



Digital Production Thanks to MES

User Report

Emil Frei GmbH & Co. KG

FreiLacke

Initial Situation

Since 1926, FreiLacke has stood for innovative paints and coatings. As a leading supplier in system coatings in Europe with 500 employees and an export share of 40 %, the family company from the Black Forest faces the constant challenge of maintaining its central strengths of continuity, quality and competence. The modular MES solution FASTEC 4 PRO has been supporting liquid paint production since 2013.

With the help of a fully automatic planning module of the MES FASTEC 4 PRO, the Emil Frei GmbH und Co. KG was able to achieve more transparency, increased production output and binding statements on production and delivery dates. Today, FreiLacke benefits from these improvements in production, logistics, controlling and sales.



"Thanks to the planning tool, we were able to increase our delivery reliability for our liquid coatings to 97.5 % within just 1.5 years."

Roland Bäurer
Authorized Signatory and Head of Materials Management
FreiLacke

Tradition Meets Innovation

FreiLacke

Goal:

Efficient Production Planning and More Transparency

In order to meet the demands for greater transparency in planning, binding statements on production and delivery dates and to achieve more throughput in production, Freilacke came up with the idea of introducing an MES system with fully automated detailed planning. Already at the beginning of the MES project, there were further concrete requirements that the new MES system had to meet: Minimize set-up and cleaning times, recognize production bottlenecks and illustrate their effects, taking into account personnel availability, plant capacity and working time models, and include plant maintenance and repairs in the planning.

Freilacke decided in favor of FASTEC 4 PRO when purchasing a new MES system, because the planning module with its high flexibility and performance accurately maps the necessary planning rules and processes.

- **ERP and Personnel Time Recording as Data Suppliers**

One step in the implementation was to use the existing ERP system dibac, the process control system Kastor and the personnel and time recording system ZEUS as data sources for planning. The interfaces required were quickly implemented using the data importer integrated in FASTEC 4 PRO.

- **Set-Up Rules Determine The Planning**

The planning horizon for liquid paint production at Freilacke is more than four weeks and includes more than 300 production orders, which in turn can include up to five operations. The fully automatic scheduling takes place on approximately 90 workstations and takes into account set-up times, deadlines, shifts, etc. Due to the color change, the changeover or cleaning of a machine is subject to strongly varying set-up times that must be considered in calculations.

In order to optimally plan, the best possible sequence in terms of the number of set-up changes, the change-over time and adherence to deadlines must be found for all orders to be scheduled. To avoid having to calculate all combinations, sophisticated mathematical algorithms have been programmed to calculate an optimal result in terms of set-up and cleaning times. For this process, FASTEC 4 PRO uses various set-up matrices (color change and change of binder) in liquid paint production. More than 200 color values are stored for the color change alone, which are taken into account in the planning process. Over 40,000 possible combinations are already being created here.

In addition to the values from the set-up matrices, underlying planning parameters such as order priorities, delivery dates from the ERP system and the current personnel availability (attendance, vacation, sick leave) must also be included. The visible result of the automatic detailed scheduling is displayed in a Gantt chart. On a timeline, the fully automated scheduled operations are displayed distributed across the individual workstations.

Fully Automated Working Operations

Positive Asset for Production, Logistics, Controlling and Sales



- **Supported By Colored RAL Codes in Gantt Chart**

The planning tool in FASTEC 4 PRO works independently; nevertheless the planner must be able to follow the planning in order to intervene and make changes if necessary. At FreiLacke, each article is assigned a RAL code which represents a unique color value.

However, the RAL code cannot be seen from the order numbers stored in the ERP system dibac, which could help the planner to display the orders in the Gantt chart. In FASTEC 4 PRO, each order number stored in the ERP system is therefore assigned its corresponding RAL color using a mapping table. On this basis, a correspondingly colored marking shows the planner which RAL color is to be produced with which order directly in the Gantt chart.



Gantt chart to visualize the planning results

- **Alternative Workstations in the Planning Process**

Often the operations of orders can be carried out at different workstations. In order to consider the resulting variants in automatic planning, information on the possible alternative workstations and their performance must be available. However, the master data stored in the ERP system offered only an insufficient data basis for this purpose.

To solve this problem, an order is now supplemented with the master data stored in FASTEC 4 PRO during import. Specifically, the selection of alternative workstations is exemplified as follows: A large quantity of system paint is required for an urgent order. It makes sense to only consider using powerful machines. The FASTEC 4 PRO planning module therefore determines the suitable machines (workstations) based on the desired production quantity and writes all possible workstation combinations into an internal list, which the planner can view, just like all working operation networks. Depending on the selection of workstations, the individual processing times vary due to the previous assignments.

The optimizer makes the final decision on the production sequence to be selected by evaluating its data.

“Thanks to the transparent capacity overview, short-term orders that previously disrupted the daily routine are no longer directly transferred to pre-packing. Pre-packing now runs more smoothly and efficiently thanks to the production planning lists.”

Simon Reichhart
Production Manager Liquid Paint
FreiLacke

Transparent Capacity Overview and Control

Individual Rules for Fully Automated Planning

- **Optimization Based Planning Tailored to the Planner's Criteria**

The planner can reassess the optimization criteria relevant for FreiLacke with each planning run. Accordingly, they are considered in the fully automated detailed scheduling. These include set-up effort, throughput time, adherence to deadlines and capacity utilization. FreiLacke pays particular attention to promised delivery dates, so the planner gives high priority to the criterion of adherence to delivery dates. Other criteria therefore influence the planning to a lesser extent. Templates can also be created for these settings, which are selected according to the planning situation. This enabled FreiLacke to achieve a very high level of adherence to deadlines with short delivery times of only three to five days.

