

# SONDERHOFF 3E FLEX

The configurable dosing cell with optional shuttle table for the processing and dispensing of 2K polyurethane or silicone systems



# The new SONDERHOFF 3E FLEX with DM 50x technology

**Configurable dosing cell with the highest process stability for automated sealing, bonding, and potting of 2K polyurethane or silicone systems**

The configurable dosing cell SONDERHOFF 3E FLEX can be flexibly adapted to your production requirements.

With the 3E FLEX, you can choose whether you want to process and dispense polyurethane- or silicone-based 2K material systems with asymmetrical or symmetrical mixing ratios.

All system components are installed on a chassis, which considerably simplifies transport and commissioning: Place, plug & work!

The MK 800 PLUS or MK 825 PLUS dynamic precision mixing heads available for the 3E FLEX are guided by the linear robot of the dosing cell in a maximum travel range of 2,500 x 1,250 x 300 mm (x/y/z).

The robot-controlled mixing head ensures repeatable and fully automatic formed-in-place (FIP) material application to the component.

If required, the optional hand-held scanner can be used to select the dispensing and CNC program for the component to be processed.

The 2K material system is mixed dynamically and homogeneously in the mixing head and precisely dispensed in a defined mixing ratio – a prerequisite for high quality.

## **Optimized process evaluation and control**

Thanks to the new MK 800 PLUS mixing head technology used in the SONDERHOFF 3E FLEX dosing cell, the machine operator now has access to a comprehensive database on the entire FIPFG application process. It also enables the preventive maintenance of wearing parts.

The automatic logging of all system, material, and process data ensures the transparency of the production sequence at any time.

To ensure continuously high machine availability, various technical service concepts are available. The fundamental idea here is preventive and scheduled maintenance.







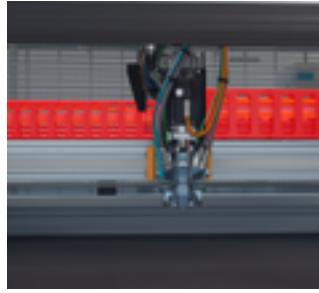


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### Mixing head MK 825 PLUS

MK 825 PLUS precision mixing head with high-pressure water rinsing

**PAGE 10**



2

### Linear robot

The 3-axis linear robot ensures repeatable guidance of the mixing head over the component being processed.

**PAGE 8**



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### Control cabinet

The control electronics, servo, safety engineering, and industrial PC are installed in an air-conditioned switch cabinet.

**PAGE 16**



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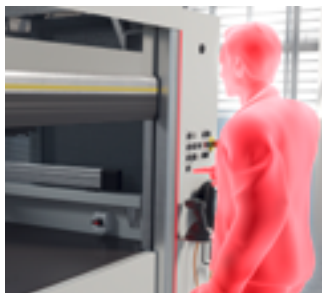
### Operation & programming via the Sonderhoff user interface

The multi-functional MP 2 Mobile Panel with touchscreen (10.1" WXGA TFT) for programming and operating the dosing machine.

**PAGE 18**

## Overview of SONDERHOFF 3E FLEX dosing





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### High-speed door

Automatic high-speed door enables CE conformity of the dosing system. Opens and closes at the touch of a button to remove the components after the dispensing process.

**PAGE 9**



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### Dosing components and material containers

At the front left side are e.g. the precision gear pump, the high-pressure water unit for mixing head rinsing, and the material pressure tank for the A and B components.

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### Filling shot and rinse water tanks

At the front right side is the opening for removing the filling shot and rinse water tanks.

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### Automation

Optionally, an attachable sliding/shuttle table or a transfer belt runs through the removable front and rear of the dosing cell, with variable working/table height in the dosing cell.

**PAGE 22-25**

## cell for 2K polyurethane or silicone systems



# The compact class for 2K polyurethane and silicone applications

Place, plug & work!

With the SONDERHOFF 3E FLEX, you can process and dispense polyurethane- or silicone-based 2K material systems with asymmetrical or symmetrical mixing ratios.

Once the 3E FLEX is removed from its transport container, you can get started straight away:

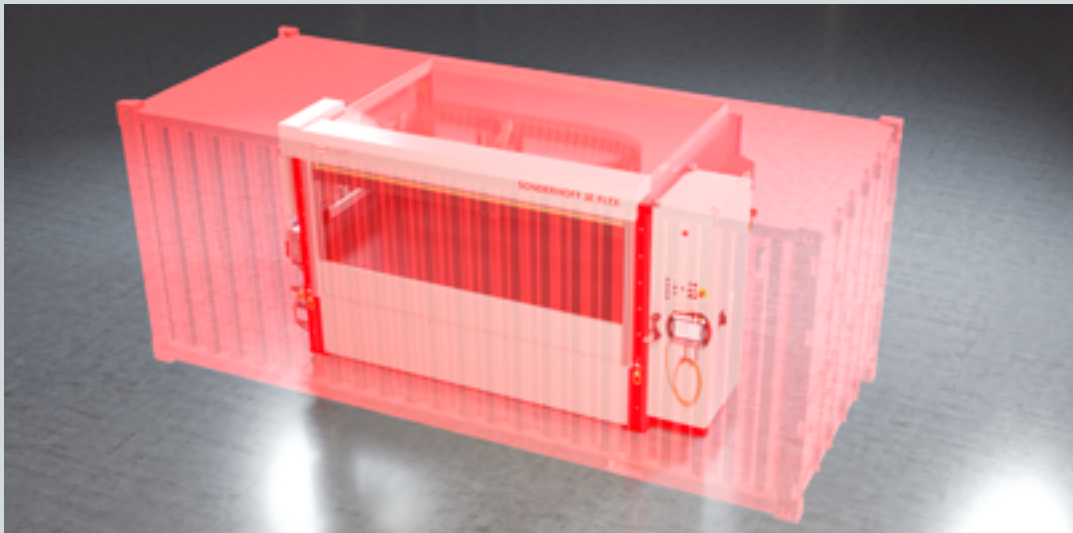
## **Place, plug & work!**

Only connect the power, water, and compressed air supplies and prepare and fill the two material components of the selected 2K polyurethane or silicone system into separate material pressure tanks. With the 3E FLEX, even small and medium quantities can be produced very economically.

The dosing machine is equipped with an automatic high-speed door. Accordingly, the machine is CE-compliant so that no additional safety fences or light barriers are required – increasing efficiency and saving space and costs.







The SONDERHOFF 3E FLEX dosing cell is designed in such a way that it can be delivered in a container, fully assembled as a single unit, and only needs to be set up and connected at its installation location.



The dosing cell is removed from the transport container, set up, and connected: place, plug & work. All features are arranged on a single chassis so that the dosing cell can be changed over very easily in production.



The dosing cell can be used flexibly as a production island with an installation footprint of approx. 9 square meters.

# SONDERHOFF 3E FLEX

Cellular mixing and dosing machine  
for processing and dispensing 2K PUR or silicone systems



The MK 800/825 PLUS precision mixing head is used in the SONDERHOFF 3E FLEX dosing cell for processing a 2K material system. In the mixing head, the material components are mixed dynamically and homogenously and then precisely dosed for application on the component. The MK 800 PLUS has a dosing capacity of 3.0 to 100 g/s and the MK 825 PLUS from 0.2 to 3.0 g/s, with an infinitely adjustable mixing ratio of 10 : 1 to 1 : 2 and a dosing accuracy of  $\pm 1\%$ .

The MK 800/825 PLUS is precisely guided within the travel range of 2,500 x 1,250 x 300 mm (x/y/z) by an integrated 3-axis linear robot.

The linear robot with the toothed-belt drive is characterized by its good stiffness. This allows the mixing head to be guided over the component being processed with very high repeatability.



Standard equipment: Precision mixing head MK 800/825 PLUS for 2 components, with high-pressure water rinsing.



## Operating the dosing machine 3E FLEX

The machine operator places one or more parts on the prepared workpiece fixtures within the working area of the dosing cell. The operator then presses a button to close the high-speed door so that the fully automatic material application to the part can start. For this purpose, the CNC-controlled MK 800 PLUS or MK 825 PLUS precision mixing head moves over the part contour to apply the material.



Multi-functional MP 2 mobile panel with integrated touchscreen



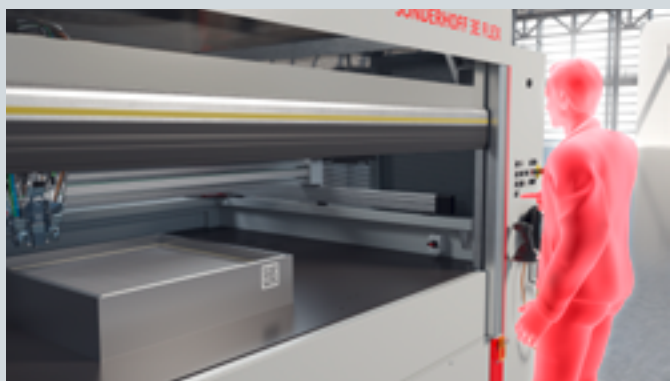
Hand-held scanner for selecting the CNC and dispensing program



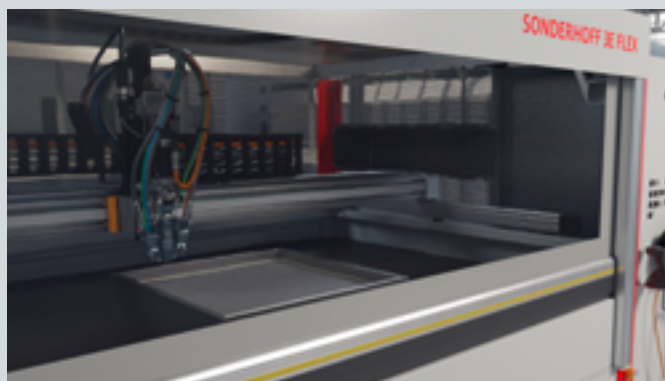
Switch for "mixing head maintenance position" preselection



Operating mode control panel with warning lights, key switch for preselection of the operating mode, operating keys for high-speed door, and EMERGENCY STOP with proven Sonderhoff SAFETY concept.



