SIEMENS

Solid Edge

TOP-TECH

Complex CAD model geometry prepared for analysis 10 times faster using Solid Edge

Industry

Industrial machinery and equipment

Business challenges

Significantly shorten processes for preparing input geometry for CAE analyses

Achieve a competitive edge by providing value-added engineering expertise

Expand new business, focusing on companies with complex engineering needs

Keys to success

Use product development tools to validate the accuracy of imported CAD geometry

Engage powerful synchronous technology to edit imported CAD geometry in real time

Exploit the "built-in intelligence" and ease-of-use of Solid Edge

TOP-TECH decreases organizational costs and increases value-added services, resulting in a significant competitive edge

Preparing CAD geometry for computer-aided engineering

TOP-TECH Działalność Naukowo-Badawcza Sp. z o. o. (TOP-TECH) is a family-owned engineering business established about 20 years ago for designing and manufacturing industrial robots and process machinery. Today, TOP-TECH focuses on computer-aided design (CAD), computer-aided engineering (CAE) and digital calculations used in polymer injection simulations.

TOP-TECH is pursuing a strategy of continuous improvement, enhancing its competencies and providing specialized, value-added engineering to win new business, focusing on customers with challenging engineering demands. To help achieve this strategy, TOP-TECH found a solution that radically shortens the CAD processes related to the preparation of geometry for CAE analyses.

TOP-TECH's requirements for its new system included flexibility and ease of use in accomplishing CAD tasks. Moreover, TOP-TECH wanted its users to have a distinct comfort level in performing CAD tasks. To meet its requirements, the company selected Siemens PLM Software's Solid Edge® software, a complete hybrid

2D/3D CAD system. TOP-TECH licensed the software as well as acquired training and support from GM System, the largest distributor of Solid Edge in Poland.

Management representatives found Solid Edge to be a uniquely advanced solution that enables users to quickly and accurately repair, simplify and modify imported CAD geometry in preparation for complex injection mold filling calculations using finite element analysis (FEA). In addition, in comprehensive tests of different CAD systems, they concluded that Solid Edge has the best ratio of useful application capabilities to cost.

Working the way engineers think

"My first contact with Solid Edge was about 16 years ago when the system was still young in the software market," says Adam Budzyński, Eng., Ph.D., technical director, TOP-TECH. "My father was a member of the American Society of Mechanical Engineers, and so I could
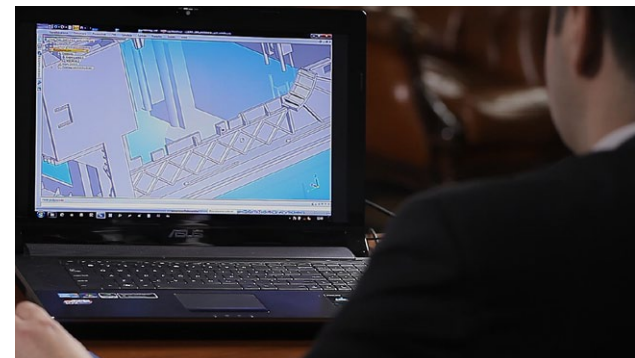
Results

Accelerated key CAD processes 10-fold; processes that previously took up to three days now can be completed in a few hours

Decreased organizational cost and provided value-added engineering services to customers

Developed a notable competitive edge, establishing new business, especially with customers possessing rigorous engineering requirements

"The most important benefits of using Solid Edge include the radical and multi-fold acceleration of design and analysis activities – up to 10 times faster. With the help of Solid Edge, we can easily accelerate and simplify key CAD tasks, allowing us to focus on providing a better service to our customers, rather than on mundane and repetitive CAD tasks. The ability to implement CAD projects with more ease and comfort gives us a visible competitive edge."

Adam Budzyński, Eng., Ph.D.
Technical Director
TOP-TECH
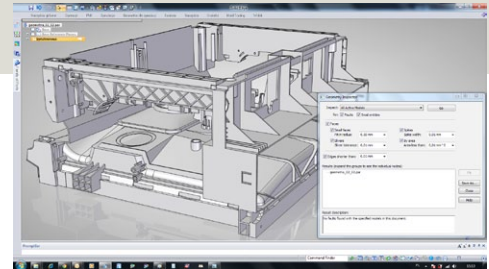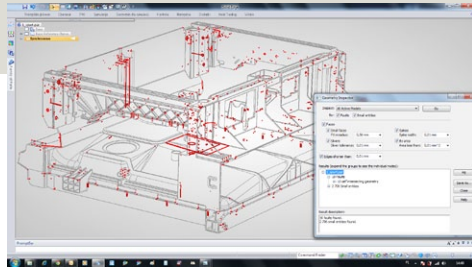
access their Mechanical Engineering journal whenever I wanted to. In 1996, I found a Solid Edge brochure attached to the publication. It all began on that day. I ordered a trial version and, after a few days of testing, I already knew – although I was still a young student – that I was witnessing a great breakthrough in engineering design. A few years later, I also understood that the breakthrough was not only in the design area, but also that the software works the way engineers and designers think."

