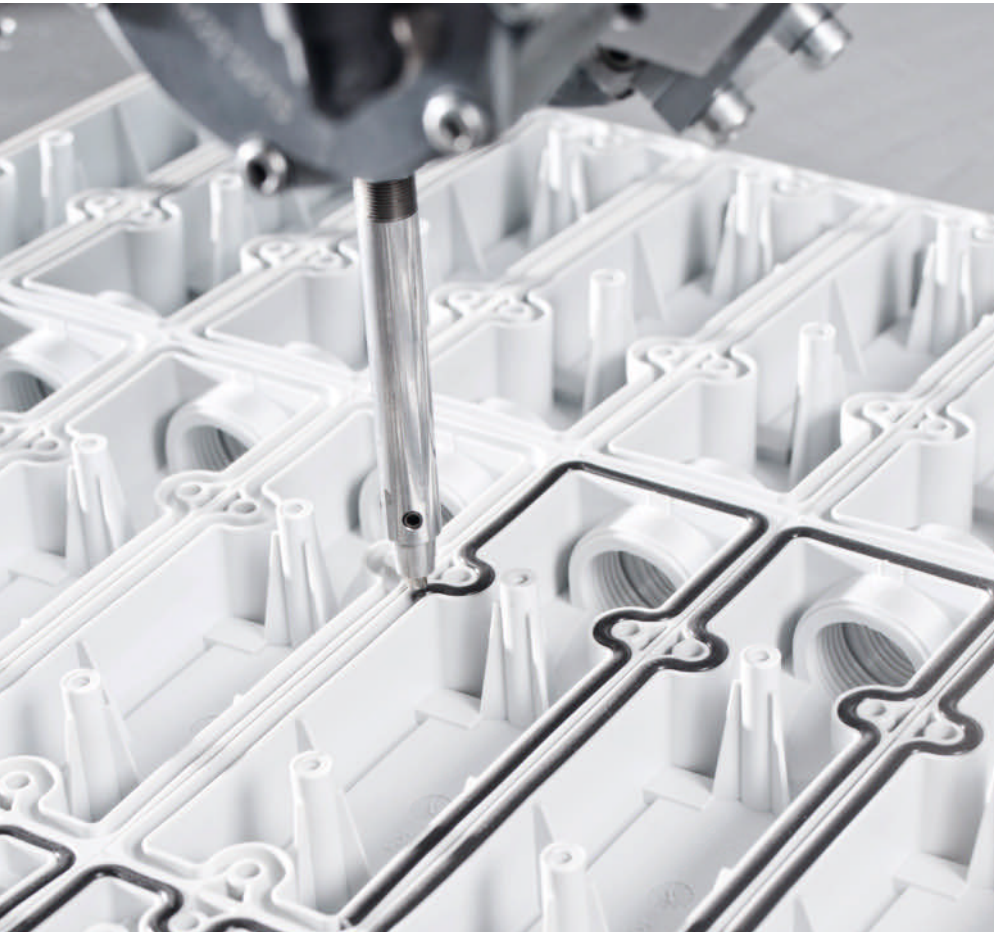


# Reliable Process, Accurately Fitting Gaskets



## Additional Machine

**Functions.** A range of new functions for mixing and dosing machines make the automatic and semi-automatic application process of foam gasketing, gluing and potting of various industrial parts and components even simpler and more reliable. Users who produce their parts according to TQM points of view profit from reliable gaskets.

### FLORIAN KAMPF

**M**anufacturers of system components in various end-user industries demand high accuracy when sealing their parts, particularly when the foam gasket material is applied to the often very narrow tolerances of three-dimensional contours. To meet these requirements, Sonderhoff Engineering GmbH, Hörbranz, Austria, developed five new reliability functions to market maturity in recent months, which will increase the productivity as well as the reliability and reproducibility of the manufacturing process:

- pneumatic nozzle cleaning,
- mechanical nozzle cleaning,
- dispensing nozzle calibration,
- electronic dosing weight control, and
- air nucleation measurement and control unit.

All functions are available with immediate effect in the low-pressure mixing and dosing lines of the DM 30x and DM 40x models and in the SD-DM 402/403 dispensing cell. The lines, equipped with the MK 600 or MK 400 precision mixing heads, can process two or more components of different materials (by FIPFG or FIP). The Flow-Control measurement unit ensures precise component dosing, while the Stop-Drop DVS-3 nozzle valve system ensures precisely defined application volume and dimensional accuracy, particularly at the seal coupling areas. For users who can only make a few changes to their machine layout and pro-

