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fluid

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# WINDHOFF

Bahn- und Anlagentechnik  
Integrating engineering disciplines via EPLAN

## Captured major productivity gains by centralizing design

The maintenance, repair and emergency vehicles that Windhoff builds at its plant in Rheine in northwestern Germany are important to the safe and efficient operations of railways throughout Germany and abroad. Whether the order is for special maintenance vehicles for high-speed lines in the Netherlands or Taiwan or fire-fighting cars for the Swiss railway system, most products have to be customized for standards and specifications of each rail company. That set Windhoff engineers to thinking about how automating design could improve productivity. "In order to accelerate work and improve the quality, a few years ago we began to develop modules that only have to be adapted to requirements of each new project," says Andreas Hellweg, graduate electrical engineer.

“Railway support vehicles built by Windhoff Bahn- und Anlagentechnik GmbH are a familiar sight for passengers who travel by train in Germany and other countries though few would know the name of the builder. Windhoff has integrated electrical, fluid and pneumatic design by centralizing those functions on the EPLAN Platform. That, in turn, has allowed it to create a bank of modular component designs for major sub-assemblies like complete electro-pneumatic brake systems that can be incorporated into projects with huge time and labour savings.”

ePLAN your engineering

# ELECTRICAL

## and fluid power engineering

### on one platform

“Our aim was and is to modularize the design by functions,” says Verena Köster, who does drafting for electrical engineering. “In our case, integrating fluid power and electrical engineering to the greatest extent possible makes sense, since the fluid-power systems in our rail vehicles are almost always controlled electrically. In addition, the procedures used by both disciplines are very similar.” Köster should know, as she once did electrical design almost exclusively and now spends about half her time on fluid power.



Windhoff, part of the Georgsmarienhütte group, adopted fluidPLAN (now EPLAN Fluid) to simplify fluid design. fluidPLAN ran on the same platform as EPLAN 5 (now EPLAN Electric P8), then Windhoff’s electrical engineering software, and became the means to integrate the two disciplines.

### Disciplines work collaboratively, not consecutively

Previously, the designers would take archived drawings from similar projects and modify them as required. The end result was a new set of drawings. Now, instead, they call up a project-neutral template for a crane or other subassembly. This template contains fluid power and electrical design elements and the hydraulic and electrical engineers work in parallel to adapt it to the project at hand, saving huge amounts of time and generating identical schematics for the two disciplines, with the same number of pages and naming of components. For constant combinations, such as proportional valves and their actuating units, the draftspeople have stored macros they call up at the click of a mouse button.

### Common development promotes communication

What used to happen in two departments, in separate rooms, is now carried out in close cooperation. “The common development of fluid power and electrical engineering lets us reach the target faster and promotes modular development,” says Hellweg. “The introduction of fluidPLAN made us think differently how work should be done.”



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# CONTROL

systems vary  
by country and by carrier

## Fluid software for compressed air, hydraulic oil and water

The Windhoff designers also use fluidPLAN and now its successor, EPLAN Fluid, to design pneumatic systems. The pneumatic components of the rail vehicles include, for example, the activation of the pantographs, the brake and the signalling as well as further control systems. In addition, the software is used to design the oil hydraulic units, such as the water supply to the rail grinding systems. Designing crucial control systems can be particularly intensive because they can differ by country and by carrier. For brake systems, all the pneumatic and electrical components have been combined on a single, compact module.

## Initial skepticism overcome

Though initially skeptical, the fluid design and production people quickly came to appreciate the advantages of close collaboration with the electrical engineers, particularly since many Windhoff suppliers, such as the manufacturer of its loading cranes, also use fluidPLAN, and that made their jobs simpler. Previously, when hydraulic engineering was still the responsibility of the mechanical design group, there had been problems with the electrical design group about the placement and connection of components. All that is in the past now.

## Links EPLAN to EDM system

Windhoff has been so satisfied with its EPLAN experience that when the current EPLAN Platform, including EPLAN Electric P8 and EPLAN Fluid was released in 2006, the company expressed a strong desire to upgrade to these programs. However, it deferred the implementation for two years until an interface that would link the new EPLAN software with the company's EDM system was created.

“In our company, the CAD systems – including the mechanical design – are linked via our keytech EDM system to the SAP system, maintaining a consistent data flow from the first design drawings through the detailed design to the commercial departments: keytech generates bills of materials directly in the SAP system, which the purchasing department then uses for ordering components,” says August Teepe, head of IT.

**ePLAN**<sup>®</sup>  
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electric P8

Projects are completed faster, with fewer inconsistencies in the total engineering process.

Two disciplines  
work as one

# SUMMARY

The close collaboration of electrical and fluid power engineering at Windhoff, made possible by putting both on the EPLAN Platform, has resulted in numerous cost and productivity advantages. Key design elements have been incorporated into archived modules that can be called up with one click and modified to suit a particular project. These advantages will become even more significant as the staff familiarizes itself with the many enhancements that have been gained by upgrading to the new EPLAN Platform that includes EPLAN Electric P8 and the latest EPLAN Fluid. At that point, both disciplines will be working off the same database and their work will become different aspects of a unified design process.

Find out more about Windhoff on [www.windhoff.com](http://www.windhoff.com)

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