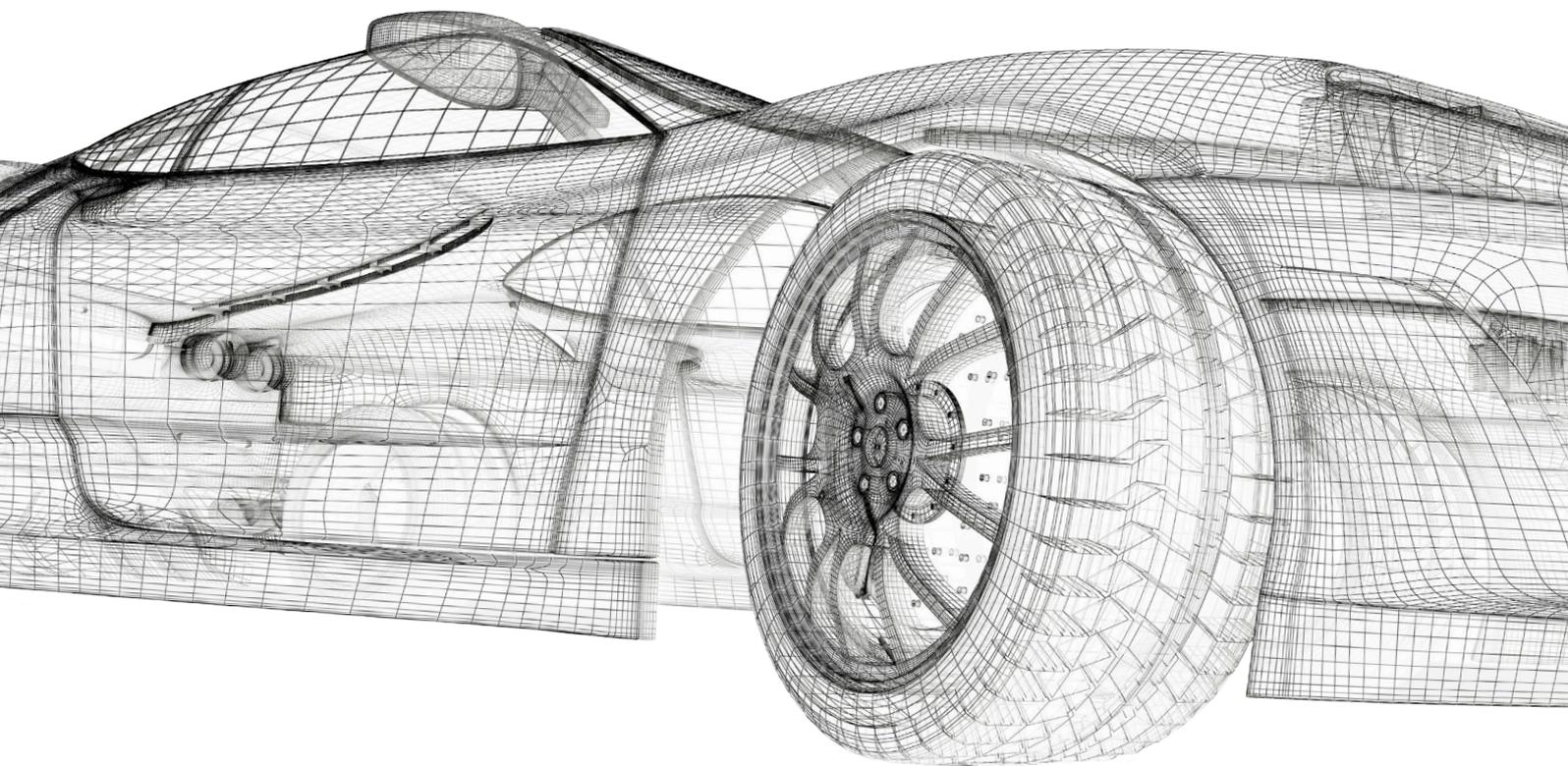


SIKORA EXTRA

Hose and Tube Magazine



SIKORA ensures the quality of automotive hoses

SIKORA EXTRA
Issue #1/2015
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Special:
Diameter measurement
Part 2: Classic diameter measurement

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INVESTING TODAY IN FUTURE GROWTH.

