



From the classic beverage can to the thin-walled aluminum bottle

Impact extrusion or DWI method? Different products require different production processes – even for the internal coating

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Economic activity connects

Where will it end? For months, presidents and politicians of countries that were long thought to be democratic have been insulting and denigrating other ethnic groups, nations and countries in the worst way. Malicious insinuations are the order of the day. As an international company with global, extremely friendly contacts and customer relations, we find this trend very worrying. How can and should we continue to face those who have been our customers for decades and who have become our friends?

The answer to this lies in the hope that these many customer relationships are more valuable and beneficial to people than the bluster of politicians who have completely distanced themselves from the opinion of those who voted them in based on their commitment to democracy, freedom and a peaceful co-existence.

Looking to the future, it is even more important to foster these relationships and establish multi-faceted trust when working jointly on machine and system projects. This means that this trust can then be transferred to the human components and long-standing friendships can be established, deepened and renewed. It is hoped that this will be so intensive that the friendships will not be at risk from politicians who have lost their way. The



Joachim Baumann, Managing Director of Sprimag

economy has connected people for centuries – and we will continue with this in 2017, remain open to the world, and establish friendships with all of our customers.

In this edition of Sprimagazine, we also report on our international projects, such as the manufacture and internal coating of aluminum drinks bottles, which is a rapidly growing global market of the future. We also provide an insight into the work in our in-house Applications Center, and we look forward to also being able to present to you the new CIM-12 end-of-line inspection machine for monobloc aerosol cans, which expands our product range. I hope you will enjoy reading the latest issue of Sprimagazine!

Joachim Baumann
Joachim Baumann

Sprimag at K 2016

At the most recent K Trade Fair in Düsseldorf (Germany), Sprimag focused on topics such as UV coatings and flexible system concepts

Even after years of growth, the plastics industry continues to develop – both quantitatively and qualitatively – thanks to continuous innovations. This was also palpable at the most recent K Trade Fair, the world's leading trade fair for plastics and rubber. With 230,000 visitors and more than 3000 exhibitors, there was plenty to see at the trade fair. This year's event was once again attended by an international crowd; visitors from all corners of the world took advantage of the largest trade fair in the plastics industry to inform themselves about current trends and technologies, network and speak to the experts.

The fact that the plastics industry is a market where the highest quality standards are placed at the top of the agenda

was also observed at our booth. We received repeated inquiries about PVD coating and UV drying, as in both the automotive and the cosmetics industries, as well as in other industries, extremely high demands are made of plastic products, such as maximum scratch resistance.

The various possibilities of flexible system concepts were another recurring topic of conversation. Recent years have seen a considerable increase in demand because of the need to respond to new market conditions more quickly as a result of shrinking batch sizes and a growing range of variants. A detailed report on this can be found in the last issue of Sprimagazine. Thank you once again for visiting us!

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From the Applications Center to the customer

From the beginning of the project to the coated end product and beyond: Sprimag's portfolio covers a wide range of services. Initial testing before the actual start of production, performed at our Applications Center which was opened in 2008, represents a core service in this regard

Whether helping new or existing customers with very specific coating requirements – many customer projects begin life at our in-house Applications Center. The expert team, comprising André Keller, Albrecht Schmidt and Joachim Schwilk, is ideally equipped to handle all tests relating to the application and coating of various parts with a wide range of materials.

In practically oriented test series, these experienced experts coat our customers' workpieces or test new developments under realistic production conditions. Using a broad spectrum of coating systems and application techniques allows the processes to be optimized even further.

A generously dimensioned, modular robot coating system represents the centerpiece of the Applications Center. The spray booth houses a six-axis coating robot, which has been extended to include linear and rotary axes. This allows the various Sprimag machine concepts to be tested in realistic conditions. Various pretreatments of the parts are also possible here, such as CO₂ snow blasting or ionization, as well as the activation of plastic surfaces using plasma or flaming. A range of drying options is also available, from convection, infrared and induction drying, all the way up to UV curing.

In addition to this, the Applications Center, which is often referred to in-house as Technical Center, has a compact robot stand, as well as a special automatic round-table coating machine. These autonomous machines and systems increase the performance capacity of the Applications Center and round off the range of services offered to customers.

