

# Clearwater Engineering and TDM Systems software team up for success

Clearwater Engineering is a small aerospace contract manufacturing firm with big goals. Now, Tool Data Management software from TDM Systems is helping them reach those goals.

Clearwater Engineering (Derby, KS), was a small firm that refused to accept second best. The result for this aircraft component engineering and production specialist: steady growth. "When I began with the firm in 2006, we had five employees," says Jaramie Cool, Engineering Director at Clearwater Engineering, "today we have forty, with a facility expansion planned within the next two years."

Clearwater deploys an impressive production arsenal to perform its chosen role as a custom manufacturer of complex aerospace parts and precision assemblies. "We have 11 CNC machines," says Cool, four 3-axis, three 4-axis, and four 5-axis along with numerous other machine tools."

## Benefits



**45%**  
reduction in  
scrap and  
fewer collisions

**26%**  
reduction in  
tool usage



**365 h**

saved per year in set up time

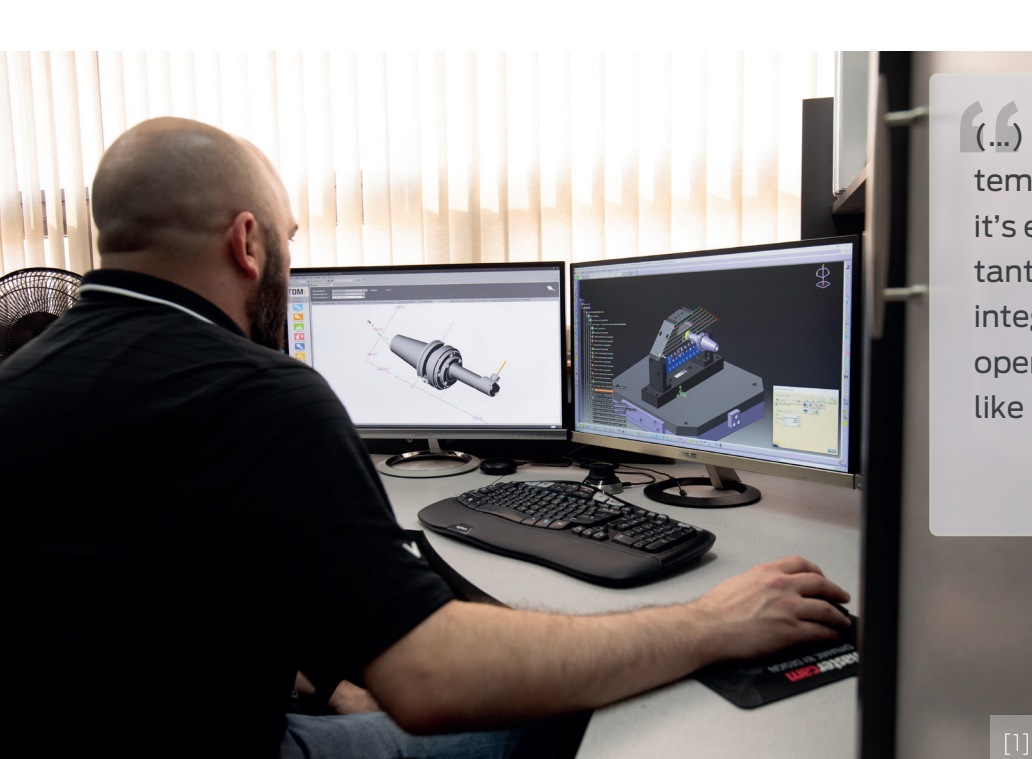
**NC**



NC-programming now  
works easier and quicker







“(…) it can integrate with other systems, such as into our presetter. And it’s expandable, which is a very important feature, because not only can it integrate production and engineering operations but higher-level systems like MRP as well.”

Jaramie Cool,  
Clearwater Engineering  
Engineering Director, Kansas USA

### Information Overload

These and ancillary equipment have enabled this custom manufacturer to successfully create precision machined and structural components, hinge support assemblies, and large structural assemblies, to name just a few. Not surprisingly, this diversity has necessitated an array of tools and holders. “We use a lot of cutters,” Cool notes. “We have 123 endmills in our library, and 487 items overall, including holders, drill bits, and the like.

