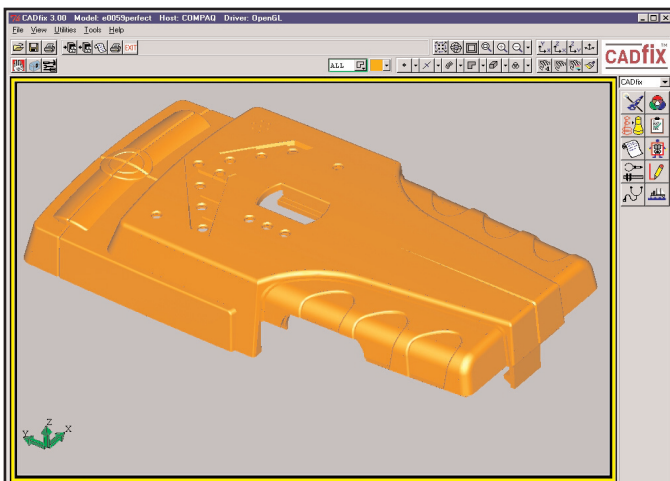


CADfix®

If it breaks the mould – fix it!

There are few areas where the nineties CAD revolution has had more impact than in the plastics industry. As rival modelling kernels vied (and continue to vie) to offer more and more sophisticated sculpting and blending techniques, so the end users – part modellers and industrial designers in particular – have been taking full advantage. Even the most mundane everyday products are likely to be designed with complex contours – typically in the interests of style or ergonomics – that would have been simply unheard of ten or 15 years ago when CAD meant 2D if CAD was used at all.

Hand in hand with such increased sophistication has been a forced change in the way designs are communicated. Traditionally, the path from design to manufacture was a smooth one. Designers were essentially committing their ideas directly to the medium that the mouldmakers were most happy with – paper. Product designers who now work exclusively in 3D however, are increasing unwilling – or simply unable – to translate their ideas into traditional engineering drawings. And they have a point: why compromise a 3D design that is destined to become a 3D product by flattening out its freeform surfaces to create a 2D drawing?



Triscanner cover repaired in CADfix



The finished product

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) specialises in producing injection mould tools for large and complex parts. It produces around 200 to 300 moulds a year for over 100 different customers, offering an attractive cocktail of 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 moulds is the easy bit – being able to read the original CAD models can be a real problem.”

Richard estimates that the proportion of jobs coming in as native solid modelling geometry has now reached 99 percent. And, while some systems are more popular than others, it is fair to say that Pacmold has been asked to process data from every CAD package under the sun.

IGES the answer?

Clearly companies like Pacmold cannot afford to put themselves in a position where they have 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 commonly used being 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 Richard. “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.”

Enter CADfix

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

CADfix takes data, particularly IGES data, from practically any modeller on the market and outputs a fully defined, clean solid model which can even be ‘flavoured’ according to which 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

An example of the benefits of introducing CADfix came last summer when Pacmold was asked to prepare a tool for the Triscanner, a new product from Zircon Corp. Zircon began life making digital watches, dabbled in computer

games, and for the last twenty years has carved out a valuable niche for itself producing electronic tools for the DIY and building professional trade. Tools such as laser-powered electronic spirit levels and tape measures with in-built voice recorders are sold in great numbers in the States and in increasing numbers worldwide.

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, which was duly carried out using 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. Richard Sanders: “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 per cent of cases, either for major repairs or for downstream flavouring,” says Richard. “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 which we cannot crack at all.”



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