To remove one or more parts after dispensing, the high-speed door opens automatically or the operator opens it by pressing a button.



The high-speed door in closed state.

# The MK 800 and 825 PLUS

## 2-component mixing head with high-pressure water rinsing

### DESCRIPTION OF THE MK 800 AND 825 PLUS

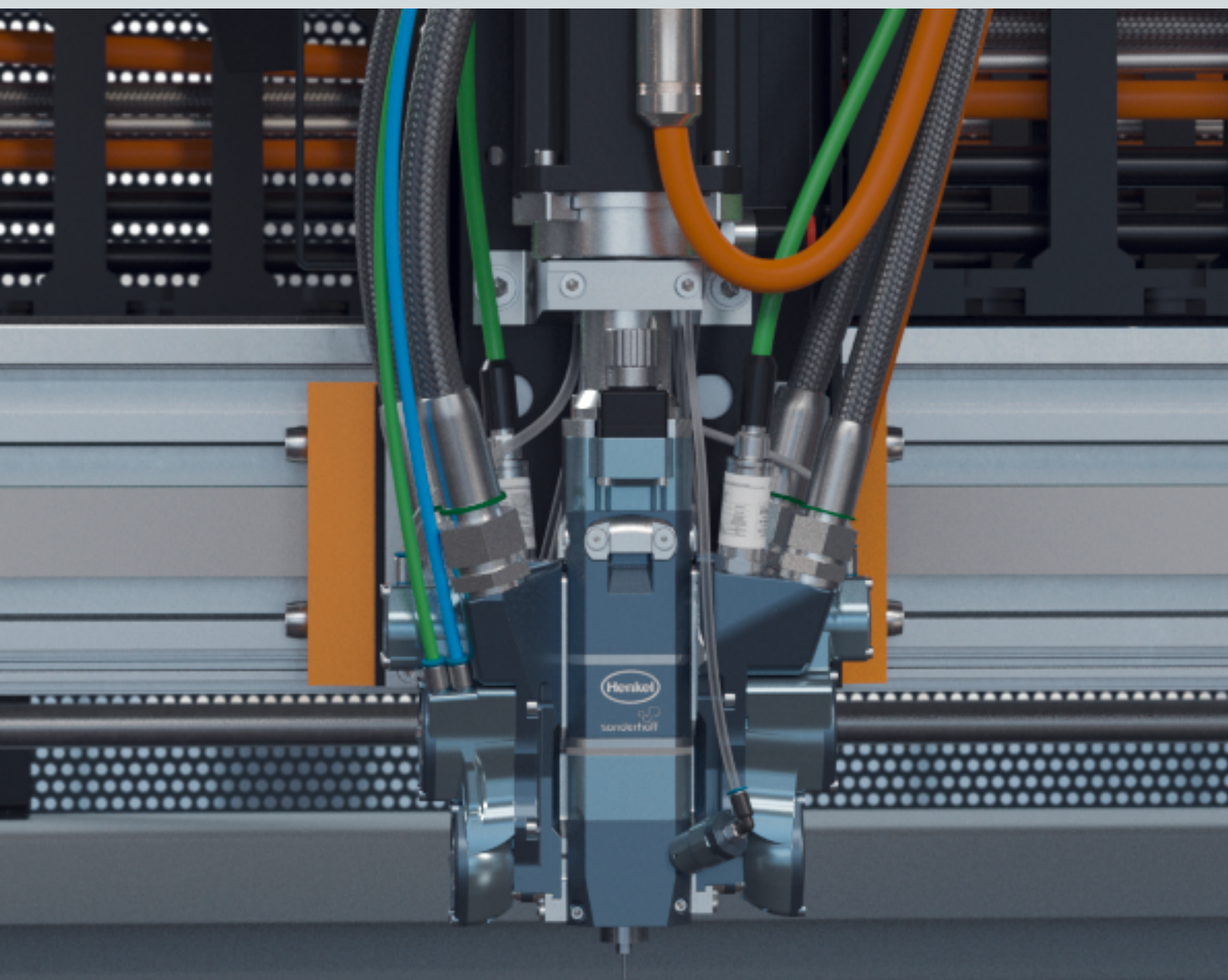
- Sensor-controlled 2-component mixing head with high-pressure water rinsing and dynamic mixing for liquid to highly viscous polymeric reaction materials for foam gasketing, bonding, and potting processes
- High-pressure water rinsing for ecological cleaning of the mixing system
- Alternative: Rinsing with A component
- Servopneumatically and hydromechanically controlled dosing valves for precise dosing
- Weight-reduced construction of a modular design, blue-gray anodized
- Size-optimized, functional V-shaped design to increase the degrees of freedom
- Robust and maintenance-free design made of high-strength aluminum alloy and chrome steel
- Direct stack injection of the components
- Electronically adjustable stirrer speed
- Special stirrer design enables gentle material mixing
- Blowing air needle valve for drying the mixing system
- Low-drip, low-maintenance nozzle shut-off system STOP-DROP DVS 3
- Simple stroke adjustment by means of an adjusting wheel
- Material pressure measurement on the dosing valve
- Mixing chamber temperature sensor
- Mixing ratio infinitely variable from 1 : 100 to 100 : 1
- Dosing capacity of the MK 800 PLUS: 3.0 to 100 g/s
- Dosing capacity of the MK 825 PLUS: 0.2 to 3.0 g/s





TECHNICAL DATA*	MK 800 PLUS	MK 825 PLUS
Dimensions (H x W x D) 2K mixing head	248 x 204 x 151 mm	248 x 204 x 151 mm
Dimensions (H x W x D) 3K mixing head	248 x 204 x 202 mm	248 x 204 x 202 mm
Operating pressure	up to approx. 20 bar	up to approx. 20 bar
Discharge rate	3.0 to 100 g/s	0.2 to 3.0 g/s
Dispense Accuracy	±1 %	±1 %
Mixing head weight for 2 components	approx. 5.5 kg	approx. 5.5 kg
Mixing head weight for 3 components	approx. 6.7 kg	approx. 6.7 kg
Mixing ratio	from 100 : 1 to 1 : 100 continuously adjustable	
Selectable mixer speed	continuously adjustable from 1 – 6,000 rpm	
Viscosity processing range	Material component A: 1,000 – 100,000 mPas (*) Material component B: 200 – 1,000 mPas (*)	

\* Depending on the mixing ratios, material viscosities, and the selection of pumps, hoses, and mixing elements.



# Dosing machine components and material containers

## Top precision and user-friendly maintenance

In the SONDERHOFF 3E FLEX dosing cell, the dosing machine components are mounted on the left of the front of the cell. This is where the precision gear pumps, the compressed air connection and dryer, the maintenance unit, the optional Peltier device for the mixing head cooling system, and the high-pressure water unit for ecological mixing head rinsing are located, amongst other things.

The double-walled material pressure tanks in the optimized sizes, either for the asymmetrical mixing ratios of the A and B components of the 2K polyurethane systems or for the symmetrical mixing ratios of the 2K silicone systems, are also mounted on the cell chassis on the left-hand front side. The material pressure tanks of the 3E FLEX can be flexibly configured as required, either with 24 or 44 liters for both material components or with a combination of 24 liters for one component and 44 liters for the other.

