



Perfect protection for discs and the environment

With UV coating machines for brake discs, the environmental pollution can be reduced and a better curing can be achieved, compared to conventional paints

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Dear readers,

The world is marked by movement more acutely now than ever before. This is true not only of people fleeing from war and terror, but also of countries and markets.

Coping with fluctuations continues to be a challenge for medium-sized businesses like Sprimag. However, sophisticated interaction between our divisions, continuous development of our tried-and-tested machine concepts, as well as sustained endeavors in specialization and further diversification, have already led to a good, sustainable capacity utilization at the start of the year. In spite – or perhaps as a direct result – of this, we will remain committed to supporting the interests of our customers this year and continue to work on our products. A number of large trade fairs, such as the PaintExpo in Karlsruhe, the Cannex in Colorado or the K trade fair in Düsseldorf, will give us the opportunity to present ourselves once again and nurture the exchange we have developed with our customers. Our intensive analysis of customer projects and discussion with customers themselves is also reflected in the Sprimagazine in front of you right now.

Page 1 introduces you to one of our latest innovation from the Application technology division. The new centrifugal gun is perfectly suited to producing coatings with sharp edges. The centrifugal unit was



Joachim Baumann,
Managing Director of Sprimag

developed as part of a specific customer project. In future, we will be able to use the unit in many more projects that have special coating requirements.

Progress in the development of Industry 4.0 demands that our machines and systems are capable of producing usable data for networking and process control, as well as process and quality monitoring. You can find out how this is implemented in practice in modern coating systems on page 2.

Now that the short and gloomy days of winter are behind us, we look forward to giving you a warm welcome at one of our trade fair stands.

Until then, I hope you enjoy reading our latest issue of Sprimagazine!

Joachim Baumann
Joachim Baumann

Special internal coating

To meet our customers' demands for flexible internal coating, Sprimag is continuing to drive forward the development of its spray guns

Centrifugal technology has been established for years at Sprimag, and allows round, sleeve-like parts to be given a coating with sharp edges. For example, using Sprimag centrifugal guns, seal rings made of latex can be applied to the ends of aluminum tubes, which then ensure that there are no leaks at the joint once it has been sealed. A further use for centrifugal technology is the internal coating of drill holes with a diameter of between 6 and 40 millimeters, as is the case on piston holes, for example.

Until now, the centrifugal guns have been powered by a three-phase motor with belt drive. However, this meant the system was limited to around 3,000 rpm. For the rotational speed of roughly 18,000 rpm that is required for centrifuging, a transmission ratio of 1:6 had to be set up. This made the drive system so large and heavy that centrifugal technology could only be used on a limited basis, as in most cases the parts had to be taken to the centrifugal unit.

To expand the range of use of centrifugal technology, Sprimag has developed a new drive system with a servomotor, which enables a transmission ratio of 1:2 with its higher rotational speed of roughly 9,000 rpm. The resulting reduction in the size of the drive belt pulley allows for a more compact design. With its smaller size and reduced weight,

the centrifugal unit can now be used for other applications – the coating of unusual parts with a robot, for example. The first serial use was in a system for coating pipes with a diameter of between 40 and 100 millimeters. The machine is currently being installed at the customer's site.

We will present the new centrifugal gun at the PaintExpo in Karlsruhe from 19th to 22nd April, and at the K trade fair in Düsseldorf from 19th to 26th October.

» Harald.Kern@sprimag.de



Due to the compact size and the weight reduction, the new centrifugal gun can also be mounted on a robot

NEWS

Award-winning design

The Sprimag HIL-94 horizontal internal coating machine was awarded the silver design prize at the 24th Baden-Württemberg International Design Awards, the Focus Open 2015. The design of the internal coating system for cans, developed jointly by Sprimag and the industrial designer Knut Braake, stood out with its clear, uniform line concept. This was continued in the attached internal coating dryer for cans. The large glass doors enable optimum access and an excellent view of the coating process. A high level of ergonomic operating comfort is achieved with a variable, movable operator control module. As a cross-system, color-distinct design element of the doors, an abstracted spray jet makes the system's operations visible. The machine design of the HIL-94 is to be introduced across the entire internal coating system product range. For this reason, we are particularly happy with this award!



