



Two colors in one coating system

SHW, a manufacturer of brake disks, invested in a Sprimag chain-on-edge coating machine to coat a wide range of brake disk types in black and silver in mixed operation

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Dear readers,

Ninety years ago, on the 31st July 1925, Sprimag was founded by Otto Heinrich in Leipzig. A lot has changed since then, despite or because of the numerous technical advances we have made.

In 1946, a Sprimag system for the internal coating of tubes could process 80 tubes per minute – a very large number at the time. A modern Sprimag internal coating system can now manage 300 parts per minute – almost four times as many.

The evolution of the car has steadily progressed over the past 90 years as well. It has changed from a simple vehicle for carrying people from A to B to a modern status symbol, with ever-increasing performance and an ever-longer list of safety assistance systems. The number of approved vehicles has also skyrocketed: In 1930, barely 36 million cars were on the roads worldwide – today, there are roughly 44 million in Germany alone. This development was significant for Sprimag, and the automotive industry remains one of our surface coatings sector's most important client bases to this day.

Just one more retrospective: In 1983, Sprimag purchased its first computer – an IBM XT – which cost an impressive 14,000 DM (Deutsche Marks) at the time. Five years later, all of the drawing boards in the design office had been replaced by CAD systems. These days, all of the machines, systems, assemblies and



Joachim Baumann,
Managing Director of Sprimag

components are drawn in 3D on CAD systems, and it is hard to imagine our daily work routine without personal computers – yet developments in this area show no signs of slowing down. The intelligent networking of machines in production – widely known as Industry 4.0 – will soon become the new standard. Ninety years ago, would anybody have believed that we would one day be able to use data networks to access important equipment data for our systems, for the purposes of production and service, from anywhere in the world?

The future is just as exciting – as are the forward-looking themes of our newest Sprimagazine. We hope you enjoy reading the interesting articles we have included, discussing a leak detection testing machine for tubes, a brake disk system that can process two lacquers in mixed operation and the new S-8 generation of spray guns.

Joachim Baumann
Joachim Baumann

Lacquer supplies for roller and spray lacquers

Sprimag is extending its product range and can now also offer lacquer supplies for exterior-decoration coating systems in the metal packaging industry

Sprimag has been involved in the field of application technology for 90 years. In addition to spray guns, pumps, pressure controllers and additional lacquer system accessories, Sprimag offers a wide range of complete lacquer supplies for coating systems. Sprimag's lacquer supplies are also used for internal coating machines in the metal packaging industry. As demand for lacquer supplies for exterior-decoration coating systems rose in recent years, Sprimag decided to develop a range of lacquer supplies specially designed for processing roller and spray lacquers for exterior-decoration coating.

The product range includes a lacquer supply for small lacquer quantities with containers for up to 30 liters, a larger variant for 200-liter lacquer barrels and a special lacquer supply with a lacquer tank that can be cooled. A circulation filter continually stirs and circulates the lacquer, ensuring it is constantly homogeneous. A fill-level sensor sounds if the fill level reaches a critical level. The lacquer supplies allow the lacquer containers to be re-

placed in an easy, user-friendly and ergonomic manner. Components can be cleaned easily using the height-adjustable supply unit. By circulating the solvent from the pump suction pipe to the dosing valve nozzle, the system can be rinsed easily, effectively and quickly.

A tip function can be integrated as an option, which ensures any remaining lacquer in the vessel can be optimally removed. Furthermore, the lacquer supplies can be fitted with explosion-proof cradle to be able to assign the exact lacquer consumption to the produced cans.

Customers who already use Sprimag lacquer supplies on other systems (such as internal coating systems) also benefit from reduced maintenance and servicing costs thanks to identical, standardized components.

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Lacquer supply for 200-liter lacquer barrels

PRODUCT INNOVATION

LRP-20: Leak detection testing machine for aluminum tubes

Sprimag is opening up a new product segment with the launch of the LRP-20

There are additional opportunities for demand-led expansion of the product portfolio where production facilities for aluminum tubes, monobloc aerosol cans and beverage cans are concerned: Sprimag has demonstrated this with its entry into the testing machine segment: The new LRP-20 leak detection testing machine for in-line inspection of aluminum tubes. The machine concept is based on a modular design that incorporates many of the components from the TGA-200 latexing machine, which has already been successfully launched on the market. This opens up new prospects in the machine market for customers.