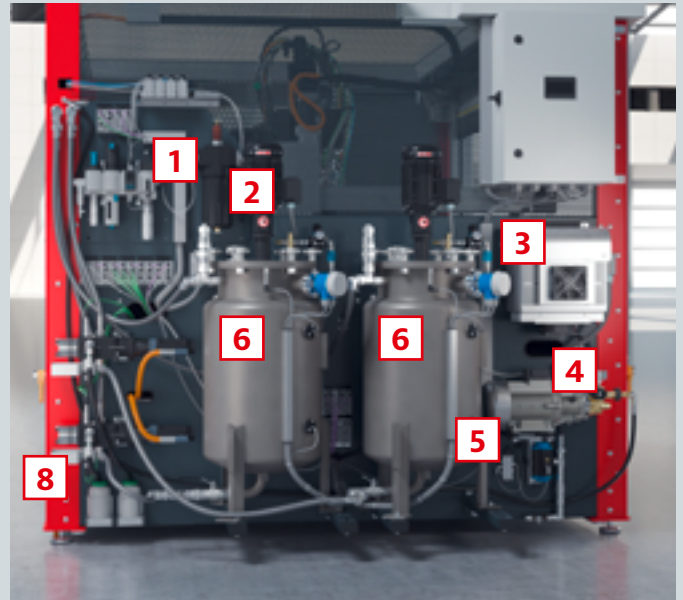
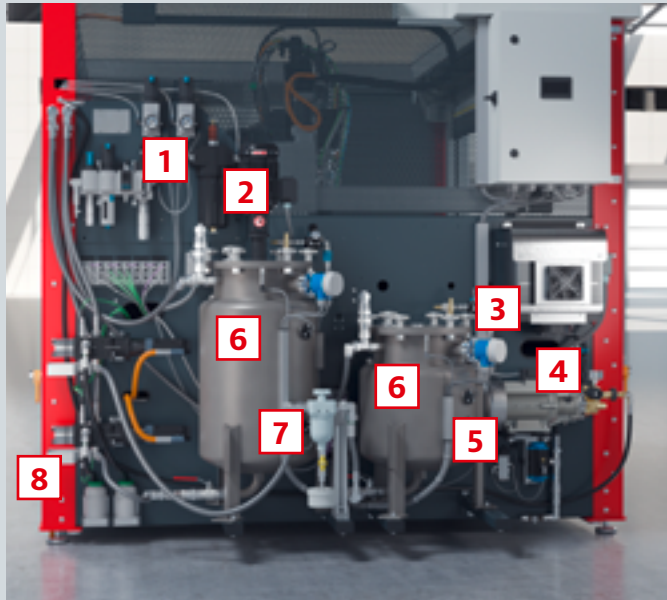
### MATERIAL PREPARATION FOR THE 3E FLEX

- Material pressure vessel with fill-level sensors, safety pressure valve (TÜV type-tested), overfilling protection and shut-off ball valve, with compressed air fittings and compressed air reducing valves for pre-pressure regulation of the vessel pressures
- 24 l or 44 l material pressure tank, double-walled, for both A and B material components
- Wire mesh filter cartridges
- For 2K PUR systems: Plate gap filter for the B component
- Three-phase agitator running at 99 rpm for tank A
- Automatic air loading
- Optional: Material supply through refilling stations for tanks from 20 to 1,000 liters. In that case, there is an overfilling protection mechanism on the pressure tanks.
- Precision gear pumps for PUR systems: Delivery rate 0.75 ccm/rev (A component) and 0.3 ccm/rev (B component)  
Precision gear pumps for SIL systems: 0.75 ccm/rev delivery rate of the A and B components of the 2K silicone systems
- Hose package for PUR systems: A component: Fabric-reinforced polyamide high-pressure hose, B component: Steel-reinforced Teflon high-pressure hose, recirculation hose package  
Hose package for SIL systems: Steel-coated PTFE high-pressure hoses for the A and B components with VA fittings made of stainless steel, recirculation hose package



## for 2K PUR systems

## for 2K SIL systems



Compressed air connection, dryer and maintenance unit



Agitator for homogenization of the A component



Overfilling protection for the use of an optional refilling station



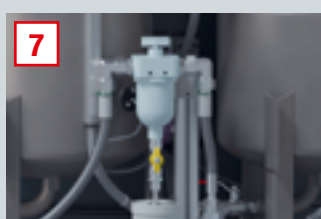
High-pressure water unit for effective and ecological mixing head rinsing



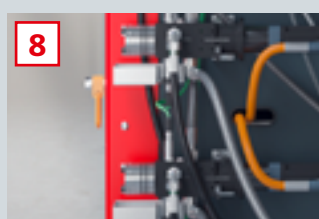
Capacitive sensors for filling level regulation



Material pressure tanks with optimized dimensions for asymmetrical (PUR systems) or symmetrical (SIL systems) mixing ratios



For 2K PU systems: Plate gap filter for the B component



Precision gear pumps for different flow rates by PUR or SIL systems

## Air loading, temperature control and material evacuation



The **air loading** in the material pressure tank helps to create the desired physical properties and cell structure of the foam. The density can be influenced by adding compressed air to the material component.



**Optional: Precision temperature control unit** for heating or cooling the material in the pressure tank



## Air loading in the thin-film process



Compressed air cushion acts on material surface



Material is continuously conveyed from the bottom of the pressure tank through a riser pipe and fed back onto the conical surface as a thin film. Due to the air loading, the density changes and the material becomes lighter in color.



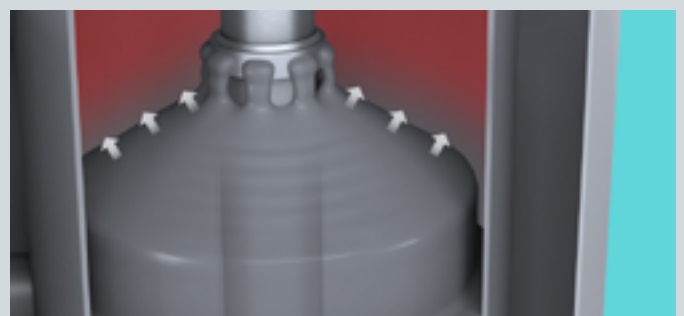
## Material evacuation in the thin-film process



Vacuum acts on the material surface



Material is continuously conveyed from the bottom of the pressure tank through a riser pipe and fed back onto the conical surface as a thin film. This process continuously reduces and completely dissolves air bubbles in the material.



# Control cabinet

## The expandable future-proof control center

The switch cabinet is the expandable future-proof control center of the SONDERHOFF 3E dosing cell with DM 50x technology. It includes the electrical distribution as well as the control and safety technology for the dosing machine and the CNC control of the 3-axis linear robot installed in the cell.

With the programmable safety logic, adjustments to the safety function are now simple and quick to implement. The safety functions of the 3-axis linear robot's servo axes are fully integrated into the safety logic and can therefore also respond very quickly to safety events. The digital EnDat encoders of the servo motors ensure very precise path behavior of the servo axes when moving the mixing head. The power supply of the servo controllers is provided by a central module, which also handles the communication of the control system.

### CONTROL CONCEPT

- Servo technology with integrated safety logic
- Safe Limited Speed / Safety Modules
- Modular B & R "IPC control system" with Powerlink
- VPN router for remote maintenance (remote collaboration)
- Cooling device for switch cabinet temperature control
- Clock timer with automatic switch-on
- EMERGENCY STOP switch-off with a tried-and-tested safety concept, realtime-capable bus system
- Switch cabinet mounted on the common dosing cell chassis
- Data backup by means of USB stick or via LAN
- Data storage for operating system and system programs
- Safety deactivation on the lifting door



VPN router for remote maintenance  
(remote collaboration)



Safe Limited Speed / Safety Modules



Modular B & R "IPC control system" with  
Powerlink



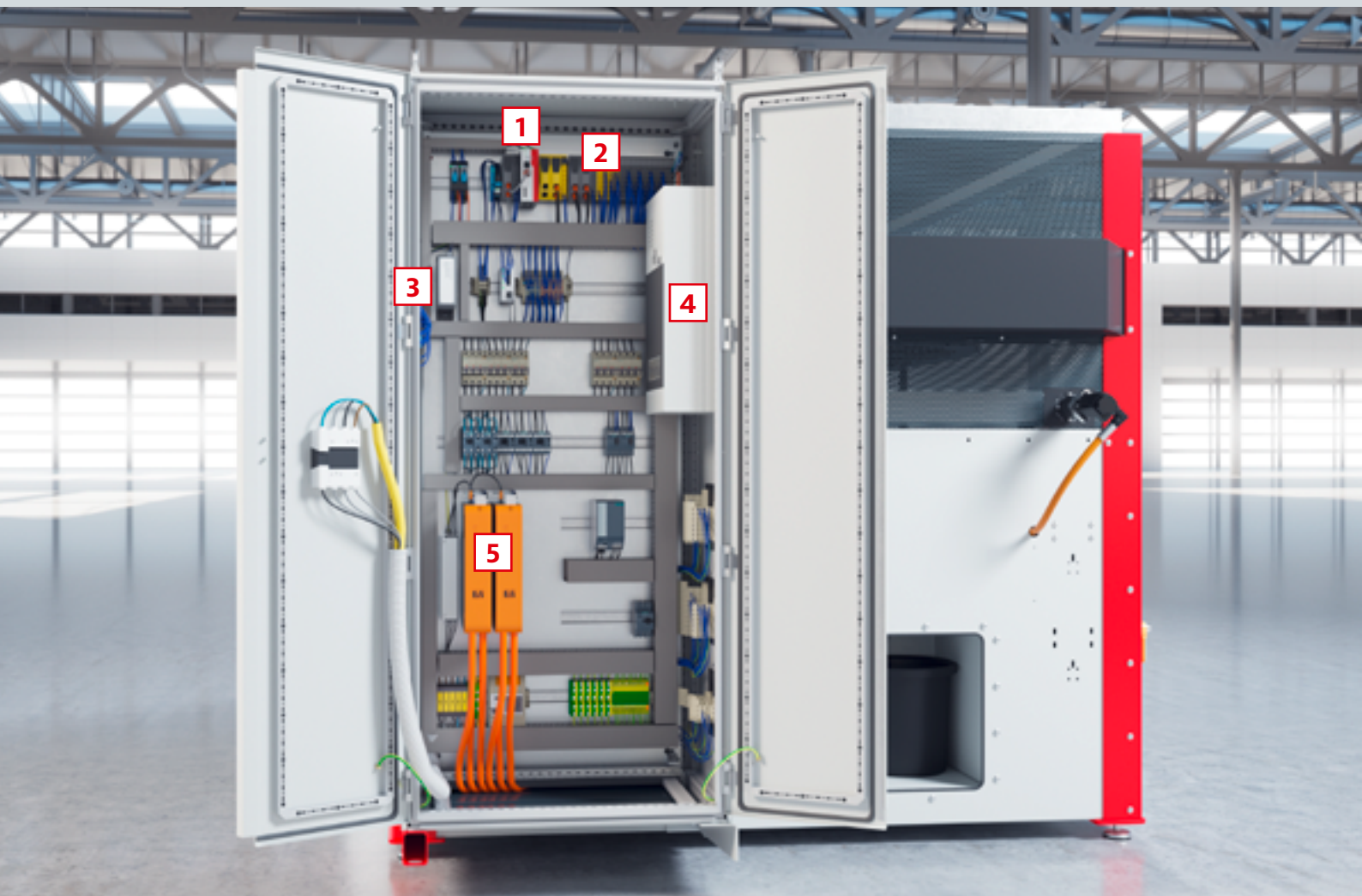
Cooling device for switch cabinet  
temperature control