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Tel./Phone: +49 421 48900 0
communications@sikora.net, www.sikora.net

Next Events

■ MSV International
Engineering Fair
Sep 14th - 18th, 2015
Brno, Czech Republic

■ Fakuma
Oct 13th - 17th, 2015
Friedrichshafen, Germany
Booth A6-6110



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Dear customers, colleagues and business partners,

Some time has passed since the publication of the last edition of our EXTRA magazine. Naturally, we have not forgotten about you, but we have pursued further intense development with regard to structure as well as our technical service spectrum. Always focussing on the market requirements and customer needs, besides the wire and cable, fiber and hose and tube industries, we are also present on the market for inspection and sorting technology for plastic granulates.

These markets have the common need for innovative technologies in their production lines in order to stay competitive in the future. Repeatable and stable processes that can also be maintained across different locations are essential in order to be first in the market.

SIKORA's product portfolio contains a wide range of future oriented solutions for quality assurance. We would like to present to you a selection of these solutions in this edition of the EXTRA. Learn how the high-end measuring devices of the LASER Series 6000 meet the highest demands for

diameter measurement, which aspects of quality assurance are of essential importance for the production of rubber hoses, and how SIKORA products are put into operation at your plant with the example of our X-ray measuring device X-RAY 6000.

Since April this year, SIKORA has been moving forward into the future with Dr. Christian Frank as CEO of SIKORA's board. Furthermore, our presence in France has been extended. Sylvain Le Foll, the new manager of SIKORA FRANCE, is taking care of our customers in France and the North African Countries across all businesses.

Find these and many more articles in this EXTRA edition. We also cordially invite you to join our lottery.

Enjoy reading!

Yours sincerely,

Harry Prunk
Member of the Board of SIKORA AG

Dr. Christian Frank
CEO of SIKORA AG

DIAMETER MEASURING DEVICES FOR VARYING DEMANDS

Part 2: High-end diameter measurement

■ **The first part of our two-part series regarding the classic and high-end diameter measurement during the extrusion of hoses and tubes introduced the historical development of the classic online diameter measurement at SIKORA. In this edition of the SIKORA EXTRA we will present the possibility to satisfy the highest diameter measurement requirements during the extrusion of hoses and tubes by using high-end technology.**

Based on increasing demands, SIKORA developed three diameter gauge head models of the LASER Series 6000, which meet the current high-end requirements in the hose and tube sector. Besides the classic features, which are also covered by the LASER Series 2000, the gauge heads of the 6000 Series combine a variety of technological innovations to improve the productivity of the extrusion line sustainably. Up to 5,000 measurements per second, each of them with highest single value precision, allow for optimum line control and provide reliable statistical data. The high measuring rate also allows the detection of lumps and neck-downs. Therefore, the user receives a two-in-one system, which reduces investment costs and leaves more space in the line, as only the installation of one gauge head is required.

Non-transparent, colored and transparent hoses and tubes can be measured with the LASER Series 6000. Additionally, the gauge heads have an integrated LCD display. This gives the operator the diameter value at one glance, directly at the measuring device and eliminates the need for an external display device.