Additional functions also contributed to the successful optimization of on-time delivery: The window "Rule Violations" displays in tabular form which orders are experiencing delivery problems in the current planning. These rule violations are further broken down in the plan analysis and thus provide the planner with a detailed basis for analyzing, justifying and circumventing production problems and delivery difficulties.

In order to meet delivery dates, the FASTEC planning module must also check whether the necessary resources are available.



- **Pre-Commissioning and Raw Material Availability**

To support the order pickers, the customer-specific view "Pre-Order-Picking" provides a list of all planned orders. The introduction of the planning module at FreiLacke has led to a significant improvement of the logistical processes within production.

The availability of raw materials is also listed in FASTEC 4 PRO and included in the planning.

In order to allow for inaccuracies in the delivery dates of suppliers, FASTEC 4 PRO automatically takes delivery data into account with one day's waiting time. After each optimization, the planning data is transferred to the ERP system dibac. At the same time, FASTEC creates the work plans in which it specifies the sequence of the individual batches.

Consider Optimization Criteria

Increasing Production Performance and High Degree of Adherence to Schedules

- **Transfer of the Production Orders to the Machine Operators**

The scheduled production orders are transmitted to the machine operators at their workstations via printed receipts. The production orders planned in FASTEC 4 PRO are transferred to the ERP system, enhanced with additional order data and sent to the printers assigned to the respective workstations as a print file.

- **Process Control System Provides the PDA Feedback**

No planning system can deliver meaningful results without feedback from production. At FreiLacke, this data comes from the process control system Kastor by the company AZO. FASTEC 4 PRO uses status messages such as start and end messages of running processes. On this basis, the planner can get an overview of the current production situation. Delays, machine failures and other deviations from the plan can thus influence the planning so that countermeasures can be initiated early on.

- **Increased Efficiency Through Planning Tool**

At FreiLacke, production output depends on many different factors, such as batch size and the proportion of large batch production in total production. Thanks to the use of the planning tool and the resulting increased efficiency, production output has been successively increased. Due to the higher level of transparency, necessary capacity adjustments can be taken into account at an early stage during periods of strong growth.



Personnel Planning

PDA

Process Control System AZO Kastor

Time Recording System ZEUS

ERP System dibac

Extensions APS

Detailed Scheduling



Highly Efficient Planning Tool

Conclusion: Increased Production Output Through More Efficient Manufacturing

• Expansion to Powder Coating Production

FASTEC and FreiLacke are currently working on extending the system FASTEC 4 PRO to include powder coating production. In contrast to liquid paint production, six instead of two set-up matrices must be taken into account when planning this project.

However, the company is confident as it looks back on the positive outcome of the liquid coatings business. Roland Bäurer comments: "We have had a very positive experience with FASTEC and are impressed by the effect we have achieved, for example in terms of delivery date reliability. We were able to use the increased efficiency provided by the planning tool to increase production output. We expect a further increase in 2016, and FASTEC 4 PRO will continue to support us."

"The use of the planning tool from FASTEC ensures a significant improvement in performance, especially with regard to delivery date reliability."

Roland Bäurer
Authorized Signatory and Division Manager
FreiLacke

Overview:

Industry: Paints and Coatings Industry

MES system FASTEC 4 PRO with the modules:

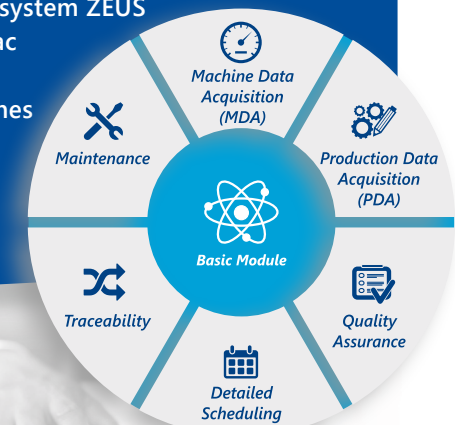
- Production Data Acquisition
- Detailed Scheduling
- Extension APS (Advanced Planning and Scheduling for fully automatic detailed scheduling)
- Personnel Planning

There are interfaces to the following systems:

- Process control system AZO Kastor
- Time recording system ZEUS
- ERP system dibac

Connected machines in use:

- Dissolvers
- Mills
- Mixers



Expansion of FASTEC 4 PRO Projected

Why Not Get to Know Us Personally?

Production companies must produce on time, in a traceable, flexible and customer-specific manner, while ensuring consistently high quality. Achieving these goals requires transparency through real-time information, good planning and quick and adequate reactions to deviations. Our Manufacturing Execution System (MES) FASTEC 4 PRO is the right tool for this purpose. With great success since 1995.

We would also like to give you a good advice personally!

Our sales department will be happy to provide you with further user reports and information material! Or else, make an appointment with our sales department for a presentation at your location, in our company or via web. Of course, you can also experience FASTEC 4 PRO live and on site with our customers.

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Additionally, we offer videos of our software and customer solutions in our YouTube channel:

www.youtube.com/FASTECGmbH

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Gold
Microsoft Partner


SAP
Silver
Partner

With FASTEC 4 PRO, you gain the necessary level of transparency in all areas of production in real time, enabling you to discover previously unused potential for increasing productivity and optimizing processes. Thanks to targeted planning, you can also respond to short-term requirements from sales and efficiently design production processes – traceable and documented.



FASTEC 4 PRO

- Get transparent data in real time
- Reduce production costs
- Detect and eliminate weak points
- Develop high productivity potentials
- Benefit from the continuous flow of information
- Use available resources efficiently

▶ **As a data hub, FASTEC 4 PRO is essential on the way to the Smart Factory.**