Servo technology with integrated safety  
logic



The front side (right) of the SONDERHOFF 3E FLEX dosing cell shows the switch cabinet attached to the cell chassis for controlling the dosing machine, to the left of which you see the holder for the MP 2 mobile panel, and to the right the opening for removing the filling shot and rinse water containers





# Multi-functional MP 2 mobile panel

## Convenient operation and working



MP 2 mobile panel and above it the operating mode control panel, e.g. key switch for operating mode preselection with selection for the operating modes of Setup / Stand-by / Manual / Automatic, warning lights and EMERGENCY STOP, part of the tried-and-tested SONDERHOFF SAFETY concept.

The SONDERHOFF 3E FLEX dosing cell is designed to enable the operator to perform a wide variety of tasks easily and safely. The system is operated via the easy-to-use, multi-functional Sonderhoff MP 2 mobile panel with integrated 10.1" touchscreen. This makes the contour programming of components significantly simpler. The MP 2 mobile panel continuously provides information about the system performance and the process data recorded.

This ensures traceability of the preceding production process at all times. In addition, the sensor system installed in the dosing machine continuously supplies measurement data on the factors influencing the production process, which can be prognostically evaluated and proactively readjusted.

### EQUIPMENT FEATURES

- MP 2 multi-function mobile panel with integrated touchscreen (10.1" WXGA TFT)
- Intuitive operation with programmable keys, function keys and touch keys
- Display language options for DE, EN, ESP, IT, F & CHIN, further languages upon request
- Modular IPC control system in the switch cabinet with Powerlink
- Selection for Setup / Stand-by / Manual / Automatic operating mode
- Recipe management
- Operator password protection selectable on 4 levels
- Programmable pot life monitoring and dosing quantity preselection, as well as automatic rinsing and material conditioning (air loading, stirring, etc.)
- Automatic and spontaneously available flow rate adjustment through pressure regulation
- Preparation of automatic refilling
- Component pressure monitoring, digital component pressure display

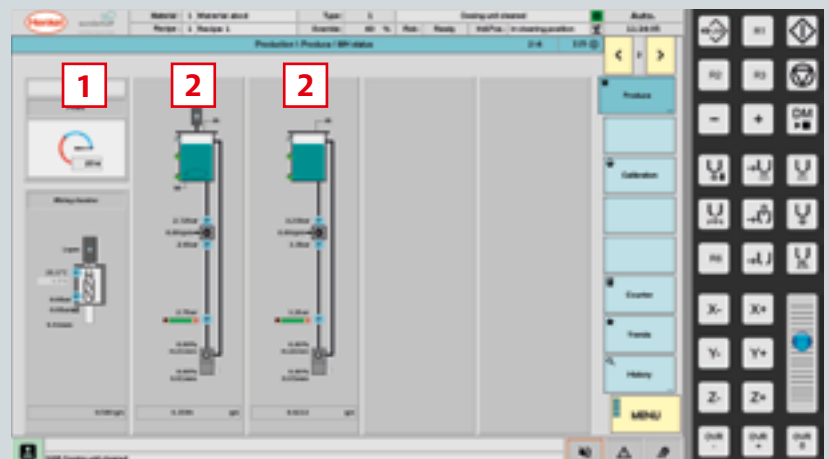
# Visualization of the user interfaces

## Intuitive system operation and simple evaluation of machine parameters

The user interface of the MP 2 mobile panel provides continuous information on the performance status of the dosing cell and the process status of the processing according to the predefined dispensing program. Due to the high level of detail of the display, the machine operator can always take corrective action and adjust the process parameters of the system if necessary. The use of universally comprehensible symbols on the operating keys simplifies operation. Clear menu layouts, the use of colored graphics, and the clear structuring of different functions in the operating menu enable intuitive operation and programming of the dosing system.

### Overview of the menu structure:

- 1** **First column:** Reactivity of the material (pot life in seconds) for active material components, plus detailed information on the mixing chamber and agitator
- 2** **Columns 2-3:** Overview of the two material components, display of the filling level in the pressure tank, line pressure upstream of the pump, speed of the pump, line pressure downstream of the pump, component pressure at the valve, recirculation control value in %, recirculation valve offset in mm, recirculation status, dosing control value in %, dosing valve offset in mm, current component dosing rate (g/s)

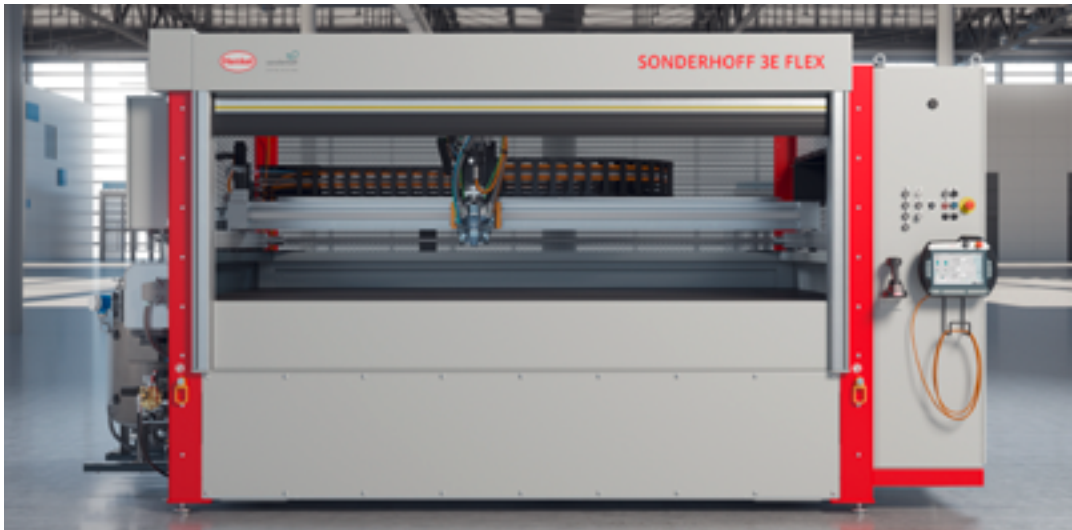


Shows the two material components, the tank level, the pump speed, the line pressure downstream of the pump, the mixing head temperature, the dispensing time (seconds), the discharge line (g/s) and the reactivity of the material (pot life in seconds)

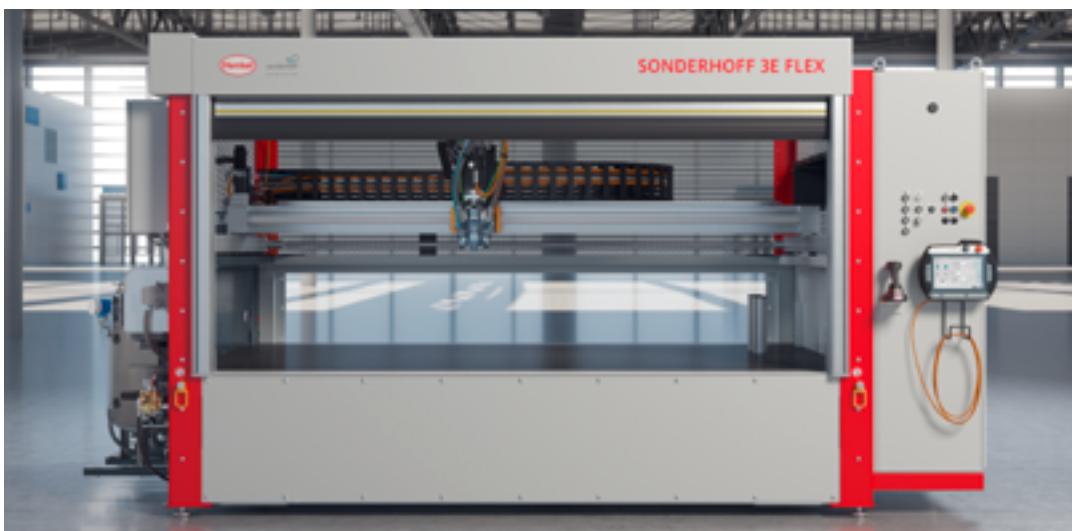


## Automation and configurations of the 3E FLEX dosing cell

Another advantage for greater flexibility is the variable table height in the dosing cell, which allows component heights of 300 to 600 mm. The standard working/table height is 1,000 mm and can be reduced to 700 mm integrate, for instance, production automation. For this purpose, the cover plate can be removed from the front and rear of the dosing cell so that, if required, a transfer belt running through the cell can be installed for loading and unloading components.