TOP-TECH's core business is carrying out digital CAE calculations based on finite element analysis. These calculations are made in support of polymer injection simulations. However, FEA systems can be very demanding in terms of the quality of the CAD geometry used in calculations. Because CAE simulations enable the formulation of conclusions as well as design and technology recommendations, there is no room for error.


"Before we receive the CAD geometry intended for CAE analyses it may have been damaged, for example, in multiple translation operations between different native and neutral formats," says Budzyński. "In many cases, the geometry must be simplified for the purposes of digital analyses to obtain more reliable results faster. But that's not all. For a large number of projects, our customers wish to introduce major changes to the CAD models of analyzed products in order to improve the injection parameters. We have to meet their demands in this respect as well. Therefore, before using the data in finite element calculations, we must address serious challenges related to the repair, simplification or modification of the CAD geometry."

Using Solid Edge, TOP-TECH quickly and comfortably completes complex CAD/CAE tasks and processes. The company has found that the unique synchronous technology of Solid Edge contributes to the success of the company and its customers.
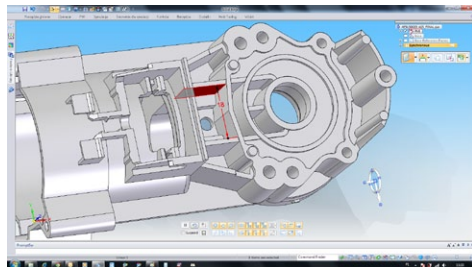
"Synchronous technology is a powerful solution for fast, efficient and easy generation of 3D model geometry, and for editing the geometry that already exists in other systems," says CAD engineer Maciej Warneński. "This geometry is often imported, so we have no control over the format. We don't need to look for a given feature in the history tree, or analyze how this operation was performed to modify a
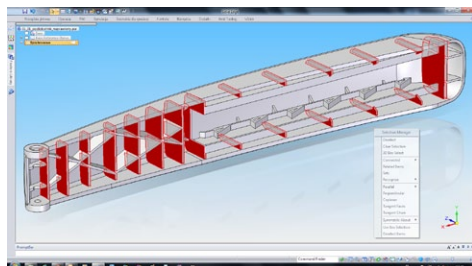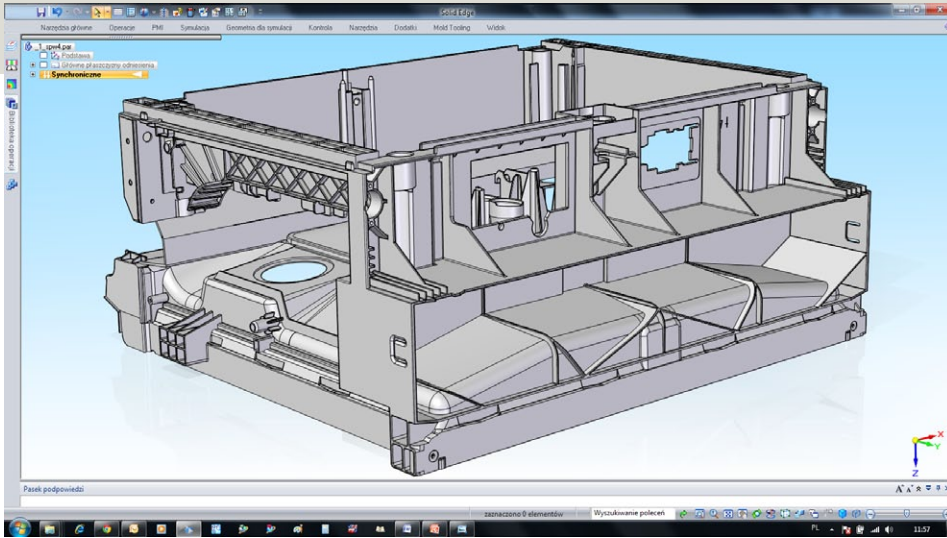
part of the model. We are not limited in editing imported CAD files, either. Using Solid Edge, selected model areas can be edited by simply highlighting faces and moving the desired parts of the geometry immediately with the intuitive 'Steering Wheel.' Moreover, the necessary changes are made in real time; there are no delays resulting from re-calculation of the changes by the CAD system, as often happens when you use other brands of software."

"Solid Edge with synchronous technology has many valuable advantages," adds Budzyński. "For example, the 'Selection Manager' makes it easy to identify geometry based on its definition, such as tangency, coplanar and coaxial, etc. Geometry can be efficiently selected even on imported data when model features do not survive translation. The 'Live Rules'


function recognizes model integrity, so holes remain concentric as they are moved and tangent faces are updated at the same time, without needing to select every single interrelated face. In order to edit a relatively large part of a CAD model, you do not need to manually highlight tens or hundreds of faces and risk that too many – or too few – of them are selected. Now, with the intelligence of the Solid Edge solution, it is enough to highlight literally one or just a couple of faces in a complex geometry to initiate a thorough and necessary edit of the imported CAD model. This is why we can work so quickly and efficiently using Solid Edge."

