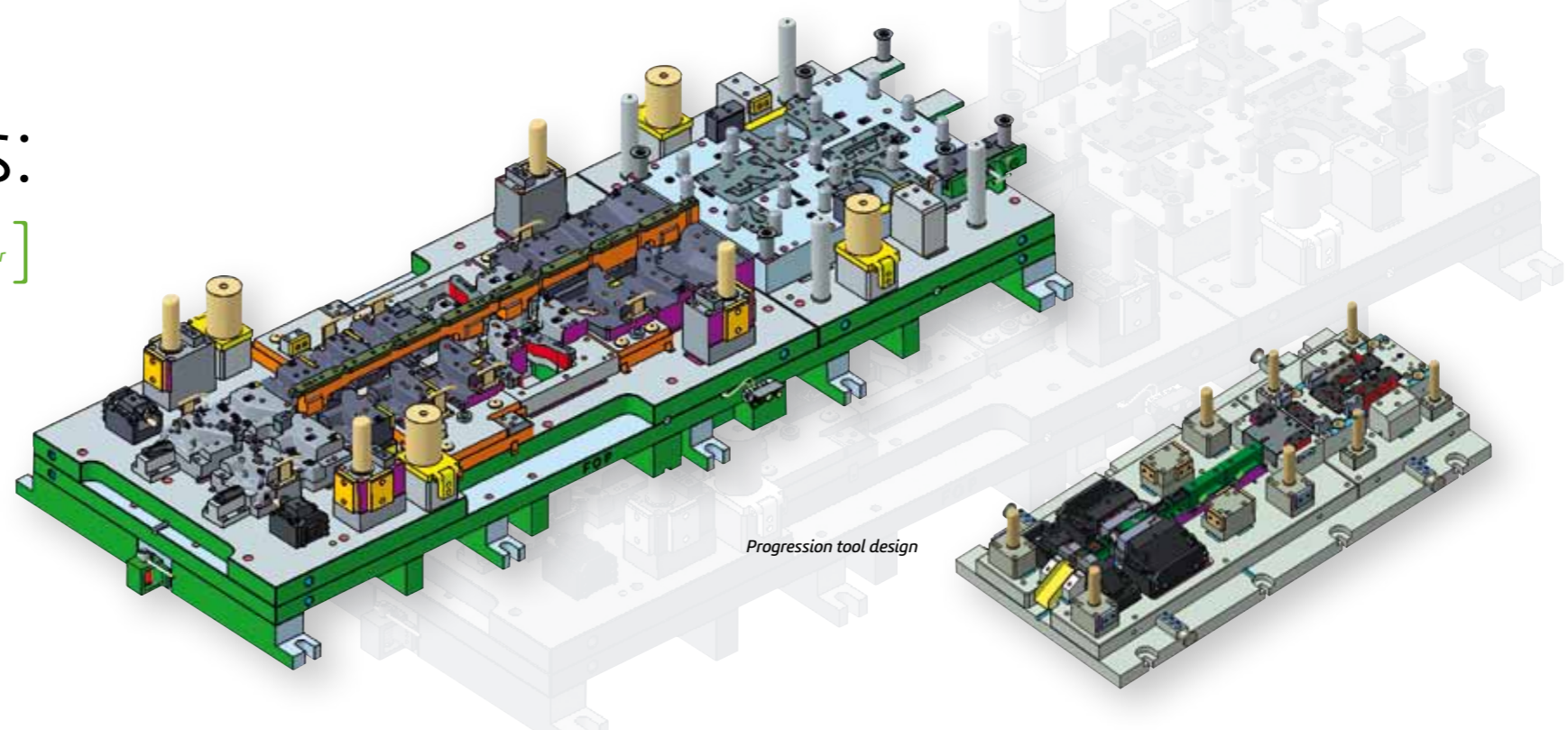


Tool & Design Solutions: Pressing ahead

By Nick Lerner]



Designing and simulating automotive press tools is both an art and a science, and success requires a perfect match of knowledge, expertise and technology. Tool & Design Solutions, a leading South-African company, deploys Dassault Systèmes methodologies to retain and enhance its leading position in the industry.

Tool & Design Solutions (TDS), based in the heart of the South-African automotive industry at Port Elizabeth, has become the premier supplier of press-tool design in the region. With more than 20 years' experience, company founder and design engineer

CATIA is the key to developing and delivering optimized design intent.

Peter Feltham develops tooling designs and solutions for an enviable list of local and international automotive tier-one and tier-two customers.

