Case Study

Design Bridges Between CAD Worlds

Automotive supplier: Use Catia and Pro/ENGINEER Data Easily and Efficiently

As a development partner for the automotive industry, the engineering consulting firm Otte needs to be able to use Catia and Pro/ENGINEER data easily and efficiently. The 3D direct modeller from SpaceClaim enables practical geometry processing for this purpose. It has proven to be a valuable tool for modifying neutralised CAD geometries and repairing defective geometries, and it is easy to use and does not need extensive training.

"As a development partner for the automotive industry, we handle a wide variety of requirements in vehicle construction, including hidden parts of the body structure as well as bumpers, wings, side panels and roofs, which we design for our customers," reported Melchior Weidner, a designer at ibo Ingenieurbüro Otte (www.ibo-gmbh.com/de), located in Isenbüttel near Wolfsburg, Germany.

The medium-sized company develops body structures and components for vehicle interiors and exteriors from the initial concept to release for series production, based on solid models and design surface data from clients. In its product development activities for customers including Audi, Porsche and VW, the design services provider uses Catia for body parts, Pro/ENGINEER for drive train components and ICEM Surf for high-quality (Class A) design surfaces.

The customers specify engineering data output in these formats in order to enable smooth data communication. However, these tools are expensive in both procurement and maintenance, they require extensive training, and they generate highly specialised, complex data sets, which in most cases can

only be correctly read and processed in the system in which they were generated.

This dependency irritates many suppliers and service providers, since in most cases 'foreign' data can only be read into the high-end systems indirectly using neutral exchange formats. However, importing data in a neutral format often leads to lost data or errors, such as gaps in volume data or missing surfaces.
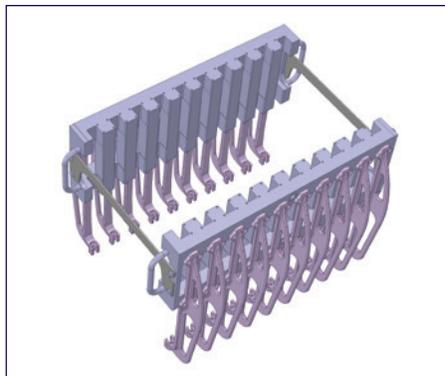

As a development partner, ibo supplies designs of car body structures and components for vehicle interiors and exteriors from the initial concept to release for series production. SpaceClaim is advantageous for this due to its easy and time-saving manner of use.

About Otte Engineering Consultancy

ibo GmbH is an independent engineering consulting firm founded in 1989 by graduate engineer Hans H. Otte in Wolfsburg-Fallersleben, which has occupied its own office building in Isenbüttel since 2000. The core business is the design and development of vehicle components from the initial concept to release for series production. Twenty years of expertise in the design of complete vehicle body structures, a wide variety of components for vehicle interiors and exteriors, surface modelling and cable routing make ibo an expert design partner. The firm's designers use advanced 3D CAD technologies for conceptual and detailed design in order to tackle all challenges individually and efficiently. Together with creativity, strong innovation and prudent management, this forms the basis for sustainable company success. Reference customers include Volkswagen, Volkswagen Commercial Vehicles, Audi, Porsche and their suppliers.

www.ibo-gmbh.com/de

Ingenieurbüro Otte GmbH
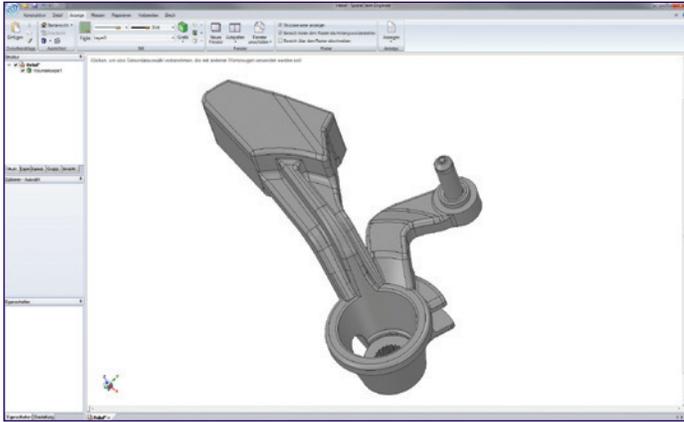
The SpaceClaim 3D direct modeller is intended to enable users to quickly and easily repair and alter designs and prepare them for further operations, such as drawing derivation and handover to production.