Front of the 3E FLEX with upper, removable cover plate. Tabletop height 1,000 mm.

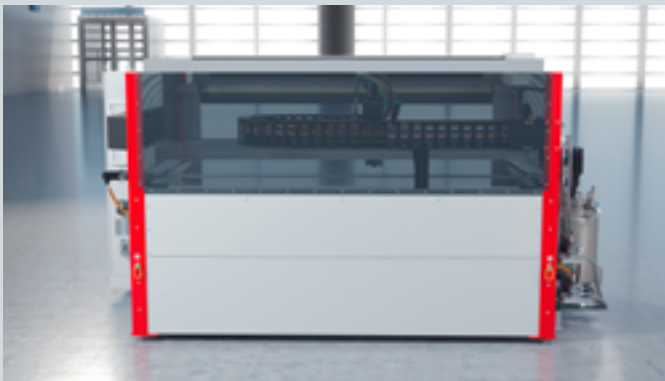


Front of the 3E FLEX: The front and rear cover plates have been removed to integrate an automation system. Tabletop height 700 mm.

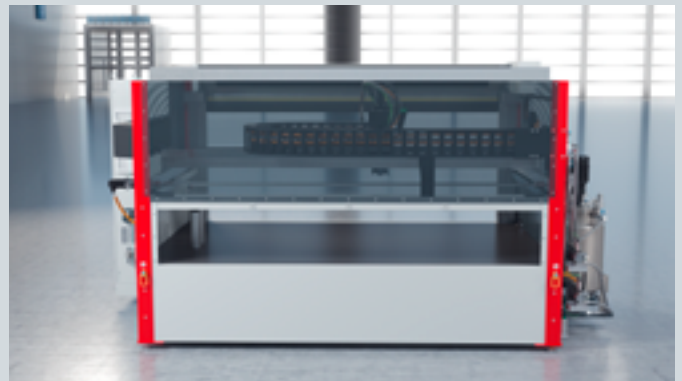


## Maximum travel range and component size

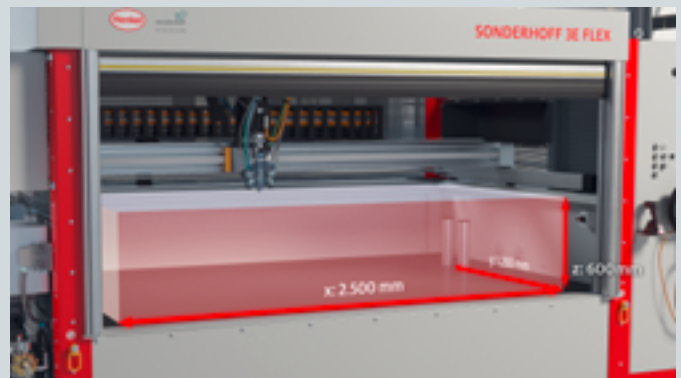
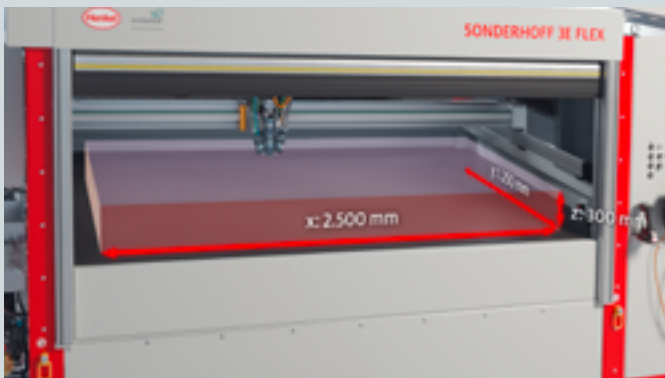
The MK 800/825 PLUS is precisely guided within the travel range of 2,500 x 1,250 x 300 mm (x/y/z) by an integrated 3-axis linear robot.



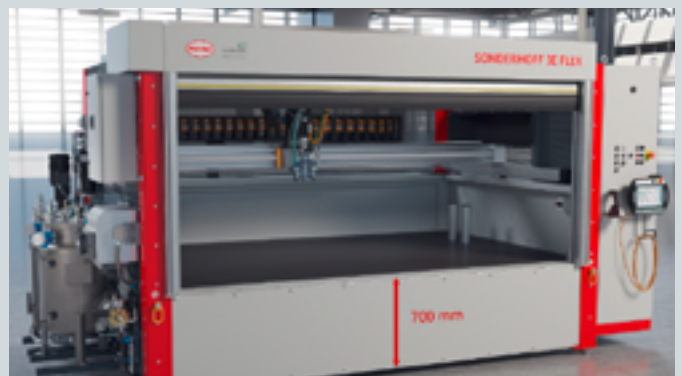
Rear of the 3E FLEX with mounted cover plate.



The rear cover plate can be removed to integrate an automation system.



The standard component height to be processed with the 3E FLEX can be extended from 300 mm to 600 mm.



The standard height of the work table is 1,000 mm. With the 3E FLEX, it can be adjusted down to 700 mm.

## SONDERHOFF 3E FLEX with optional shuttle table

Supply and removal of parts via alternating shuttle mode

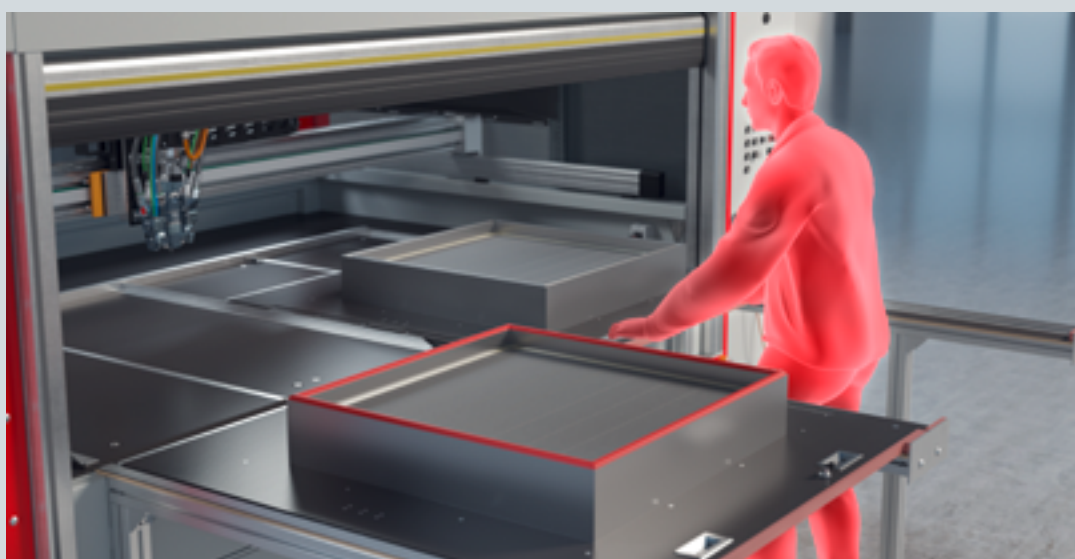
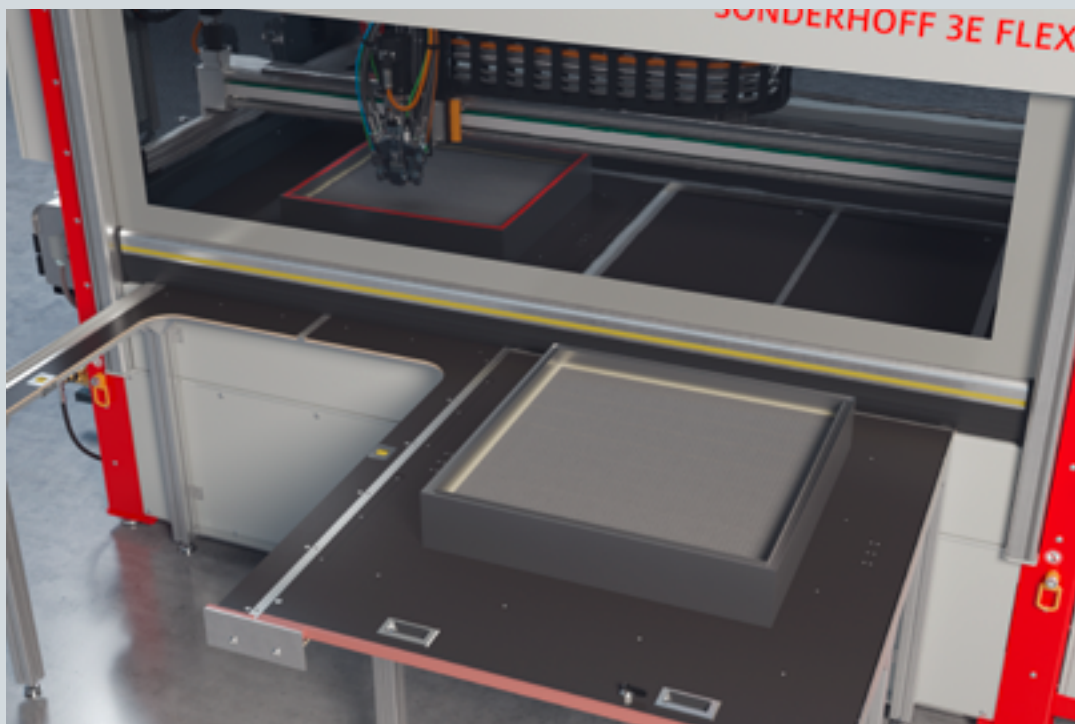


The parts can also optionally be loaded via an attachable sliding/shuttle table by manually moving the mounting plates.

