AUCOTEC info

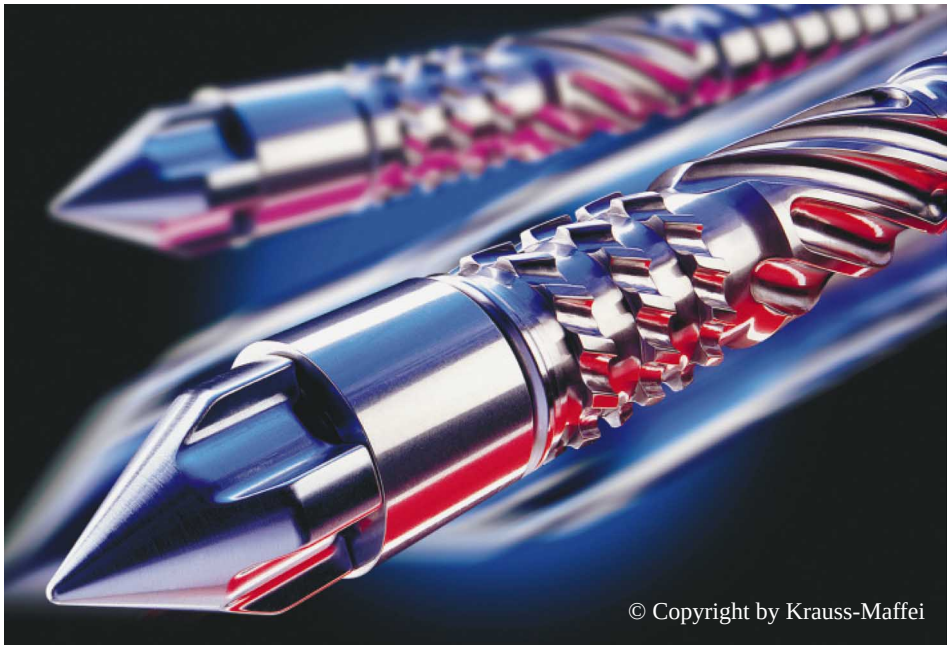
Issue April 2005

# Successful use of ELCAD Studio at Krauss-Maffei

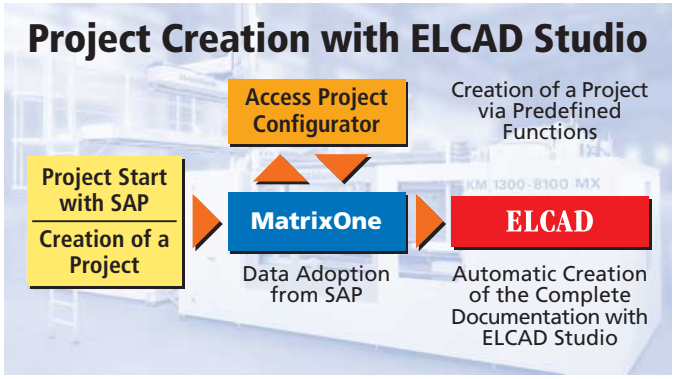
Krauss-Maffei Kunststofftechnik GmbH in Munich has for years successfully been using ELCAD and AUCOPLAN for projecting purposes. With over 50 installed licenses, the documentation can be created efficiently even for complex machines.

In the design department for injection moulding machines, due to the switchover to a new production line it became necessary to develop an overall concept enabling the mapping of the modular design of the machine. At the same time customer demands were to be met faster, and the workflow for the creation of the total documentation was to be optimized.

In cooperation with Krauss-Maffei, AUCOTEC has developed a concept that on the hand integrates the existing interface between SAP, MatrixOne and ELCADedm and on the other hand leaves it up to the project engineer to change modules or supplementary equipment for the new machine on short notice.




**Description of the Solution**
At Krauss-Maffei a new job is entered in SAP, and the data relevant for this job is made available by means of an interface. Using MatrixOne, this data is read into a job configurator developed by AUCOTEC.