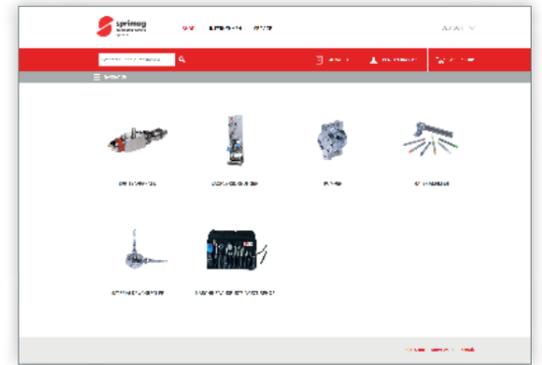
» marketing@sprimag.de

Sprimag online shop

All parts from the standard range of Sprimag application technology are available now at shop.sprimag.com. The various spray guns, including the nozzle sets, spare parts and any other coating supply products you need, can all be selected conveniently from your PC. After a one-off registration process, you can add products to your personal memory list at your convenience and send your request directly to Sprimag Customer Care at the click of a mouse. You will then receive a custom quote and can complete your order as usual. The Sprimag online shop has been redesigned using responsive web design guidelines. This means that however you choose to access the Internet, the website will detect whether you are using a computer, tablet or smartphone and fit the user interface to the screen.

» service@sprimag.de

shop.sprimag.com



New Sprimag Webshop for an easy and comfortable inquiry of application technology parts

NEW PRODUCT

Process monitoring for quality assurance

To achieve consistent coating quality and to increase the rate of production, Sprimag is increasingly using real-time monitoring of the relevant process parameters

One reason for the increasing demand for integrated process controls in coating systems is the rise in documentation requirements within the automotive industry. However, coating system owners themselves are keen to monitor, analyze and document coating processes, to en-

sure consistent production quality, and as such, to reduce rejected parts.

So that consistent coating quality and production reliability can be achieved, the complex interactions between system technology, coating material and environmental conditions must be con-

trolled. For this reason, in addition to the already standard process controls, systems to monitor coating thickness, viscosity and flow rate as well as the temperature of parts or coatings are increasingly being used in modern coating systems.

These new systems are also being increasingly used in Sprimag coating systems. In a recently completed coating system for adhesive agent applications, two process control technologies were integrated. A color sensor checks the first coat immediately after application. Following the application of the second coat, the entire coating thickness is measured using a system for contactless coating measurement. Data collected from process controls and the system program are stored in the control system.

Another piece of technology for integrated real-time process monitoring in an anti-friction lacquer coating system is a camera system that checks the quality of the coating. As part of this process, a fluorescent assembly anti-friction lacquer is applied initially, and the coated area is photographed multiple times under UV light. After the pictures are assessed, the operator receives the signal as to whether the part has been coated correctly or not.

Process monitoring to maintain a consistent quality of coating is vital, particularly for components from the engine compartment, in order to continue to ensure that the engine will function correctly. The metal parts are pre-warmed before coating to ensure consistent coating quality. Therefore, the temperature

of parts is measured and checked directly before the coating process, with any deviations being reported directly to the control system.

Today, the possibilities for monitoring, analyzing and documenting processes are very varied. Choosing the right systems from the available plant technology is dependent, among other things, on the function that the coating must perform, quality requirements and also economic aspects. In addition to the integration of process monitoring into a new coating system, existing systems can also be upgraded.

» Mark.Dekreon@sprimag.de



Camera to control the coating quality



Information on whether the parts are ok or not are displayed on a monitor

RETROFITTING

Retrofitting ensures future plant availability

A 15-year-old Sprimag machine used for the internal coating of aluminum tubes has been updated by means of extensive modernization work

Linhardt GmbH & Co. KG, a packaging manufacturer based in Viechtach in Bavaria, supplies the pharmaceutical, personal care, food and non-food industries with aluminum and plastic tubes, aerosol cans and other packaging made from these materials, such as pipes, cans or cigar cases.

