

SIKORA EXTRA

Wire and Cable Magazine



**SIKORA Interfaces –
perfectly connected**

SIKORA EXTRA
Issue #4/2016
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Special topic:
Preventive Maintenance S. 4
Condition monitoring with FFT

Development PURITY CONCEPT Systems S. 5
Service Trainings S. 9
Interview: Harry Prunk, Executive Board SIKORA S. 10

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Next Events

■ Interwire
May 8 – 11, 2017
Atlanta, GA, USA



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Fl.: Dr. Christian Frank, Harry Prunk

Dear customers, partners and business friends,

One of SIKORA's key company topics is generating added value for our customers. Regarding process stability, high quality standards or efficiency – we optimize your production.

A production line consists of a variety of components, conceived on each other to operate together. Malfunctions of each single component have an impact on the process and eventually on the end product. Regular, preventive maintenance of the production line assures process stability. An innovative solution to detect changes early in the process is the usage of the FFT analysis during the production of the product. Learn more on page 4.

SIKORA is known for high quality standards. For more than 40 years we have been producing innovative products with

the highest quality at our headquarters in Bremen, Germany. We monitor the market permanently, discover new challenges, trace the development of industrial trends and implement them in our devices and systems.

Reliability of measuring devices in the production line is an important factor. At any time, measuring and control devices need to provide reproducible and precise measuring values in order to guarantee the best possible production results. Perfection during the manufacturing process also places high demands on the staff. In this respect, we have devised special training programs for your employees. Learn more on page 9.

Enjoy reading!
Sincerely,

Dr. Christian Frank
CEO SIKORA AG

Harry Prunk
Executive board SIKORA AG

PREVENTIVE MAINTENANCE

Detect sources of risk with the FFT analysis before they emerge

■ In the last edition of the SIKORA EXTRA we introduced an interesting application of SIKORA measuring devices for the determination of the Structural Return Loss (SRL) based on FFT (Fast Fourier Transformation) analysis. In the second part of our series, we introduce how SIKORA measuring devices can be used to determine potential sources of risk within the production line and assure the “Condition Monitoring” respectively the “Preventive Maintenance”.

The health of a human can be measured and evaluated by indicators like pulse, temperature or blood pressure.

The functional control of a production line works similar. For the Condition Monitoring, parameters such as cable diameter, eccentricity and/or capacity are measured. Re-occurring, periodical fluctuation of these parameters indicate defect components in the production line.

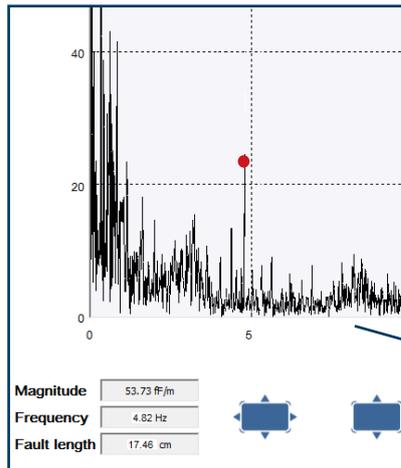
Periodical fluctuation of cable parameters may be caused by irregularities such as a “pumping” of the extruder, imbalance of rotating parts, periodic fluctuations of the line speed, cyclic changes of the degree of foaming and/or periodical irregularities during the conductor preheating. Such fluctuations are to be avoided during the

production of data cables to guarantee an optimal data transfer.

Usage in cable production lines

The usage of an FFT frequency analysis offers advantages, not only for the production of data cables. Manufacturers of all cable types can take advantage from this modern control tool, as once the cause of periodically occurring diameter fluctuations is detected and eliminated and the production process is optimized by material savings.

SIKORA devices have a high measuring rate and an integrated FFT analysis. The smallest periodical changes in the product are reliably detected by using diameter, capacitance and/or eccentricity measuring devices and provide clues of emerging quality influencing components



CAPACITANCE 2000



FFT analysis is visualized at the ECOCONTROL 6000

INSPECTION AND ANALYSIS OF PLASTIC PELLETS – ONLINE / OFFLINE

PURITY CONCEPT Systems: Development of the laboratory analyzing device

■ SIKORA devices stand for the highest precision and absolute perfection. The purity of the material is an important criteria at plastic production and processing. SIKORA's program of innovative inspection, analysis and sorting devices inspects raw plastic material and detects impurities inside the pellets as well as on their surface.

Online Analysis

The SIKORA PURITY SCANNER for the online inspection and sorting of plastic pellets has been successfully integrated into production lines worldwide. Plastic manufacturers, processors and end users use this innovative device, that uniquely combines X-ray and optical technologies, to check their plastic material online for contamination. Contaminated material is automatically sorted out.

In the segment of cable production, specifically those companies producing medium, high and extra-high voltage cables as well as subsea cables are focusing on this technology.

Offline Analysis

For smaller throughputs as well as production lines where sample testing is sufficient, or for the control of incoming goods, SIKORA developed the PURITY CONCEPT Systems. These analysis devices offer an inspection by X-ray (X), optics (V) or infrared (IR) technology. Detected are contamination in pellets, flakes and films/tapes.