At this point the project engineer can implement the changes or special wishes of the customer. All logical operations and dependencies of the modules with respect to each other are stored in the job configurator so that projecting errors are excluded at this point. The variant technology of the Krauss-Maffei products represents a special challenge for the team members. Here the variant management options of ELCAD Studio could be fully exploited. Thus all tasks could be solved and customer requirements be met.

After termination of the configuration in the job configurator, the data is transferred to MatrixOne. MatrixOne then creates a complete ELCAD project using the ELCADedm module.

The function modules created with the job configurator are read into this project. Subsequently ELCAD Studio automatically creates the diagrams belonging to a module by copying them from a template project. ELCAD Studio stores all resource data online in a database.

By means of the variant management integrated into ELCAD Studio, various macros and symbols are placed for certain modules so that it is possible to drastically reduce the number of templates in the template project. This again reduces the time required for the setup and maintenance of all standard data. All derived documents such as terminal diagrams, parts lists, connector diagrams, contents table etc are automatically available.

Should the customer want any changes after completion of the documentation, the project engineer can quickly and with little effort react to these changes by exchanging the function modules in the function table and the concomitant automatic exchange of the devices, terminals and cables. The possibility to retrospectively change module lists and variants is likewise a special feature of ELCAD Studio and enables mapping of the actual customer workflow.

Up to now, Krauss-Maffei used to spend about 1-3 hours for creating the first complete documentation. With the implementation of the new concept and the use of ELCAD Studio, this expenditure can be reduced by over 90 %. An additional advantage is that the modular data concept of a standard project excludes projecting errors and that module exchange errors are considerably reduced.

# Integration of ELCAD and SIMATIC

## The unique combination of E-design with automation and maintenance

**Diagnosis and maintenance with AUCOTEC*view* and SIMATIC WinCC**

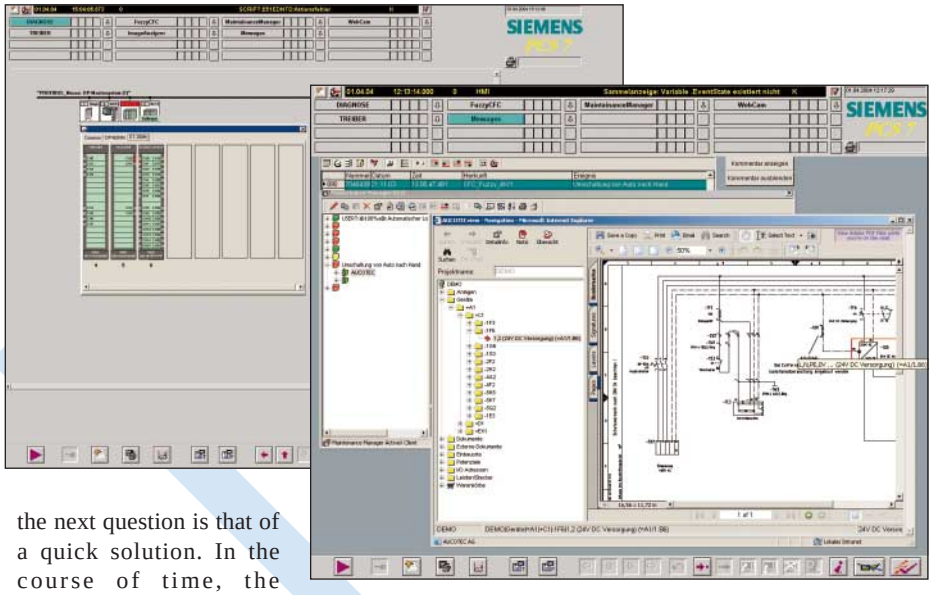
Projecting in mechanical engineering and plant construction with its pertinent CAE systems concentrates largely on hardware planning and documentation, with the creation of function groups, data sheets, circuit diagrams and switching centre layouts as well as derived materials such as distributor and connector diagrams. Due to the increasing use of field bus and remote I/O systems and their hardware components, the pressure for the integration of the world of engineering with that of the plant operator also increases, the goal being an additional increase in efficiency.


For plant operators, the crucial point of a process control system is the operation and monitoring of a plant. An essential component of this process control is the handling of error messages from the plant. Here a quick response is required because a disturbance means not only physical danger but also financial losses due to downtimes.

