

SIKORA^{EXTRA}

Wire and Cable Magazine



SIKORA wishes a
Happy New Year!

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AHEAD WITH PASSION.

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Next Events

■ wire Düsseldorf
Apr 4th – 8th, 2016
Düsseldorf, Germany
Booth 9A41



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Dear customers, colleagues and business partners,

For over 40 years, the company SIKORA has been excelling by passion for technology, innovative ideas and groundbreaking developments in the areas of measurement, control, inspection and sorting technology. For the wire and cable as well as hose and tube markets, the SIKORA AG has already become an established presence. Furthermore, SIKORA sets new standards in the areas of plastic manufacturing and processing as well as the optical fiber and fiber cable production.

In 2015, SIKORA employees were able to realize promising technologies, which is for example represented by the new PURITY CONCEPT Systems. The devices for the on-line and offline analysis of plastic pellets, flakes, films and tapes can, according to the individual requirements, be equipped with X-ray, optical or infrared technology. Therefore, the PURITY CONCEPT Systems are suitable for the quality assurance during the incoming goods inspection of plastic materials.

Also, 2015 was characterized by a special anniversary. The CENTERVIEW 8000, successor of the CENTERVIEW 2000 and the WANDEXE 203 and therefore, of the first groundbreaking invention by Harald Sikora, was sold for the 1,000th time in 2015. Due to permanent advancements, research and optimization, the success concept has been on the market since the 1970s and is proof for the future oriented alignment of SIKORA systems.

At the turn of the year we promise you continuously new achievements for all markets and individual solutions for your production.

We wish you personally and professionally all the best for the coming year!

Enjoy reading!

Sincerely,

Dr. Christian Frank
CEO of SIKORA AG

Harry Prunk
Member of the board of SIKORA AG

CONCENTRICITY IN CABLE PRODUCTION LINES

Process optimization with the SIKORA CENTERVIEW 8000

Part 2: Precision even for inclined position or curvature of the conductor

■ In the last edition of the SIKORA EXTRA we showed how the CENTERVIEW 8000 by SIKORA can match the challenges of rotating/oscillating conductors during the cable production, especially for the areas installation, automotive, control as well as coax and communications cables.

We are using this edition to further inform you, how the SIKORA measuring device helps to detect and compensate variables such as an inclined position or curvature of the conductor.

Therefore, the system offers process reliability in every situation.

Inclined position and curvature of the conductor

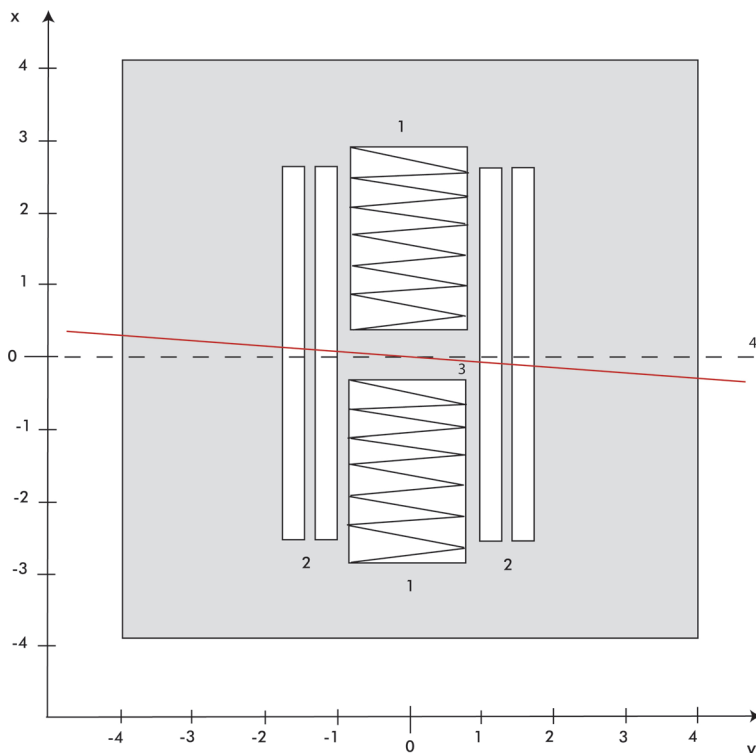
During the extrusion process, it is possible that a wire, with or without guide rollers, shows a slight inclined position while passing through the measuring plane. Eccentricity measuring systems need to be able to generate accurate measuring values even for such inclined positions.

