

ferroDECONT & ACAM

Fast and environmentally-friendly securing of groundwater contamination

Construction of automated testing system with reliable software suite from Solid Edge and Smap3D Plant Design

CAD Software

Solid Edge

Smap3D Plant Design

To date, ferroDECONT GmbH from Austria is the world's only complete solution provider using the in-situ method based on the ferroDECONT process for securing and decontaminating former industrial sites and for the treatment of industrial and process wastewater contaminated with heavy metals. The revolutionary process is based on many years of research and development by the two founders, Robert Mischitz and Peter Müller, at the Institute for Sustainable Waste Management and Disposal Technology at the Leoben University for

Mining, Metallurgy, and Materials.

Registered as an international patent, the process succeeds in securing groundwater contamination quickly and easily. Further spreading of the soluble pollutants is prevented. At the same time, soil material excavation can be eliminated through decontamination based on this method. This is associated with a gentle and environmentally friendly process: the cleaned-up waters can be reinjected into the soil due to the low salinity.



The two managing directors of ferroDECONT Robert Mischitz (right) and DI Peter Müller (left) in front of the testing system.

Construction of an efficient testing plant - with little time for incorporation into CAD

The founders and managing directors of ferroDECONT faced the challenge of developing and building an efficient testing system for their process. Batch tests of customer wastewater and further research were to be carried out. There was little time to become involved with design software. The aim was to implement their visions quickly and purposefully.

A solution was needed that would enable the designer to plan according to his

innovative line of thinking - and not one in which the optimal implementation of his idea had to be painstakingly determined step by step. For this reason, software systems which block or prevent further development of the ideas due to their complicated handling and chain of command were excluded. At the same time, the solution needed to provide a reliable foundation resulting in no additional costs due to manual errors.



Color reaction for analytics

Smap3D Plant Design "is an essential component, a kind of engine for our conception, so that we can quickly implement ideas. Due to the process reliability, the error potential can be largely reduced or even eliminated. Smap3D Plant Design's process reliability reduces development time by more than 50 percent."

Peter Müller, DI ferroDECONT

Digital twin with 3D CAD Solid Edge as reliable 1:1 model for the system

Above all, ACAM impressed the company with its presentation of the Smap3D product chain. With Smap3D, all relevant processes, from P&ID to 3D piping to isometry, can be covered. At the same time, the exceptionally good support ensures enthusiasm.

The two founders decided on the 3D CAD system Solid Edge from Siemens PLM Software and the 3D piping solution Smap3D Plant Design from Smap3D Plant Design GmbH. Without the solution, support and training provider ACAM Systemautomation from Austria, however, it would not have been possible to research and identify the suitability of this optimally matched software combination: "Our partner ACAM Systemautomation is our single-source provider for industry-proven complete solutions for system planning," says Peter Müller, Managing Director of ferroDECONT.

With Smap3D Plant Design, media breaks are avoided and the design process is accelerated significantly. For Peter Müller, Smap3D Plant Design "is an essential component, a kind of engine for our conception, so that we can quickly implement ideas. Due to the process reliability, the error potential can be largely reduced or even eliminated. Smap3D Plant Design's process reliability reduces development time by more than 50 percent."

By using Solid Edge to create a digital twin, they succeeded in generating a virtual and reliable 1:1 model of the system.



The digital twin, a virtual and reliable 1:1 model of the system.

The two managing directors would not want to do without this planning security, which enables testing and simulation of other ideas. But there is still reliance on the software specialist ACAM Systemautomation: The company's decision was not only based on the regional proximity. Above all, ACAM impressed the company with its presentation of the Smap3D product chain. With Smap3D, all relevant processes, from P&ID to 3D piping to isometry, can be covered. At the same time, the exceptionally good support ensures enthusiasm. This description is upheld by service providers who can be reached easily and quickly. However, the personal touch is the extra special element in many customer relationships. And according to managing director Peter Müller, ACAM possesses a successful mix along with the optimal amount.

Due to its experience gained in plant construction, ferroDECONT GmbH now also designs and manufactures small automated testing systems. These can be visualized based on the software environment of Solid Edge with Smap3D Plant Design and implemented according to customer requirements.

ferroDECONT process:

Rapid deployment, gentle cleaning, low investment

The advantage of the ferroDECONT method is obvious: The otherwise rather high decontamination costs of old sites, which usually arise at the start of decontamination, are significantly reduced. The mobile and compact concept of the cleaning system ensures that the initially high investment costs for stationary infrastructure construction are eliminated.

The in-situ method guarantees rapid operational readiness and promises fast improvements in the pollutant situation in well-drained soils. Toxic wastewater is gently cleaned without toxicologically hazardous chemicals. The heavy metals removed do not have to be disposed of, but can be sent to a downstream treatment process. The cleaning itself is done by means of zero-valent iron particles in fluidized bed reactors, which ensure a

good mixing of pollutants and particles.

This results in intensive contact of dissolved contaminants and the reactants.

The solid reaction products formed in this process can subsequently be separated from the liquid, thus generating a solid recyclable material from a dissolved pollutant. An example of this is the soluble and carcinogenic hexavalent chromium, which after treatment is present as solid and non-toxic chromium hydroxide. A separator separates these resulting fine solid particles, creating a chromium-enriched sludge. This sludge can then be recycled and the chromium portion recovered. In addition to the effect of recyclables separation, salting of the waste water is prevented and recycling or waste water discharge is facilitated.

The mobile and compact concept of the cleaning system ensures that the initially high investment costs for stationary infrastructure construction are eliminated.



Close-up of the testing system

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