



Schlemmer Prozess Systeme GmbH
MEASURING AND CONTROL TECHNOLOGY

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RETROFIT of a glass press

An economic modernization concept for production machines, which got into older years

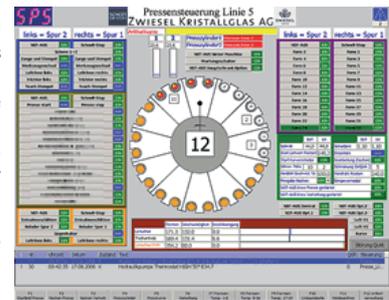
Glass manufacturer must keep the machinery on a technologically advanced level to persevere in the highly competitive glass market. Most of older machines are still in good mechanical condition, but the control system and the drives don't fit today's standards. Schlemmer Prozess Systeme offers modern control and drive technology, which can be adapted to the individual requirements.

We achieve very high performance by means of the newest Siemens Simotion control systems. It is possible to control 80 cams and more and switch them with a reaction time of 125 µs. The position control is also done with a cycle time of 125 µs, which is extremely fast. The cycle times of older control systems are many times slower than this.

RETROFIT practical example:

Modernization of a 24 station glass press at Zwiesel Kristallglas AG

This glass press was in a very good mechanic condition, only the old control system didn't work reliable anymore and didn't fit today's standards. Therefore, we came after a meeting with our client to the decision to modernize the machine with our RETROFIT concept. We replaced on the one hand the control system and on the other hand the whole electrical equipment (control cabinets, operation tableaus, cables etc.). Also the auxiliary equipment, like control system for conveyor belt, plunger and measurement system got renewed. Disassembly, assembly, wiring and commissioning could be done without any loss of production during annual plant shutdown of 17 days. We used the Simotion D445 control system.



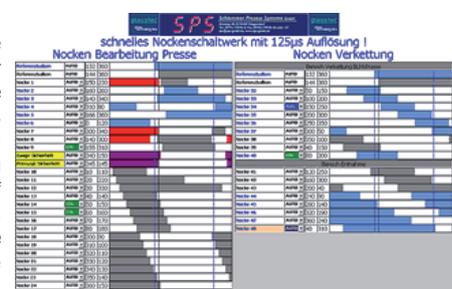
The first class yield has increased enormously with this modernization according to Zwiesel Kristallglas AG. In addition, alarm messages are now displayed in clear words and not only in error codes. That makes troubleshooting a lot easier for the operator. There is also the possibility for our clients to get the source code for our programs. In this case we give the employees also a training to get basic knowledge of Simotion and to understand the program structure. Our clients become also detailed documentation as well as complete and correct wiring diagram of the machine after commissioning.

This picture shows how the desired pressing curve can be set within 16 steps. The settings can be tested by using a virtual plunger. After ensuring correct settings the curve can be transferred to the real plunger(s). By the way, it doesn't matter whether a hydraulic or electric cylinder is used. When a hydraulic cylinder is used, we analyze the mechanism of the pressing cylinder exactly and. Afterwards, we create a correction curve and save it in the control system. With this, best regulation results can be realized by maximum repeat accuracy. The different heights of the molds will be equalized by automatic mold correction from the control system. Consequently, fluctuations in the weight of the gobbs will be adjusted automatically and defective goods reduced to an absolute minimum.



The recipe management is included in the pictures "production setup" and "article management" of the visualization. Every adjustment of a produced article can be saved on hard disc or on a server. If such an article should be produced again, the adjustments must only be loaded again from the recipe file. All parameter, which the customer needs, can be saved. It doesn't matter if the data are general information or cams with thresholds.

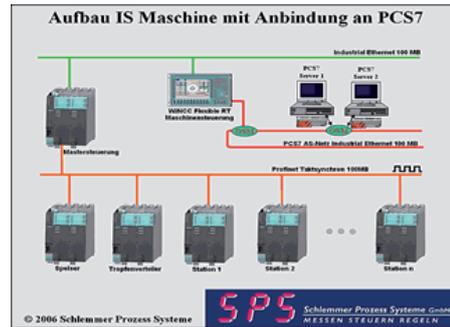
The sequential circuit with 125 µs cycle time is an absolute innovation in this sector. Short-circuit proven outputs for cams put the lid on it. We also introduced /ttps. axes. The cams will be assigned to the appropriate master axes, because there are cams which must always switch at the same time and there are cams which must switch according to the rate of production. As you can see in the picture of the visualization, the cams are shown in different colors. Blue cams are assigned to the leading axis (this one depends on the rate of production) and grey cams are



assigned to the table axis. In addition, all cams can be combined with safety areas (red indicated). These values can't be changed from the operator and are used to safe the machine from mechanical damage.

Not only production machines like press, blowing machine, IS machines, edge melting machines and cutting machines are part of the production process and should be equipped with modern control technology but also annealing Lehr loader, annealing Lehr unloader and all the other conveyor belts etc. All these machines can be compared to a chain, and the chain is only as strong as its weakest link. Even a "simple" annealing Lehr unloader, wich isn't working very accurate, can reduce the first class yield about several percentage points. Consequently, this "simple" part of the whole production line can put a profitable production in the red.

Machine modernization with new control and drive technology combines a lot of advantages and is a very good economical solution.



Increase in productivity will be achieved by:

- Decline of down time
- Less energy consumption
- Faster and more precise processing
- Linking and synchronization with the whole production line
- Easier operation
- More safety functions
- Cheaper spare parts
- Data exchange with business-management systems