Minimization of downtimes is the point where the global solution chain starts.

- **Process control diagnosis**
  The first thing to be achieved is to immediately recognize and locate the cause of the disturbance. The "Process Control Diagnosis", a product of the SIEMENS division Industrial Solutions & Services, offers precisely these functions. It takes the maintenance personnel a few seconds to obtain an image telling them which component of the plant is faulty or has broken down. This function is integrated in a simple manner into the process user interface of SIMATIC PCS 7 or SIMATIC WinCC. One can see at once whether e.g. a wire leading to a temperature sensor is broken.

- **Maintenance Manager**
  This WinCC AddOn supports the service technician in the following steps. Once the cause of the disturbance has been located, the next question is that of a quick solution. In the course of time, the Maintenance Manager is fed with incoming data from the service technicians. Upon mending a fault, they record their actions. With this tool it is moreover possible to branch to any desired documents in various formats. Apart from manuals, operating instructions, Internet pages etc., direct access to the engineering data in ELCAD and AUCOPLAN is an obvious choice here.




- **AUCOTEC*view***
  As soon as WinCC recognizes a disturbance, the System Diagnosis gives you detailed information about the faulty component. The Maintenance Manager supports you by proposing past solutions, which have been recorded on the basis of the experience accumulated by qualified engineers. Alternatively it automatically calls AUCOTEC*view*. Here for instance the corresponding ELCAD document is called, and depending on the request the terminal, the input/output or the item where fault tracing is to begin is marked.

**This offers the user the following advantages:**

- Quick recognition and localization of the cause of a disturbance
- An integrated solution, the user does not have to know the individual tools and components
- Minimization of downtimes
- The navigation enables easy access from process control even to complex engineering data, with all of the additional information.

This holistic approach offers a practical proof of how the products from different manufacturers can be professionally combined. The user is not confronted with different product philosophies. Thanks to the integrated solution he can fully concentrate on the plant.

### Using rationalization potentials already at the engineering stage

The two engineering worlds CAE and automation technology converge. Exploit the technological developments to save time and money in engineering. Even now, you have the following options:

- **Hardware Configuration Link**
  The data created with ELCAD is used as basis to fully automatically create the hardware configuration with SIMATIC STEP 7 / PCS 7 or to automatically complete the ELCAD data with hardware configurations and I/O assignments.

- **SIMATIC PCS 7 Import / Export**
  The process engineering software SIMATIC PCS 7 is already clearly marked for optimized engineering. With the import / export wizard, the possibilities for data exchange with ELCAD and AUCOPLAN can be used also in this case. Thus the item designations and signal definitions already created there can easily be adopted. Further engineering with PCS 7 is carried out on the basis of this data.

- **SIMATIC WinCC Projecting**
  Is graphic data from the engineering tools ELCAD and AUCOPLAN to be used as basic diagrams for plant illustrations? Special tools based on the basic interfaces of the AUCOTEC products carry out this task for you. Save time and money also in this case and use already created data!

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# New Standards in Electrical Engineering

Electrical engineering systems are documented according to certain standards mostly conforming to agreed norms. The item designation is modelled on the DIN 40719 standard, the symbols correspond to DIN 40900. However, these standards have no longer been valid for almost five years. They have been replaced by new international IEC standards. The most important ones are:

- IEC 61346 Structuring principles and reference characteristics
- IEC 61082 Documents for Electrical Engineering
- IEC 61355 Identification and Structuring of the Documentation
- IEC 60617 Symbols

There is a high degree of uncertainty, and erroneous information encourages this state: Thus manufacturers of CAE systems claim that they cope with the new standards by simply offering a new symbol library with rotated connector texts. This is a huge error! The new standards result in considerable changes in the structuring of plants and above all in the documentation.

The slightest changes are those concerning the graphic symbols. Here the position and orientation of the connector texts conform to the direction of the outgoing connections. The texts are now parallel with the connection

The consequences for plant structuring are grave, however. Only some aspects are listed here: Both the hitherto common item designation as combination of the plant designator, location designation and type/count number (BMK) and the hierarchy plant > location > item designation are no longer valid. According to IEC 61346 there are three independent views of an electrical engineering system:

- Function view: What does the object do?
- Location view: Where is the object located?
- Product view: What is the composition of the object?

