

The Siemens logo is displayed in a bold, teal, sans-serif font.

Ingenuity for life

A large industrial dosing machine with a white frame and blue accents. It features a control panel on the left and a mixing head on the right. The brand name 'sonderhoff' is visible on the side of the machine. A blue banner is overlaid on the bottom right of the image.

Mixing and dosing – precise and simple

Sonderhoff relies on automation technology from Siemens

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Sonderhoff fits all its mixing and dosing plants with Siemens automation technology. A G-code interpreter has also been programmed for the SIMOTION Motion Control System.

At its site in Hörbranz, Austria, Sonderhoff Engineering GmbH develops and manufactures dosing machines and automation concepts for gasketing, gluing, and potting polymer reactive materials. The components are then applied automatically or semiautomatically to many different types of two-dimensional and three-dimensional components. The product portfolio ranges from electronic components to control cabinet doors and lamps, to automobile headlights. On two-dimensional parts a three-axis linear robot guides the mixing head quickly, precisely, and with a high degree of repeat accuracy over the gasket contours. To provide the full mobility range, there are also systems with articulated-arm robots.

Intelligent automation – with Siemens

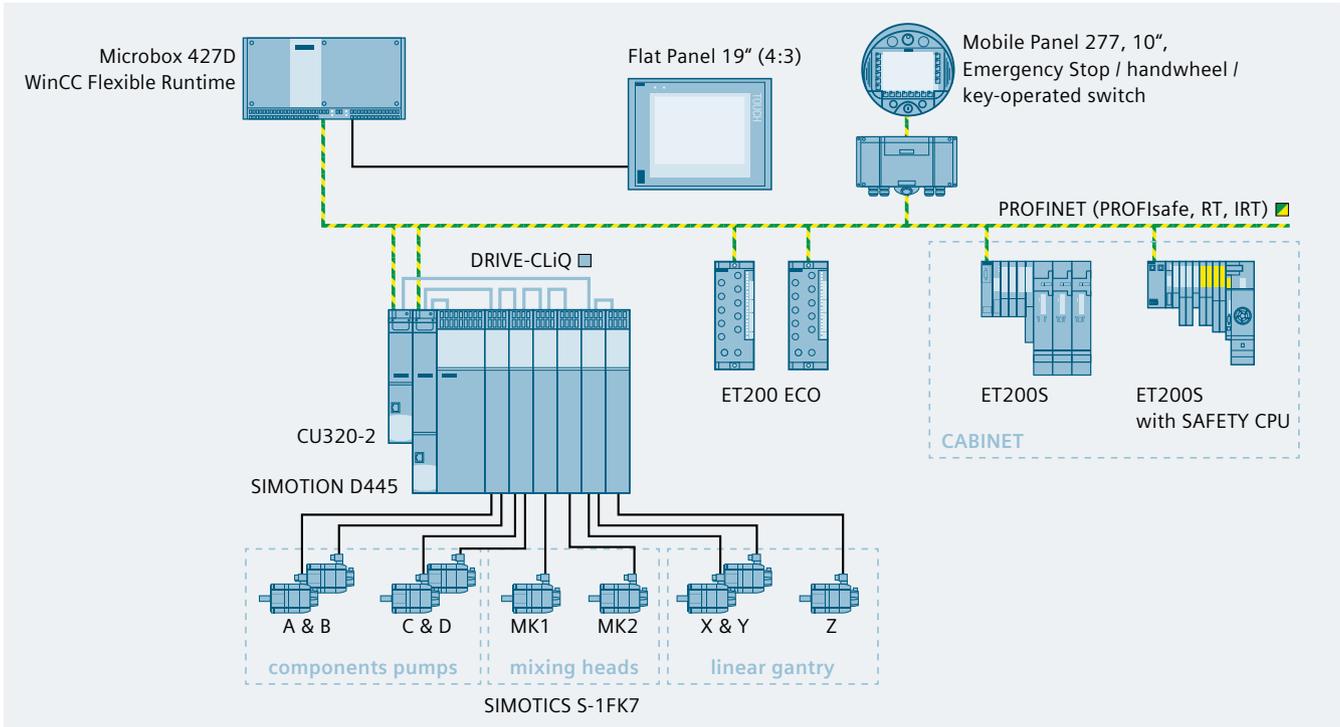
The automation concept developed together with Siemens relies on the SIMOTION D445 motion control system at its core for guiding the movements of the linear robot and for controlling all process plants such as mixers, pumps, mixing heads, and so on. A failsafe SIMATIC ET200S control system with the IM151-8 PN F-CPU interface module protects man and machinery. Additionally, there is a SIMATIC Microbox PC to visualize the sequences on a 19" SIMATIC flat panel touch-