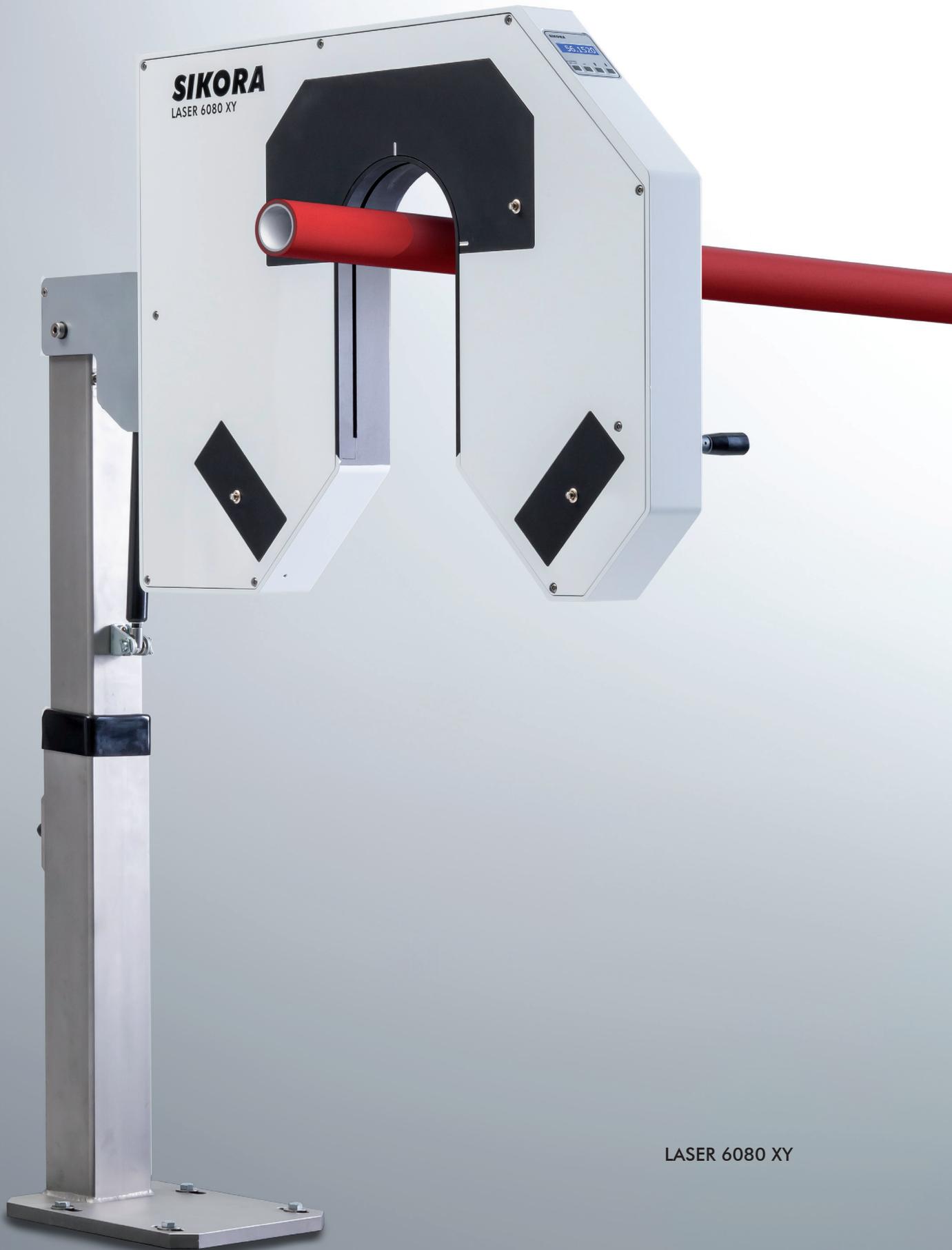
For applications where statistical data needs to be collected and stored and/or where printed reports are necessary, the ECOCONTROL, an external processing system, is available.

Regarding the possible interface connections, the LASER Series 6000 is in the forefront. Directly integrated in the gauge heads is a universal interface module for all connections such as RS 485, RS 232, Profibus-DP, Profinet or alternative industrial field busses as well as conventional analog outputs.

Furthermore, the devices are equipped with a Wi-Fi interface for the direct communication with a smartphone or laptop. The Wi-Fi interface serves for diagnosis and quality control and transfers measuring values, trend and statistic data, as well as video signals. The Wi-Fi interface, the interface module as well as all plug connections are completely integrated into the gauge head and, in this position, protected against water, dirt or mechanical in-

fluences during production. Furthermore, the LASER Series 6000 can be used for mobile quality control: The SIKORA App allows the operator to display all production data in smartphones; the App also offers calibration verification of the gauge head in accordance with ISO 9001. The values of the test probes are fed via QR Code and the measuring values are saved in a log file. For the quality management system, a test certificate is created, sent and archived.

An important feature for the integration in the production line is the swiveling gauge head design. The gauge heads can, for example during a product change, be easily moved up and out of the extrusion line. All measuring heads are open at the bottom side to prevent dirt and water from falling into the measuring area. The feeding of the cable connection to the interface module is also safely protected in the gauge head stand. SIKORA's LASER Series 6000 offers three diameter measuring devices for a product diameter from 0.2 up to 78 mm.



LASER 6080 XY



LASER 6020 XY

Conclusion

The decision which measuring and control device for quality control is being used in the production line depends on the requirements that the operators impose on the testing devices. Diameter measuring devices have to control the quality continuously during production. They provide actual information about the product and therewith the basis for automatic control. Ultimately, only the combination of the gauge head and the control device contribute to cost reduction during production. The diameter is automatically controlled to the minimum value based on the measuring results and the comparison with the nominal value. Hence, there is only as much material used as currently required. In this way, costs can be reduced, scrap avoided, and the productivity is increased significantly.

The LASER Series 2000, in combination with a line PC or control device, offers classic technology features which enable the operator to react quickly to tolerance deviations and to produce optimum quality.

