



# With safe pressure

Integrated safety solution for dry presses



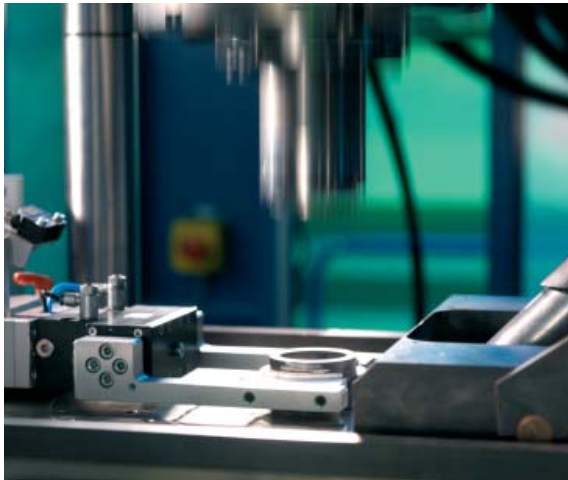
safety control



**bachmann.**



Products made of metal powders have now become indispensable in many industries and application areas. The mechanical presses from DORST Technologies are among the world's leading machines for dry pressing of metallic or ceramic powders. The company used the completely integrated safety solution of the Bachmann M1 automation system when developing a new servo-electric mechanical press.



▲ **50 tons of pressure, up to 60 times a minute:** With the DORST EP50 servo-electric press dimensionally precise, mass-produced articles are created.

DORST Technologies is a medium-sized company with approximately 450 employees. Corporate headquarters and the company's technical center are located approximately 50 km south of Munich, Germany in Kochel am See. Here research is devoted to intelligent system solutions for machines and systems for the production of ceramic and powder metallurgical products; in this regard the preparation of raw materials and forming are among the company's areas of specialization. The knowledge associated with the individual process steps and the diverse influence variables involved in the production of several end products make DORST an internationally recognized expert in forming ceramic and metal powder.

### Maximum precision for automotive engineering

Parts consisting of pressed metal powders play an ever greater role, particularly in automotive engineering: Today synchronous hubs for passenger car transmissions, timing belt pulleys, shock absorber parts, valve guides and much more are manufactured on dry press machines from DORST. Due to the extremely low level of residual moisture of the pressed raw material, the dry presses are particularly well suited for mass-production of dimensionally accurate parts.

For manufacturing, the finest grades of granulates and powders are compacted in steel dies that are profiled appropriately for the part that will be produced. »When filling the die, even distribution of the material is extremely important«, explains Herbert Gröbl, Director of Development – Control Technology at DORST. Inhomogeneous density distributions could cause the parts to warp or even crack and thus negatively influence the load capacity and precision of the component«, continues Herbert Gröbl. Consequently treatment of the basic raw material also plays an important role, since the parameters and characteristics not only need to be clearly defined but they must also be reproducible.

### 50 tons of pressing force, maximum safety

The new EP50 servo-electric press from DORST offers a pressing force of 50 tons (500 kN) and works with up to 60 lift cycles a minute. This requires a high level of safety for operating personnel, which is ensured by the integrated

safety solution from Bachmann. The press is completely enclosed in operation. Access is only possible through the lockable protective doors that can only be unlocked under defined conditions: »This means that the machine must be at a standstill and the axes must be in safe position«, explains Herbert Gröbl. It is only possible to operate the press with the door open when tools are changed, and then operation is only possible at a safely reduced speed (»Safe Limited Speed«).

If an emergency stop button is activated or if the voltage monitor trips all axes are brought to a standstill with maximum delay. Then a »Safe Torque Off« occurs, i.e. drive torque is switched off. »Safe Torque Off« is directly triggered in »Tool Change« mode.

### Easy integration is convincing

The easy integration of the safety solution in the standard control system convinced DORST immediately, as the system is based on consistent hardware. All process variables can be accessed in a consistent level. »With communication via the Bachmann Standard Variable Interface (SVI) we achieve cost-saving potential«, the Director of Development describes the advantages: diagnostic I/Os are no longer required, the hardware and wiring complexity is reduced, there are fewer error sources. »All this means lower costs and is an ideal prerequisite for faster amortization of the system« is how Herbert Gröbl describes an important customer benefit of the DORST press that is automated with the Bachmann M1.

DORST also saves time and costs with the Bachmann solution when programming the system. »With the safety components integrated in the Bachmann Safety Developer in accordance with PLCopen we succeeded in quickly and easily implementing the safety application«, continues Herbert Gröbl referring to his expe-

### Dry presses

In the dry pressing process a granulate is compacted by a top punch and a bottom punch in an extrusion die. The powder is dosed and supplied via a filling device. For the one-column presses only the top punch is moved, for the two-column presses both top punch as well as bottom punch are moved. The pressed article is lifted out of the die via an ejector and automatically removed by a gripper.

- ▼ Successful synthesis engineering and technology know-how: The new dry press EP50 from DORST.



periences in setting up the system. By using the function blocks (Safety Compounds) the firm succeeded with a clean, easy to understand structuring. »Of crucial importance for us in this regard was the fact that we can use these blocks in a project-overlapping manner and thus can quickly implement them in similar machines or systems«, explains Herbert Gröbl.

### Easy remote maintenance of the safety solution

DORST presses are installed in more than 70 countries around the world. Equally important for companies as well as customers is the possibility of maintaining the safety solution remotely, directly via the M1. »The SolutionCenter engineering tool offers the service technician extensive diagnostic possibilities and thus permits simplified troubleshooting«, cited the Director of Development as an important detail.

### Positioned as a trendsetter

The names DORST and Bachmann stand for high quality, for innovation, technology leadership and strong customer orientation. The close collaboration of the two companies produced a trend-setting solution for safe automation. With the new generation of the servo-electric press DORST succeeds with a successful synthesis of engineering and technology know-how. In this regard automation with the Bachmann M1 system and its integrated safety solution promises even higher level of safety and system availability for the owner.

#### FACTBOX

#### Bachmann Safety Control – the scalable solution

The SLC284 safety controller has been developed in accordance with the latest research knowledge. All data processing is executed with two channels in a homogeneous, redundant structure with self-diagnostics: Two processors continuously execute all calculations in tandem and cyclically compare the results. Thanks to the integrated inputs and outputs of the SLC284, safety tasks can be directly implemented without the use of additional modules.

With the safe digital input and output modules SDI208 and SDO204, the number of channels required for more extensive applications are provided. Thus the Bachmann Safety System can be optimally configured for a wide variety of applications.

All safety modules can be plugged into the M1 automation system at any point desired, in particular, they can also be plugged into substations.