screen at the main control panel, and a portable SIMATIC Mobile Panel 277 with a 10" display for setting up traverse programs at the machine (teach-in).

Cost-efficient design of customized plant versions

The robot axes, mixers, and dosing pumps for the product components are driven by SIMOTICS S-1FK7 servo motors to create a continuous and integrated control and drive system. Remote diagnostics are also possible right up to the drive level. A compelling argument for using SIMOTION 445 in the design of the modular SINAMICS S120 converter system was the option of adding single- or dual-axis motor modules as required.

This means that customized plant versions can be set up cost-efficiently, either without robots, with servo motor modules for two or more handling axis and with two to four additional components. SIMOTION D445 coordinates both the axis movements and all switching operations at the mixing head via Profinet with a synchronized control cycle of 2 ms. Even at feed rates of up to 30 m/min, extremely constant and exactly reproducible positioning movements with a precision of up to ± 0.1 mm are guaranteed. The acceleration of up to 10 m/s² is also important, especially for smaller radii; determining the feed rate that must be maintained at a constant level over the entire path. Both these factors are important in ensuring even application of the sealing compound, both



in terms of width and height, and good visual quality of the sealing bead, especially at the joints. Rapid traverse rates of up to nearly 60 m/min help minimize idle time when switching between machining positions.

HMI with G-code editor

To protect both personnel and machinery – especially during the teach-in with the SIMATIC Mobile Panel close to component and robot – traverse speeds are constantly monitored and kept at a specified value by the SLS (Safely Limit Speed) safety function in the drive system. If the permissible values are exceeded, or if other safety breaches occur in automatic mode, the distributed F-CPU switches off the axes and units in a controlled manner.

Siemens has developed a high-performance G-code interpreter for SIMOTION to retain the familiar operator control. The software interprets the traverse programs for execution in the motion controller. The operator interface is a customized human-machine interface (HMI) with a G-code editor under SIMATIC WinCC flexible runtime. This means that individual traverse programs can be taught, edited, and managed at the machine. Basic CNC knowledge is sufficient to operate the plant after only a short time.

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To secure plants, systems and machines as well as networks against cyber attacks, a holistic industrial security concept must be implemented (and continuously updated) corresponding to current state-of-the-art technology. Products and solutions from Siemens are just one component of such a concept. You can find additional information about industrial security at siemens.com/industrialsecurity

Specialists at the Siemens Application Centers in Vienna and Erlangen helped port the software, and the series-ready DM 403 LR-HD (High Dynamic) pilot plant was built in an extremely short time. "Our preferred SIMOTION programming using Structured Text high-level language helped us do this quickly," stresses Christian Schwabl, technical manager at Sonderhoff Engineering, "as we used existing software libraries and were therefore able to considerably shorten the development time." Moreover, according to the Sonderhoff manager, the Siemens solution greatly increased the options of applicable third-party hardware and software components.

Highlights

- Facilitated integration in existing manufacturing structures due to integrated automation
- Full freedom of movement thanks to articulated robot
- Precise, constant and exactly reproducing traversing movement due to SIMOTION D445
- Visualization of processes by the SIMATIC Microbox PC
- Integrated diagnosis also from a distance

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