It's not enough simply to be ›small‹

The need to apply material to tiny dispensing points is nothing new in the production of electronics and semiconductors. It is important, however, to be able to apply very different **VOLUMES ALTERNATELY** to the same component in the shortest possible time.

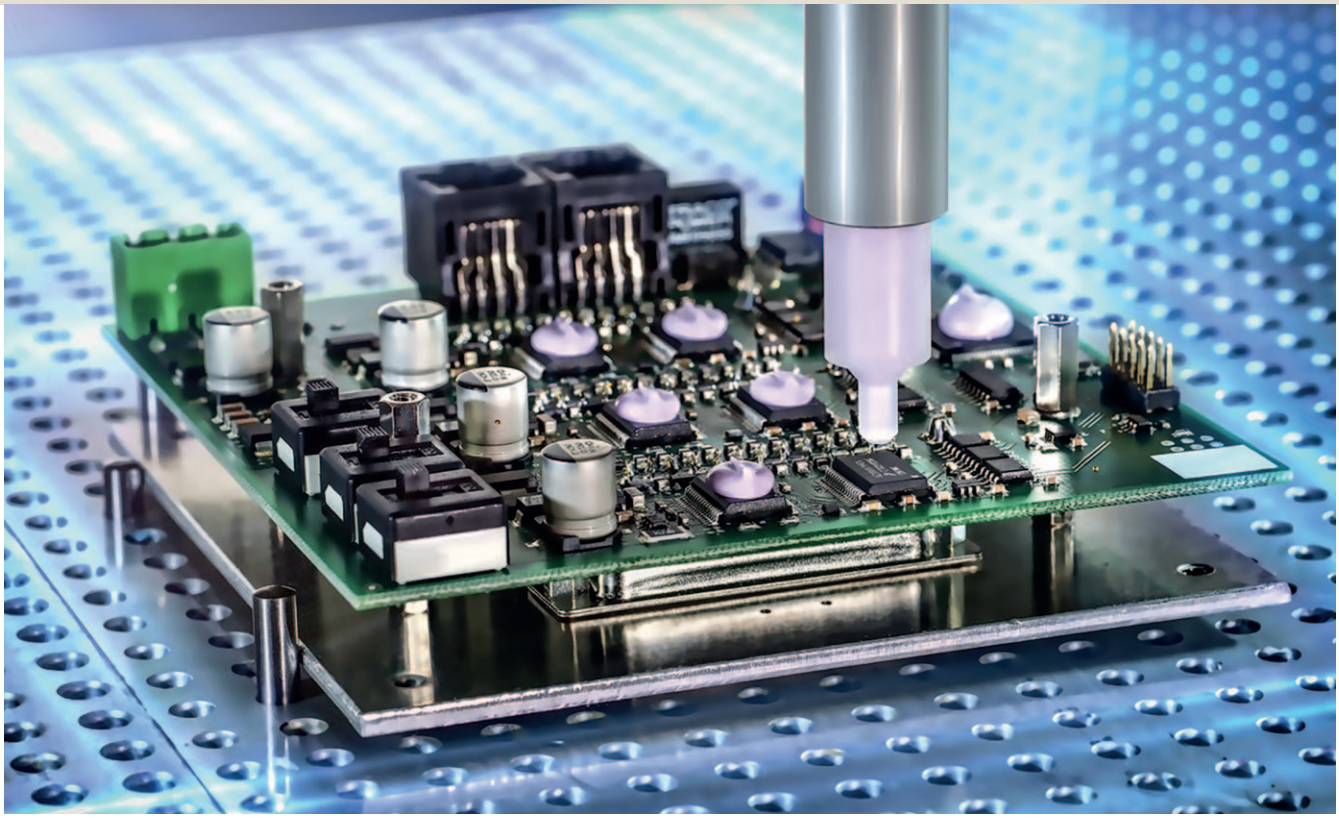

Figure: Scheugenpflug

Figure 1. Processing of modern printed circuit boards calls for a wide variety of dispensing applications

SEBASTIAN SCHMITT AND KARIN STEINMETZER

A high degree of flexibility in dispensing processes is essential, especially in the production of electronics and semiconductors. Volumes starting from the microlitre range up to several millilitres have to be applied in a single step and with a high level of precision. Dispensing systems that focus on a narrow volume range have difficulty meeting this requirement.