The PURITY CONCEPT X inspects up to 3,000 pellets (200 ml) that are placed on a tray. Within seconds, these pellets are inspected for contamination. Subsequently, contaminated pellets are optically highlighted which makes the extraction of the in-

dividual contamination significantly easier.

The Combination for Perfection

SIKORA recommends the combination of the PURITY SCANNER and PURITY CONCEPT X for a comprehensive process optimization. Once the PURITY SCANNER has successfully detected and sorted contaminated pellets, the PURITY CONCEPT checks these pellets again and marks contamination optically for an easy separation of all rejects. This perfect interaction of online and offline inspection and analysis enables the absolute control of the material purity as well as knowledge to prevent future contamination.



PURITY CONCEPT X with Tray

LASER SERIES 6000 INTERFACES

Perfectly connected

■ Each cable manufacturer has company specific requirements and each production line is individually built. As diverse as the production lines are the networking opportunities of the line components, the process control and the measuring technology for quality and process control. Whether CANopen, EtherNet/IP, DeviceNet, Profibus or OPC UA – the variety of networks can be a real challenge for the communication of the components. SIKORA was one of the pioneers regarding integrated Profibus interfaces and also nowadays, our engineers offer solutions for an optimal communication. With the introduction of the diameter measuring device LASER Series 6000, a flexible concept, that matches the customer's requirements at all times, was created.

On the way to a global networking of production lines, the industrial Ethernet is put into focus. Compared to the previous year, the market share of the Ethernet division increased about 30% in 2016.

As a company with a close customer relationship and an open ear for innovative ideas, SIKORA discovered this development early and therefore,

offers the interface module ProfiNet and OPC UA for the measuring devices of the LASER Series 6000. The advantage of this module is the smart connection of present technology and ports with the future-oriented worldwide networking.

SIKORA does not simply follow a trend. Many production plants have made Ethernet interfaces, such as ProfiNet, one of their standards. This way, SIKORA has also built a foundation for future developments. All SIKORA LASER Series 6000 gauge heads are technically prepared to go the next step towards the "Industrial Internet of Things" (IIoT) and Industry 4.0.



LASER Series 6000



SIKORA LASER 6020 XY with integrated ProfiNet module

SIKORA
Technology To Perfection

Quality in its high-end form.

With passion, we develop future-oriented measuring and control devices for quality assurance of wires and cables, such as the **LASER Series 6000**. A high-end solution using non-contact CCD line sensor technology combined with pulse-driven laser light sources that ensures reliable data and perfect line control, for optimal quality and increased productivity.

- continuous non-contact diameter measurement with up to 5,000 measurements/axis/sec and extremely high single value precision
- integrated lump detection for demanding end products
- Wi-Fi interface and SIKORA App for flexible diagnosis and connectivity
- integrated display to have the measuring value at a glance



www.sikora.net/laser6000



Visit us from May 8th to 11th,
2017, at the Interwire in Atlanta,
GA, USA

SIKORA LASER DIAMETER GAUGES DETERMINE THE WALL THICKNESS

Average insulation wall thickness based on the differential measurement

■ Today, measuring and control technologies are an industrial standard in cable production lines with focus on quality control, process optimization and reduction of manufacturing costs. Directly integrated in the production lines, the systems measure in real time, product dimensions such as diameter, ovality, wall thicknesses and eccentricity. A prevailing method for determining the average wall thickness is the diameter differential method. From the values of two diameter measuring devices the wall thickness is calculated.

40 years ago, the first SIKORA wall thickness measuring devices called ISOWAND based on the principle of differential measurement, where used in insulating and sheathing lines. Today, the measurement of the average wall thickness as well as the control of extruder rpm and line speed are still attractive methods for quality assurance and process optimization.

With the diameter differential method, the diameter of the product is measured without contact at coincident points before and after the extruder by SIKORA laser gauge heads. The evaluation is realized in combination with the processor controlled display and control systems ECOCONTROL 1000 or 6000. A delay time memory

controlled by the line speed delays the diameter value measured before the extruder until this point of the measurement reaches the position of the second gauge head after the extruder. Using the difference between the diameter measuring values, recorded at the identical position, the average wall thickness is determined with high precision. The material shrinkage is already considered in the displayed wall thickness measuring value. The percentage of the shrinkage value is taken from a recipe or automatically calculated with an additional diameter gauge head at the end of the line from the hot/cold values of the diameter with the Hot/Cold control module HC 2000.

The differential measuring principle is particularly suitable for production lines where an eccentricity measurement is not required. This method is also used in tandem lines, in which case both wall thicknesses are calculated from a measurement before the first and second extruder as well as after the second extruder.

For production lines where, in addition to the wall thickness, eccentricity values of the product are required or where a wall thickness determination by means of a differential measurement is insufficient due to the cable construction, the use of the X-ray measuring system X-RAY 6000 PRO is recommended. This equipment precisely measures in real time the wall thickness, diameter and eccentricity of up to 3 layers of different material. A control of the measuring values is done in combination with the processor system ECOCONTROL 6000.