With this solution, the operator loads the two mounting plates with the parts in an alternating sequence. The components are positioned in workpiece fixtures, which are mounted on the mounting plates made of coated multiplex.

## Alternating shuttle mode

The machine operator positions the parts on the prepared workpiece fixtures, while in the dosing cell, with the high-speed door closed, the CNC-controlled mixing head applies sealing material to the parts on the other sliding table.



After the dosed application, the machine operator opens the high-speed door and pulls the sliding table with the finished parts out of the working area for removal.

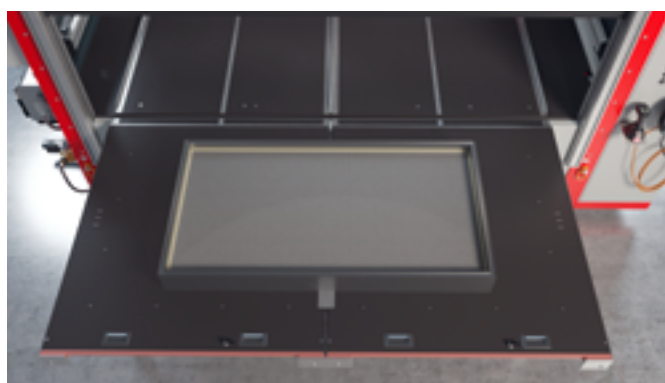


## SONDERHOFF 3E FLEX with optional shuttle table

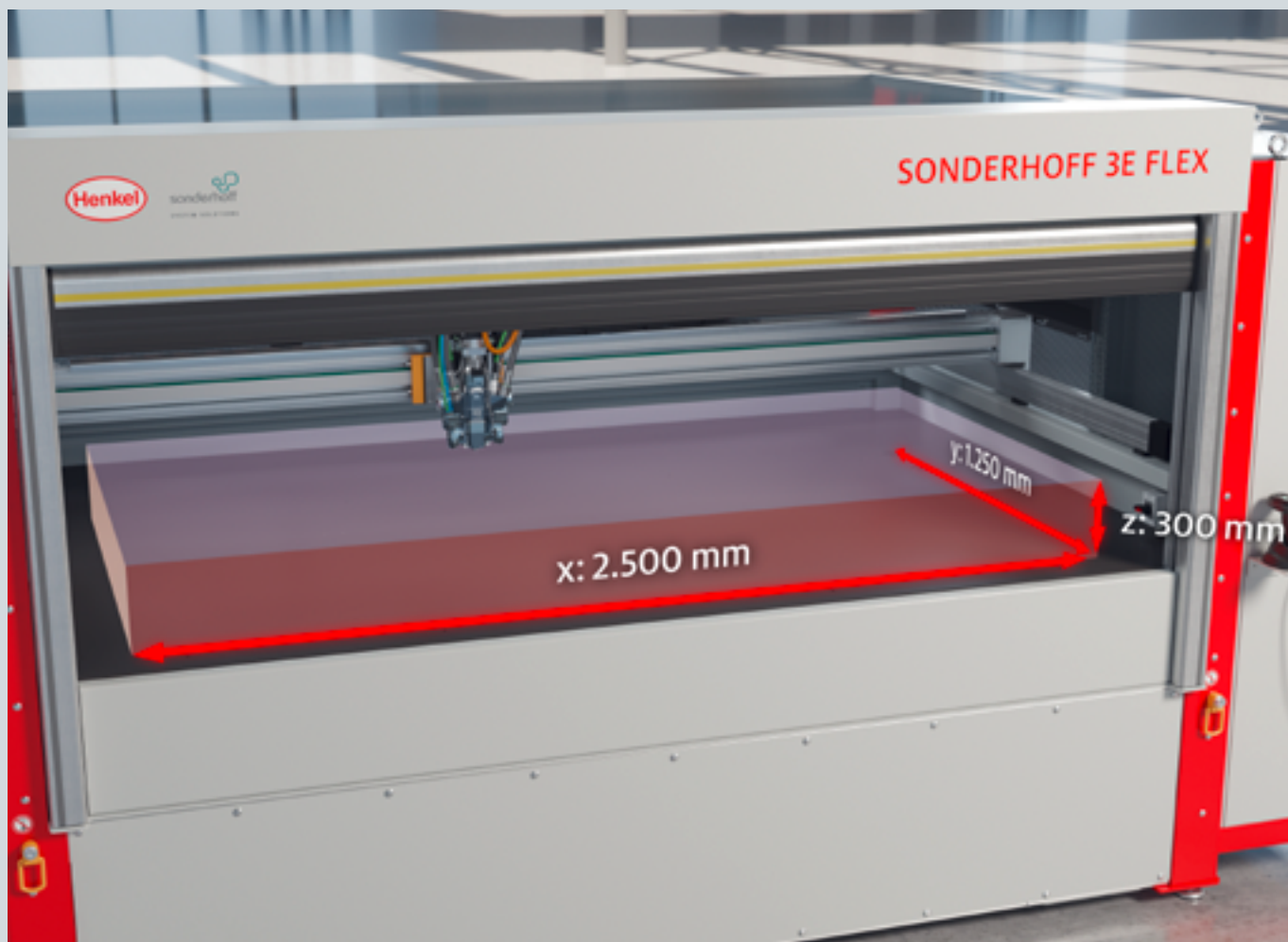
Sliding table with connected pick-up plates for oversized components



With all three 3E dosing cell variations, the two mounting plates can be connected to form a single large sliding table for material application on oversized parts.



The two mounting plates are connected by couplers so that one large sliding table can be formed.



To produce oversized parts with a maximum dimension of 2,500 x 1,250 x 300 mm (3E FLEX) the two sliding table plates are joined for one large mounting plate.

LINEAR ROBOT	
Max. travel speed	15 m/min
Max. acceleration	2 m/s <sup>2</sup>
Repetition Accuracy	+/- 1 mm
Travel range x/y/z	2,500 x 1,250 x 300 mm

# Automatic refilling stations

## Accurate refilling for a continuous supply of material

The 3E FLEX dosing cell has the option for a refilling station for automatic material supply. This ensures material-specific preparation, homogeneous consistency, and a continuous supply of materials to the component containers of the mixing and dosing system – without exposure to or contamination of the products to be filled. The BIG ELEVATOR and ELEVATOR refilling stations have an automatic lifting device for improved ease of operation and greater operational and system safety. Production interruptions are therefore a thing of the past.

The stations are controlled via the mixing and dosing system. Capacitive sensors monitor the filling level in the material containers. A choice of unregulated and regulated agitators with adjustable speed ranges and a programmable timer are available to ensure optimal homogenization of the reaction materials. All refilling stations are available with different stirring elements depending on the material. Existing production plants can be retrofitted.