Even if we assume that a conductor passes the extrusion system stretched, conductors show slight curvatures while passing the gauge head of the

eccentricity measuring systems. If no measures are taken, even invisible radii of curvature from 5 to 20 meters can cause eccentricity faults of up to 40 micrometers.

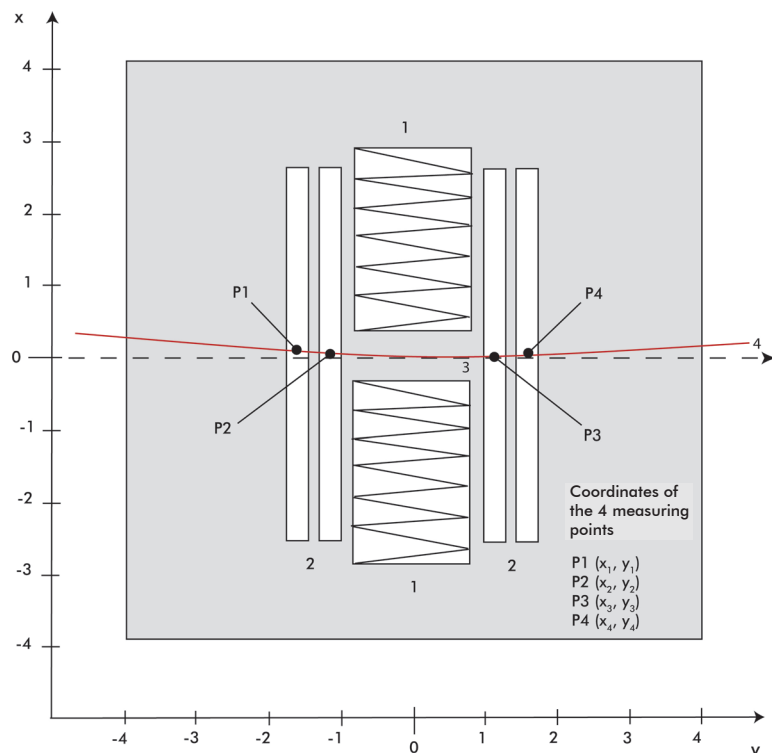
Inclined position of the conductor

Image 1 shows the course of a strand along a straight line. But it runs oblique to the planned production line¹. It is known that a straight or bevel, in this case a stretched conductor, is defined by two points. By the first and second optical measuring unit of the CENTERVIEW 8000, the inclined position of the conductor is not only detected but also completely compensated. In this measuring state, the position of



- 1 Inductive sensors
- 2 Respectively, 2 parallel, optical lines
- 3 Inclined position of the conductor
- 4 Direction of production

Image 1



- 1 Inductive sensors
- 2 Respectively, 2 parallel, optical lines
- 3 Curvature of the conductor
- 4 Direction of production

Image 2

CENTERVIEW 8025



CENTERVIEW 8010



the conductor in the inductive measuring plane is for example determined by the interpolation between the measured inclined positions.

Sag or curvature of the conductor

Image 2 shows a conductor with sag and a curvature¹. The curvature of the conductor can be described by a circle. Its position and the radius of the curvature are defined by three points. Using this information, the processor system is able to calculate the exact position of the conductor in the inductive measuring plane as well as to compensate inclined positions and/or curvatures completely. The measuring system CENTERVIEW 8000 was developed with four measuring points.

Therefore, the system is able to even detect irregular deformations of the conductor.

Unique

Due to the 4-axis diameter measurement as well as the 8-point eccentricity measurement an inclined position of the conductor in the measuring plane is detected. An inclined position of the conductor, either horizontal or vertical, is automatically compensated by the measuring system in order to prevent influences of the measuring results.

Equally, the measuring system determines accurate measuring values even if the conductor passes

through the gauge head with sag or a radius of curvature.

Guide rollers only help seemingly to straighten the conductor. Actually, they cause an uncontrollable curvature depending on traction, even if it is not visible.

Only the SIKORA CENTERVIEW 8000 measuring system ensures highly qualitative insulation on conductors. At the same time, the device contributes to process reliability and cost effectiveness during the manufacture.

¹ The inclined position and curvature of the conductor are shown excessively for a better understanding.

