Application Notes

DATRON DYNAMICS, INC.
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Part: ..... 94 Ghz Test Block

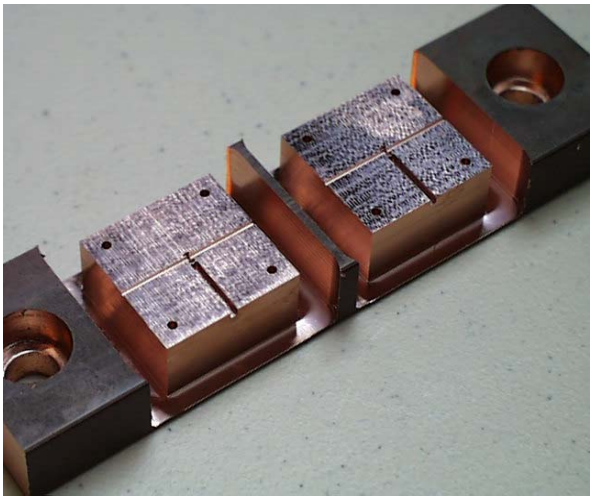
Material: ..... Copper (supplied by customer)

Machine Used: M4

Features Utilized: ..... High frequency spindle, automatic tool change and tool length sensor

Software Used: ..... On-line Datron macro programming language

Total Cycle Time: ..... 43 minutes (per block)



Machining Details:
Tool 1: Center drill at 15k rpm 15 i.p.m.
Tool 2: .0628" drill at 25k rpm at 15 i.p.m.
Tool 3: .032" ball nose mill at 42k rpm at 10 i.p.m.
Tool 4: .015" 4 flute endmill at 50k rpm at 5 i.p.m. (i profile and small bridge between i and slot)
Tool 5: .040" 4 flute endmill at 45k rpm at 10 i.p.m. (roughing out long square slot)
Tool 6: .025" 4 flute endmill at 48k rpm at 5 i.p.m. (semi-roughing long square slot)
Tool 7: .020" 4 flute endmill at 50k rpm at 5 i.p.m. (finish pass on long square slot)
Tool 8: .236" 1 flute endmill at 30k rpm at 20 i.p.m (milling the perimeter of the 1" square part)

Summary of the Application:

Based on the results of the first sample, many changes were made with this part. First there was a program error in the .032" ballnose toolpath in the depth. This accounts for the strange measurement on the inspection report. We changed the tooling to 4 flutes, took much lighter passes in machining and slowed the cut feeds to obtain better surface finishes. Please note that Datron Dynamics does not have the equipment to properly inspect the part in this tolerance range, so we could not compensate for any tool size variances. Any oversized or undersized profiles should be consistent to the tooling. Due to time limitations, we had to compromize inside radius tolerances to work with the common stock 4 flute tooling available, that had the sufficient cutting lengths. In conclusion, it appears the surface finishes were improved from the first test and the part should be more consistent in accuracy.