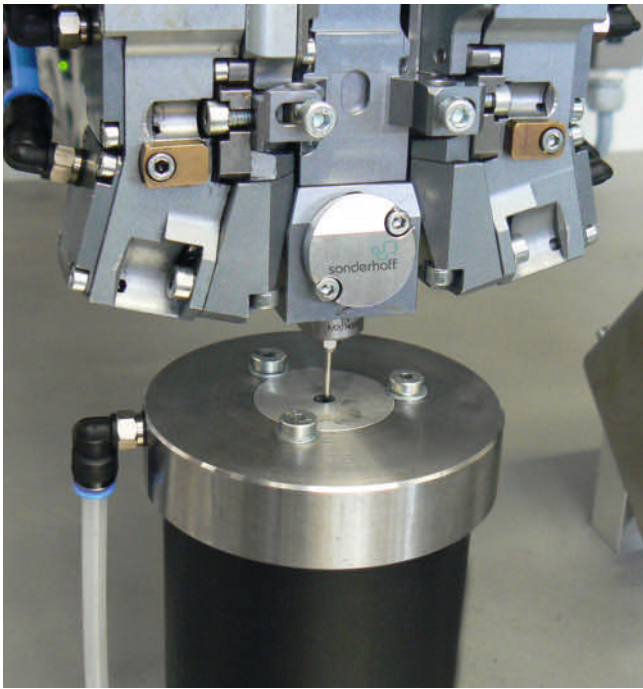
duction workflows because of restricted space, the compact and modular dispensing cell SD-DM 402/403 dosing offers a solution for incorporating additionally automated foam gasketing of parts into their existing manufacturing concept.

## Dosing with a Spotlessly Clean Application Nozzle

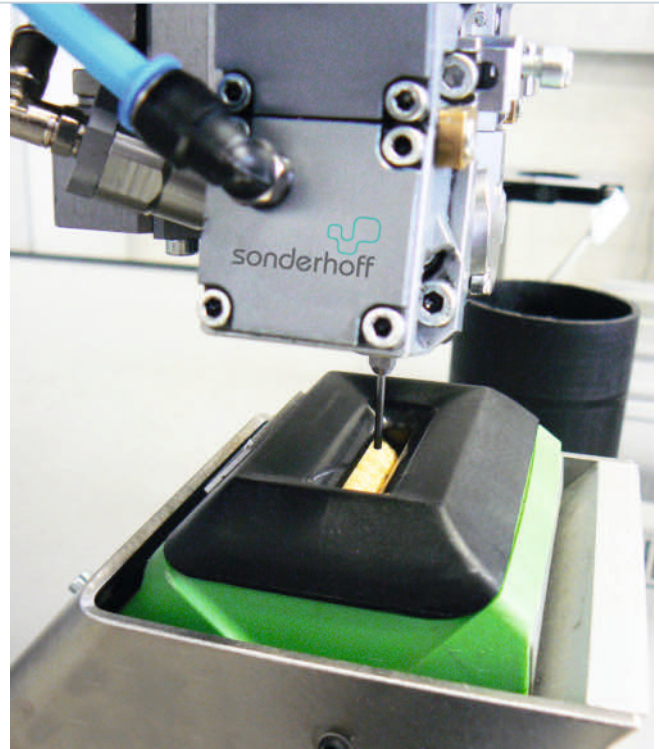
A spotlessly clean and precisely dispensing nozzle for application of gasket material is a basic prerequisite for a reliable process and flawless gasket. The high-pressure ecological water rinsing system patented by Sonderhoff and forming part of the standard equipment of a mixing and dosing machine primarily performs the function of removing contamination resulting from the foam reaction that is already taking place there. The tap water →

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**Fig. 1. A pneumatic nozzle cleaner removes material residues, particularly for gaskets with low viscosities** (photos: Sonderhoff)



**Fig. 2. Cured material residues on the application nozzle are removed by a mechanical nozzle cleaner**

used for this can usually be simply discharged into the normal drains after use – this saves costs for complicated wastewater treatment and the expensive disposal of a conventional solvent-based cleaning material used to remove residues of the reacted gasket material from the mixing chamber.

In addition, Sonderhoff Engineering optionally offers two new cleaning functions: the Sonderhoff Airclean pneumatic nozzle cleaner, which removes material residues at the nozzle end, particularly for gaskets with low viscosities (Fig. 1), and the Sonderhoff Mech-Clean mechanical nozzle cleaner, which removes hardened material residues from the application nozzle using rotary cleaning elements specially developed for this purpose (Fig. 2). The intervals be-

tween these cleaning functions can be freely adjusted in the mixing and dosing control system, depending on individual customer demands and the requirements for the part.

### Accurately Contoured Gaskets with Calibrated Nozzles

Depending on the viscosity of the material used, material residues may be deposited in or at the dispensing nozzle depending on the part tolerances. This in turn can affect the contour accuracy of the gasket on the part. The position and dimensions of the gasket can also be altered by an incorrect positioning angle of the nozzle on the application surface, for example if the latter bends. This increases the risk of the gasket's functionality be-

ing impaired, which can leave the part interior exposed to harmful environmental effects.

Sonderhoff Engineering has solved this problem with a newly developed nozzle measuring unit, the Sonderhoff Nozzle-Control. Two laser sensors at right angles check the position of the application nozzle (Fig. 3). For measurement



**Fig. 3. Two laser sensors at a right angle to one another check whether the application nozzle is correctly positioned**

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of the nozzle position in x, y and z directions, the nozzle is traversed through light barriers, and the position coordinates of the nozzle flanks are compared with the setpoint values in the machine program. If they lie outside the tolerances, a signal is given and the position of the nozzle is corrected according to the reference values entered in the machine program.