ONE CONCEPT – SEVERAL POSSIBILITIES TO ASSURE QUALITY

Online and offline analysis of Pellets, Flakes and Films/Tapes

■ SIKORA presents its new and pioneering models of the PURITY CONCEPT Systems. With that, the company offers an outlook on the varied potential of its systems for online and offline inspection and analysis of plastic material. According to the application, the systems are equipped with X-ray technology (X), infrared technology (IR) or optical sensors (V) and can be used for samples during the production in order to find impurities from 50 μm .

Especially interesting are the systems for the production of high voltage cables. An essential criterion of high voltage cables is the production over long distances with as few joints as possible. Various reasons make the production of a cable in one length sometimes impossible to realize. In this case two cable ends have to be connected to each other in order to cover larger distances.

Weak point: Joint

In order to connect two cables with each other, the ends have to be stripped first. Both blank conductors are welded together. The occurring gap in the insulation is being closed by manually applied layers of tape. Thereby, it is essential that the tape does not contain any contamination, which might later cause breakdowns of the

cable. But for all the care, there might be contamination that are not visible with the naked eye – metallic and organic contamination from 50 μm in the tape.

Therefore, SIKORA suggests the application of the PURITY CONCEPT Systems for the inspection and analysis with optical sensors for thin, transparent films/tapes or with X-ray technology for e.g. thick, black tapes¹. This way, it can be ensured that the same quality, as used for the main insulation, is used during the production of the tapes.

Production films/tapes

Films and tapes for the insulation of joints in the high-voltage cable area are produced by using the same high-quality XLPE² material that is used for the insulation of the cable. This brings some logistic challenges with it: Tapes are coiled when they are sent out by the manufacturer and need therefore to be delivered and used before they get cross linked by environmental circumstances. Therefore, a stockpiling order is just as problematic as possible delivery delays.



PURITY CONCEPT X for the analysis of films and tapes

A possible solution is the independent production of films/tapes at the own manufacturing site. By using an extruder, the tapes can be extruded. The used XLPE material can either be inspected for contamination from 50 μm prior to entering the extruder by the PURITY SCANNER or after the extrusion by the according PURITY CONCEPT System.



Flexible Joint subsea cable

¹ Used films/tapes are often thin enough that they can be inspected with both the X-ray technology and the optical sensors

² XLPE: Cross-linked Polyethylene

SPARK 2020 DC WITH 25 KV*

Enhancement of the SIKORA product portfolio

■ **Discover new – the DC voltage spark tester SPARK 2020 DC with up to 25 kV*, developed for the check of phone lines, data cables and mini coax cables with foam insulation, automotive and installation lines with a diameter from 1.0 to 20 mm.**

During the extrusion of cables it is essential to inspect the insulation for possible insulation faults in order to detect, record and eliminate them. For this matter, spark tester (high-voltage test devices) are used. For the inspection, the dry cable runs through

the bead chain electrode of the spark tester, which is installed directly after the cooling section. Thereby, the insulation of the cable is exposed to the set up test voltage in order to reliably detect insulation faults. This way, the quality management is able to assure that only fault-free cables are delivered.

SIKORA is always answering the requests of the market and the most current standards. Therefore, the range of the SPARK 2020 DC, that is available for more than 10 years now, was expanded in the high-voltage test

range. With now 25 kV*, the spark tester meets the standards BS, VDE, CENELEC, UL, AS, CS etc.

Due to the optional combination with a display and control device of the SIKORA ECOCONTROL series, an automatic analysis of the faults as well as the creation of a test report is easily possible.

* option



SPARK 2020 DC

Did you know?

In addition to the SPARK 2020 DC, SIKORA offers also high-frequency (HF) and AC spark tester. For all SIKORA spark tester, the test voltage is adjustable continuously.

SIKORA CONSULTING

Individual consulting on-site

■ Whether service or sales – at SIKORA we are working according to a simple guiding principle: “Every first encounter is the beginning of a long and successful partnership.”

That is true for tasks regarding the modernization of existing production lines as well as for the planning of a new plant. Therefore, SIKORA offers you more than general sales presentations in meeting rooms or impersonal cost estimates.

On the basis of your request, your personal contact person will get into contact with you in order to familiarize with your production. This person is your contact for all your requests. SIKORA service technicians and sales manager look back on many years of experiences at production sites all over the world and help you at any time to find the best possible potential to assure the quality and processes of your line.

