



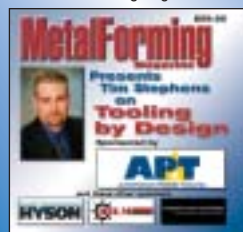
TOOLING BY DESIGN | TIM STEPHENS

Toys in the Sandbox

Tim Stephens has been engineering, managing and troubleshooting stamping tools and dies since 1986. An authority on die mechanics, Stephens is known for his methodical, results-oriented execution approach to solving complex tooling issues for high-risk mission-critical projects. He also is a technologist who focuses on developing innovative digital technologies to automate commercial and technical business transactions for manufacturing. Stephens is president of a tooling-related entrepreneurial venture and consults with the global industry on die and stamping issues, technology and legal matters as an expert witness.

Tim Stephens
www.diejedi.com
866/DIE-JEDI
E-mail: tim@diejedi.com

The Tooling by Design CD features dozens of articles, updated with new information, graphics and animation files. Articles explore foolproofing dies, prevailing theories, incorrect practices, die-set essentials and the Laws of Die Mechanics. Additional articles explore die-design/simulation software, tooling nomenclature and more. Order it online at www.metalformingmagazine.com.



When I saw a die design for an automotive body stamping for the first time, it was a confusing sea of intersecting lines drawn on paper with a pencil. Bond and H-lead to be exact. The only real choice was 36- or 42-in.-wide bond. Sure, some designers used HB lead, but the only decision was between wood pencils or the mechanical variety.

We designed on vertical boards 8 ft. high and 15 ft. long. We only had two types of drafting machines: Emmert and Vemco.

Those were the simple days. Jeff Baltzer used to pace up and down the bay chanting “Lines, boys. Lines.” And he could spot a bad die condition from 30 yards.

The reality today is a seemingly infinite parade of technologies, consultants and three-letter abbreviations. We live in a world where chaos reigns. This chaos is perpetuated by too many choices offered by too many consultants and experts with too many three-letter abbreviations for engineering and manufacturing technologies.

First, it was CAD/CAM, short for computer-aided design/computer-aided manufacturing. Then it was solid modeling, which has its choices of smart, smarter and super models. Then came the knowledge-based engineering flavor, which is the launching pad for the latest buzz: engineer-to-order or ETO. Where is my pencil?

Ok, so my chief information officer (CIO) won’t let me turn back the clock. Knowing I need to choose a brand of software, I pick X. My customers have A, B, C and D. Then, I find out my suppliers have E, F and G. These brands do not play well together. In most cases, they don’t at all.

As it turns out, I pick X because of its

engineering capability. A lot of good that does manufacturing because it needs Brand Y to program cutter paths. Inspection tells me it needs Brand Z for the CMM and optical scanners. My chief financial officer (CFO) tells me we could have saved a lot of money by designing with paper and pencils on plywood because that technology did not integrate with manufacturing nor with inspection equipment.

Simply put: There are too many toys in the sandbox. The guiding principle should be simplicity. To get back to the core, we need to remove the barriers and find the simplest, direct method to get the job done.

There are two file types: native and translatable. Native files are the ones with brand-specific extensions. Translatable files are at best an approximation of the original or native that can be read into another brand of software.

Before the dot-com guys (I often refer to the Information Technology [IT] professionals as dot-com guys) flood me with technical information on how good translatable file formats like STEP and IGES and DXF are, let me provide two points.

First, if the translatable files were just as good as the original, we would not need translatable files. Second, if the files were comparatively the same, then we would not experience a loss of data integrity or lost attributes such as notes and dimensions.

The problem, even today, is interoperability. The problem is not only between brands, but also among the engineering, design and manufacturing disciplines.

Tools and dies are custom-built, typically one-of-a-kind manufactured assemblies. The entire operational

model from quoting to shipping is driven from one mission-critical input: the engineering file.

Most shops and all of the custom-component manufacturers receive engineering from a variety of customers in every imaginable form. How can a company compete globally as a mass-customizer under these conditions?

Worse still, what happens if your select brand goes out of business, like Calma or Visionael, for example? What if your main customer decides to change to brands that are not compatible with yours?

Instead of fighting outsourcing, perhaps we should be battling for one solids-based native file format. Being a realist, we need to find better toys.

The technology needs to be simple to use. The less skill required the better. We went to school for weeks on end to learn how to use certain types of solid-modeling engineering software. I still

have trouble just opening a file.

There was no class on how to use the Internet. The first time most of us got on the Net, we were able to browse, search, click and buy. Why should engineering and manufacturing technology be any different? Think about it. How many engineers have you worked with that are better at surfing the web than using engineering software?

The toy needs to import and export other native file types. As the mass-customizing manufacturer (MCM), we need to seamlessly and effortlessly communicate with customers and vendors.

The technology also needs to be unified across disciplines. Some software brands do this well today, but are still limited to that particular brand's file type.

Finally, the technology must have the on-board intelligence to have components custom-built on-demand. This is the key element in transitioning from a job shop to a mass-customizer.

I personally do not like the terms CAD/CAM. To me, they characterize antiquated technologies. The computer should not aid anything. The computer should compute and the human operator should aid the machine by directing inputs and outputs. Besides, say the word CAM to a die person, and they instantly think of die-mount cams, aerial cams or any other mechanical device that converts vertical motion to nonvertical work.

As with everything in this industry, there are issues to overcome. The key is to turn the issues into opportunities.

There is a Tool and Die Roundtable event April 6-7 in Nashville. I will be speaking on the 7th on CAD/CAM Interface Issues and Opportunities. Other topics to be presented include hard milling and metalforming simulations. For more information, contact Allison Grealis at PMA, 216/ 901-8800. Hope to see you there!

MF