“I was heavily involved in our shop floor trying to standardize what we are doing in this respect as we grew,” he continues. “Nobody was quite sure what we had available. We were frequently delayed by getting tools wrong and matching the

wrong insert or the wrong holder with the tool. There was too much searching through drawers for the right tool. This resulted in too much and unnecessary custom-made tooling. A similar situation existed with our programs. Finally, we decided there must be a better way.”

In the winter of 2017-18 Cool searched intently online. One possible solution stood out from the rest. “TDM, I liked the fact that they interfaced with CATIA because we rely heavily on it.” Clearwater makes extensive use of the latest CATIA V5 capabilities including NC programming, modeling, and tool design.



### Why TDM Systems?

The Tool Data Management system from TDM Systems (Schaumburg, IL) ensures that tool data is available where it is needed, when it is needed. It does this by linking all relevant systems – CAM, presetting, tool crib, and CNC machine controls, and it can also reach upstream to planning and execution level, such as PPS, ERP and MES systems. To do this, a Tool Lifecycle Management system has to open and accommodate a variety of import and export interfaces, and to integrate data from as many sources as is necessary, such as catalogs or 3D models created in house, into a central database.

TDM collects production data and makes this available to other systems, affecting the selection of tools, their use in production planning, and ensuring seamless transfer and use of that data on the shop floor. Process information continuously flows back to the central database creating a growing mass of data that’s accessible throughout the system. This is the sort of system Clearwater needed, and this is what they got.

Integration is a large part of TDM’s appeal for Clearwater. “Just as we thought it would, TDM has a lot to offer us,” notes Cool. “Among other things, it can integrate with other systems, such as into our presetter. And it’s expandable, which is a very important feature, because not only can it integrate production and engineering operations but higher-level systems like MRP as well.”

“We’ve had a 45% reduction in scrap due to wrong holders used or tools being set wrong, all thanks to TDM.”

Jaramie Cool,  
Clearwater Engineering  
Engineering Director, Kansas USA





## Too Small to Benefit?

Cool admits there was some hesitation because of Clearwater's size. Powerful systems like TDM are usually the province of large facilities. "But we were confident this would take us to a different level and help us to be more productive not only with today's business but with the expanded, challenging level of business we plan to attract in the future." "Full implementation," he adds, "took us about six months. Now we're 100% TDM." That includes the TDM Base Module, TDM Production Document Management (to store the documents which are important for production, such as those related to tooling and NC-programs), the CATIA V5 CAM interface, the Simulation-Interface to Vericut, TDM 2D-Grafik Editor and TDM 3D-Solid Editor for editing 2D and 3D tool graphics, and the TDM 3D-Solid Converter for CATIA and Vericut.

TDM's capabilities in the abstract are impressive, but what has it done so far for Clearwater? It's a subject that Cool enjoys discussing.

"When a tool is called for the system prints out a bar code. This leaves no ambiguity as to the correct tool. Our people used to have to waste a lot of time looking through drawers for a tool that would do the job. And we're confident we can precisely match that tool to the right toolholder because our holders now come with numbers from TDM etched into them.

Before that it was whatever was available. Too often the toolset was wrong, with toolholders hitting fixtures on multi-axis machines. There have been time and quality savings as a result, including fewer scrapped parts.

"We've had a 45% reduction in scrap due to wrong holders used or tools being set wrong, all thanks to TDM." Cool notes. "And nobody is working off a separate spreadsheet anymore," he continues. "And the CATIA interface is user friendly, which helps make programming easier and quicker.

"The TDM catalog feature and the fact that they have a massive database for tools have been extremely helpful. We can store all of our tool list and have a record of what a particular cutter was used for and import all those tool programs back into our system for future use or reference." He also praises TDM's "outstanding" simulation analysis performed with real part and tool data. The result: fewer collisions with fixtures, fewer scrapped parts, less wasted time.

Along with the 45% reduction in scrap due to wrong holders used or tools being set wrong mentioned above, Cool notes that "We've had a 26% reduction in tool usage, and we calculate 350 hours saved per year in time spent in setup as well as other savings since we implemented TDM. It's an amazing software. We are glad we invested in TDM. It's been extremely helpful for both our engineering and the shop floor."

## Process Innovation