When applying material to very small dispensing points it is crucial to switch between the dispensing positions as quickly as possible. As a result, the process time increases with the number of points. If the application pattern has different contours, large quantities of material need to be dispensed in a short time. Dispensing speed is then the key to productivity.

Different applications on PCBs

Modern printed circuit boards in particular combine a large number of dispensing applications, some of which require very different material quantities. Different volumes are needed depending on the desired function, such as heat dissipation. Capacitors and ▶

> CONTACT

MANUFACTURER
Scheugenpflug GmbH
D-93333 Neustadt/Donau
Tel. +49 9445 9564-0
info@scheugenpflug-dispensing.com
www.scheugenpflug-dispensing.com

Figure 2. The piston dispensing principle allows a high degree of flexibility for applying different volumes

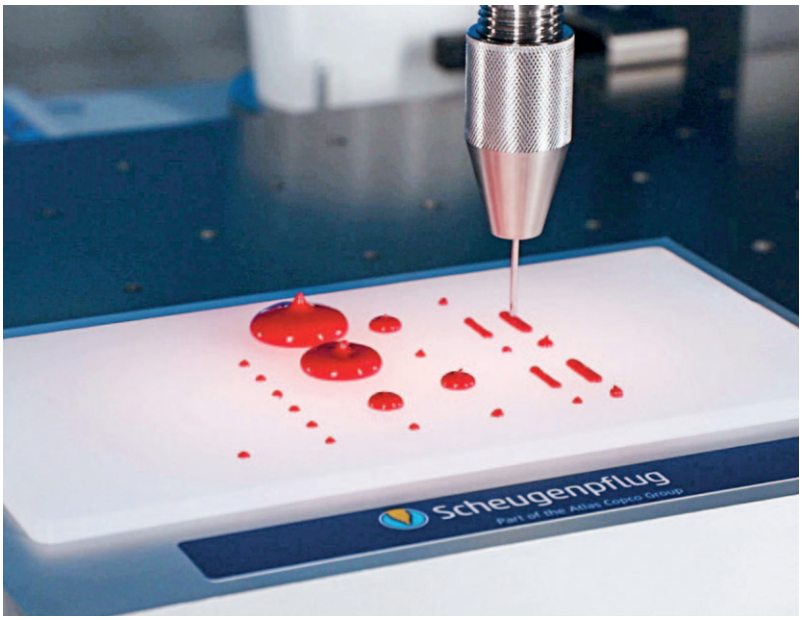

Figure 3. Precise application of a wide variety of material volumes in the shortest possible time

batteries require lateral stabilisation and are also fixed to the PCB by means of potting compound. A ›glob top‹ protects semiconductor chips from moisture, dirt and solvents. This involves applying a thin protective layer to encapsulate the sensitive electronics. ›Dam & fill‹ applications, on the other hand, require the absolutely precise application of very fine lines. In addition to meeting the highest requirements for precision and the handling of different materials, including highly abrasive and highly viscous ones, the ability to make rapid changes in volume will ensure that the dispensing process can be completed quickly with no downtime **(Figure 1)**.

The ›DPL2001‹ low-volume dispensing head meets the need to dispense both small and large quantities at high speeds. The smallest points (1K) up to 0.003 ml can be set, and the entire cylinder filling of the piston dispensing head can be used for dispensing for large or multiple components. If the entire cylinder filling is used, up to 4 ml (2K) is possible in one shot. Very short valve switching times and dispensing speeds of up to 10 ml per second are possible in this system **(Figure 2)**.

