If It Breaks the Mold – Fix It!

The finished product

CADfix

CADfix removes barriers preventing the reuse of solid models. By providing an extensive set of geometry manipulation tools for importing, repairing and exporting data, CADfix maximizes the reuse of CAD data in downstream applications.

There are few industries in which the CAD revolution has had more impact than the plastics industry. Rival modeling kernels offer more sophisticated sculpting and blending techniques, and end users have been taking full advantage. Even the most mundane products are likely to be designed with complex contours that would have been unheard of ten or 15 years ago when CAD meant 2D if CAD was used at all.

With increased sophistication comes a forced change in the way designs are communicated. Traditionally, the path from design to manufacture was a smooth one with designers committing their ideas directly to paper – the medium with which mold makers were most happy. Product designers who now work exclusively in 3D, however, are increasingly unwilling – or simply unable – to translate their ideas into traditional engineering drawings. And why should they compromise a 3D design that is destined to become a 3D product by flattening out its freeform surfaces to create a 2D drawing?

The fact is that design intent is increasingly communicated directly by 3D CAD model, and this is not without its problems. Take the case of Pacmold.

Pacmold

California-based Pacmold (a contraction of Pacific Mold) specializes in producing injection mold tools for large and complex parts. It produces over 300 molds a year for more than 100 customers, offering specialist know-how, state-of-the-art manufacturing technology and competitive prices and lead times via its offshore production facilities in Shanghai and Taipei.

“Our success has been based on being able to offer the best of both worlds: the finest materials and the best value manufacturing in the world,” says Richard Sanders, President of Pacmold. “But for us, being able to build complex molds is the easy bit – being able to read the original CAD models can be a real problem.”

Sanders estimates that the proportion of jobs coming in as native solid modeling geometry has now reached 99 percent. And, while some systems are more popular than others, Pacmold has been asked to process data from just about every CAD package.

IGES the answer?

Clearly, companies like Pacmold cannot afford to turn business away because they are unable to process 3D data. The aim, therefore, is to find a file format that anyone can export to and that will include sufficient quality 3D geometric data. On the face of it, such formats do exist (the most common is IGES), but in practice, such neutral file formats have significant limitations.

Because IGES is more a set of guidelines than a rigidly defined format, the way it is treated varies from software to software. Different CAD packages have different standards for tolerances, for example, so when raw geometry is transferred via IGES, the receiving application must do its best to apply its own tolerances to the unresolved geometry and topology. This can result in fine details being lost during file transfers or, perhaps more significantly, gaps appearing between surfaces. This can play havoc with some applications, especially those that require meshing.

“Internally, we design our tools in Pro/Engineer and CATIA and verify them in C-Mold,” says Sanders. “But until recently we sometimes had trouble getting the part geometry into our CAD systems so that we could design the tooling. Then we found out about CADfix.”

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Now there is no question of having to turn away geometry because it cannot be translated. This is a situation that simply never arises.

Enter CADfix

CADfix has been written specifically to address this issue. Its automated and interactive diagnostics and repair tools tackle interoperability problems head on, locating trouble spots and suggesting the best way of correcting them.

CADfix takes data, particularly IGES data, from practically any modeler on the market and outputs a fully defined, clean solid model that can even be "flavored" according to whichever system it is headed for. In short, CADfix bridges the frustrating gap between CAD system X and the rest of the world.

A case in point

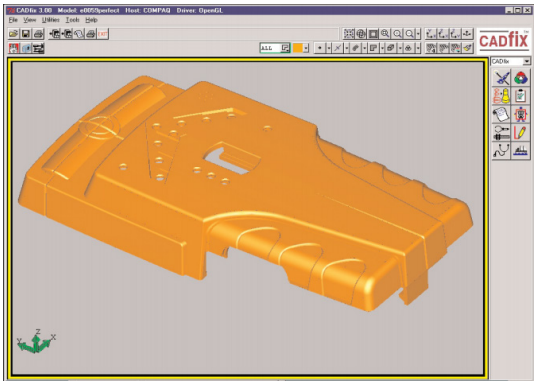
Pacmold was asked to prepare a tool for the Triscanner, a new product from Zircon Corp. Zircon produces electronic tools for the DIY and building professional trade. The Triscanner is a handheld tool used to detect hidden objects behind walls. Its electronic scanning circuitry will locate studs, pipes and power cables, thus saving potential embarrassment and even danger for the budding DIYer or contractor.

Zircon called on Fusion Design to do the mechanical product design of the Triscanner, for which they used Matra Datavision's Euclid. Pacmold's need to translate the Triscanner CAD geometry into Pro/Engineer is a classic example of the way CADfix can help two companies communicate. Sanders states, "CADfix enabled us to rapidly process the Euclid IGES into our Pro/Engineer environment, saving precious time when we had to meet a very tight production deadline."

Barriers removed

CADfix has meant greatly improved channels of communication between supplier and customer across Pacmold's business. Now there is no question of having to turn away geometry because it cannot be translated. This is a situation that simply never arises.

"I would estimate that CADfix is used in about fifty percent of cases, either for major repairs or for downstream flavoring," says Sanders. "The many automatic and interactive features encourage us to do as much fine-tuning as possible in CADfix which, in turn, makes life so much easier when we really get down to work.
"But," he adds, "The real bonus has been eliminating the frustration of encountering a file that we cannot crack at all."



Triscanner cover repaired in CADfix

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