

Enclosure
Construction

ePLAN[®]
cabinet



SIEMENS AG

Control cabinet design in top 3D quality

From control cabinet production to solutions factory

That is the motto of the Siemens site in Chemnitz. Boasting more than 130 clients worldwide, the Plant for Combination Technology (WKC) develops and manufactures electronic assemblies and complete cabinets with exceptional success. Anyone who operates in the highly competitive environment of control cabinet production must offer their customers something special if they are to be successful. Engineer Hans-Peter Kasparick, head of specialist tasks/software engineering at Siemens Chemnitz, explains: "We distinguish ourselves from our competitors because as partners to the customer, we cover the entire value-added chain: We collaborate with our customers very early in the development phase, and if required, can produce complete automation concepts. For on-going series, we work tirelessly to achieve cost optimisation of the enclosures."

“The Siemens Plant for Combination Technology (WKC) in Chemnitz, which develops and produces control cabinets for more than 130 customers, uses EPLAN Cabinet for its 3D planning. In order to accelerate workflows and respond quickly to changing order and customer requirements without compromising its high quality standards, Siemens has also created an integrated information flow from SAP via EPLAN Electric P8 to EPLAN Cabinet.”



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COMMUNICATION

between

E-CAD/CAE and ERP

“In addition to this linking possibility, Siemens also makes use of other interfaces such as those to its in-house component library and to the libraries of various other suppliers like Rittal (RiCAD 3D/selection of enclosures) – here too, the aspect of integration plays a key role.”



Increasingly important: Production of small series and one-offs

WKC is also very flexible when it comes to production: Of the 14,000 control cabinets that leave the factory each year, many are only produced in small quantities via the one-off process. In such cases, efficient planning and production is particularly important. With this in mind, Siemens has worked hard to establish an integrated information flow which begins as soon as the customer submits the first project documents. Hans-Peter Kasparick explains: “We receive a wiring schematic, a bill of materials and usually a layout proposal from our customers.”

Time is of essence

Because throughput time is a decisive factor in control cabinet manufacturing – and short throughput times translate into a competitive edge – Siemens checks the plausibility of the documents in advance, e.g. by comparing the bill of materials and wiring schematic. Hans-Peter Kasparick explains: “Our aim is to begin production without any incorrect parts in order to guarantee planning and process reliability in production.” First, the bills of materials are transferred into a self-developed, easy-to-use software package for bill of materials administration, and from there into the SAP system. These bills of materials may then in turn – and this is where modern E-CAD/CAE technology comes into play – be transferred into the EPLAN Electric P8 system. At this point, the database structure of the new EPLAN software really comes into its own: Without this structure, it would not be possible to implement the interaction between E-CAD/CAE and ERP (Enterprise Resource Planning) so easily.

From wiring schematic to finished enclosure

In a subsequent stage, the Siemens engineers convert the wiring schematic into technological production documents. One of them is the mechanical layout plan of the enclosure. In the past, this was implemented in 2D technology, but now they work in a 3D environment, based on the EPLAN data with EPLAN Cabinet. This new software built on the new EPLAN Platform was designed especially for the project planning of mounting plates and control cabinets. The intuitive interface and intelligent engineering tools make the engineers’ work easier. Cable ducts, support rails, terminals, contactors, etc. are easily positioned at a click of the mouse. The system makes allowances for minimum spacings and blocked surfaces. An online collision control function helps to avoid positioning errors. The basic module may be extended to include additional functions such as wire routing and the generation of production data for NC machines.

Three-dimensional engineering

It makes sense to add a third dimension to engineering, and not just because control cabinets are becoming ever more complex. Increasingly, components are being positioned on assemblies, doors, bases and side panels; the 3D view avoids collisions and ensures the required component clearances. A second



HIGH

quality and
faster processes

argument is even more convincing: in view of the limited construction space and ever-increasing number of components, greater consideration needs to be given to thermal design and heat dissipation. For this reason, the Technical Competence Centre Cabinet Cooling, based at the Chemnitz plant, is dedicated solely to this purpose. As a service, this team collaborates with the customer to devise thermal solutions, implement optimizations and measurements, and perform type testing with proof of compliance with environmental specifications. In this respect, EPLAN Cabinet conveniently offers an interface to the thermosimulation software used by Siemens, which is capable of emulating thermal distribution and dissipation in the control cabinet. This requires a 2D interior view of the cabinet. EPLAN Cabinet supplies this geometric data to the program. The engineer can input an ambient temperature and calculate whether the planned layout is correct from a thermal viewpoint.

Integrated database

The central parts management feature in the EPLAN Platform is a genuine advantage for Siemens, because the integrated database allows optimum preparation of the production processes to a high quality standard, and also paves the way for short preparation times. Hans-Peter Kasparick explains: "For us, the greatest potential for time savings and cost cuts lies in the preparation process, i.e. in the engineering; EPLAN Cabinet helps us to tap into this potential." Many third-party products are already stored in EPLAN and others are due to follow shortly. Preferred suppliers have been asked to supply 3D data with dimensions, connection points, etc. which will then be fed into the database.

Customized module makes engineering easier for one-offs

When planning one-offs, Siemens has collaborated with EPLAN Software & Service to incorporate an additional labor-saving feature: A similar project with many identical parts is used as a basis, and EPLAN Cabinet automatically compares the current data from the EPLAN bill of materials with the new project. In Siemens' experience, this approach offers significant time savings in engineering, which in turn translates into a competitive advantage, since the module was custom-designed for Siemens.

Link to mechanical production

Siemens contracts out the production of the cabinets to local suppliers. Cabinets are delivered with an NC file generated by EPLAN Cabinet – or more specifically, by the NC interface module – which the suppliers are able to load into their machines, containing precise data for the drilling and laser-cutting of holes and cutouts and for the production of mounting plates. In this way, mechanical engineering and E-CAD/CAE are becoming ever closer.

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Siemens also offers an additional service for customers who like to know exactly what is going on at any given time: They can keep an eye on the current status of their enclosure via a webcam and discuss technical details of the configuration.

3D view as a multi-beneficial tool SUMMARY

Pre-assembled cables with routing function

Using EPLAN as a basis, Siemens has implemented an integrated information flow for the entire engineering and production chain; the interface to bill of materials administration and to SAP also facilitates a link to commercial activities such as procurement and cost accounting. In the near future, the Siemens Chemnitz plant is planning to integrate additional process stages into the E-CAD/CAE software. For example, they intend to use pre-assembled cables that are planned using a routing tool, available as an EPLAN Cabinet module. This will help to significantly shorten throughput times.

Marketing benefits

There is also a "soft" factor in favor of 3D control cabinet design with EPLAN Cabinet. Hans-Peter Kasparick explains: "The 3D view is an excellent marketing tool. The customer is able to visualize his product early on and has a better idea of the appearance of the cabinet – this is important in view of the growing emphasis on design aspects in mechanical engineering."

Find out more about Siemens on www.siemens.com

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