In contrast to eccentric screw dispensing heads, piston dispensing units are significantly faster. The former are designed for small quantities and require considerably more time to apply large volumes due to the design of the

Figures: Scheugenpflug

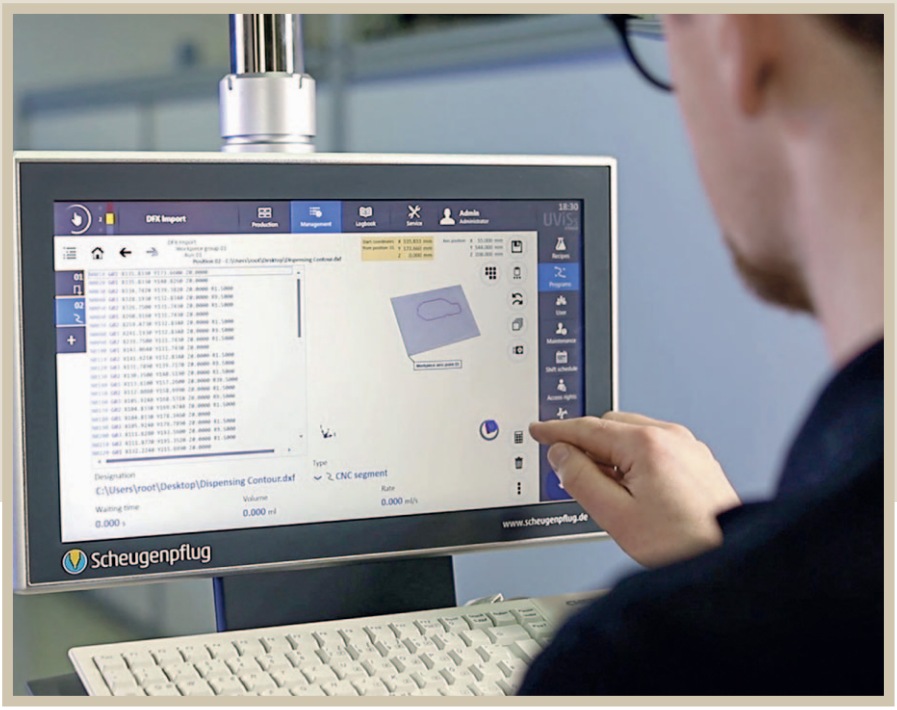

Figure 4. Uncomplicated data import: entering the CAD contour in the UPIC 5 editor

stator/rotor system. The reason is the volume-specific design of the system, with correspondingly different system sizes being offered for different volumes. For applications on PCBs, but also for numerous other applications in electronics and semiconductor production, the DPL2001 low-volume dispensing head can reduce the number of dispensing systems required to a single system. The dispensing head operates on the principle of volumetric dispensing. The amount of material dispensed is determined by the geometry and stroke of the cylinders. When 2K media are used, the mixing ratio is kept constant by simultaneously discharging both cylinders into the shared mixing tube. The valve system allows zero-displacement dispensing. All the contours are therefore identical and can be mapped with the highest precision from the very first application.

In combination with a very stable design, a wide range of materials and especially highly abrasive heat-conducting materials can be dispensed. Media sensitive to pressure, moisture or shear forces can be dispensed gently without any risk of altering the material **(Figure 3)**.

The entire dispensing process is monitored by a sophisticated control system consisting of new sensors and control software. For example, nine sensors per component measure the dispensing pressure. Viscosity fluctuations or a growth in the mixing tube can therefore be reliably detected.

The dispensing contour in just a few steps

Scheugenpflug's ›UVIS 5‹ software offers a powerful user interface tailored to the application. ›UPIC 5‹, the universal programming interface, complements and expands this interface. Data import is therefore easy. Once the dispensing contour has been optimised to fit the component and has been created in CAD at the workstation, it is transferred to a storage medium and can then be passed directly to the system. The ›UPIC 5 editor‹ enters the DXF file for the CAD contour directly and automatically generates the NC block. Application of the dispensing contour can then start immediately **(Figure 4)**.

With its flexibility, its reliability and its accuracy, even when handling challenging materials, the DPL2001 low-volume dispensing head is precisely designed for challenging applications in the production of electronics and semiconductors. ■

AUTHORS

SEBASTIAN SCHMITT is an Area Sales Manager at Scheugenpflug,
DR. KARIN STEINMETZER is Head of Marketing; presse@scheugenpflug-dispensing.com