RWE Power AG

Customer Success Story

Autodesk® Inventor®

Energy – Power for Everyday Life

RWE Power – the power generation company that forms part of the RWE Group – produces electricity, heat, and mines coal. It is Germany's biggest power supplier and generates electricity from both nuclear energy and fossil fuels. The international group employs 17,000 people and is the largest lignite producer in the world, accounting for 100 million metric tons a year. It is based in the Rhine-Erft region.

Power Through Professional Training

The best solutions for the largest bucket-wheel excavators in the world

Bucket-wheel excavator 290 operating in the Tagebau Hambach strip mine; it can move up to 240,000 tons of coal or overburden a day (Photo: RWE Power)

Bucket-wheel excavators rank among the most spectacular machines in the world. Moving these giants of the mining industry from one mine to another may mean temporarily closing a motorway or filling in a river bed. RWE Power, Germany's biggest power supply company, uses these machines – including the largest bucket-wheel excavator in the world – in its lignite mining operations. The company's Technical Center in Frechen is responsible for maintaining the steel leviathans, and it is there that experts design replacement parts for them, calling on their extensive technical know-how, a healthy fascination for the massive orders of magnitude involved, and the help they get from Autodesk Inventor. They are masters at what they do – in no small part thanks to consistent further professional training.

Autodesk®

Engineers and technicians use Autodesk Inventor to design excavator components in 3D – the digital drawings help drive the development process forward.

King of the Mine

Mines have always been known for the huge machines and the powerful, earthy men who work in them. RWE Power uses around 40 bucket-wheel excavators and spreaders in its lignite mines. And one of them is “Bagger 290”, the world’s largest bucket-wheel excavator, which was built by Krupp Industrietechnik back in 1979. Compared to this giant, even the most impressive road building excavators look like Matchbox toys. Its dimensions speak for themselves: 190 meters long, 40 meters wide and approximately 95 meters high. With its bucket-wheel, which itself is at least as high as a house, Bagger 290 can move up to 240,000 tons of coal or cubic meter of overburden in a day..
Given the extended service life of these machines (the oldest excavator dates back to 1955) and the quantities of earth and coal they move every day, maintenance and repair are critical to maintaining operability and productivity. That is why RWE Power chooses to maintain the excavators and spreaders in its own Technical Center in Frechen. Its design engineers, who number 50 at seven different locations, also strive to optimize replacement parts: the bucket-wheel teeth, for example, are fitted with a protective sheath in order to extend the service life of the wheel. Just recently, the Technical Center completed a complex and spectacular maintenance operation on a roller bearing assembly for one of these mining giants that is 30 years old.

Peter Schnitzler, Engineer of Machine Technology, next to the crawler track assembly drive train (Photo: Autodesk)

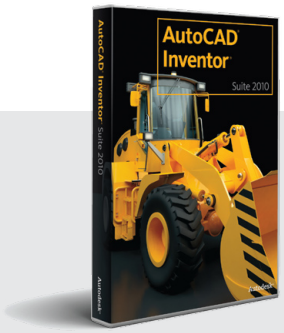
Detailed 3D representation of the bucket-wheel (Image: RWE Power)

Steel Construction in 3D

The Technical Center uses Autodesk Inventor to design its replacement parts. It opted for this 3D system at the end of the 1990s, not least because it offered a certified SAP interface and because the interplay between data generation and management promised significant added value in terms of workflow consistency. The engineers and technicians use Inventor to design excavator components in 3D, such as the extension arms for the spreader, or the bucket-wheel complete with buckets and teeth, taking full advantage of the digital drawing facility to drive the development process forward. Their number-one priority is to minimize equipment downtimes and extend the operational life span of the material. This means that the engineers must not only have in-depth technical knowledge, but must also be able to use the software productively and effectively. And this is precisely why Ralf Münch and Thomas Breidenich, the CAD Administrators for the Technical Center, arranged regular Autodesk Inventor training sessions for the team from the outset. The sessions are run by CIDEON Systems, an Autodesk partner and certified Autodesk Training Center in Düsseldorf.

RWE Power's Technical Center relies on Autodesk's customized training concept.

> "The training aims to teach users how to operate Autodesk Inventor more quickly and effectively."
>
> —Peter Schnitzler,
> Engineer of Machine Technology,
> RWE Power AG



The Autodesk® Inventor® product line provides a comprehensive and flexible set of software for 3D mechanical design, product simulation, tooling creation, and design communication that helps you cost-effectively take advantage of a Digital Prototyping workflow to design and build better products in less time.