These views are independent of each other and are in no way hierarchically related. They can be substructured to whatever depth. One of these views (usually the product view) must be unambiguous for the identification of all plant objects. Superordinate parts of the identifications, which previously were shown in the drawing header, must no longer appear there. They are displayed on the upper left in a box. The drawing header now may show only designations required for the identification of the drawing as a document. A number of further changes concern the identification systematics and the document identification.

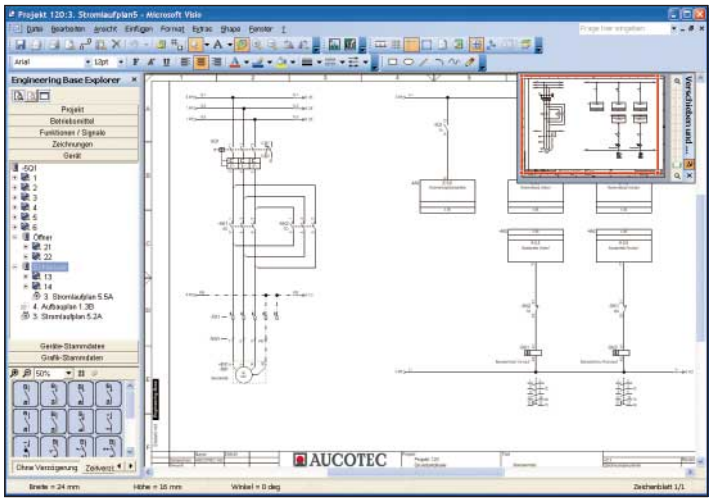
Some companies have started to implement the new standards. This especially the case where new technologies are used, new product lines are started or where there is pressure from abroad. We offer special seminars covering this subject where we tell you how to optimally use AUCOTEC products in terms of the new standards.

# Engineering Base Released for the German-Language Market

## *Engineering Base*

Based on Engineering Base 2004, which is already in use internationally, AUCOTEC has released the first German-language version on schedule for the Hannover Fair. For this purpose, Engineering Base has been considerably enlarged. For example it is now possible not only to actively edit, print or output to EXCEL items such as device lists, wiring lists, cable assignments or simply the sheet directory but to also integrate them into diagrams. Engineering Base sees for itself to page breaks in multi-page lists and keeps the contents up to date at all times; every change carried out anywhere in a circuit diagram, the cabinet layout or a hydraulic/pneumatic plan immediately bears on all list presentations. The terminal diagram according to the German template with representation of jumpers, destinations and cable matrix also derives directly from the database. Together with the already implemented online determination of wiring data in the background, the terminal diagram immediately shows the altered wiring situation after each circuit diagram change, and that without any generating run.

Another important supplement of the Engineering Base is the integration of hydraulic and pneumatic symbols and the appropriate device types. Of course there are automatic cross-references between devices in the respective diagrams and the coil representations in electric diagrams. The cabinet layout has been simplified by not only as in the past using universal symbols that automatically adjust to the device dimensions – now appropriate representations are assigned to device master data already in the catalog and are then preferentially offered by Engineering Base for placement. Especially for devices such as control units the path is now open even for photorealistic representations. All told, Engineering Base is an attractive offer especially for the medium-sized business practitioner who must quickly and flexibly react to varying challenges and in this context, depending on the task, must create everything from the general plan via circuit diagrams, hydraulic and pneumatic plans down to various lists, terminal diagrams and cabinet layouts.






**News in the Internet**

1. ELCAD-Fluid
2. Coupling smartDESIGNER
3. Free viewing tool: AUCOTECview

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# DRAKA Wire & Cable Assemblies – Optimum Support of the Manufacturing Processes with KABI

The DRAKA company is a world leader in the development and production of cables and cable systems for telecommunication, automotive and aircraft industries, shipbuilding, oil and gas industries as well as elevator technology and facility management. With a total turnover of the DRAKA Holding of 1.7 billion Euro and over 9,600 employees, DRAKA holds the third place among the manufacturers of low-voltage and special cables in Europe. Following an intensive selection phase carried out over two years essentially by DRAKA Wire & Cable Assemblies Czechoslovakia, DRAKA has decided in favour of KABI. To begin with, 8 licenses are used at 5 locations in Czechoslovakia, Turkey, The Netherlands, Germany and France. An expansion of the licenses at the individual locations and others is intended. The crucial factor for the decision was the high functionality of KABI, which enables full support of the specific DRAKA manufacturing process.