Our customers have very different

requirements when it comes to the application of leak detection testing machines. One part of our customer base would rather have the tubes positioned ahead of the capping machine in order to analyze the membrane for potential defects. Others prefer a cost-efficient inspection solution after capping is carried out, integrated into the latexing machine. According to their argument, no individual defects would in fact occur in the membrane. However, there are also customers who request in-line inspections of this type to be located as close to the potential cause of defects as possible, i.e. after annealing in the case of aluminum tube production.

Sprimag can now satisfy all of these different customer requirements: The LRP-20 is offered as a stand-alone version and as a 2-in-1 solution optionally integrated into the TGA-200 latexing machine. The integration of the LRP-20 leak detection testing machine into the line ahead of the capping machine, and that of the TGA-200 latexing machine after the capping machine (to provide functional framing), has been shown to be a system configuration that offers operators significant advantages thanks to the exacting part identification that results: The equipment works to just one system and operating concept and the need to stock replacement parts is reduced.

Customers who prefer the 2-in-1 combination benefit from a compact system configuration, reduced transfers and the significantly lower investment it requires.

Both machine configurations are designed for a maximum number of cycles of 200 tubes per minute, with the 20 rotating testing heads guaranteeing a sufficient inspection time. At maximum machine speed, the system can detect leaks with diameters of 0.1 mm to 0.04 mm with ease. Much like the TGA-200 latexing machine, the LRP-20 leak detection testing machine is set up for aluminum tubes of almost any diameter. The transfer drums separately assigned to each process provide the precision re-

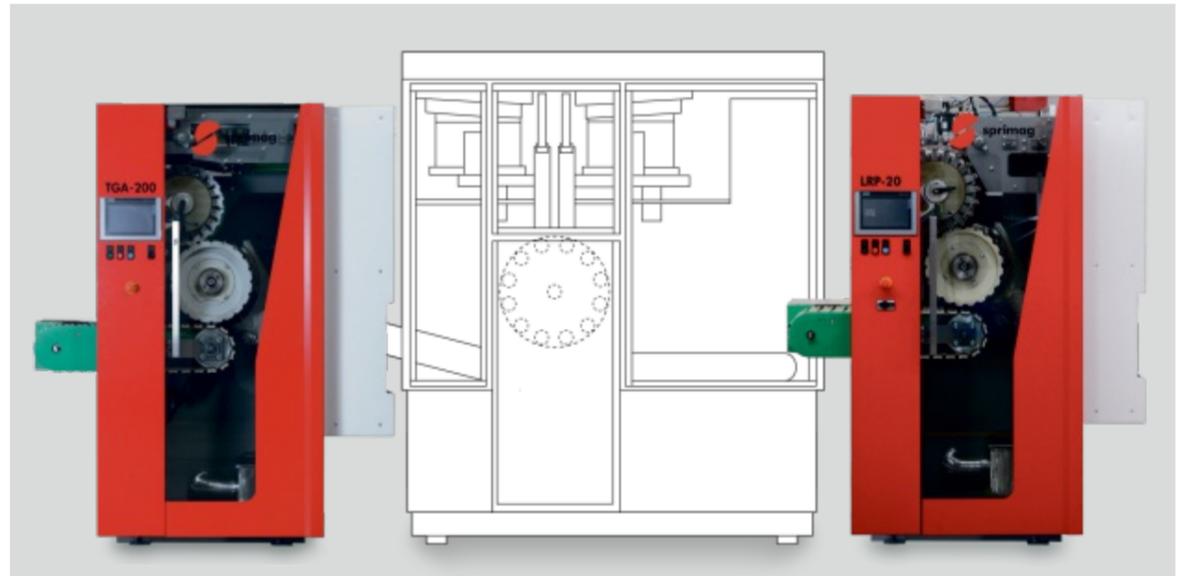
quired during both the inspection and latexing processes. The variable transfer to the infeed conveyor system and to the horizontal outfeed conveyor system means that the machine can be adapted to the transfer concepts of any standard equipment placed ahead or after it in the line.