Roughly 220 million aluminum tubes, cans and pipes, as well as approximately 260 million aerosol cans are manufactured in Viechtach every year. At present, there are 16 Sprimag machines used for the internal coating of aluminum cans and tubes at the production site. One 15-year-old tube internal coating machine – a Sprimag HIL-42 – should now be fit for future use. “The decision to have the internal coating machine retrofitted was determined by the need to ensure future plant availability and reduce downtime.

We also wanted to bring it up to the same technological standard as other internal coating machines that were manufactured more recently. The aim of modernization is also to reduce ongoing maintenance costs in the long term and guarantee the availability of spare parts,” says Stefan Ernst, Maintenance Manager at Linhardt, explaining the reasoning behind their decision.

In addition to converting the HIL-42 internal coating machine, the retrofit also involved converting the tube annealing oven (TGO) and the tube internal coating dryer (TIT). Since some of the components in the 15-year-old machine had been discontinued, the control, drive and automation components had to be replaced to guarantee the supply of spare parts and continued availability of the plant.

Working closely alongside Wago Kontakttechnik, it was possible to retain the existing fieldbus modules, so that only the obsolete PROFIBUS technology had to be replaced with modern PROFINET technology. The control structures were implemented using a safety concept based on Safety Integrated technology. This particular step was very quick, taking just one week to install. Since the Atlas Copco servo technology had already been discontinued some years previously, it was replaced by an up-to-date version manufactured by Baumüller. The control system was also updated, with the Siemens S7 controller now replacing the SPS S5 machine controller. In addition, all the displays were replaced with new HMI displays for more convenient operation.

The full conversion of the internal coating machine and dryer was com-

pleted in just three weeks, including recommissioning, training and production support.

“Thanks to close cooperation between Linhardt and Sprimag, the conversion was completed in the shortest time possible. Two of our electricians were on hand to assist Sprimag personnel, which encouraged the exchange of information and helped us keep to the tight schedule,” summarizes Stefan Ernst.

Contact for conversions and retrofitting:
» Mark.Gotzmann@sprimag.de



The comprehensive retrofit includes the renewal of control, drive and automation components

UV coating systems for *brake discs*

The modern and compact system design by Sprimag offers perfect protection for discs and the environment

Demand for motor vehicle brake disc coating has risen noticeably in recent years. On the one hand, this increase has aesthetic reasons as brake discs are visible due to open wheel designs. On the other hand, installing a coated disc has become much easier, especially in the aftermarket sector. This is because corrosion protection that is applied to uncoated discs no longer needs to be elaborately removed. If nothing else, discs or drums with corrosion protection have a higher level of performance through their entire lives. This is because the self-cooling effect is not reduced by rust, for example inside cooling channels.

There are different types of coating on the market, which each have their advantages and disadvantages. Currently, the most prevalent coatings are zinc flake coatings, zinc dust systems and black-colored systems made with zinc phosphate or oxide. In this field, Sprimag has developed a number of coating systems with the aforementioned media.

Furthermore, Sprimag has years of experience in brake disc coating using UV coatings. Several car manufacturers and OEMs, Sprimag's main customer group in this sector, have recently given their approval to UV coatings. Therefore, Sprimag has produced two further UV coating systems for brake discs in the past twelve months.

"The essential advantages of this type of coating are the short processing time, solvent-free coating agents and the relatively low amount of energy required for curing," explains Rainer Mendl, Head of Construction and Development at Sprimag. These attributes increase the possibility of integrating

this type of system directly into a machining line. The high minimum layer thickness values that occur are a disadvantage, which is why functional surfaces such as bicycle surfaces or secondary system and friction surfaces are

» Arguments for UV-coating systems are the short processing time and a compact machine design. «

Rainer Mendl

not coated. Other disadvantages: Coating of surfaces that are not exposed, such as ventilation ducts, is either difficult or virtually impossible.