The LASER Series 6000 is additionally equipped with various advanced features, with which the users can run their production lines more efficiently. Especially the extremely high measuring rate, measuring accuracy and repeatability are setting new standards in the precise controlling of the production line and, therewith, for the production of high quality hose and tubes.

ENHANCEMENT OF THE ECOCONTROL DISPLAY AND CONTROL UNITS

Intuitive operation and stable processes

SIKORA's display and control units of the ECOCONTROL series enable precise regulation of production lines, resulting in a high repeatability and stability of processes. The units are combinable with all SIKORA measuring systems and thus, offer relevant data for the regulation of processes quickly and clearly.

In order to facilitate the production work for machine operators, SIKORA has enhanced the ECOCONTROL 600 and ECOCONTROL 1000 devices by some practical features. Both devices were equipped with intuitive

control elements at the front and a USB port for the optional storage of production data on an external storage medium.

In addition, the operating system of the ECOCONTROL devices was updated to Windows® Embedded, enabling a modern and structured display of measuring as well as trend and statistical data. On a 8" or 15" TFT display, the ECOCONTROL 600 and ECOCONTROL 1000 offer the operator time and length related values, graphical visualization, comprehensive statistics at minimal, maximal

and nominal values, information on the standard deviation as well as Cp and Cpk values.

Naturally, you can also find all these functions and features on the 22" TFT color monitor of the ECOCONTROL 6000.



ECOCONTROL 1000 and ECOCONTROL 600 were upgraded by practical features

5.4 BILLION METERS OF INSTALLED AUTOMOBILE HOSES IN 2014

X-ray technology ensures quality during the production of rubber hoses

■ In 2014, around 900 million passenger cars were on the road. In 2035, the worldwide number will presumably, have risen to 1.7 billion.¹ Typically, 6 to 10 meters of rubber hoses are installed in each car. Altogether, this corresponds to around 5.4 billion meters of installed automobile hoses in 2014. In order to ensure the perfect function of this hose network in cars, quality control of rubber hoses during production as well as cost savings are gaining importance.

Today, the requirements for rubber hoses are very high and complex, especially with regard to functionality and safety, specifically for hydraulic and turbocharger hoses.

Rubber hoses, produced in extrusion lines can have one, three or five layers, depending on application and strain. The first extruder creates the inner layer (inner rubber). In the next step, the outer layer (outer rubber) is extruded. For certain applications,

such as turbocharger hoses, several inner layers and reinforcements are applied. For certain types of hoses, silicon is used as inner layer on which the reinforcement is applied to. It is combined with special kinds of rubber, as for example fluorocarbon rubber, which are perfectly suited to transport heterogeneous media such as fuels and oils.

Quality control with X-ray technology

Today a number of different technologies are used for quality control during the production of rubber hoses. Common technologies like ultrasound are suitable to a limited extent as signals of the single layers in the rubber hose are not clearly transmitted. Additionally, a coupling medium is required that may influence the measuring values. The precise measurement of all hose parameters without any dependence on environmental or material influences can only be ensured by using X-ray technology.

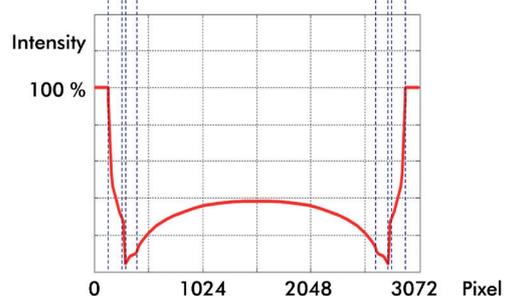
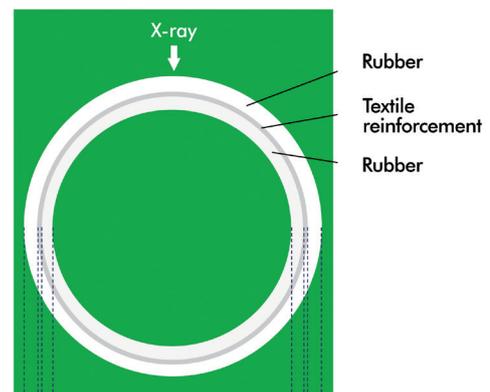
Since the early 1990's, SIKORA has been offering X-ray technologies for continuous quality control of extruded products during manufacture. Depending on the requirements, the X-ray measuring device is installed directly after the extruder (hot measurement) or at the end of the line (final quality control). The 4-point-online measurement provides values for the wall thickness, eccentricity, inner and outer diameter and ovality. The system measures up to three different material layers. These measuring values such as the eccentricity, are displayed in real-time, numerically and graphically and represented as hose cross sections at eight points allowing the operator to center the extrusion tool quickly.