When the machine was first presented to customers who had long been seeking alternative solutions for efficient and cost-effective leak detection, it was quickly established that customers were not only very interested in the machine itself, but also in the option to choose between the different concepts.

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20 testing heads test up to 200 aluminum tubes per minute for leaks

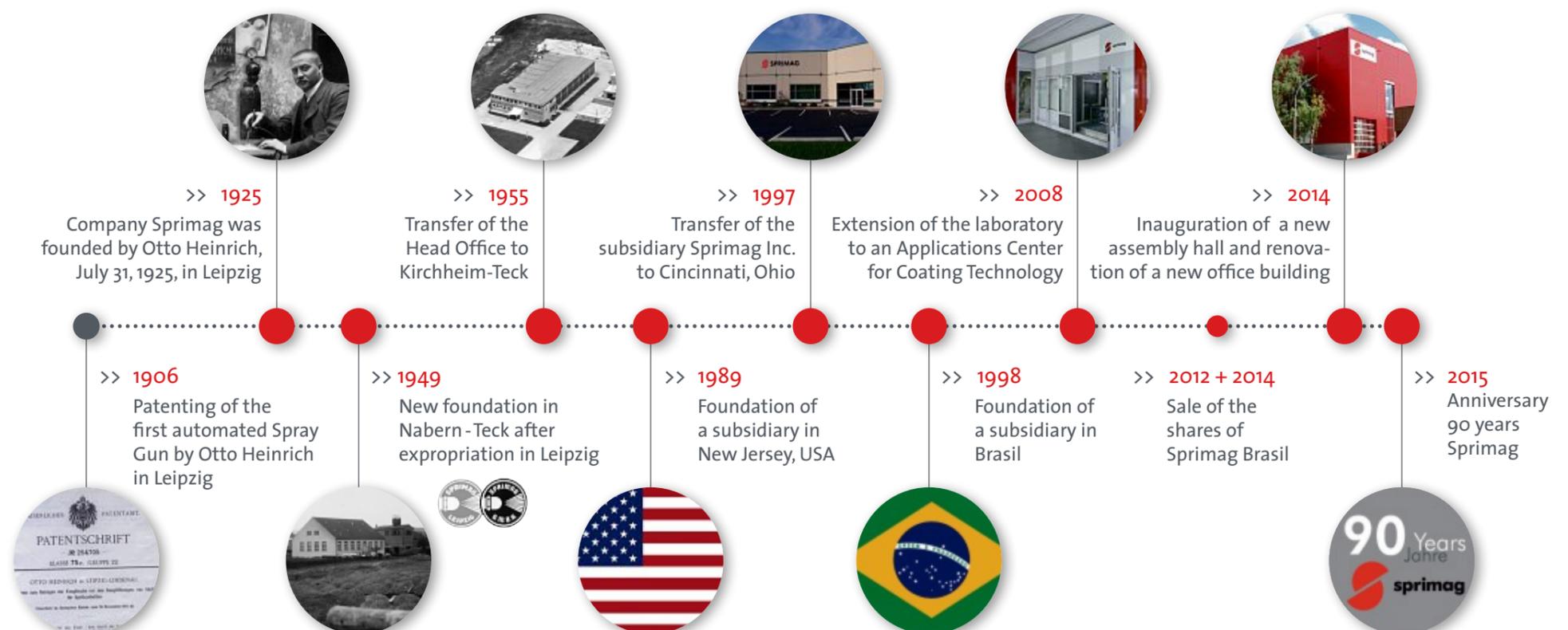


Tube latexing machine TGA-200, example of a capping machine, leak detection testing machine LRP-20

ANNIVERSARY

90 years of Sprimag

On the 31st of July 1925, Sprimag was founded by Otto Heinrich. Stations and locations in 90 years of company history



A camera system is used to determine brake disk types on the basis of their hole layout, located after the measuring station

Black and silver in one system

Sprimag has developed a system concept for SHW, a manufacturer of brake disks; the system makes it possible to process two lacquers in mixed operation

SHW Automotive GmbH is one of the leading automotive suppliers in Germany. Approximately two million pre-finished cast-iron brake disks and lightweight brake disks are produced annually in Neuhausen ob Eck, Southern Germany. The company planned to further expand production capacity and to implement new coating developments in the production of brake disks.