If contamination of the nozzle is ascertained during the measurement, the mixing head is automatically moved to the rinsing station and the nozzle will be cleaned. The function of the Sonderhoff Nozzle-Control thus always ensures that the dispensing nozzle is precisely posi-

tioned and clean, and that the gasket has an accurate contour on the part.

### Calibrated Control of the Dosing Weight

The aim of the new electronic Sonderhoff Dosing Weight Control is to achieve reproducibility of the preset dosing weight, and therefore a reproducible, top-quality gasket. OEMs who manufacture according to TQM (total quality management) expect a “calibrated” and documented process accuracy of the mixing and dosing equipment used in production.

At regular intervals chosen by the user, the constancy of the application volume is checked by a calibrated electronic balance during dosing (Fig. 4). By comparing the dosing weight determined in this way, with the setpoint value entered in the machine program, deviations can be identified and the discharge volume automatically adapted. The precise material weight and therefore the precise application volume is an important prerequisite for the dosing accuracy of the application nozzle.

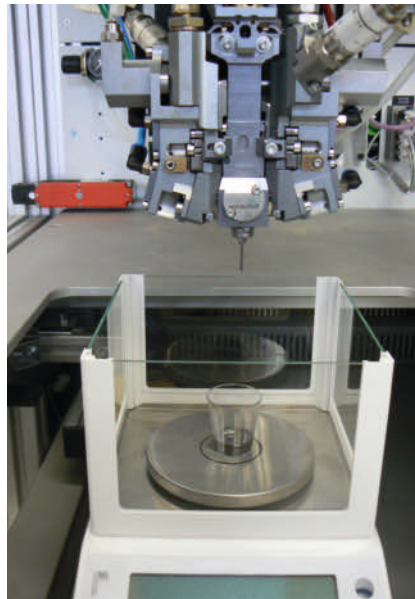


Fig. 4. At regular intervals, the constancy of the application amount is checked by a calibrated electronic balance

ponent with the Sonderhoff Nucleation Control II always keeps the air nucleation within the desired range – the uniform, fine-celled foam structure thus

produced is a prerequisite for a constantly high gasket quality (Fig. 5).

Before and during the production of foam gaskets, a special sensor continuously makes measurements of the current air nucleation and compares it with the preset value for the gasket material used. If there is a deviation, the air nucleation is adjusted appropriately.

With the new instrumentation and control unit, Sonderhoff has succeeded in taking the conventional method a stage further. The air nucleation of the starting material can now be measured more accurately and corrected if necessary. Principally, the continuous control and documentation of the measurement values offers additional reliability and the greatest possible operator convenience.

### Summary

OEMs can benefit from quality and productivity advantages thanks to the optional extra functions of mixing and dosing equipment – from dispensing nozzle calibration and electronic dosing weight control, through mechanical and pneumatic nozzle cleaning, to the air nucleation measurement and control unit. They can thus meet various end-user industries’ requirements for the highest dimensional and process accuracy in the sealing application of industrial parts and components. As a result, the part interior is better protected, particularly under extreme ambient conditions. The automatic logging of all equipment, material and processing data ensures that the preceding production workflow can be traced at any time. ■

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FLORIAN KAMPF, born in 1966, is team leader for Marketing/PR at Sonderhoff Holding GmbH, Cologne, Germany.

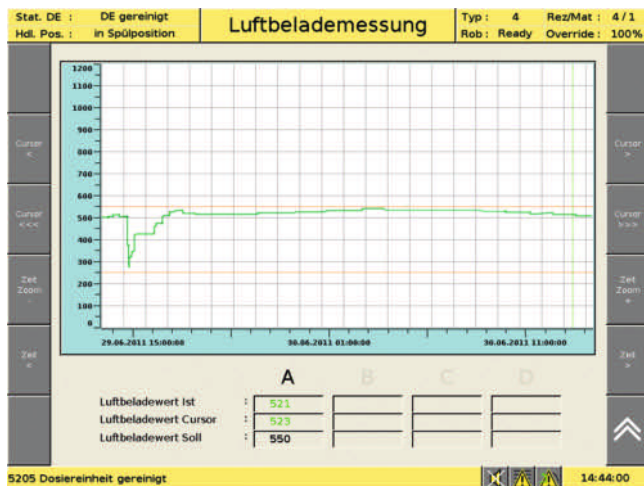


Fig. 5. The air nucleation in the starting material can now be precisely measured and adjusted

zle. The dimensional accuracy of the gasket on the part is improved by the interaction of a uniform dosing accuracy with a constant travel rate of the mixing and dosing head, and precise actuation of the shot start and shot end.

### Uniform Air Nucleation

For gasket products of foamed polyurethane, a uniform fine-celled foam plays an important role in the sealing quality. The cell structure and density of the foam gasket applied to a part are determined by the “air nucleation.” Automatic measurement and control of the amount of air dissolved in the A com-