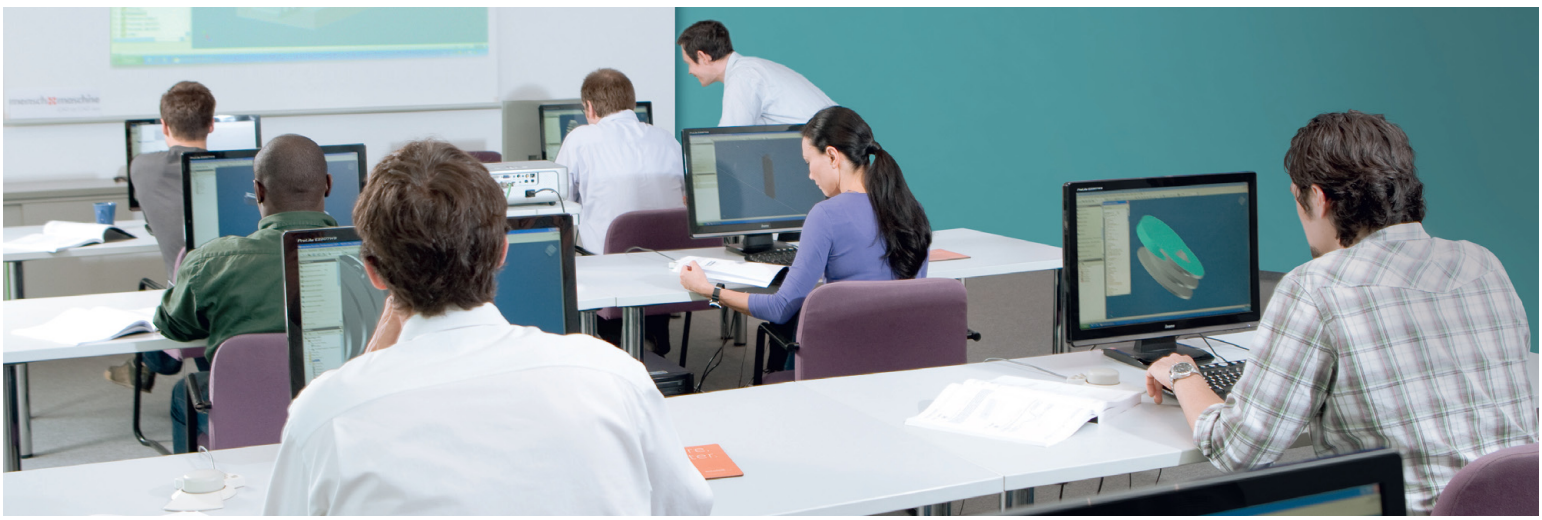
More detailed information available on:
www.autodesk.com/inventor

Achieving the Goal with a Methodical Approach

The Technical Center's CAD Administrators rely first and foremost on the conventional Autodesk training concept that is employed by CIDEON: introductory training for all newcomers to Autodesk Inventor, advanced training to improve product knowledge, and update training whenever a new release is issued. This approach equips the designers with a very good knowledge of the 3D solution, so their work is both target-oriented and productive. However, in order to extract even greater benefit from the program when it comes to those maintenance requirements that are specific to RWE Power, methodical training is also employed. Ralf Münch explains why this type of training is so important for the company: "The comparative methodical approach plays an important role in design. Working with the people from CIDEON, we've made steel construction design our main focus – and we've achieved a significant improvement in productivity as a result of our training sessions."

Over and above all the other training, highly-customized workshops are also run once or twice a year. Developed jointly with CIDEON, these are specifically tailored to the needs of the Technical Center and their aim is to improve data quality and optimize processes. Ralf Münch again: "These training sessions teach us how to use Autodesk Inventor to produce complicated designs more simply and in a uniform way. This meets our need for improved data quality and users also become quicker at working with the program."

All the workshops have a very clear practical relevance. Before each workshop, the trainer consults Ralf Münch and his colleagues on which components are to serve as practical examples for particular exercises. He then devises a training session that incorporates original designs.