The company therefore turned to Sprimag. Rainer Mendl, Head of Design at Sprimag, explains the request: "SHW asked us to develop a system concept, using which a range of different brake-disk types could be lacquered in black or silver in mixed operation." Sprimag had already implemented coating solutions for different component types in mixed operation on numerous coating systems. Even the request to use two different lacquers in one system was nothing new. "When designing the system, we were faced with the challenge of wanting to process two different colors in one coating booth," Mendl says when explaining the details. Thanks to Sprimag's many years of experience manufacturing brake-disk-

coating systems and SHW's application expertise, the two companies were able to work together closely to develop a system concept that perfectly met the stringent requirements.

Part identification using a measuring and camera station

The brake disks automatically filter from several manufacturing lines into the automatic chain machine. If required, the brake disk function can also be performed manually. In mixed operation, the brake disks find their way into the system via a conveyor belt. To be able to identify the particular brake-disk type, the parts are identified on the conveyor belt inlet using a measuring station. The following parameters are measured: Outer diameter, pot height and friction-ring height. A camera station is also installed to identify the parts based on the hole pattern. Furthermore, the curvature of the ventilation

ducts is used to detect whether a disk is a left- or right-hand version. The data gathered when registering the type is saved dynamically and then transferred to the subsequent transit stations in the system.

Pre-heating zone for consistent coating quality

The brake disks are transferred from the conveyor belt to the chain conveyor automatically. A sensor checks the brake disks are fitted correctly on the chucks, then the disks pass through a cleaning station where the cast dust is blown off. The disks are then pre-heated to a temperature of 40 °C in a pre-heating zone using infrared heaters. This procedure is necessary to ensure a consistent coating quality that is as high as possible.

Using two lacquer colors in one booth

In the coating booth, three robots then coat the brake disks based on the specific component. These robots are fitted with Sprimag spray guns that feature specific nozzle heads and can be selected based on a program. All coating parameters are managed by the control system based on the type. Each robot is fitted with two spray guns that either use lacquer type 1 (silver) or lacquer type 2 (black). Thanks to precision transport and Sprimag nozzle technology, it is possible to coat all or part of the brake disks without masking. The different lacquer types circulate in separate circulation systems and spray guns, and can therefore be called up in the machine cycle. A special coating strategy and screening shades ensure there is no cross-contamination of different neighboring lacquer types across all spindles. The spray-gun nozzle heads are automatically cleaned in a fixed cycle on integrated cleaning stations. The servo-motor-driven friction in these areas ensures smooth acceleration and a constant speed, including for future cycles. Using coating positioning,

the direction of rotation can be automatically changed in the machine cycle depending on the detected part geometry. To do this, the disks are first slowed down gently if necessary.

Integrated lettering with Data Matrix code

Following the check, the components are transported to the pre-drier and then the end drier. Once the brake disks have been dried and fired in accordance with the specifications provided by the lacquer manufacturer, they are transported to the cooling area. They are then transported along the outlet conveyor belt to an integrated Data Matrix code (DMC) station. The code position can be varied along the entire upper projection surface of a disk. In addition to the DMC, plain-text information and revocation information can also be lasered on in the event of faults. The marked disks are then transported to the on-site chain belt. Here, various belts can be chosen, based on the component. Faulty products can be assigned to a separate belt. A special brush-holder device ensures a long service life for the workpiece holders between the complete cleaning cycles.

Zlatko Scukanec, Production Manager at SHW in Neuhausen, is pleased: "Sprimag's system concept meets our needs perfectly in relation to quality, efficiency and system capacity. The system will also allow us to react flexibly to a range of different market requirements in the future."