Complex CAD geometry can be repaired, simplified and modified up to ten times faster than before

The use of Solid Edge has helped TOP-TECH achieve an edge over its competitors, dramatically improve its productivity, provide value-added engineering services and attract new customers that present increasingly challenging engineering demands.

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Maciej Warneński, Eng.
CAD Engineer
TOP-TECH

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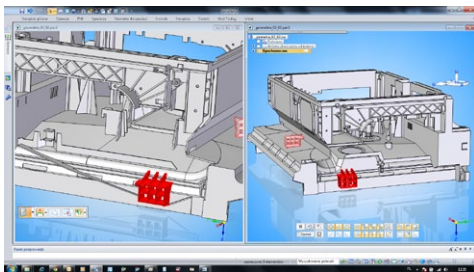
Solutions/Services

Solid Edge
siemens.com/solidedge

Customer's primary business

TOP-TECH, with extensive experience in industrial machinery emanating from the company's start in this field, now specializes in computer-aided design and simulation.
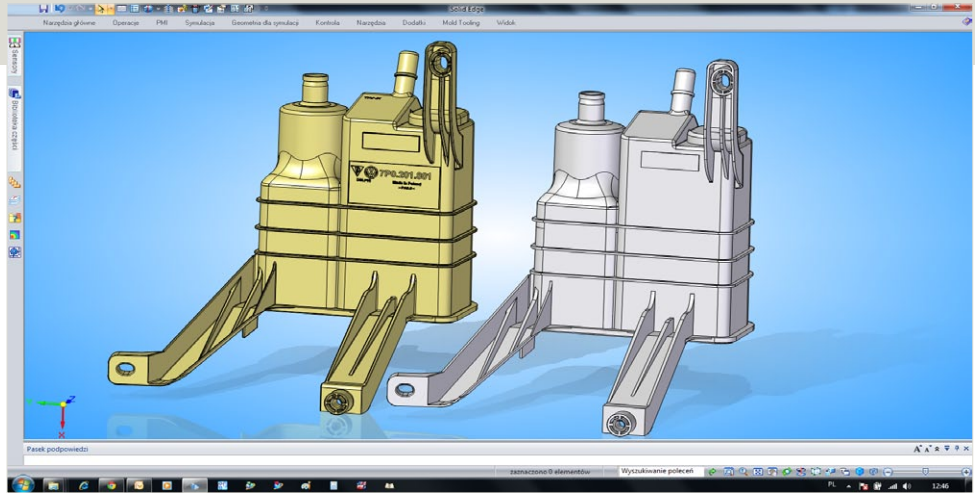www.top-tech.us

Customer location

Bydgoszcz
Poland

Partner

GM System
www.gmsystem.pl

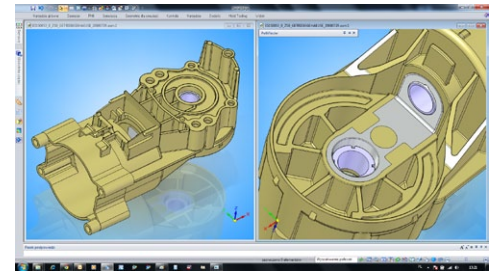*"Solid Edge gives us a unique edge and we certainly make use of it."*

Halina Ferens-Budzyńska,
Eng., Ph.D.
CEO
TOP-TECH

"One of the most important benefits of using Solid Edge is the extraordinary acceleration of design and analysis activities – up to 10 times faster," says Budzyński. "With the help of Solid Edge, we can easily accelerate and simplify key CAD tasks, allowing us to focus on providing a better service to our customers, rather than on mundane and repetitive CAD tasks. The ability to implement CAD projects with more ease and comfort gives us a visible competitive edge. Now we can fulfill ever more demanding and challenging orders, which significantly improve the profitability of our business."

From a sheer productivity perspective, processes that previously took up to three days now can be completed in a few hours. Complex CAD geometry can be repaired, simplified and modified up to ten times faster than before. "Solid Edge gives us a unique edge and we certainly make use of it", says TOP-TECH's CEO, Halina Ferens-Budzyńska, Eng., Ph.D.

TOP-TECH also attributes its success to the excellent service provided by GM System, which handled the comprehensive system implementation and provided software training and support. "We greatly appreciate the high-quality and excellent training, seminars and technical support provided by GM System," says Budzyński. "With the support received from Siemens PLM Software and GM System, we can continue to extend the scope and degree of utilization of Solid Edge in key areas of our market. It is very important to us; in fact, one of the reasons we decided to continue this significant and successful partnership."