Operating the equipment under industry-like conditions allows custom-

ers to see the kind of coating results they can achieve themselves with their system. Sample series for major customers, tests and feasibility studies for internal and external UV LED coatings, validation of highly reactive UV coatings on complex 3D parts and internal coating of cosmetic items with heavily abrasive coating materials, all the way up to very low volume flow coating of multi-component coating systems are just a small selection of the test series completed at the Applications Center last year.

» Operating the equipment under industry-like conditions allows customers to see the kind of coating results they can achieve themselves with their system. «

Axel Bolowich

We are also involved in constant research and development work in the field of application techniques. Last year, we conducted tests in the field of adaptive coating control, for example, i.e. continuous mass flow control via material pressure during ongoing production. Comprehensive rheological testing of UV coatings, all the way up to optimization in the field of coating temperature control, represented another focus.

It therefore came as no surprise that many existing customers once again relied on the services of the Applications Center in 2016. Among others, these include customers involved in coating operations for chassis components, brake discs, pistons, bearing shells and plastic parts for car interiors. Beside these, several machines in the sanitary and healthcare sector also made their way through the assembly hall following initial testing at the Applications Center and found their final home with long-standing customers.

Following the classic start of projects with initial tests, many end up as implemented projects in the assembly hall, which was built in 2014. The modern equipment of this hall meets the strictest demands in terms of flexibility. Boasting 2000 m², it offers enough space to complete the entire pre-assembly process, as well as to commission the core processes of a coating system, all the way up to a complete system. Many customers welcome the option of performing a preliminary acceptance test at the Kirchheim facility. This offers clear benefits, as customers have access to specialists in the event of problems, and rapid implementation of modifications is possible thanks to in-house component manufacture that uses the latest machinery, which results in faster on-site installation.

Sprimag also sees excellent prospects for continuing the success enjoyed last year into the future and is happy to offer its entire portfolio of services to both new and existing customers. Maybe your next project will start with exciting tests at the Applications Center, too.

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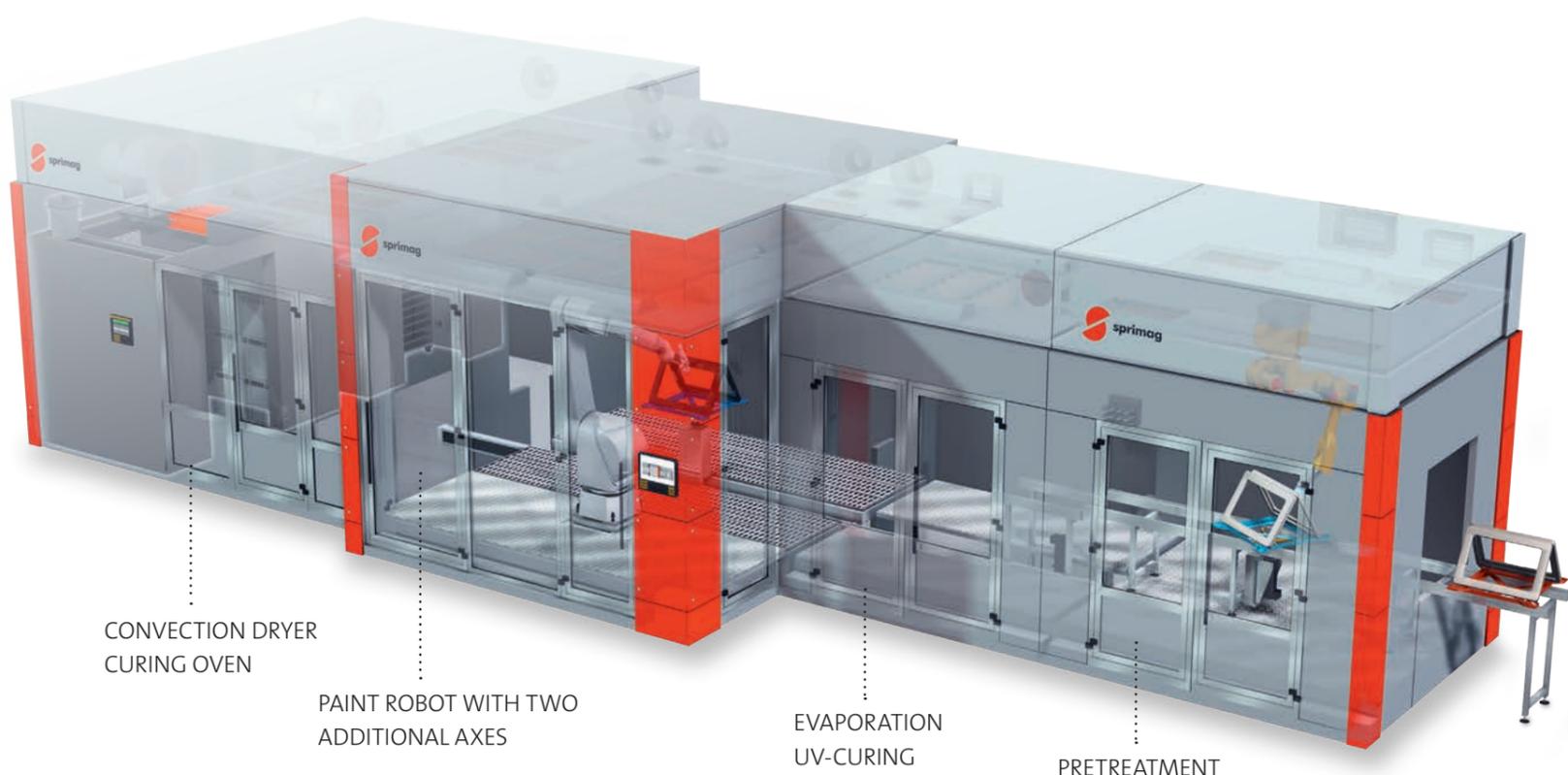
The Applications Center team (from left to right): Joachim Schwilk, André Keller, Albrecht Schmidt