More than 4,000 journeys per year

In 2015 alone, SIKORA employees were able to gather experiences and new ideas in over 4,000 journeys to customers. Naturally, this knowledge is spread to their colleagues in regular meetings and trainings and therefore, permanently optimized. Thus, your personal contact is always up to date.

and technical specifications as well as possible combinations and applications.

All SIKORA measuring and control devices as well as systems for inspection, analysis and sorting excel in strong availability values and a fast amortization. Furthermore, they help to lower the resource consumption and therefore decrease according costs enormously from day one. At the same time, the quality of end products is increased.



Your advantages

After your SIKORA service technician or sales manager familiarized with your products and requirements he/she will create an individual offer on possible devices, according settings

Start your modernization now – arrange your personal consulting appointment: sales@sikora.net

Map legend

Red: SIKORA Headquarters Bremen
Green: SIKORA Offices worldwide



CENTERVIEW 8000

Milestones for the diameter measurement

■ This year, the measuring and quality control system for diameter, wall thickness and eccentricity, the CENTERVIEW 8000 by SIKORA, celebrates a special anniversary. With more than 1,000 sold devices since its introduction in 2008, it is one of SIKORA's bestsellers. Therefore, it is time to check the history behind the device.

In the 1970s, Harald Sikora developed the basis for the modern inline measuring and control technology in insulation lines – the eccentricity measuring device WANDEXE 203. Equipped with visible light, the device was the first to allow a non-contact measurement of eccentricity and diameter during the production.

With the introduction of the X-RAY 8000, based on X-ray technology, the WANDEXE 203 was replaced as a measuring system of larger diameters and was further developed for smaller diameters from 0.05 to 25 mm from this time on. For that, the 4-point line sensor technology was developed around the turn of the century. The CENTERVIEW 2000 offered the possibility to analyze the measuring values of the line sensors as a stand-alone solution directly in the device.

In 2008, the idea of the CENTERVIEW 2000 was refined. The CENTERVIEW 8000 was brought to the market as the next innovation step. Due to the integrated 8-point measurement more measuring values per

second can be recorded. Therefore, the device allows for even more precise measurements. Optionally, the measuring values are visualized on a connected ECOCONTROL display and control device, which allows also for an automatic control.

The CENTERVIEW 8000 is produced for measuring ranges from 0.05 to 25 mm and can be delivered as a standing or flat lying (compact) version.

1970s

Development of the first non-contact measuring device for continuous measurement of the insulation wall thickness and concentricity during the cable production – WANDEXE 203

1980s

Introduction of the first line sensors for the continuous detection of cable diameters

At the time only 512 Pixel – today in the CENTERVIEW 8000 more than 14 megapixel

2000s

Usage of the 4-line technology for the measurement of smaller cable diameter

CENTERVIEW 2000

smaller case
shorter measuring times
stand-alone calculation in the device

2008

The CENTERVIEW 8000 is introduced

The innovative 8-point measurement allows more precise values and more measurements per second
The unique scatter plot shows the distribution of short-term variations



1973

Founding of the sole proprietorship HARALD SIKORA – predecessor of the present SIKORA AG

1990s

Delivery of the first X-RAY 8000 for the measurement of the wall thickness of 3-layer medium, high and extra-high voltage cables
X-ray technology replaces line sensors for the measurement of larger diameters

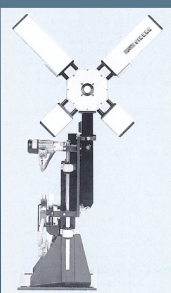
2005

Innovative ideas by SIKORA get more room

Construction of a new business building for more research and development at the headquarters in Bremen

2015

SIKORA sells the 1,000th CENTERVIEW 8000



X-RAY 6000 X-RAY RADIATION

With safety for highest quality

■ On November 8th, 1895, the German physicist Wilhelm Conrad Roentgen discovered the X-ray radiation (Roentgen radiation), which was named after him and brought him the first Nobel Prize in the field of physics in 1901. Since the discovery of the radiation over a century ago, mankind learnt a lot about its applications, advantages but also about the dangers of the invisible waves.

