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Sonderhoff at the IZB: Potting and dispensing with high precision

Components such as LEDs, relays, transformers, PCBs and sensors must be extremely well sealed to protect them from moisture, dust and corrosion, and mechanical, chemical and thermal damage. For many years, electronics manufacturers have relied on the Fermadur family of potting compounds from Sonderhoff Chemicals, as well as the processing equipment developed by Sonderhoff Engineering. From 6 – 8 October 2010 the sixth International Suppliers Fair (IZB), a leading European automotive supplier show, was held in Wolfsburg, Germany. The IZB partner countries were the USA and Canada. For the Cologne-based Sonderhoff Group, IZB proved again as an ideal platform to present its innovative potting and dispensing solutions.

Fig. 1: LED lamps by LM Electronic are potted by the dispensing cell SD

Sonderhoff Engineering brought one of the new **SD – DM 402/403** dispensing cells from Austria to demonstrate to visitors, live and in real time, the advantages of the new system and the new transparent or translucent **Fermadur** potting products developed by **Sonderhoff Chemicals.** Through the ESD windows of the closed cell mould, visitors were able to observe how the dispensing cell sealed LED products supplied by **LM Electronics,** using a two-component PU potting compound in a two-layer process **(fig. 1).**

LEDs are becoming steadily more important in automotive electronics, and will continue to do so. Whether for headlights, rear lights, position lights or interior lights, LED technology will play a central role in the future. Sonderhoff has developed new products to protect LEDs from water, dirt and weather, by sealing them with either a crystal-clear UV-resistant material or with coloured translucent material.

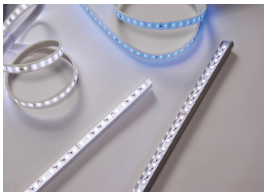

Fig. 2: LED products supplied by LM Electronics

Chemistry tailored to electronic components
With Fermadur, the Sonderhoff Group has created a high-quality, cold setting two-component casting compound system comprising polyurethane-based hard, soft and gel-like potting products. With FIP (formed in place) technology, they can be applied and cured directly on or in the component.

Fermadur systems allow economic processing of even the smallest production runs, and are processed with two-component low pressure mixing and dispensing machines. The systems consist of a resin basis (A-component) and a hardener (B-component) which are mixed together in a prescribed ratio. This forms a bubble-free potting compound, which is extremely resistant to outside influences such as moisture, UV radiation, dust, mechanical stresses and temperature. The flowability, reactivity, hardness classification and colour of the components can be adjusted as required.

Fig. 3: The new dispensing cell SD – DM 402/403

The recommended processing temperature is +23 °C ± 5 °C, with a relative humidity between 40 and 70 %. At room temperature, the material begins to react in just one minute. The very fast tack free time of Fermadur had a welcome side effect at the show – in addition to LED lights, keychains could be cast live and handed out in just a few minutes as give-aways for the visitors.

The LM Electronic company, which specialises in the manufacture of SMD circuit boards, provided Sonderhoff with small LED lamps for the IZB. The LEDs were potted using the dispensing cell SD – DM 402/403 **(fig. 2 and 3).**

Bubble-free material
For years, LM Electronic has relied on Sonderhoff processing equipment and potting products for sealing its electronic components. "Sonderhoff has more than convinced us, for a variety of reasons," said Manfred Fink, CEO of LM Electronic. "In addition to excellent value for money and technical consulting, we especially like the way Sonderhoff has been able to configure material and machine to create a perfect fit for our needs. If there's one quality that is indispensable in LED potting, it's that the potting material be completely free of bubbles – and with Sonderhoff, that's always the case."

Fermadur systems by Sonderhoff achieve particularly good adhesion to parts, due to the chemical reaction of the two components on the carrier material. In addition, Fermadur systems are distinguished by exceptional long-term behavior and high heat distortion resistance, as well as by an extremely low expansion coefficient. They also have low shrinkage and low surface tension, plus very good dielectric properties. The self-healing property of the material is particularly noteworthy. Indentations from mechanical impacts disappear on their own.

Sonderhoff can look back on experience with more than 500 different Fermadur formulations, and more are added all the time. Other applications for Fermadur include solar-cell sealing, sensor potting, potting stone tiles, coating wood inserts, and design uses.

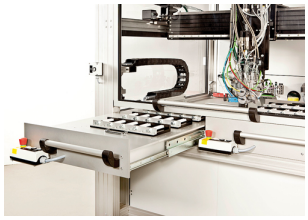

Fig. 4: Simple, sure parts replacement by the operator thanks to the quick-change drawer, available as an option for the dispensing cell SD

The new dispensing cell SD – Modular and compact, with a small footprint
The new Sonderhoff dispensing system SD – DM 402/403 **(fig. 3)** is a multi-component dispensing cell for use in semi- and fully-automatic operation for foam sealing, bonding and potting a very wide range of components. In addition to Fermadur, the system also precisely processes liquid, medium to high viscose media such as polyurethane, silicones, epoxy resins and other polymer reaction substances. The dispensing cell works at a constant production quality and constant dimensions, even with substances of different consistencies.

Sonderhoff Engineering designed the dispensing cell SD – DM 402/403 to enable users to simply and securely handle a very wide array of tasks **(fig. 4).**

The machine is equipped with the **Sonderhoff-Control II** user interface and touch screen. The fact that all system and process parameters can be preset and controlled means that the system is able to handle fully automatic production sequences.

The use of the new multifunctional Teach-in-Box simplifies the contour programming for the processed parts. The modular hybrid construction facilitates the access to the machine and thus the cleaning and maintenance work.

The SD – DM 402/403 processes materials at a consistently high level of dimensional and consistence quality. The state-of-the-art sensors and actuators ensure the effective control of any system and process. The automatic logging of all set-up, material and process data enables to track any preceding production sequence.

The **Sonderhoff-Safety** package – based on the principle of preventive maintenance – will help to gain continuously high machine availability.

Flexible today and tomorrow
The system lets users react flexibly to different needs, to process a wide variety of components with new geometries and materials, even under changing conditions. The SD – DM 402/403 permits parallel operation with different materials, as was demonstrated at the IZB. In this operation, LED lamps were sealed in a two-layer process: The first step was the application of a transparent potting compound, followed after drying by a second translucent layer.

The future-oriented technology of this dispensing cell provides for the use of Sonderhoff **MK 400** and **MK 600** precision mixing heads with recirculation and high-pressure water rinsing system. Due to its modular and compact design, the dispensing cell DM 402/403 can be integrated into any production concept.

The use of this cleaning technology for mixing chambers, which has been patented by Sonderhoff, brings an array of additional benefits, especially with regard to quality and efficiency. In addition, it completely eliminates the need for solvents and cleaning agents, which not only saves money but also offers advantages for disposal and environmental sustainability.

A further benefit of this dispensing cell is its **Flowcontrol** mass metering system. In combination with the pressure-controlled recirculation-valve technology, this ensures precise material output.

The integrated **Stop-Drop-DVS-3** mixing chamber shut-off device also allows an even material outflow and dimensional accuracy when applying foam seals, particularly in the coupling areas.

The control system of the new dispensing cell – DM 402/403 uses a future-oriented industry PC technology with a real-time operating and bus system. Due to this system, no mechanical parts like hard discs or fans are required anymore. All system and programme data are stored on compact flash cards. The networking and connection of external equipment can be carried out without previous parameterisation (plug & play).

Onboard and remote diagnosis by modem or TCP/IP makes the outstanding service of the Sonderhoff Group available to customers all over the world.

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