A compact robot stand and a special automatic round-table coating machine round off the range of services in the Applications Center



The 2,000 m² pre-assembly hall is equipped with 5 cranes and thus allows a flexible final assembly



CONVECTION DRYER
CURING OVEN

PAINT ROBOT WITH TWO
ADDITIONAL AXES

EVAPORATION
UV-CURING

PRETREATMENT

From the classic beverage can to the thin-walled aluminum bottle

Not all aluminum bottles are the same. Depending on customer requirements, aluminum drinks bottles can be manufactured using either the impact extrusion (IE) or DWI method. Different products require different production processes – even for the internal coating



Typical Japanese DWI-manufactured drinks bottles with short length-to-diameter ratio

DWI-manufactured drinks bottles with large length-to-diameter ratio

Impact-extruded bottles

Back in the 1990s, a variation on the classic beverage can – thin-walled aluminum bottles manufactured using the DWI method – were brought to market in Japan. Today, these bottles are an indispensable part of Japanese everyday life. Many drinks – from soft drinks to alcoholic beverages, such as sake and beer, through to iced coffees – are now sold in this customary aluminum bottle, usually with a large screw cap closure, particularly in the millions of drinks vending machines that can be found all over Japan, as well as in major convenience stores such as Seven Eleven, Lawson or FamilyMart.

American and European manufacturers were much slower to pick up on aluminum bottle production. This eventually led Ball to launch several versions of the FUSION® bottle at once, with different sizes and necks. At the start of the new millennium, Exal brought its C2C (Coil-to-Can-manufactured) aluminum bottles for soft drinks to market, as did Boxal (F).

Until that time, the products were still produced using a combination of IE and DWI technology. It was only with increasing unit sales that other manufacturers identified aluminum drinks bottles as an attractive market and subsequently developed the "pure" DWI bottle (Draw Wall Ironing). Plants that manufacture these DWI bottles can produce between 600 and 1500 bottles every minute, whereas the impact extrusion method suppliers produce only between 150 and

220 bottles per minute. Depending on the bottle's purpose, reverse impact-extruded bottles are still in use today, especially since both manufacturing processes produce versions of the bottle which differ in a number of aspects and have corresponding advantages and disadvantages. The first aluminum bottles outside of the Japanese market were largely manu-

factured by means of reverse impact extrusion, which is the same method used to manufacture monobloc aerosol cans. The method, specifically the necking process, was refined further to better match the classic bottle shape. The insides of the first reverse impact-extruded bottles were almost all coated on Sprimag internal coating systems. Back then, Sprimag had already built up decades of experience coating the insides of monobloc aerosol cans. With the launch of the 16 fl. oz. aluminum bottle for

its beers, brewery giant Anheuser-Busch (Budweiser) notably pointed the way to the future. Once again, Exal initially manufactured these bottles using IE production alone, but subsequently modified the production process to include DWI technology in separate production steps. Eventually, Anheuser-Busch and its in-house production company MCC (Metal Container Corp) refined the original IE beer bottle to adapt a twist-top seal. This led to the creation of a pure 16 fl. oz. beer bottle with screw cap closure, and they were able to produce the DWI beer bottle at rates of 1,200 bottles per minute – not the least thanks to their use of Sprimag HIL-05 inside spray lancing technology.

