More Options for the Coating of Components for Electric Vehicles

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The demand for sealing components made from elastomers is rapidly growing. A major reason for this increased demand is the e-mobility. To meet the requests of numerous coating job shops Walther Trowal has developed the new Rotamat R 100. Compared to its predecessor models the usable volume of this coater is practically doubled. In addition, the R 100 also allows the coating of sealing components with a wider range of materials such as different types of oil, wax and slow drying lacquers.

Rotamat coaters have established themselves as the ideal solution for coating sealing components made from elastomers, such as O-rings, with anti-friction lacquers. Rotamat machines are also used for coating thin-walled metal rings - for example, shaft seal rings - with a bonding agent.

Larger components and higher production volumes

For their drive trains and accumulator batteries e-vehicles require numerous sealing components. These are not only utilized for the accumulator cells but also for cooling purposes. Even components like control modules for e-vehicles have their own cooling systems with

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The new Rotamat R 100 allows the coating of components with diameters of up to 300 mm. On the right, Rotamat coaters in the final assembly stage at Walther Trowal in Haan.

heat exchangers, where elastomer sealing elements with sizes of up to 300 mm are utilized. At coating job shops, already handling millions of components, this technological trend created the need for coating systems with higher processing capacities. To meet this demand Walther Trowal developed the new Rotamat coater R 100. With a usable volume of 160 liters and a payload of 100 kg it can process about 1,000 sealing rings in one single batch. Compared to its predecessor model R 85 it coats twice as many components – within the same cycle time and with only marginally higher energy consumption and space requirements. The first R 100 will be delivered shortly to a coating job shop in Italy. The diameter of the rotary drum in the R 100 is 1,000 mm. To completely cover the entire internal drum space the machine is equipped with two spraying systems.

Processing of more oil and wax types

Another technological trend is the increased use of oil and wax for the coating of sealing components. For example, in medical engineering lacquers are being displaced by silicone oil as the predominant coating material for high value sealing elements. For obvious reasons: silicone oils are more compatible with the human body. Since they are applied in thin layers, but require a highly homogeneous surface coverage, precise dosing within a tolerance of a few grams is essential.
Walther Trowal achieves the required dosing precision of the coating materials by utilizing ultra-modern sensor technology and an electro-pneumatic valve. This guarantees that the precise quantity of coating material reaches the component's surface within a given time period. The result is a consistent coating thickness and long-term quality of the applied coating material on the component.

Utilization of more types of lacquer

Several technical features in the new Rotamat coater now allow the application of a wider range of lacquers. Some lacquer types, respectively, coating media demand quick, sometimes even abrupt, cooling of the work pieces after the coating process. To achieve this Walther Trowal added a bypass for the exhaust air coming from the drum. It allows the air to bypass the heating unit after the spraying operation and guides ambient air into the drum. This prevents any residual heat from the heating unit from reaching the coated components. Therefore, they are not sticking to each other and are discharged from the drum as single pieces. The result: A higher yield of work pieces in "1a quality". Walther Trowal generally equips the Rotamat coaters with a four-stage exhaust air system. It consists of a Papp labyrinth filter, a filter mat and two pocket filters. Therefore, solvents contaminating the exhaust air can never reach the environment. This solution has proven its effectiveness and reliability in many coating applications. With some lacquer types the overspray requires a longer time for curing and becoming dry dust. To prevent sticky lacquer mist from passing through the filter and migrate to the exhaust air system of the machine user, Walther Trowal has further optimized its filtration technology. If needed, fresh air is added to the exhaust air, which causes the residual lacquer particles to dry abruptly. The resulting dust particles are safely retained in the Rotamat filtration system – a significant benefit for occupational safety and the environment.

Higher degree of automation

The automatic drum inclination is another important step towards full automation of the Walther Trowal coating systems. A manufacturer

The Rotamat R 100 coater can safely coat elastomer sealing components with diameters of up to 300 mm. On the right, a plastic sealing ring before (left) and after coating (right) with an anti-friction lacquer.

of sealing components reported that he had to frequently adjust the drum inclination during the coating process. He noticed that the components not yet coated displayed different tumbling characteristics than the components already coated. To date the inclination of the rotary drum was activated by an electromechanical drive but had to be initiated manually. In the new Walther Trowal Rotamat coaters the drum inclination is fully automated, and the respective process parameters are part of the PLC processing programs for the various work piece categories. The machines now automatically adapt the drum inclination to the required coating buildup on the work pieces and are, therefore, running fully automatically during the entire coating process. Even with applications requiring multiple changes of the drum inclination the only manual operations are the loading and unloading of the rotary drum.

Higher process stability

With the new control system for dosing the coating material Walther Trowal was able to further improve the process stability of the Rotamat coaters. The new system automatically adjusts the pressure so that under different operating conditions the specified amount of coating material is precisely applied to the surface of the components. In addition to the sophisticated temperature management and the exact fresh air flow, the new pressure regulator ensures optimal conditions in the rotary drum during the entire coating operation. However, the new pressure control system improves not only the overall process stability, but it also simplifies the coating operation.

About Walther Trowal

For more than 90 years Walther Trowal has produced and sold modular and custom-engineered solutions for the most difficult challenges in the field of surface treatment and refinement.
While initially focusing on mass finishing, over time Walther Trowal has continuously expanded its product portfolio. Today the company offers a broad range of mass finishing, shot blasting and coating equipment for surface refinement, cleaning and drying of a variety of work pieces as well as coating of mass-produced small parts.
Walther Trowal develops and implements complete surface treatment solutions: By linking and automating various processing modules Walther Trowal adapts the respective process technology to the specific requirements of the customers. This also includes peripheral equipment such as process water cleaning and recycling systems. Comprehensive services like processing trials with the customers' work pieces or the global repair and maintenance service are rounding off the company program.
Walther Trowal serves customers in a wide range of different industries all over the world, for example, automotive, aerospace, medical engineering and wind power.