Apart from the medical applications, X-ray radiation is nowadays also used for the inspection of food as well as for the luggage and people screening at airports for example. Furthermore, X-ray technology has become indispensable in cable production lines. Especially for the manufacture of wires and cables in insulating and jacketing lines, e.g. communication or energy cables, an absolute concentricity of the insulation is necessary to ensure the mechanical and electrical functionality of the cable. Control of the specifications regarding diameter, wall thickness and concentricity guarantees enormous savings of time, material and costs.

For more than two decades, SIKORA is offering X-ray technology, e.g. the X-RAY 6000/6000 PRO measuring devices, which are installed directly after the cross head, in-between two cooling trough sections or after a cooling trough and continuously ensure the quality of cables.

Safety is important to us

When it comes to X-ray technology, the question about safety keeps coming up. It is a special interest of SIKORA to build safe devices, which pose no health risk at any time.

The X-RAY 6000/6000 PRO devices are designed in a way that the radiation on the outside of the case and the contact protection, at a distance of 0.1 meter, amounts less than 0.5 microsievert/h. A fact that is also verified by RöV experts¹. Therefore, the X-ray values are only at 50% of the maximum value of 1 μ Sv/h, which is defined in the "European Directive 96/29/Eurotom".



SIKORA ensures that the radiation does typically not exceed the natural environmental radiation. For each device there is an expert report as well as the according measuring protocol to proof this fact.

General safety information

People are exposed to several different radiations every day. The natural radiation exposure (cosmic radiation, earth radiation etc.) as well as the civilisatory radiation exposure (nuclear facilities, radiation from research, technique and household etc.) alone amount for 3.9 millisievert/year². A flight from Frankfurt to New York has to be accounted with additional 28 μ Sv. Somatic cells, which are damaged by the radiation and therefore rejected, can be reproduced without any problems so the body can regenerate itself.

Nevertheless, one should seek to avoid unnecessary additional radiation. According to § 31a of the RöV, the effective dose for occupationally exposed persons is not allowed to exceed the limit of 20 mSv per calendar year. The limit of radiation of 20 mSv/year, even for a continuous work in the close proximity³ of the X-RAY 6000/6000 PRO, is not roughly reached but only amounts 1 mSv/year. SIKORA guarantees safety and highest quality!

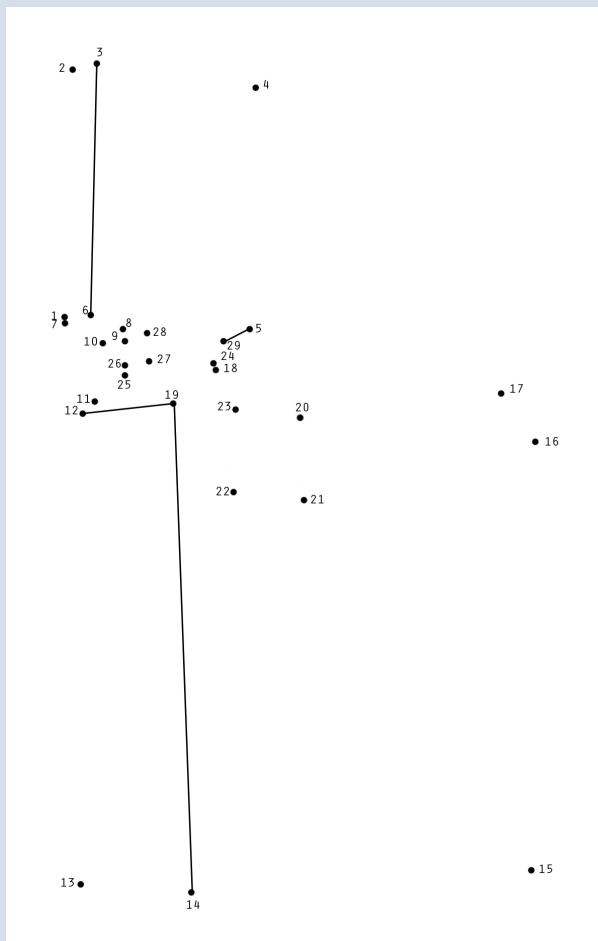
¹ RöV (Röntgenverordnung): German X-ray regulation

² Radiological clinic Bonn: X-ray radiation in the radiological diagnosis – www.uni-bonn-radiologie.de/front_content.php?idart=430.

³ Based on a daily working time of 8 hours on 5 days per week and 50 weeks per year.

RAFFLE

SIKORA Picture Puzzle



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