### EQUIPMENT FEATURES

- Column with drum lid lift, or alternatively with pump holder (ELEVATOR models)
- The drum lid lifting device is moved pneumatically. (ELEVATOR models)
- Optional material conditioning using an electric geared agitator with agitator shaft and agitator blade
- Agitator programming with clock timer built into the switch cabinet of the refilling station
- Pneumatic piston pumps or diaphragm pumps, adaptable
- Hose package for connection to the mixing and dosing system
- Drip tray with grating (option)
- Pump and hose set for larger application capacities (optional)



## SPECIFICATIONS

<b>Paint coating</b>	2C textured paint RAL 7035 (light gray) / RAL 3020 (red)	
<b>Piston pump ratio</b>	from 5 : 1 to 10 : 1 / from 10 : 1 to 55 : 1	
<b>Agitator speed</b>	With the unregulated version:	23 rpm at 0.18 kW
	With the regulated version:	20 – 150 rpm at 1.5 kW; alternatively: 30 – 300 rpm at 3.0 kW

## VARIANTS

<b>BIG ELEVATOR</b>	Automatic container refilling station with agitator (0.18 kW), unregulated, without pump; Automatic container refilling station with agitator (1.5 kW or 3 kW), regulated, without pump
<b>ELEVATOR</b>	Automatic drum refilling station with agitator (0.18 kW), unregulated, with piston pump; Automatic drum refilling station with agitator (1.5 or 3 kW), regulated, with piston pump
<b>SUPPLY TAP</b>	Automatic drum refilling station with piston or diaphragm pump



### BIG ELEVATOR

Automatic container refilling station with lifting device and optional regulated or unregulated agitator for liquid and thixotropic products (e.g. polyols)



### ELEVATOR

Automatic barrel refilling station with lifting device and optional regulated or unregulated agitator for liquid and thixotropic products (e.g. polyols)



### SUPPLY TAP

Automatic drum refilling station for low-viscosity products (e.g. isocyanates)

# SONDERHOFF 3E: Economic – Efficient – Ecological

Configurable dosing cell with the highest process stability for automated sealing, bonding and potting of 2K polyurethane or silicone systems

## TECHNICAL DATA 3E FLEX

### CONTROL CONCEPT

- MP 2 multi-function mobile panel with integrated touchscreen (10.1" WXGA TFT)
- Intuitive operation with programmable keys, function keys and touch keys
- Display language switching for German, English, French, Spanish, Italian, Chinese. Further languages on request.
- Modular B & R "IPC control system" with Powerlink in the switch cabinet
- EMERGENCY STOP switch-off with a tried-and-tested safety concept, realtime-capable bus system
- Safety deactivation on the lifting door
- Switch cabinet mounted on the joint dosing cell chassis, with air-conditioning unit for temperature control of the switch cabinet
- Selection for Setup / Stand-by / Manual / Automatic operating mode
- Strand identification
- VPN router, data connection for remote diagnostics and maintenance
- Recipe management
- Operator password protection selectable on 4 levels
- Programmable pot life monitoring and dosing quantity preselection, as well as automatic rinsing and material conditioning (air loading, stirring, etc.)
- Automatic and spontaneously available flow rate adjustment through pressure regulation
- Preparation of automatic refilling
- Component pressure monitoring, digital component pressure display
- Clock timer with automatic switch-on
- Data backup by means of USB stick or via LAN
- Data storage for operating system and system programs

### MATERIAL PROCESSING

- Mixing ratio: from 10 : 1 to 1 : 2, continuously adjustable
- Dosing capacity of the MK 800 PLUS: 3.0 to 100 g/s / Dosing capacity of the MK 825 PLUS: 0.2 to 3.0 g/s (\*)
- Selectable mixer speed: continuously adjustable from 1 – 4,500 rpm
- Pressure monitoring for material supply of the pump
- Viscosity processing range: A component: 1,000 – 100,000 mPas (\*); B component: 200 – 1,000 mPas (\*)

(\*) depending on the viscosity and mixing ratio / other application rates and viscosities on request

### PRECISION GEAR PUMPS

- For PUR systems: A component: 0.75 ccm/rev; B component: 0.3 ccm/rev.
- For SIL systems: 0.75 ccm/rev delivery rate of the A and B components of the 2K silicone systems

### HOSE PACKAGES

- For PUR systems: A component: fabric-reinforced polyamide high-pressure hose, B component: steel-reinforced Teflon high-pressure hose
- For SIL systems: steel-coated PTFE high-pressure hoses for the A and B components with VA fittings made of stainless steel, recirculation hose package

### MIXING HEAD

- SONDERHOFF MK 800 and 825 PLUS with recirculation and high-pressure water or component rinsing

### MATERIAL PREPARATION

- Material pressure tank with fill-level sensors, safety pressure valve (TÜV type-tested), overfilling protection and shut-off ball valve, with compressed air fittings and compressed air reducing valves for pre-pressure regulation of the tank pressures
- 24 l or 44 l material pressure tank for A or B component, double-walled; Alternatives: for A and B component 24 l or 44 l each
- Wire mesh filter cartridges, with the 3E FLEX for 2K PU systems: plate gap filter for the B component
- Three-phase current agitator running at 99 rpm for tank A
- Automatic air loading
- Material supply through refilling stations for containers from 20 to 1,000 liters

### PNEUMATICS (OPTIONAL)

- Pneumatic system with filter pressure reducer, maintenance unit with pressure monitoring, and valve cluster for controlling the pneumatic consumers

### LINEAR ROBOT

- Max. travel speed 15 m/min
- Max. acceleration 2 m/s<sup>2</sup>
- Repeat accuracy:  $\pm 1$  mm
- Travel range x/y/z: 2,500 x 1,250 x 250 mm

### DRIVE TECHNOLOGY

- Pump drive power: 0.6 kW
- Mixing head drive power: 0.6 kW
- Pump drive speeds: 1 - 400 rpm
- Mixing head drive speeds: 1 - 6,000 rpm
- Speed-controlled servo gear motor with speed display and adjustment on the display

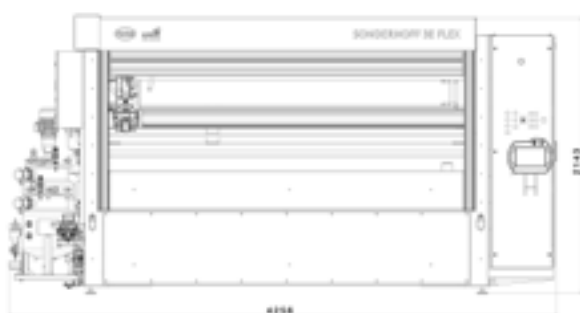
### CONNECTION VALUES

- Electrical system: design according to EN 60 204-1
- Power supply: 3 x 400 V, 50 Hz (voltage adjustment, 60 Hz version available at extra charge)
- Rated power: approx. 10 kVA
- $\emptyset$  consumption: approx. 4 kVA
- Compressed air connection value: approx. 150 l/min at 6 -7 bar
- Water connection value: approx. 13 l/min at at least 4 bar

### GENERAL

- Dimensions W/H/D approx. 4,217 x 2,065 x 2,130 mm
- Work surface made of coated multiplex board
- Chassis in a compact design, powder-coated
- Weight of the 3E FLEX dosing cell approx. 1,500 kg
- Compressed air dryer
- Rinsing and filling shot container
- Spare parts packages

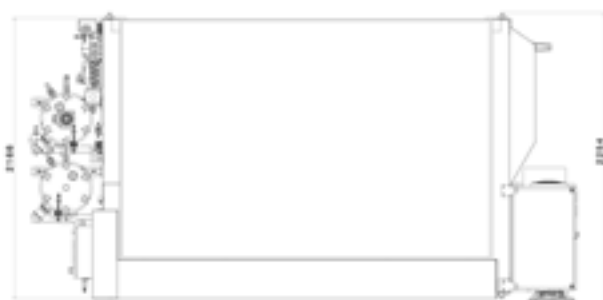
## Dimensions of the 3E FLEX dosing cell



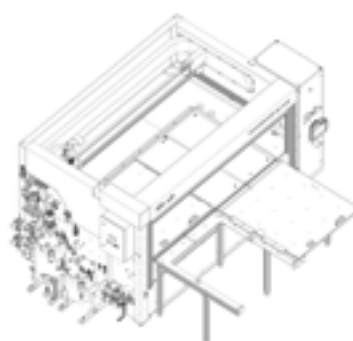
Front view



Side view



Top view





# Combined service package 3E FLEX for all-round service

Configurable dosing cell with the highest process stability for automated sealing, bonding, and potting of 2C polyurethane or silicone systems

The productivity of a machine is significantly determined by its reliable availability. This is why we ensure the intelligent minimization of error-related downtimes and maintenance-related production interruptions.

To this end, we can offer you various forms of maintenance and servicing for our dosing machines – from on-site maintenance to the preventive maintenance of machines at regular intervals, to the even more effective approach of predictive maintenance using sensor-based data collection, with subsequent analysis and evaluation.

Our service package is a further reliable pillar of our system solutions. It contains:

- a risk analysis
- pro-active inhouse service
- skilled on-site-service
- quick response online service (remote collaboration)
- spare parts supply

With this package, we support you in the reliable planning and execution of your production processes and predictive maintenance.

## **Inhouse service: Proactive service is the best protection against machine downtimes**

The Inhouse Service forms the basis of our after-sales services. Here, all services are provided that can be planned in advance through predictive maintenance and which ensure continuous machine operation. Key elements here are the risk analysis of your dosing machines during ongoing production and our associated consulting service for prospective production planning.

## **Online service: Distance no longer matters**

With the Remote Collaboration offer, we use audio, video, and machine data communication via a VPN connection for our services to support you directly and quickly in an emergency. This enables us, to discuss specific tasks with you and eliminate operating errors. This service can also be used for online training, which reduces the cost and time required for this.

## **On-site service: We will be happy to come to you!**

We can provide you with on-site support in the form of a wide range of services from our service technicians:

- Commissioning of machines
- Creation of complex dosing programs
- Machine inspection according to cost or with service contract
- Machine repairs
- Machine relocation for production site changes
- On-Site Training

## **Service contract and spare parts supply**

By concluding a service contract, you receive optimum support for your production – from regular checks of the optimum functionality of your dosing system, to a system inspection using original spare parts from our high-bay warehouse, to machine repair and rapid assistance in the event of damage.