¹ International Energy Agency (IEA): Mobility Model MoMo (2013).

For the production of rubber hoses, a 3-axis X-ray measurement can be an important tool for quality control. The measurement in 3 planes allows for a six point wall thickness measurement and in combination with a high measuring rate as well as the detection of defects of the inner hose. The measurement in 3 planes can be done for products from 6 to 65 mm.

Industrial X-ray technology as it is used by SIKORA, fulfills the highest safety demands and offers simultaneously, a measurement with the highest precision and reliability. The technology is independent of the temperature of the measured material and does not need a coupling medium. Therefore, it is easily installed within the extrusion line without any additional expenses. The X-ray measuring system is especially effective in combination with a processor system for the automatic control of the line speed or the extruder rpm.



Typical course of X-ray intensity during the measurement of a rubber hose

Did you know...?

With the use of the X-ray measuring system, around 5% less material is required for the production of rubber hoses. This represents a cost reduction of more than 100.000 €/annually (extruder output: 300 kg/h, operating time: 6,000 h/per year, material costs: 1.5 €/kg). Today's available X-ray technology covers a product diameter of 0.7 mm to 650 mm.

CHANGE IN THE EXECUTIVE BOARD OF SIKORA AG

Dr. Christian Frank moves to the top



Dr. Christian Frank
Chief Executive Officer SIKORA AG

■ A change in the leadership of SIKORA AG took place in April 2015. Dr. Christian Frank, who has been a member of the board since 2013, took on the position as Chief Executive Officer effective April 1st, 2015.

Dr. Christian Frank replaces Harry Prunk as chairman. However, Harry Prunk, who has successfully fulfilled the role as CEO since 2011, will continue on as an important member of the board.

In the course of reorganization, Dr. Christian Frank is now responsible

for Human Resources, Controlling, Research and Development, Business Development/Strategy as well as Operations. Furthermore, he is in charge of the plastics sector for all departments. Harry Prunk is now managing Sales, Marketing and Service and is interdepartmentally leading the divisions of Wire and Cable, Hose and Tube as well as Optical Fiber.

Dr. Christian Frank brings his expertise for new markets to the lead position of the executive board. For the new CEO, the objectives of the company are clear. "Our main focus is on finding solutions for our customers,

to optimize the production processes and the end product itself, with innovations and the possibility of reducing costs at the same time" says Dr. Frank. "We want to continue to expand, and therefore, we want to use the vast technical potential of SIKORA in order to develop new products for new markets but without losing sight of inherent markets."

NEW MANAGER OF SIKORA FRANCE

Expansion of existing and future markets

■ Sylvain Le Foll has been managing the SIKORA FRANCE office since April 1st, 2015. He is now responsible for all sales activities in France and the North African countries Algeria, Morocco and Tunisia. With his support, intensive supervision of the „Wire and Cable“ area as well as the expanding of the “Hose and Tube” and “Plastics” markets are planned.

“France is an important market for SIKORA, where many cable producers of industrial areas of communication, automotive, energy and installation are located. With the help of Sylvain Le Foll, we want to strengthen and extend our market position and local presence” says Harry Prunk, Executive Board SIKORA AG.

The graduate mechanical engineer, Le Foll, was able to gather experienc-



Sylvain Le Foll
Managing Director SIKORA FRANCE

es regarding extrusion technology in his previous occupation and is therefore a competent contact person for SIKORA customers. In his position, Le Foll will take on the responsibility for the areas sales and service. Next to his mother tongue French he speaks English and German fluently. With

Sylvain Le Foll and Jérôme Charbonnel, service engineer SIKORA FRANCE for support and service, SIKORA has a strong team that is perfectly positioned to serve this economically important area.



SIKORA is represented worldwide by 12 offices and its headquarters in Germany.

SIKORA AT THE DKT 2015

Great interest in presentation and devices

■ From June 29th to July 2nd SIKORA presented its comprehensive product range for a continuous online quality control in the hose, tube and plastics industries at the Deutsche Kautschuk-Tagung 2015 (DKT/German Rubber Conference) in Nuremberg. Thereby, many interested visitors were able to become convinced by the extensive portfolio of measuring, testing and controlling devices for hoses and tubes as well as innovative inspecting and sorting technology for plastic pellets.