INITIAL IMPACT

Having trained at General Motors and worked at Comau, Feltham understands the auto industry's need for extreme accuracy, materials control and process minimization. Feltham explained how this is achieved: "CATIA Mechanical Shape Optimization (HCX) is used to model press tool designs using digital 3D and specialized forming simulation software. Using Dassault Systèmes technology in this way, it is possible to reduce the number of tools and processes needed to press a panel.

This can take up to 30% of time and cost out of the equation. The rewards of this working methodology are consequently significant."

"The use of new materials and specialized steels in the automotive industry increases complexity. Hardness, resistance and springback have to be accurately simulated and factored

into the eventual design. Errors are potentially very costly, with a single press tool worth as much as 20 cars on the forecourt."

Feltham continued: "CATIA HCX is an ideal tool to use for this work since it incorporates shape optimizing features, advanced surfacing and morphing tools and the facility to easily manipulate press tool shapes. It is also excellent for sharing visual data with customers, who are then able to fully visualize the design and its operation. Their iterated inputs can be accommodated quickly and easily, ensuring fully informed sign off."

SPRINGBACK

CATIA's surface-definition technology is fundamental to the work at TDS, and because CATIA has become the automotive industry standard design/development platform, accuracy is ensured. Feltham commented: "CATIA has become the standard industry tool because it has no limitations and it enables design intent to be retained from concept through to engineering, manufacture – and beyond. The system's intelligence means that there is no shape you can't make. The system's Shape Optimizer allows for accurate adjustment for compensation of springback, and because this can be seen graphically, customers can make better-informed planning choices with a greater range of engineering options."

Feltham added: "Timing is crucial in this industry, and a poorly designed tool or an unnecessary extra process can add expensively to overall delay and unforeseen engineering costs. CATIA helps avoid

these problems before they even start, and it is an excellent tool to deliver the knowledge, skills and design experience that I have developed over the years."

UNDER PRESSURE

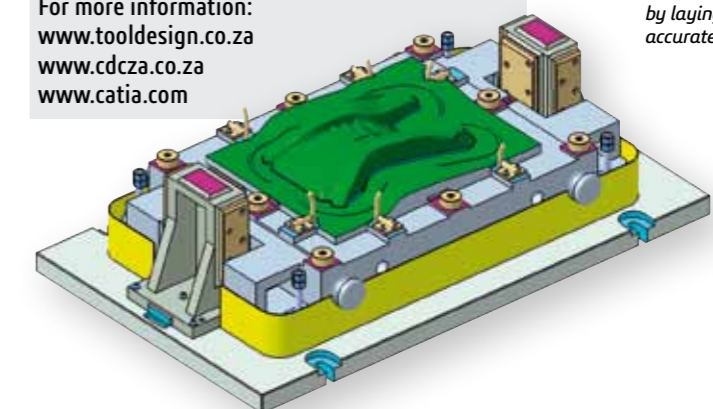
Dassault Systèmes portfolio of PLM software (including CATIA) is represented in South-Africa by CDC, an authorized Dassault Systèmes partner. By working with Tool and Design Solutions since its inception, CDC has helped to ensure that Dassault Systèmes technology is used to its best technical and commercial advantage. The system was initially installed by CDC, who also provides training and support to maintain the software - and its operators - at the forefront of technological advantage. CDC acts as an interface with Dassault Systèmes and is able to understand the newest developments and advise on their suitability and implementation.

Feltham added, "Despite a retraction of the automotive business, we have never been so busy. This can be explained by the efficiencies that CATIA brings to the automotive industry and the great savings that can be delivered if the right simulation technology is deployed. In lean times, companies look harder to reduce waste, and so require better methodologies to eliminate it from their processes. 3D digital simulation allows designs, and the processes through which they will be put, to be thoroughly optimized in a way that is not possible with any other system. Because CATIA is so well able to deal with the subtleties of press tool design, customers bring us their most difficult problems, certain that a

better solution is discoverable. In all cases, CATIA delivers the best result at lower cost and within a quicker time."

"The work that CDC and TDS have achieved together has helped South-African industry to take a step forward. By showing the benefits of 3D digital working to other industrial users in the region and explaining the advantages of Dassault Systèmes technology, TDS has accelerated progress and increased overall expertise in the region. As the economy picks up and demand improves, the methods that enhance productivity and reduce waste will persist, and this brings the further benefit of improved quality. The confidence to make better engineering and commercial decisions, the availability of finer tolerances, and getting it right on the screen with simulation so that it's right in the factory, are no longer merely on the wish-list but are available now, bringing terrific advantage to those who choose to exploit what is available to today's industry." 

For more information:
www.tooldesign.co.za
www.cdcza.co.za
www.catia.com



L&RH part positions optimized by laying the flanges out accurately for this draw die

Die face compensation based on simulation springback results using CATIA realistic shape optimization