The compact Sprimag concept for a UV coating system for brake discs includes the intake and removal of discs on a roller track, including an automatic transfer handling system. Coating takes place on a rotary indexing table with at least four stations. The intake process can be supplemented by part recognition, which allows products to be handled in mixed operation, for example.

When the discs have passed through the transfer station, they reach the coating station. Combined with the Sprimag S-7 jet nozzle series, the S-7 extension and a coating robot, the system can meet very flexible and varied coating demands. The use of a robot enables cycle times of between 20 and 27 seconds for partial coating. This also approximately complies with UV curing time, which is a result of coating-specific peak UV performance and the required overall UV dose.

The 100% UV coatings that are coming into use have black pigmentation and cover with a layer thickness value starting at roughly 20 micrometers. Other pigmentations are possible and, comparably, they enable a high level of flexibility when it comes to the color scheme. The required layer thickness values on the disc surfaces that need coating are between 20 and 80 micrometers. Higher surface thickness values are essential for non-functional surfaces, as they must meet the highest requirements for corrosion protection. Functional surfaces are only lightly coated, or not at all.

Any overspray in the coating chamber is removed using dry aspiration with two-stage filtering and then led away through the roof or into a central aspiration system. An air supply with filtration is also integrated.

A particular point of note applies to the coating supply for these UV coatings. This is because the temperature of the coating agent must be increased during application, so that it can be sufficiently atomized and can reach the required values of layer thickness and evenness. This temperature must be guaranteed in all operating conditions of this type of system, which means at the start of production, during continued production and during interruptions in production. This is achieved using coating-warming equipment with direct linear medium temperature control and monitored coating circulation with quantity compensation. The best-possible insulation of the circulation increases the exactness of the temperature and reduces unnecessary energy losses. This paint supply system is integrated into the system, and is locked using separate doors and is also aspirated in order to avoid fumes from the UV coating entering the atmosphere.

At the emptying station, which is connected to the coating station, the coating process is paused before curing so as to optimize the process. An optional IR emitter can be installed here.

The last station provides the UV radiation curing. The UV emitters used have a nominal power of around 200 W/cm² with focusing. The position of the emitters to the product is crucial, and can be easily set and reproduced. If needed, they can also be automatically positioned.

The improved corrosion protection, lower energy consumption, the composition of media in a more environmentally friendly way, and the shorter process times are crucial arguments in favor of continuing the trend of UV coated brake discs. Another plus is the reduced space requirement for UV drying and coating systems. A compact design is made possible due to the removal of exhaust gaps and cooling compartments.

Sprimag offers modern UV coating systems for coating brake discs, which are adapted to meet our customers' needs. As a particular focus is required to process UV coatings in the spray gun field and coating supply, Sprimag scores highly in system technology with its own perfectly adapted application.

» Rainer.Mendl@sprimag.de



The coating robot is equipped with two Sprimag spray guns, thus different requirements regarding the coating layer can be met



Transfer station on discs with object identification for the production in mixed operation



UV-coating machines are particularly compact, as no exhaust air section and cooling zone is required



Comparison of process energy of current coatings

COATING SYSTEM	REQUIRED PROCESS ENERGY PER 5 KG DISK ¹	REQUIRED PROCESS ENERGY PER 15 KG DISK ¹
Zinc flake ²	0.71 kWh	1.84 kWh
Zinc dust ³	0.12 kWh	0.24 kWh
UV system ²	0.13 kWh	0.16 kWh

Comments: 1: Electric energy for heating or radiation and cooling, 2: Low on or free of VOC, 3: Solvent-based; extra energy required as needed for reduction of VOC

NEW PRODUCT

New machine for growing markets in the beverage can sector

The latest generation of the Sprimag HIL-34, an internal coating machine for beverage cans and tins, is impressive due to its excellent reliability and high production capacity

The beverage can industry is continuing to grow all over the world. The USA, where the first can went on sale in 1934, continues to be the largest consumer. In 2014, the European market achieved a considerable growth rate of just short of four percent according to a current market report written by the BCME – Beverage Can Makers Europe. This means that the number of filled beverage cans rose to 63 billion in Europe alone. BCME considers the continued positive development in Eastern European countries such as Hungary and Poland to be one of the factors encouraging the strong growth. But Germany is also experiencing a significant rate of increase: In 2014, the number of filled beverage cans increased sharply

by around eight percent here, reaching its current figure of over 3.6 billion. The soft drinks sector in particular expanded by an impressive 22 percent. The continued popularity of energy drinks is one of the key factors in this great upsurge. In contrast, the number of beer cans filled in Germany increased by only 1.1 percent, a growth rate which was achieved by special promotional cans and marketing campaigns.