Display of the diameter on the processor system ECOCONTROL 1000

SIKORA TRAININGS

SIKORA Trainings for the optimization of your production

■ No one knows a production line better than the people working with it every day. Additionally, no one is faster on site, if a repair or maintenance task should be necessary. Therefore, SIKORA offers tailor-made trainings for employees who are responsible for the maintenance and troubleshooting directly at the plant.

Starting at theoretical basics regarding the measuring principle, to practical exercises and a detailed fault de-

tection with the aid of troubleshooting lists – within 2-3 day trainings SIKORA service engineers provide a professional insight into the technology of the measuring, control, inspection, analysis and sorting systems.

Find your suitable SIKORA Training at www.sikora.net/service/trainings – for example: the training on the X-RAY 6000/PRO & ECOCONTROL 6000 – and sign up today.



SIKORA service engineers explain how to use for example the X-ray measuring device X-RAY 6000 PRO even more efficiently



Training – X-RAY 6000/PRO & ECOCONTROL 6000

Duration	3 days
Location	SIKORA AG – Bremen, Germany
Target group	Technical employees
Participants	Min. 3/Max. 6
Languages	German, English

- ✓ Device presentation
- ✓ Basics X-ray technology/measuring principle
- ✓ Device commissioning
- ✓ High-voltage/cooling water supply
- ✓ Overview modules incl. LED status and testing points
- ✓ Manual chapter “Maintenance & Fault detection”

- ✓ Diagnosis software - device parameters at a glance
- ✓ ECOCONTROL 6000 Software
- ✓ Interfaces
- ✓ Preventive maintenance
- ✓ Device check with a troubleshooting list
- ✓ Searching and fixing simulated errors

Sign up today!

DEVELOPMENT OF THE CABLE MARKET

Interview with Harry Prunk, Management SIKORA AG



Harry Prunk

■ **SIKORA presented its measuring, control, inspection and sorting technology recently at the wire China in Shanghai and at the Wire & Cable India in Mumbai. Which trends in terms of technology did you recognize in the Wire and Cable Industry?**

From what we see, cable suppliers have re-focused, as the market has changed in regards of quality demands, costs and production efficiency. Therefore, all companies are currently focusing on optimizing their extrusion processes. Repeatability of the process is the keyword, as quality is not only required today, but every day for up to 24 hours of production.

A few years ago, diameter measuring devices were used exclusively for monitoring the quality-relevant parameters. In recent years, we see a change here: only if the line is controlled in automatic mode, the human influences on the processes are

eliminated, the quality measurably improved. Today, we see that further steps had been taken already.

What are these further steps?

Here are five examples: At the manufacturing of optical fibers, we see that today manufacturers care about temperature, they care about airlines in the fiber cladding and they consequently monitor the detection of even the shortest lumps in the coating of the fiber.

In the area of data cables, manufacturers always did a capacitance measurement. Today they also need online information on the Structural Return Loss (SRL).

At the manufacturing of automotive cables, manufacturers look for a perfect adhesion of the insulation to the conductor as those cables are in the following steps automatically processed, which requires high uniformity of the product.

In the area of cable sheathing, manufacturers look for concentricity in or-

der to reduce cost and in the field of high voltage cables, manufacturers demand absolute cleanliness of the insulating material in order to avoid cost resulting from breakdowns at discharge tests. I conclude that manufacturers rechecked and redefined all of their processes.

What are your comments on the global cable market outlook in the near term?

The global cable market is still faced with major challenges which must be addressed, amongst others, in terms of infrastructure – not only in the developing countries, but also in highly developed countries. We see all of these changes globally, when it comes to the power supply based on wind and solar energy. Further, we see the discussions about electrically operated vehicles and the increasing demand for higher data volumes in the communication. All these changes present new challenges for us – not only in the near future but also in the long term.

RAFFLE

Find the errors

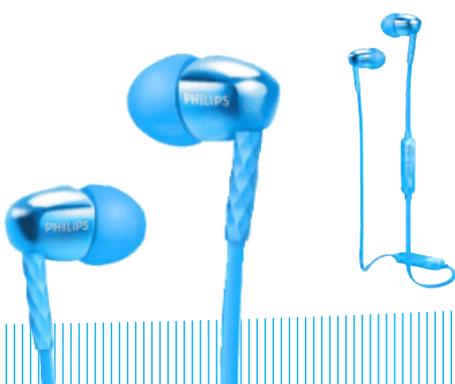
There are 5 errors in the upper picture of the PURITY SCANNER in the in-house clean room at SIKORA.



Find all errors and send us a picture of your solution per e-mail to communications@sikora.net.

Send us an e-mail with a picture/scan of your solution until January 6th, 2017 to:
communications@sikora.net

PHILIPS Bluetooth In-Ear Headphones
(picture similar)



Each correct answer takes part in the raffle. Employees of SIKORA AG and SIKORA Holding GmbH & Co. KG and their relatives are excluded from participation. 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!

Congratulations to the winners!

- Dennis Czapla
- Joseph Maraite
- Tim Jensen

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Technology To Perfection

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