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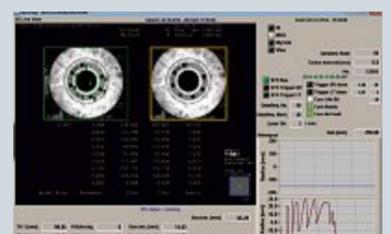


Image taken by the camera showing the hole layout identification process



The brake disks are lacquered in black and silver in mixed operation



Data matrix code label



Mario Speck, Production Process Supervisor at SHW, is enthusiastic about Sprimag Technology

INTERVIEW

New Sprimag spray gun: S-8

The new S-8 spray gun was specially designed for the internal coating of cans. Achim Simon, Application Technology Specialist at Sprimag, explains the background of the development process

For which application area was the new Sprimag S-8 spray gun developed?

The S-8 was designed to coat the interior of cans. It will mainly be used on internal coating machines from the HIL series. It covers a large range of can diameters and lengths, and therefore complements the possibilities offered by the established S-233 spray gun. The S-8 therefore extends the portfolio in the areas of interior coating.

What are the highlights of the new spray gun?

The main highlight of the S-8 spray gun is the twin-tube design in combination with the lacquer circulation to the end of the nozzle. Thanks to the innovative nozzle extension design with two tubes, the diversion air and atomizer air are controlled separately and guided to the nozzle. Both air flows are set externally: The strength of the diversion can be easily set on the control panel by controlling the pressure. This means operating personnel no longer have to enter the coating booth to set the diversion air or atomizer air.

Furthermore, the new spray gun has been equipped with a lacquer-flow circulation system. This means the lacquer circulates right to the end of the nozzle. The main advantage of this is that the lacquer does not cool down should production be interrupted, for example, as the lacquer is continuously circulated. As a result, waste is significantly reduced, lacquer is saved and it is ensured that components produced at the beginning of the production run are also of a high quality.

What are the main differences between the S-8 spray gun and the S-233 spray gun?

In comparison with the S-233 that has been used to coat the interior of cans until now, the new S-8 provides advantages, including improved operability, low maintenance needs, extended and convenient setting options, as well as new features to guarantee quality. In addition to the above-mentioned highlights – the twin-tube design and lacquer-flow circulation system – the S-8 also features an air-tube locking system and a quick-change system.

The air-tube locking system ensures that the best air-tube position is indexed, meaning the position can be reproduced exactly. This is an important point when removing the air-tube for cleaning or maintenance as it is no longer necessary to spend a long time readjusting the tube; this also prevents a reduction in quality due to incorrect positioning.

The S-8 design with a quick-change system is a further feature for precise positioning. The spray gun is separated from the quick-change plate by undoing two screws. The air and material supplies are combined in the quick-change plate so that the lacquer supply pipes do not have to be disconnected from the spray gun.

The double-piston design in the spray gun is another new feature. The main piston (control piston) is connected to two further small pistons. As the control system for the two air flows has been directly integrated in the spray gun, it is no longer necessary to

spend time programming it, and the diversion- and atomizer-air currents can be controlled separately. Thanks to the double-piston design, when converting or retrofitting an existing system, there is a further advantage as external valves are no longer required as a result of the integrated atomizer-air control system.

What was the greatest challenge when developing the new S-8?

Our greatest challenge was probably minimizing the weight of the spray gun as far as possible, despite the numerous features. Moreover, the high number of cycles on internal coating machines (up to 300 cans per minute) and continual performance increases were also particular developmental challenges. The reaction time – or the spray gun's switching time – had to be as short as possible. Despite the additional logic in the spray gun, a precise and sophisticated design was required to meet this requirement. An even lacquer distribution and layer thickness are also challenges we set ourselves for each new development.

When will the S-8 be available from Sprimag?

The first prototypes have already been produced and are currently being tested. The expertise gained from this test series will be taken into account when developing the product further to manufacture new prototypes. Then, field tests will be carried out on our customers' production lines. The S-8 spray gun is therefore expected to be available in 2016.

» The new S-8 provides advantages including improved ease of use, low maintenance needs, extended and convenient setting options, as well as new features to guarantee quality. «

Achim Simon



ABOUT ACHIM SIMON:

Achim Simon has been working in the development department at Sprimag since 2009. The trained industrial mechanic and mechanical engineer has already played a part in numerous developments for Sprimag application technology products.

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Sprimag thanks all of these employees for their many years of service and for their long-standing relationship with the company.

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