About Lino – Leading Innovation

Lino GmbH, based in Mainz, Germany, has accumulated over 50 years of development and project experience, which it dedicates to serving companies from machinery and plant engineering, automobile manufacturing, packaging, automation, electrical engineering, plastics and wood, medical technologies and design and engineering services sectors.

Lino offers practical technology consultation and implements innovative system solutions for customers in IT, development and production contexts. The consulting company Lino specializes in premium R&D consultation, 3D-CAD and integration with products from configuration, FEM, PDM/PLM, ERP and classification. Customers include companies like Applied Materials, Carcoustics, Coko Werk, Fraunhofer Institute, Kranunion, Robert Bosch, Salzgitter Mannesmann or Zodiac Cabin Controls. Lino GmbH is an authorized SpaceClaim, KeyShot, Tacton and Simus Classmate reseller as well as a TactonWorks Certified Service Partner.

www.lino.de/spaceclaim.html

The Direct Modelling Solution

For this reason, ibo was looking for an economical 3D tool that would allow them to get around the constraints of the high-end systems, such as converting Pro/ENGINEER data into Catia data. Another requirement for the tool was the ability to quickly modify, supplement or clean up the data if necessary, without first needing to complete extensive CAD training courses. The designers at ibo heard about SpaceClaim more or less by chance, as a result of word-of-mouth advertising.

In a project meeting with a customer, the conversation turned to options for simplifying the use of engineering data in design and production processes. Their project partner recommended SpaceClaim Engineer, which the customer was evaluating at the time, and ibo decided to order an evaluation licence from SpaceClaim reseller Lino.
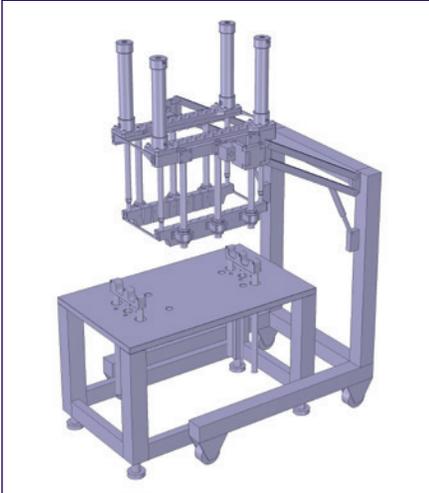
"When we started using the program, we were distinctly impressed right away by how much SpaceClaim could do," said Weidner. For example, ibo frequently receives isolated Catia data from customers from which parameters have been removed in order to protect the intellectual property. Although this data can be dimensioned, making changes in Catia is very time-consuming. "SpaceClaim enables us to modify this data quickly and efficiently," added Weidner's colleague and fellow designer Ernst-Otto Voigtländer. "SpaceClaim's ability to recognise features immediately in the neutralised CAD data – for example in STEP or IGES exchange format – and to allow these geometries to be modified quickly, is a big help and time-saver for us."

A Solution for Lots of 'Odd Jobs'

The designers also discovered that SpaceClaim is good at repairing defective CAD data sets. The function buttons on the Repair toolbar enable the designers to eliminate various defects in the components. "It's impressive how that works," said Weidner. Functions such as 'Fix Gaps,' 'Missing Faces' and 'Inexact Edges' are especially helpful. Weidner also finds the Prepare toolbar, which contains functions for removing curves, faces and overlaps, highly useful.

