ ER32 collet holder	Er32 collet holder
MPM	115 m/min	478 m/min
RPM	700 / 3000	12000
MMPT	0.31 / 0.06	0.11
MMPM	889/762	5080
ADOC	3.81/ 25.4	25
RDOC	31.75 / 0.50	0.76

All Dimensions are in mm

The STN Advantage



Component cut by a STN carbide coated 4-flute ball end mill and STN toolpath.

This benefit significantly affected their production of these parts, including the amount of scrap they were generating because of the block holding problems. Although Intertech does not track scrap numbers, they estimate that scrap due to blocks tipping out of fixturing has been reduced by roughly 25%. The smooth tool motions generated by STN allowed INTERTECH to increase the feed rate 10 times, while taking 80% smaller peripheral cuts at four to eight times the depth of cut depending on the cutter being used.

"Overall, this has equated to about a 40% time savings on milling operations. We realized a 208% increase in productivity using STN toolpaths on a larger punch block," Jake Lee said.

STN Tool CO. ltd helped us to eliminate the poor machining conditions and traditional toolpaths that have been produced since the advent of numerically controlled milling machines. CNC machines only execute commands given by a toolpath engine, which give poor instructions and require machine tools and cutting tools to operate under adverse conditions. Our Tool paths which can work with any CAM system, generates toolpaths with ideal machining conditions, enhancing machine utilization and shop productivity.

STN toolpaths increase the return on the investment in machine tools, cutting tools, and fixturing components by increasing machine-utilization efficiency, shop productivity, and cutting tool life. These savings are particularly important in adverse economic environments. **STN offers the lowest-cost approach to increasing productivity for the manufacturing shop, and it usually pays for itself in a single job.**

OKK MCV1060 CAT50 13K spindle machine milling An A2 steel component.