Sprimag continues to confront this trend in the market for thin-walled, DWI-manufactured drinks bottles, and thanks to the HIL-05, now offers an internal coating machine specifically for coating the insides of drinks bottles that have a large length-to-diameter ratio.

Naturally, the machine can also be used to coat the insides of classic beverage cans, where now even greater limits in the length-diameter ratio are desirable (e.g. slim cans for soft drinks, large volume beer cans). They can be

sprayed safely and reliably on Sprimag HIL-05 stand-alone machines, or other machine platforms from Sprimag, even at high cycle rates.

The HIL-34 internal coating system from Sprimag, for example, is one alternative which is particularly suitable for coating the insides of beverage cans and bottles with a short length-to-diameter ratio.

Just recently, beverage can manufacturers outside of America, particularly in Asia, have shown great interest in

manufacturing thin-walled aluminum bottles for beer, especially for 12 fl. oz. and 16 fl. oz. volume bottles. Sprimag is equipped for high-quality/high-speed spray coating in both lancing and fixed spray gun requirements for the beverage can industry, and can rely on her vast years of experience in successfully implementing internal spray projects.

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» Sprimag is equipped for high-quality / high-speed spray coating in both lancing and fixed spray gun requirements for the beverage can industry. «

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HIL-34: Internal coating of beverage cans and bottles with a short length-to-diameter ratio

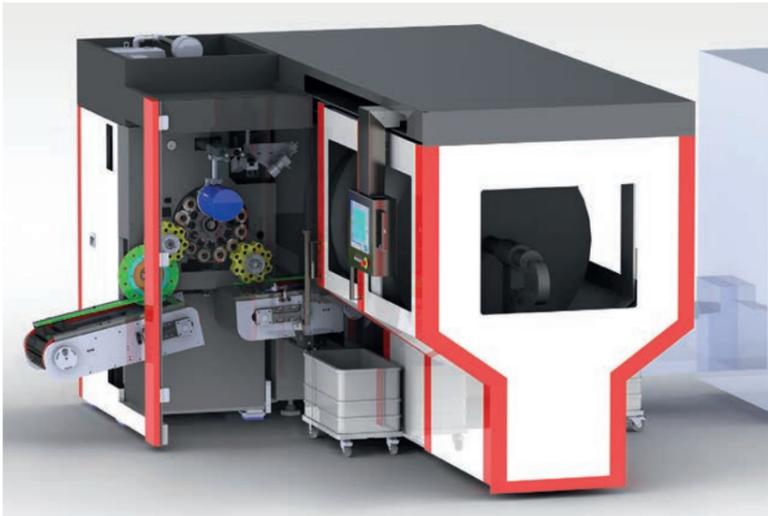


HIL-05: Internal coating of beverage cans and bottles with a large length-to-diameter ratio