Since January ibo has been using SpaceClaim for tasks such as reading in Pro/ENGINEER data, processing the data and writing it out as isolated Catia data, or loading and optimising isolated Catia modules. That works well, according to Weidner, especially for standard modules with data volumes up to 100 MB or so. The Catia data exported from SpaceClaim passes through a special Catia data checker, after which it can be delivered to the vehicle manufacturer without any problems.

The software also meets ibo's need for a 3D solution suitable for handling the many minor design and modification tasks that arise every day. They need to be done quickly and easily, and Catia is actually overkill for these tasks, according to Weidner. "We use it to move and reposition simple subareas of designs, or to isolate or copy them and merge them into other component designs. That's especially helpful because speed is of the essence in all of our jobs, but quality can't be allowed to suffer as a result."

"SpaceClaim's ability to recognise features immediately in the neutralised CAD data – for example in STEP or IGES exchange format – and to allow these geometries to be modified quickly, is a big help and time-saver for us."

— **Ernst-Otto Voigtländer**
   Designer, ibo

SpaceClaim's CAD data import capabilities make the program especially suitable for automotive industry suppliers and design service providers that are tied to high-end CAD formats but need options and geometry processing capabilities suitable for everyday tasks.

Creative CAD: Chat and Try

In discussions during the conceptual design phase, it is necessary to occasionally shift design features and to visualise, discuss and try out changes in order to determine whether the idea is feasible, according to Voigtländer. For example with Catia V4 data sets or isolated, IP-protected V5 data sets from customers, which must be taken as the basis and redesigned. "We receive isolated Catia data and ultimately have to deliver isolated Catia data, but for the many small operations in between, SpaceClaim shows its strengths again and again." The same applies to read-in Pro/ENGINEER data, which can also be processed nicely before it is imported into Catia.

In contrast to established high-end 3D systems where the toolbars often appear bloated, SpaceClaim is very tidy and easy to use, and even users without extensive design experience can easily learn how to work with it. This is illustrated by the fact that ibo's designers spent only one day in training at Lino's office in Bremen. "We learned everything else ourselves, since the system is very intuitive and it comes with practical online help," according to Weidner. "If we did have a problem that we couldn't sort out so easily, we could always rely on support from Lino."

In the view of designer Voigtländer, SpaceClaim and Catia are two different worlds – the one relies on intuition and the other relies on a strict methodical procedure for optimal design results. "In many cases you can do a lot with a single function in SpaceClaim – sometimes you can hardly believe it's so easy." For example, he considers it especially helpful that the toolbars have been reduced to such a small number of buttons. "By contrast, Catia's parametric approach only shows its real strength in complex designs with several iteration steps, and that requires a well-considered structure for the CAD model." With SpaceClaim you can concentrate more on the design itself, and you don't have to pay so much attention to how you use the program.

About SpaceClaim

SpaceClaim was founded in September 2005 to create solutions that would enable engineers to leverage 3D design to innovate, win more business, and get products to market faster. Since then, SpaceClaim has become the leader in 3D Direct Modeling solutions for rapid concept design and geometry manipulation, with adoption rates within engineering, product development, and manufacturing companies soaring.

Customers include three of the world's largest auto makers, and industry leaders across aerospace, medical devices and machine tool manufacturers. SpaceClaim has OEM agreements with TRUMPF, Flow International Corporation, and Geomagic, as well as a licensing and distribution agreement with ANSYS, the global leader in simulation software.

SpaceClaim's world-class board and management team combines deep experience in 3D and design software – including the inventors of feature-based modeling – with proven track records in successfully bringing new design software to market.

SPACECLAIM
CORPORATION

150 Baker Ave. Ext.,
Concord, MA 01742 USA
Tel: +1 978.482.2100
Fax: +1 978.369.5864
www.spaceclaim.com

Lino GmbH
Erthalstraße 1
D-55118 Mainz
Tel: +49 [0]6131 90 64 480
Fax: +49 [0]6131 90 64 482
www.lino.de