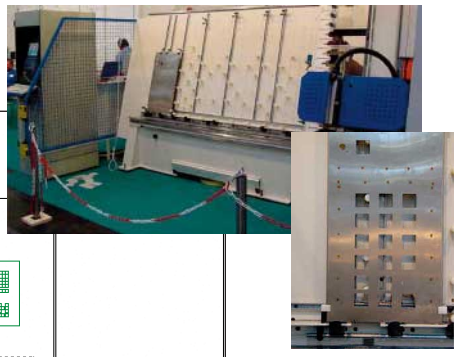
For this purpose an intensive workshop was organized where all company-specific demands on KABI, the basic design of the database spanning several locations and all contact persons were specified. Four-day training courses were held in two user groups each.

With the KABI-solution, the customer-specific data of the cable harnesses (from-to information) are imported via Excel into KABI and are used as basis for the entire planning process down to cable harness manufacturing (mounting plate). The output of all cable harness data (parts list, cutting list, summary list, splice information etc.) is done automatically in KABI.

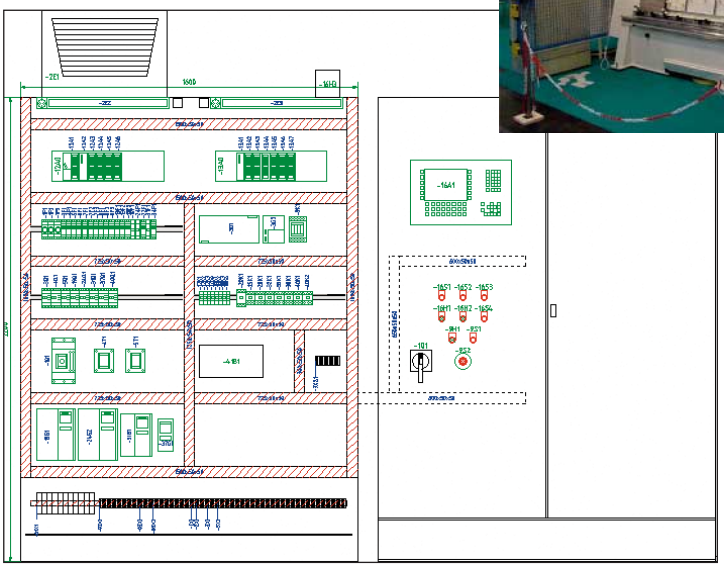
# Interface to Kiesling Drilling Centre Perforex BC

**Perforex is a system of machines for manufacturing mounting plates, mounting boxes and cabinet doors.** The required holes and threads (about 200 for a medium-size cabinet), recesses and openings are sawed, milled and bored automatically. This is based on a so-called "hole layout", which can be created directly on the machine by reconstructing the cabinet with respect to the components relevant for boring.

The boring schemas of the components placed on the cabinet are the basis of a boring diagram. This layout diagram can be handed over to Perforex directly from ELCAD. Thus the time-consuming reconstruction of the cabinet data relevant for boring can be dispensed with in the future. The ELCAD designer creates a job order in Perforex, which can then be directly accessed by the manufacturing department or can be executed directly and without reworking.



*Example of a layout diagram in ELCAD 7.3*



### Advantages of the Solution

- No redrawing of the layout during manufacturing. Thereby avoidance of errors and saving of operating steps
- Central master data storage in ELCAD. No duplicate storage of the component data
- Data consistency: All design changes are available online in the manufacturing layout
- Manufacturing-relevant rework in Perforex is safeguarded. The hole layout can be checked and cleared by the finisher

## GET IN CONTACT

*Let's make engineering easy!*

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