Case Study

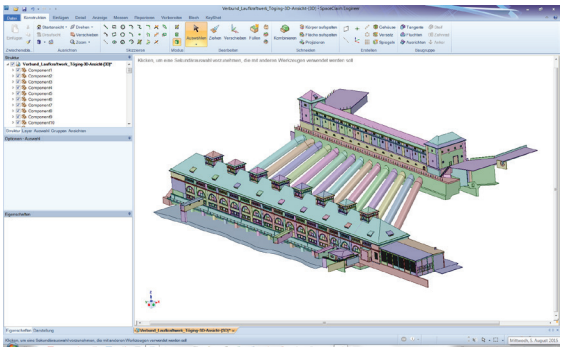
ANSYS® SpaceClaim + Vokal

"Without ground-breaking software like SpaceClaim we never would have been able to broaden our portfolio."
Norbert Vokal

With 3D Software to new Business Areas

The Munich surveying company Vokal+Partner no longer offers its clients only construction and design surveys. To survive in a highly competitive surveying market, the client-oriented company is broadening its range of services with the 3D modeling software SpaceClaim as well as with Laserscan, Lasertracker and other modern technologies.

Marian Vokal founded the Vokal engineering office in Munich in 1992. In 1998 his son Norbert Vokal took over the reins, bringing in his brother Mario in 2002. The brothers quickly recognized the limited opportunities of the surveying market. “To begin with, one-person offices are waging bitter price wars in particular in the Munich area, so we decided to broaden Vokal+Partner’s range of services.” says CEO Norbert Vokal. Today the engineering company Vokal+Partner cannot complain about a lack of orders. Ordinarily the orders come from Munich area, but there are also orders from elsewhere in Germany and in Europe. Both new and regular clients are impressed with the company’s expertise, passion and its use of the latest technologies. The expansion of the company’s range of services played an important part in this: Along with surveying work, building information modeling (BIM) and 3-D modeling have also added new business areas to the mix, which, according to Norbert Vokal go together quite well. He sees the introduction of a 3D modeling system as a prerequisite for this: “Without ground-breaking software like SpaceClaim we never would have been able to broaden our portfolio.”



Complete 3D-model of a whole powerstation for BIM

Everyday Life in the Surveyor’s Office

In typical construction surveying projects that are divided into inventory and design measurements, the surveyors provide measurement data to planners or architects. They use the data for the digital planning of buildings, streets, bridges or properties. For example, boundaries, height profiles or axial points for shell constructions are measured. Another one of Vokal+Partner’s mainstays is architectural and industrial surveying for the generation of digital factories and target/performance analyses. To this end, buildings and machines are recorded with a laser scanner; 2-D outlines or 3D models can be generated with the obtained measurement data. BIM serves as the basis for building administration, whereby Vokal+Partner edits the measurement data into a virtual component-oriented 3D building model. In recent years the engineering office has been making greater inroads into the area of 3D modeling.

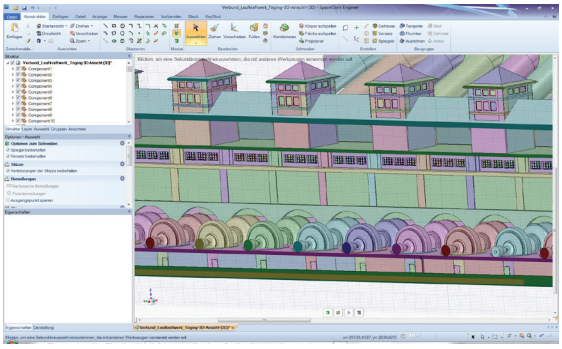
Efficient Technologies

Every surveyor’s office has the standard surveying instruments such as tachymeters, but Vokal+Partner has consistently relied on modern technology. The Munich company has been using laser scanners since 2005, although back then laser scanners were nowhere near as efficient as today’s laser scanners: “With the new laser scanners we perform the same work in one day that used to take three days.” Norbert Vokal explains. Beginning in 2008 the firm began implementing laser trackers, which furnish even more precise results. With the so-called measurement arm it is possible to record the smallest of objects up to 0.1 millimeters in size. Recently the engineers have begun scanning persons also and making them available as 3D models for further use. As is the case with the measuring instruments, Norbert and Mario Vokal also place a great deal of emphasis on effective technology with software. The CEO

believes: “In order to do custom work and fully exploit our potential, we try to get the most out of our resources. To this end we are taking a look at what our existing programs are suited for and tapping into new areas of business.”

No 3D Design without SpaceClaim

In 2012 Norbert Vokal was looking for a software program suitable for 3D design. In November of that year during a trip to the trade show at Euromold the brothers discovered SpaceClaim at distributor Lino GmbH’s booth and were immediately impressed by the performance of the software program. Just one month later they purchased the program and completed a two day training session early in 2013 at Lino’s facilities in Mainz.