To allow Sprimag to further improve the services it offers for the growing beverage can market, it developed a new version of the HIL-34 internal coating machine. The new generation was presented at the Metpack trade fair back in 2014. The machine is particularly impressive because of its flexibility, for example it enables beverage cans and tins to be processed on identical basic machines. The modern machine design of the Sprimag HIL-34 was developed together with industrial designer Knut Braake. The paneling, entirely constructed from stainless steel, is a perfect example of how a sophisticated design can be combined with functionality. The new paneling also ensures that the machine is easier to access. The cover opens upwards in a straight line with pneumatic support, leaving the entire machine interior accessible for cleaning or maintenance work. An automatic opening can also be set in the paneling, for example to provide a visual signal for pre-set cleaning intervals.

The first generation of the Sprimag HIL-34 was put on the market back in 1995. Sprimag has therefore been able to collect feedback from customers based on their experience with the machine over the course of two decades and continually

further develop and improve the machine. One modification which was implemented in the latest version of the HIL-34 is the fine adjustment of the spray gun's angular position, for example. This ensures that the position of the gun can be reproduced with precision. Other optimization measures achieved simplified maintenance, reduced maintenance times and increased intervals between maintenance work. To shorten cleaning times too, the spray area and extraction system surfaces which need to be cleaned were designed to be only as large as was absolutely necessary.

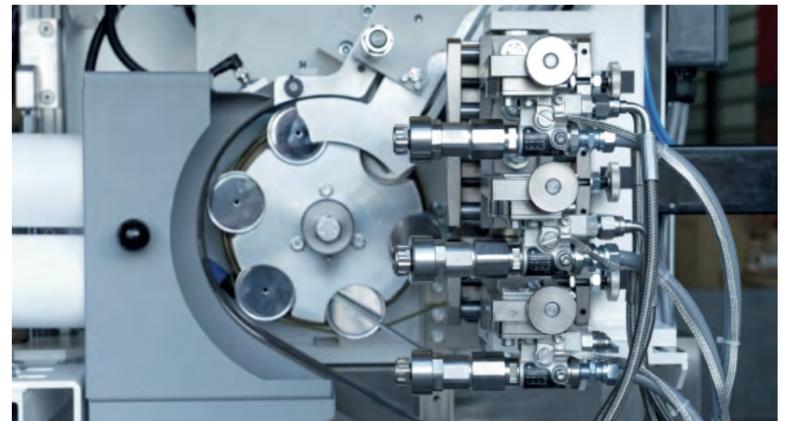
» The flexibility of the machine is a significant advantage. «

Matthias Allar

For certain applications, the HIL-34 can also be equipped with three spray guns instead of two. This makes it possible for the machine to coat layers of various thickness on to different areas of the can, therefore saving paint.

The latest generation of the Sprimag HIL-34 has been very well received, with around one hundred machines sold since the market launch. Every single piece of feedback we have received from customers following installation has been positive. The machine that you have been waiting for, with its attractive design, improved user-friendliness and robust, modern technology, has arrived.

» Matthias.Allar@sprimag.de



For certain applications, the HIL-34 can also be equipped with three instead of two spray guns, thereby lacquer can be saved.

Above: maintenance position, Bottom: production position



The new design of the HIL-34 allows an easier access for cleaning or maintenance work

TECHNICAL DATA OF THE HIL-34:

- Production speed up to 350 cpm
- Standard diameter D min 52mm, D max 85mm
- Standard length L min 85 mm, L max 180 mm
- Spray guns / spray runs 3 / 3 times, 2 / 2 times

IMPRINT



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