

# United Tool & Mold improved machining efficiency and electrode-finish quality with WORKNC



## United Tool & Mold

Tooling failures that bring production to a screeching halt can be a manufacturer's worst nightmare, which is why tooling experts United Tool & Mold have made a thriving business of coming to the rescue.

Established in 1995, United Tool & Mold's mission is to keep production up and running, primarily by repairing damaged injection molds within a three-day time frame, and offering comprehensive engineering services.

The Company, which performs a significant amount of work for the automotive industry, employs a team of about 75 and operates facilities in Rainbow City, Alabama; and Liberty, South Carolina.

"We don't know of any other tool makers whose main focus is repair — which does set us apart," said Chief Operations Officer Chad Lamance, who started his career at United Tool & Mold in 1996, when he was hired to sweep floors.



United Tool & Mold - CNC

“Increasingly complex tooling has been the biggest change that we’ve seen over the years, but there’s nothing that we can’t make now, and everything is made just-in-time.”

In 2010, United Tool & Mold implemented the WORKNC computer-aided-manufacturing (CAM) solution to increase machining efficiency, and due to the solution’s ability to work seamlessly with a wide range of computer-aided-design (CAD) systems.

“One of the things that we quickly noticed was improved cycle time and improved quality,” Lamance said. “It’s hard for us to qualify the software’s value in time savings because we don’t do production, but we do have a much better finish than we had before WORKNC.”

United Tool & Mold uses WORKNC and a range of equipment to machine in up to five axes, primarily by performing 3+2 operations with the use of a rotary table. During 3+2 operations, the cutting tool is locked into a fixed position as the machine tool’s two rotational axes move.

“We use WORKNC exclusively for all of our electrodes because it increases the surface-finishing efficiency of our electrode making machine — an OKK DGM 400,” said Engineering Manager Mike Williams of United Tool & Mold.

With nearly 40 years under his belt as a manufacturing professional, Williams — who was hired for his first industry job as a truck driver and shop sweeper — understands the art and science of machining. For less skilled employees, however, some of the automation tools within WORKNC can help to bridge the gap.

Among those tools are machining sequences, which enable United Tool & Mold to customize and automate significant portions of its programming workload. Use of sequences also supports the implementation and enforcement of company production standards.

“With a less experienced person who doesn’t know all of the intricacies, he doesn’t have to have the knowledge of how the sequences work,” Williams said. “He only needs to know when to apply them.”

To streamline electrode production, the company applies sequences that include several different approaches and eight different cut programs.

“The sequences are stored in a directory on the computer, so he understands which sequence needs to be applied depending upon the visual appearance of the electrode,” Williams said.

“We have a series of five sequences for graphite, and we want them to be taller than what the finished product shows. We use a roughing program to get a raw look of the final shape, and to get it down into a manageable shape so we can then go in with smaller tooling.”

As WORKNC automatically saves programming data, it’s easy to maintain records on toolpath, tolerances, cutting tools, and any other parameter information that can be helpful to create sequences. The system enables users to specify sequences for specific operations, such as roughing and finishing, for fast and simple selection and application. Recorded cutting data includes information for speeds, feeds, and stepovers.



To further increased efficiency, the team at United Tool & Mold also takes advantage of the sophisticated machining cycles within WORKNC, including the Waveform roughing strategy.

Waveform roughing is a high-speed cutting technique used to remove a significant amount of material while maintaining a constant tool-cutting load by ensuring that tool engagement in the material is consistent throughout the operation.

“Waveform is a high-efficiency cycle, but you can invoke it in all types of shapes, which makes it adaptable to whatever we’re doing,” Williams said. “The sophistication of it is that it isn’t specific to a shape or form.”

Due to the cycle’s inherently smooth toolpath, sharp changes in direction are eliminated and the velocity of the machine tool is consistent. With constant tool engagement, feed rate is maintained at an optimal value throughout the cycle, which improves tool life and reduces the risk of tool breakage.

Likewise, the sophistication of WORKNC’s re-machining operations increase efficiency while ensuring a desirable finish. Re-machining entails automatically removing material that remains following roughing operations with increasingly smaller tools in subsequent operations.

“One of the things that WORKNC does really well is that, when it’s a sophisticated model, the roughing strategies and rest machining tend to be more strategic and more efficient than what I can generate in other software that I’ve used,” Williams said.



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**Chad Lamance,**  
Chief Operations Officer, United Tool & Mold



United Tool & Mold - OKK2

**Company:** United Tool & Mold

**Website:** [www.utminc.com](http://www.utminc.com)

**Business:** Tooling, primarily injection molds for the automotive industry

**Benefits achieved:**

- Improved finish quality
- High-efficiency machining with the Waveform strategy
- Cut programng time with saved programming sequences



United Tool & Mold - Shop



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