Whole factories arise as a digital model in ANSYS SpaceClaim step by step

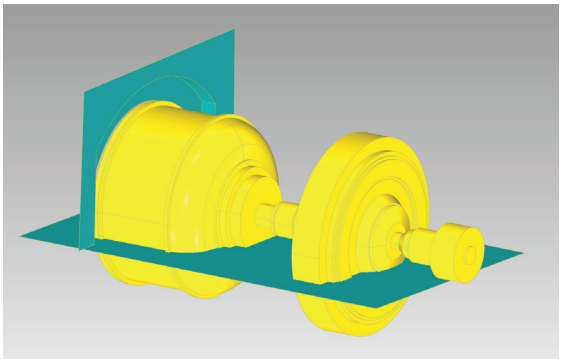
“Since that time we have been using SpaceClaim for reverse engineering, design of 3D-solid models and creation of reverse engineering models.” says Norbert Vokal. 3D design with SpaceClaim is a very good fit for Vokal+Partner’s existing portfolio. The modern laser scanners are the starting point. The laser scanners create a huge digital point cloud with millions of points, each with three space coordinates. These points are combined into triangles. As a result a mesh develops, forming a rough body. This “meshing” results in very large files. SpaceClaim is able to radically simplify these files, converting the large mesh into a surface and thus considerably reducing the file size. Most notably, this facilitates 3D design, since less memory is required and the loading times are shorter. Depending on how often and the angle at which one sets up laser scanners objects are not always completely recorded. Engineer Norbert Vokal rounds out these incomplete scans digitally with SpaceClaim. He adds: “I am an experienced user of current CAD programs. SpaceClaim has an altogether different design than the other systems, but I got used to it quickly. The easy, intuitive operation surprised me, for example you can create a 3D body from a 2D sketch very quickly.”

In the case of reverse engineering the approach is precisely the other way around. A real object is supposed to be represented in 3D as closely as possible to the original. Vokal uses SpaceClaim to construct a closed model from the scanned point data for surface reconstruction. He creates digital 3D models for large construction projects. As a result, for example in the case of road construction, planners and investors have access to a realistic model, including streets, houses and terrain. To this end the engineers from Vokal+Partner survey the terrain and construct a terrain segment with a socket from the data in SpaceClaim. “In this kind of project functions like simple scaling or cutting planes in a few mouse clicks are a great help to me.” Norbert Vokal explains. Vokal+Partner were only able to offer these services after implementing the CAD program.

Norbert Vokal obviously enjoys working with the 3D software: “All of my expectations were fulfilled. In the meantime I prefer working with SpaceClaim, because it is so easy, quick and user-friendly and above all runs very stably. Users are not overwhelmed by initially unnecessary functions; instead they can make the adjustment as required. As far as I am concerned, SpaceClaim has no competition and the price rounds out the successful software package.”

SpaceClaim can edit or output all of the usual data formats in construction such as stp, stl, sat, igs, prt. Thus, Vokal+Partner can cater to each client’s needs and every client gets their data in the desired format. SpaceClaim has established itself as a convenient and flexible 3D modeling software program that allows users unimpeded access to third party data. Intelligent and self-explanatory functions like “Pull”, “Move”, “Fill” and “Combine” make it possible to adapt CAD models quickly and easily to user’s own specific requirements and intended purpose. Thanks to

countless interfaces, files from all current CAD systems can be imported. Without having to concern themselves with parametrics and the history of the models, engineers and designers can have direct access to the geometry and make changes to the object. Parametric modeling via Excel and geometric goal seek functions are also available. Norbert Vokal also has high praise for Lino's support crew: "Whenever there was a problem, Lino was always there immediately, whether with email, TeamViewer or tutorial videos. I would really like to do another in-depth training course, but right now there's simply no time due to our backlog of orders."



ANSYS SpaceClaim repairs the scanned turbine

In the future even more projects with and thanks to SpaceClaim

The company plans to use the software more in the future, above all in the area of building administration, or BIM. Different manufacturers offer 3D catalog models, such as lights, heaters or chairs for facility management. These files require a great deal of memory and Vokal can drastically reduce file sizes with SpaceClaim. Consequently BIM is not so memory-intensive for Vokal's clients. There are also plans to use the software more in the areas of building preparation and terrain modeling. Norbert Vokal ends by saying: "We want to use our programs as often as possible. So we are looking for further areas of application for SpaceClaim."

SpaceClaim

SpaceClaim's multiple-award-winning software enables anyone to create, edit, and repair geometry no matter where in the workflow they need it. With a easy-to-learn and CAD neutral environment, it enables engineers and other mechanical engineering specialists to quickly work with geometry without worrying about the underlying technology.

More Information:

ANSYS SpaceClaim
978.482.2148
www.spaceclaim.com

ANSYS, Inc.
www.ansys.com
ansysinfo@ansys.com
866.267.9724