

TMAC Cuts Tooling Costs by 72% with Real-Time Tool Breakage Detection

RESULTS - INSTALL 9636

CHALLENGE

This customer's gun drilling process was very unstable and tool life was widely unpredictable. The customer was challenged with vertically drilling very tiny holes with microtools. Drills were breaking as often as every 3 to 15 holes. This excessive tool failure was caused by stray chips landing in the piloted holes. When the micro-drill followed to peck-drill the holes, it would often snap when it came into the piloted hole if chips were present.

Breakage would go unnoticed until the operators made their rounds. Since the holes were piloted, they could not tell where the drilling stopped, and therefore, had to manually inspect thousands of pin-sized holes in the part to find the breakage location, extract the broken tool bit, and then restart the program from that point.

TECHNOLOGY



SOLUTION

After implementing TMAC, the customer has gained valuable insights into their cutting program, and the ability to pinpoint problem areas in the drilling to make the necessary adjustments to the program. TMAC monitors and displays real-time cutting and records all the data for analysis. TMAC has a built-in historical viewer that allows the user to interrogate the cuts on multiple levels to identify issues. Now, after optimizing the program with TMAC, they can drill several hundred holes before breaking a drill.

The customer set an extreme limit with TMAC to interrupt the drilling if the drill encounters stray chips on the way into the piloted hole. TMAC stops and retracts the tool instantly when it encounters a chip, saving the tool from breaking. Then, using a touch probe, they check tool length and continue if the tool is good, or, error out, if not. This allows the tool to repeat this process until the chips are safely cleared without breaking the tool.

To save downtime when tools do break, they set an undercut limit with TMAC to detect the broken tool location. If a tool breaks, it is identified on the subsequent hole with an undercut alarm (no contact with material), and the machine is stopped instantly. Utilizing the CNC position data provided by TMAC, (isolating the exact XYZ location of the CNC at any point in the monitored cut), they can precisely locate the hole where the tool broke for immediate extraction.

RESULTS

- *Reduced tooling budget allocation over 3 years by 72%*
- *ROI for multiple machines equipped with TMAC was less than 6 months*
- *Customer is getting the maximum life out of each drill*
- *Downtime significantly reduced*

INDUSTRY

Weapons
Die Manufacturing

MACHINE TYPE

Vertical Machining Center

MATERIAL

Stainless Steel



SMART MANUFACTURING SOLUTIONS