Inhouse service



On-site service



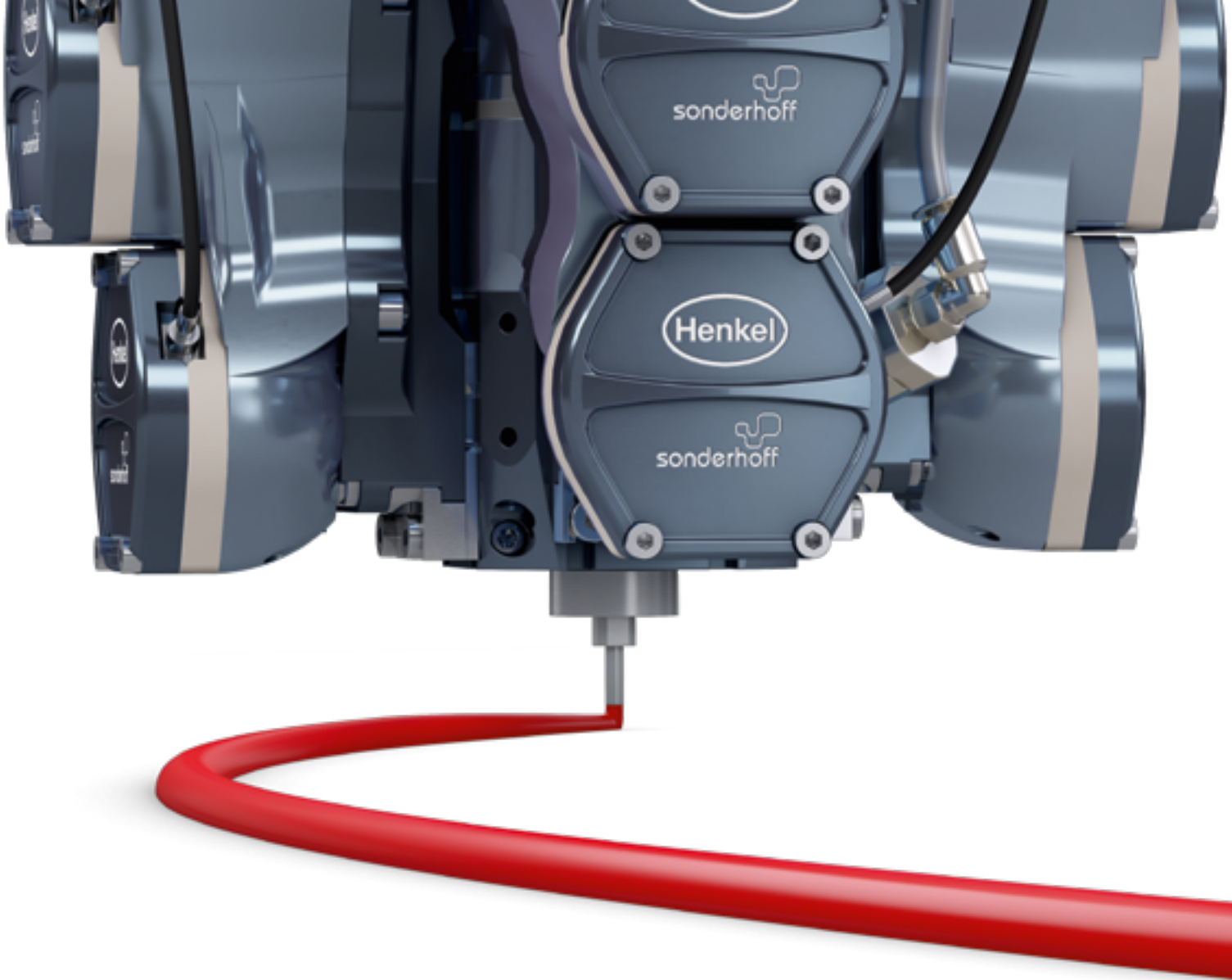
Online service



Service contract



Spare parts supply



This is why you should use FIP technology  
in your production process



#### Advantages of the Formed-In-Place technology

- Sealing standard in many industrial sectors
- Highly accurate material application controlled by contour robots
- Processing and full curing at room temperature
- Perfect coordination of the material system and dosing system
- Suitable for 2D and complex 3D part geometries
- More efficient use of materials compared to punched seals
- Cheaper compared to 2-C injection molding, as there are no tooling costs
- High degree of future viability, due to suitability for use in a wide variety of industries & applications





## Advantages of our mixing and dosing machines

- Combination of processes (bonding, foaming, caulking, potting)
- High flexibility of the dosing system
- Simple, intuitive operation
- Automatic material preparation incl. handling
- High dosing and repeat accuracy
- Short machine downtimes and cycle times
- Fine-cell foam structure due to dynamic mixing
- Reproducible foam quality
- Ecological high-pressure water rinsing
- Easy maintenance



## Advantages of our FIPFG foam gaskets

- More cost-effective than compact systems due to lower foam density
- Seamless seal / hardly visible coupling point
- Compensation of component tolerances
- Good resilience
- Multiple compression and release processes possible
- Broad range of properties / wide variety of recipes
- Individually adaptable recipes
- Good form fit to the component contour
- Resistant to moisture, dust, temperature & media
- Flame-retardant according to UL 94
- IP classes up to IP 68 or NEMA 4 to 6 and NEMA 12
- Special PU foam with low VOC emissions
- Very fast reacting PU foam (Fast-Cure)

## Perfectly coordinated solutions for material, machine and contract manufacturing all from one provider

With its Sonderhoff brand, Henkel has not only acquired many years of experience in the manufacture of tailor-made 2K sealing systems and mixing and dosing machines, it has also acquired expertise in application-specific material processing.

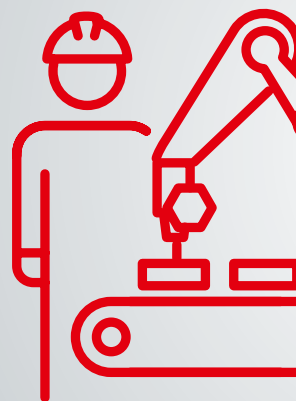
With the Sonderhoff portfolio, we offer all the advantages of a system provider from a single source and the solutions to meet your technical and commercial challenges.

We ensure efficient production processes in line with the requirements of fully automated series production and our service staff all over the world will gladly be at your disposal.

If you would like to take advantage of all the benefits for your production in a flexible, fast, uncomplicated manner and without having to make your own acquisition investments, we can provide expert sealing for your components at one of our contract manufacturing sites worldwide. There, the spectrum ranges from the sampling of prototypes and small batch series to production scale manufacturing.

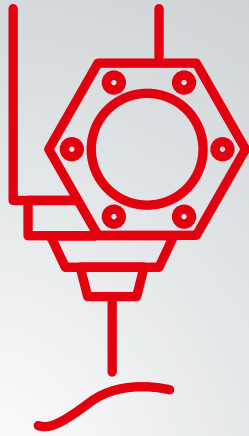
The choice is yours!

You can either decide in favor of our all-inclusive package, consisting of material, machine and contract manufacturing, supported by application advice, sampling and training. Or you can choose the individual solutions that suit you best. We combine our products and services from a single source in such a way that you receive the optimum solution for your requirements profile.



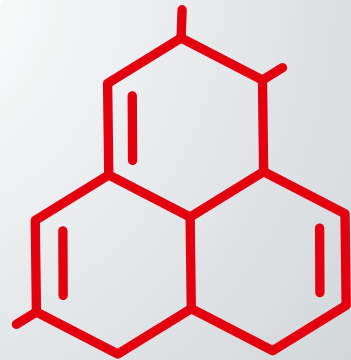
**MANUFACT**

# *Flexibility & Precision*



**EQUIPMENT**

# Automation Solutions



**MATERIALS**



**MANUFACTURING**



## Customer-specific solutions – worldwide and for many industries

The Henkel specialists for the Sonderhoff portfolio  
are available globally

**KOLO, POLEN**

External Subcontracting Location

**DÜSSELDORF, DEUTSCHLAND**

Center of Expertise

**ELGIN, ILLINOIS, USA**

Regional Hub

**RICHMOND (KANSAS CITY), USA**

Regional Hub

**DORNBIRN, ÖSTERREICH**

Center of Expertise

**BARCELONA, SPANIEN**

External Subcontracting Location

**OGGIONO, ITALIEN**

Regional Hub

**INCHEON, KOREA**

External Subcontracting Location

**SHANGHAI, CHINA**

Regional Hub

**PUNE, INDIEN**

Regional Hub

**PUNE, INDIEN**

External Subcontracting Location

**SÃO PAULO, BRASILIEN**

External Subcontracting Location

*Global presence*



Every year, more than 300 million seals are manufactured in more than 50 countries using products from Henkel's Sonderhoff portfolio. At our Centers of Expertise and Regional Hubs, our specialists offer application engineering advice, e.g. selecting a suitable material system and sampling of your components, as well as project management for dosing systems and automation. You will receive training from us on how to use the FIPFG technology and we will support you with the selection of spare parts and a regular service offering. Furthermore, we will be pleased to take over parts of your production for you – from small to large series – at our subcontracting locations.

Sales staff at all other Henkel locations worldwide will also be happy to answer any questions and provide you with further information on our sealing, bonding, and potting solutions. We look forward to hearing from you.



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