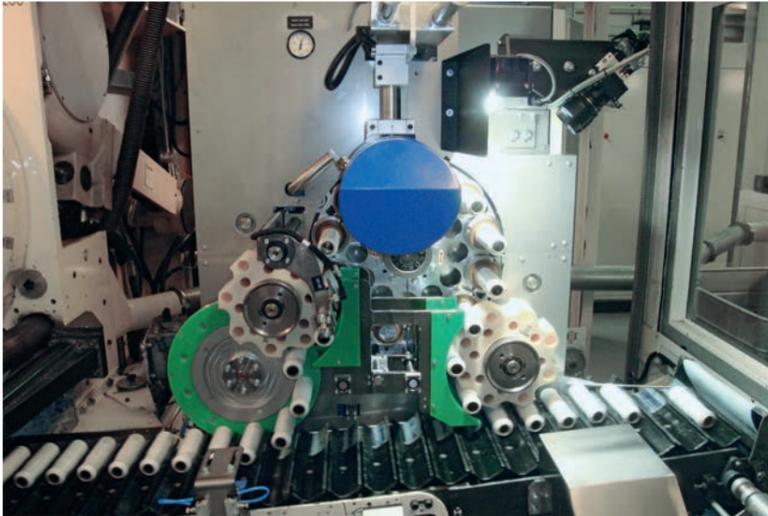
NEW PRODUCT

Camera-based end-of-line inspection for monobloc aerosol cans

After developing a leak testing machine for aluminum tubes (LRP-20) and another for monobloc aerosol cans (LRP-30), Sprimag is now rounding off its product range in this field of inline quality check with a camera-based end-of-line inspection machine for monobloc aerosol cans



CIM-12 line integration into outfeed conveyor belt necking machine



All-in-one variant LRP-30C: Combined with leak detection machine

The development of the CIM-12 testing machine for aerosol cans arose from a specific request made by our customer, Moravia Can in the Czech Republic, to develop a camera-based testing machine for end-of-line inspection as an installation downstream of the necking machine. Once production on their 250cpm high-speed system had been converted to DWI technology, Moravia Can took up the challenge of eliminating the risks of damage during the production process, which increased as a result of significantly reduced wall thicknesses in the DWI process. The forming process in the necking machine in particular and all preceding transfer operations pose an elevated risk of damage because the production and packaging processes are fully automated and manual interventions are no longer

possible. Modern camera-based systems designed specially for this purpose can now limit these risks without additional labor costs.

Thanks to two independent camera systems, the new CIM-12 inspects both the entire can body as well as the neck area from above. The CIM-12 testing machine is designed as an open platform so that a wide variety of camera systems from different manufacturers can be fitted. Customer preference in this respect is often decisive, based on the installation from the area of the printed image control and neck control in the necking machine. Moravia decided for the Genius System camera system from Applied Vision. The US company based in Akron (OH) was able to contribute all its experience in the high-speed inspection of beverage cans, as well as its expertise in the inspection of the printed design on aero-

sol cans. This requires the use of two independent camera systems on the CIM-12. In addition to inspecting the curl, a line camera system takes on the more important role of checking the overall shape of the can body.

The CIM-12 inspection machine ensures that cans are transferred from the upstream necking machine to the downstream machine and simultaneously serves as an installation platform for the camera systems. Once the cans are transferred, they are firmly fixed to a 12-station turntable by means of a vacuum and mechanical support and set in rotation for the 360° inspection. During the inspection, the exact rotational speed is determined by means of rotary encoder and passed on to the camera system. All defective cans identified by the camera system are detected, registered by the controls and subsequently blown out separately.

The CIM-12 was developed as a modular concept: The machine can be directly integrated into the extended conveyor belt of the necking machine and, in future, will also be available as an independent machine that can be installed in the line between the necking machine and packaging machine. A third variant of the machine is an all-in-one combination of inspection machine and the LRP-30 leak detection machine. In this variant, the CIM-12 shares not only the control cabinet, but also the machine platform and housing with the LRP-30. Integrating the two machines in this way also saves transferring the cans from one to the other.

Sprimag is convinced that end-of-line testing systems will continue to find their way into the aerosol can production process in future. Especially in plants owned by Japanese customers, a variety of cameras are already integrated in the entire production process and thereby guarantee production of aerosol cans which have a significantly higher standard of quality. In addition, this has led to considerable improvements in the quality of analysis, as well as the detection speed of the camera systems in recent years.

Sprimag can rely on extensive experience from similar projects in the field of beverage and aerosol cans, as well as inline quality checks on coating processes in the surface coating sector. Sprimag will make every effort to pass on this knowledge to its customers. To that end, the CIM-12 forms the basis for machines in the field of aerosol can production in future.

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CALENDAR 2017/2018

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TECHNICAL DATA:

PRODUCT DIAMETER	22 – 66 mm	CAMERA SYSTEM	depending on customer's request: e.g. TEMA Shape Control or Applied Vision Genius System • High Speed Sealing Surface Camera • High Speed Line Scan Camera
MAX. CAN LENGTH	300 mm		
PRODUCTION CAPACITY	250 cpm		
TRANSFER SYSTEM	Can transfer by vacuum		