One highlight at the SIKORA booth was the X-ray measuring system X-RAY 6000 PRO that ensures the quality of hoses and tubes during production while optimizing the material con-

sumption. Therefore, the device makes sure that the extrusion line runs with the highest productivity.

Regarding this topic, Mrs. Cornelia Fischer, Sales Manager SIKORA ITALIA, held a presentation with the title "X-ray technology for continuous online quality control and material saving during extrusion of rubber hoses". "Our X-ray systems measure the inner and outer diameter, wall thickness, eccentricity and ovality of single and multi-layer hoses and tubes during the production. In combination with the processor system ECOCONTROL 600/1000/6000 an automatic control of the line speed and the extruder rpm, regarding minimal values, is possible. These advantages are naturally interesting for many manufacturers of rubber hoses or for example, composite pipes. This interest is reflected in the positive feedback on our devices and the presentation," says Fischer.

Furthermore, SIKORA presented the successful LASER Series 2000 for the classic diameter measurement and the high-end LASER Series 6000 at its booth. The diameter gauge heads meet all requirements regarding highest precision, reliability and various interface options and thus, a first class quality control for the hose and tube extrusion. Additionally, the lump detector LUMP 2000 XY/T for the detection of lumps and neckdowns on the product surface was displayed.

In general, the mood within the hose and tube market is very good. Especially SIKORA's X-ray technology continues to create strong interest at the manufacturer's site. Cornelia Fischer concludes: "We are looking forward to the next hose and tube exhibition and further positive response."



f.l.: Cornelia Fischer, SIKORA ITALIA and Peter Hügen, SIKORA AG at the DKT 2015

CLEAN ROOM IN OPERATION

■ The PURITY SCANNER laboratory and developing area was extended by a new clean room in January of this year. Due to the constantly filtered air and the slight overpressure in the room, plastic materials can be tested for impurities under clean room conditions.

SIKORA provides the perfect conditions for reliable detection and sorting results by the PURITY SCANNER. “Thanks to the implementation of the clean room, we are able to work with the smallest probability of external contamination and achieve the best possible test results”, states Klaus Bremer, project manager for the PURITY SCANNER.



Klaus Bremer
Project Manager PURITY SCANNER

The new clean room for the PURITY SCANNER was positively tested and perceived by many customers. Further

material tests are also planned for the second half of the year in Bremen and can still be requested on short term.

When purchasing the device, charges for material tests are refundable.

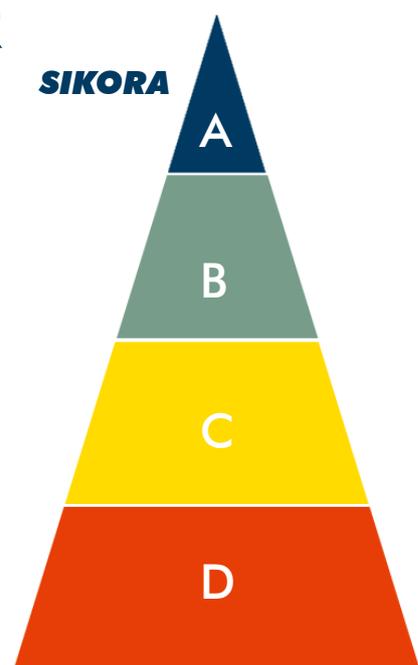
SIKORA – A-LEVEL SUPPLIER

■ As a worldwide respected producer of outstanding product quality, it is of high importance that SIKORA excels in all business areas. Therefore, delivery reliability, competitive prices, fast response times and flexibility are as important as SIKORA’s extensive expertise.

Those types of criteria are considered when classifying suppliers in the four categories A, B, C and D. At the beginning of 2015, SIKORA was evaluated twice as an “A-level” supplier. OMAN

CABLES as well as COFICAB Tunisie rated SIKORA as top provider in overall service and performance.

Evaluations like this are generally done once a year and provide an important basis for decision making regarding the procurement of material within the purchasing department. SIKORA views these positive evaluations as motivation to continue to provide the highest quality levels and to support its customers as a competent partner.



General supplier classification in four categories



Michael Schaffrath
Head of Software, SIKORA AG

“A SUCCESSFUL PRODUCT IS THE BIGGEST REWARD”

Michael Schaffrath, Head of Software at SIKORA AG, talks about today's indispensable technology trends and gives an outlook on further requirements

Mr. Schaffrath, what are the tasks of the software development department at SIKORA AG?