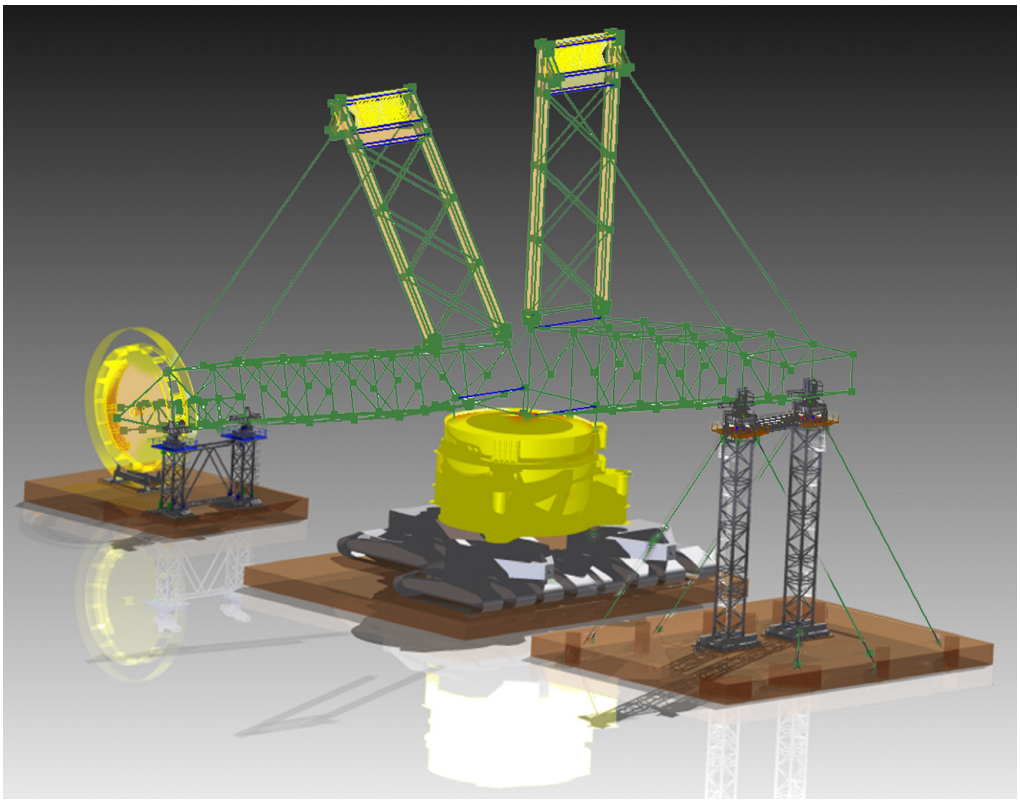


Autodesk Authorized Training Center (Photo: Autodesk)

Update training is an important and integral part of the training concept, because it ensures that new functions are implemented effectively.

Wow Effects and Productivity

It is not only the customized workshops that bear the hallmark of RWE Power. CIDEON attaches great importance to working with data provided by the company when it comes to update training, too. The fact that CIDEON is also RWE Power's user support provider for Inventor is an added bonus here, as it means the company has an extremely close all-round working relationship with the designers and the trainer knows exactly which new Inventor functions will be of greatest benefit to them. Those attending update training session are always keen to see what the latest release is able to do, what new possibilities it unlocks. Most recently the designers being trained in skeleton modeling were taken aback when they learned just how quick and easy it can be to draw complex support structures using sketches.



Complex support structures drawn by using skeleton modeling (Image: RWE Power)

Update training is an important and integral part of the training concept, because it ensures that new functions are implemented effectively. Ralf Münch estimates that his users have mastered roughly 60 percent of Inventor's total potential. Update training is therefore all the more important if productivity is to be maintained at this level even after a new release has been issued.

While most of the training that CIDEON provides to RWE is delivered in the Technical Center, the trainers do sometimes also train employees at other locations. And in certain cases, for example if a new employee at a particular site requires introductory training, they may ask the individual in question to travel to Düsseldorf, to CIDEON's own training center. Ralf Münch is firmly convinced of the need for regular training. "Our primary goal is to extend the service life of our technical equipment. Alongside many other factors, optimal use of our design software also helps us to achieve that objective. We simply can't imagine being able to use the software productively without regular training."

Back when RWE Power first opted for Autodesk Inventor, the team dreamed of being able to design an entire bucket-wheel excavator in 3D. But the maintenance of individual components keeps them so busy that that dream remains a long way off. Until then, there are still plenty of opportunities to see these giants in situ at the mines, or on public open-day display events, when a VW Beetle might be seen to disappear inside a bucket-wheel to demonstrate its massive proportions.

"Autodesk training empowers our people to productively use around 60 percent of Autodesk Inventor's full range of functions."

—Ralf Münch,
SAP PP and CAD Administration, Lignite Mining/Beneficiation Branch,
RWE Power AG

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