The software division works closely together with the hardware, construction, research, service, sales and production departments in order to identify technical challenges, customer requirements as well as new developments and to find suitable solutions. According to the principal “Our aim is to offer an innovative and efficient measuring and control technology that serves all customer and market demands”, SIKORA's developers are

working on the continuous improvement and development of the systems. Furthermore, we regularly present special solutions and adaptations of the system in order to meet the individual requirements of our customers.

What are today's most important requirement characteristics regarding industrial processor systems?

Today, the requirements for industrial processor systems vary due to technological capabilities. Ten years ago, applications were strongly user ori-

ented towards the machine operator and relatively inflexible. For example, metallic front panels with hardware displays were used.

Besides the machine operators, process technicians and quality management (QM) expect to obtain information from the system, which is used for continuous production optimization. Our colleagues from SIKORA service, QM and R&D also need information in order to provide qualified service, offer continuous process optimization and, naturally, develop the systems further. In order to equip our

customer's production lines with sustainable and future-oriented devices, SIKORA's software division is always working on developing expandable systems. Thus, with regular updates, our devices and applications always meet the highest quality requirements, even after many years.

What are the customer benefits of the ECOCONTROL Series from a developer's point of view?

With the ECOCONTROL Series, the customer receives compatible software solutions for his SIKORA measuring, controlling and sorting systems from a single source. An ECOCONTROL can be used with all measuring devices at the production line and supports the machine operator with comprehensive visualizations and, additionally, offers the possibility of remote maintenance of the SIKORA systems.

Where is the trend heading regarding software development for industrial computers in general and ECOCONTROL in particular?

In general, the trend is clearly heading towards HMIs (Human Machine Interface), which are more intuitive to use. Multi-touch and gesture control open up completely new operating options. Moreover, a location-independent access to HMIs from mobile devices is becoming increasingly important. Today, this is being discussed as IoT (Internet of Things). Therefore, we equip our measuring devices more frequently with central access points via LAN or Wi-Fi (WLAN).

With the ECOCONTROL we focus on reliability. Our customers operate the devices 24 hours, 7 days a week. In addition, support for the machine operator, the process technology of QM

and SIKORA (service, QM and R&D) as well as easy servicing and the possibility of remote maintenance are essential aspects we consider when developing processor systems.

How important is the data security for the software development?

Data security is a very important topic as it has a direct connection with the permanent availability of our devices. Our measuring and control devices are used for process and continuous quality control during production. Therefore, issues like "outside attacks", virus protection, protection of customer data and protection of the complete system are essential in the software development. Special encryption algorithms ensure that no data is lost or passed on and prevent viruses from entering the systems.

What fascinates you most about your work in the software division? What makes your job exciting? What are the challenges?

I enjoy working with my committed colleagues – including the other departments: hardware, construction, research, service, sales and production – searching for new solutions and realizing them.

Furthermore, I am fascinated by the technological developments in the areas of operating systems, development tools, computer platforms and interfaces. In addition to the ECOCONTROL systems, at SIKORA we are working in the varied field of Embedded Systems with DSPs (Digital Signal Processor) and MVCs (Model View Controller). This is rather close work with the hardware and with high real-time requirements.

Motto: Boredom is a complete foreign concept.

It is exciting to witness technological developments and to be creative at the same time. Furthermore, there is no bigger reward than a successful product that serves its purpose.

The biggest challenge is to consider many customer requests and to find a fitting standard. That means to connect "request" and "reality" with each other in a meaningful manner. As a developer you like to see all the available possibilities, but the aim always is to realize the needs of the customer as the user of the product.

Mr. Schaffrath, thank you very much for the interview!

»First class hoses and tubes are the benchmark!«

Holger Lieder
Sales Director SIKORA AG



Online quality assurance of hoses and tubes

The X-RAY 6000 PRO from SIKORA is a sophisticated system for continuous process control and online quality supervision in hose and tube extrusion lines.

Your benefits:

- Reduced start-up times by an online measurement of eccentricity, wall thickness, inner and outer diameter and ovality of single and multi-layer products
- Increased productivity and cost saving
- No start-up scrap
- Process stability
- Reliability with no need for calibration



KNOWLEDGE

SIKORA quality management and service ensure high availability

■ **Availability is the degree to which machines and technical measuring devices can be in operation without breakdown or maintenance. In order to calculate the availability, two factors are considered.**

The first factor is the Mean Time Between Failures (MTBF) and describes the nominal time a device can be in service without a need for repair or maintenance. The second factor is the Mean Time To Repair (MTTR) and is calculated from the time that is necessary to put the device or line back into operation in the case of a breakdown.

Due to exceptional quality management - SIKORA has been certified according to ISO 9001 since 1993 - and the technical innovations which make maintenance procedures of

the SIKORA devices nearly unnecessary, very high availability values are achieved. In order to guarantee limited down times, SIKORA also has a global well-developed network of service subsidiaries, which are available with quick response of our service engineers or the provision of replacement devices when needed.

All SIKORA devices are built to be in service 365 days a year, 24 hours a day and can be operated with minimal maintenance times. Some devices reach peak values of up to 99.98% availability.

Customer satisfaction is of utmost importance for SIKORA AG. Therefore, we are constantly optimizing our devices and services to offer our customers the optimum availability.

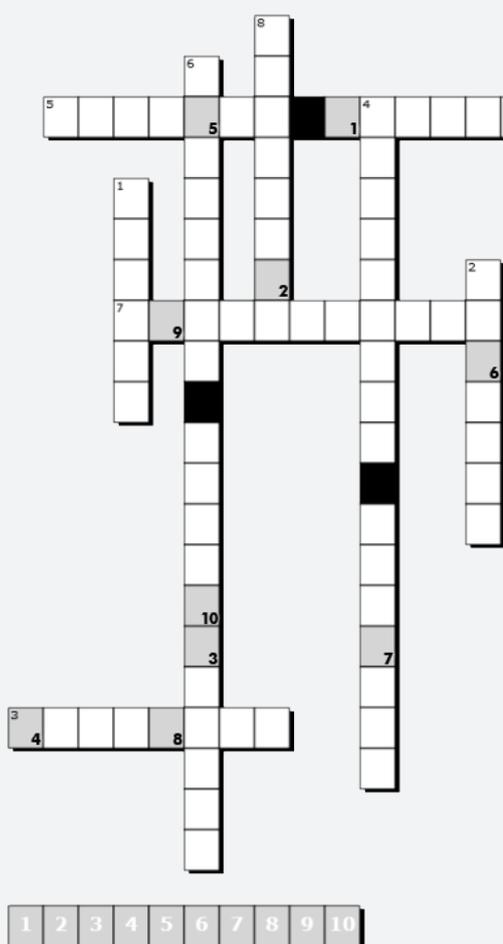
An element for achieving a high availability is the SIKORA calibration verification program that ensures a preventive annual inspection.



SIKORA measuring devices have a high availability

RAFFLE

Solve our crossword puzzle and barbecue like a champion!



1. Which international SIKORA office has been managed by Sylvain Le Foll since April 1st, 2015? SIKORA ...
2. In which month was the SIKORA research and development center of the PURITY SCANNER in Bremen extended by a clean room?
3. Which position within the SIKORA AG was taken on by Dr. Christian Frank on April 1st, 2015?
4. The SIKORA display and control devices are combinable with all ...?
5. Which operating system was used in the upgrading process of the SIKORA ECOCONTROL display and control devices?
6. Which SIKORA department is managed by Michael Schaffrath?
7. Besides France, which area falls under the responsibility of the SIKORA FRANCE office?
8. By changing his position within the company, Dr. Christian Frank took over the responsibility for six departments. Which department are we looking for?

If you know the answer, send an e-mail until September 18th, 2015 to:

communications@sikora.net

The price is one of three 3-part barbecue cutlery sets „Style“ by Weber®!



Each correct answer takes part in the raffle. Employees of SIKORA AG and SIKORA Holding GmbH & Co. KG and their relatives are not allowed to participate. Each player can only participate once. We value the first e-mail, all subsequent e-mails will be considered invalid. The legal process is excluded.

Good luck!

The correct answer of the last raffle was:

CCD line sensor

Congratulations to the winners!

SIKORA AG
Bruchweide 2 · 28307 Bremen
Germany
Phone: +49 421 48900 0
www.sikora.net
sales@sikora.net

BRAZIL

sales@sikora-brazil.com

CHINA

sales@sikora-asia.com

FRANCE

sales@sikora-france.com

INDIA

sales@sikoraindia.com

ITALY

sales@sikora-italia.com

JAPAN

sales@sikora-japan.com

KOREA

sikora@chol.com

RUSSIA

sales@sikora-russia.com

TURKEY

sales@sikora-turkey.com

UKRAINE

sales@sikora-ukraine.com

UNITED ARAB EMIRATES

sales@sikora-uae.com

USA

sales@sikora-usa.com

