

# SIKORA EXTRA

Your magazine for Hose & Tube | Sheets



**SIKORA**  
CENTERWAVE 6000

**Perfect combination – CENTERWAVE 6000  
and CENTERWAVE 6000 NEXT "to the pipe  
head"**

**04**

**Quality assurance where it is of most  
importance – Medical tubes save lives**

**07**

**Dear readers,**

It is that time again, you are holding the latest edition of the EXTRA magazine in your hands. In this edition, we look closely at the CENTERWAVE 6000 NEXT "to the pipe head", which was presented for the first time at K in October last year. Find out on page 04 details regarding the principle of the new system and the benefits arising for your extrusion lines. Further on page 06 you can read about how the automatic calculation of the refractive index of the CENTERWAVE 6000 ensures reliable and reproducible measuring results without any calibration.

Quality assurance is of utmost priority for the production of medical hoses and tubes. The application of high-precision measuring technology leads to compliance of specifications and helps that vital functions of the medical tube can be guaranteed. More on page 07.

We are especially proud to have received once again the award for ranking among the TOP 100 companies of German medium sized businesses by the Munich Strategy Group. Find out more on page 09.

Discover these and other topics in the latest EXTRA edition.

Enjoy reading!

Sincerely,



Dr. Christian Frank  
CEO SIKORA AG

Harry Prunk  
Executive Board SIKORA AG



f. l.: Dr. Christian Frank, Harry Prunk

## CONTENT

CENTERWAVE 6000 and CENTERWAVE 6000 NEXT "to the pipe head"	04
Who does not calibrate (does not have to calibrate), wins	06
Quality assurance where it is of most importance – medical tubes save lives	07
X-ray technology from SIKORA	08
SIKORA ranks among the "TOP 100" of the German medium-sized companies	09
Welcome to SIKORA Service	10
Raffle	11

# OUR PASSION? YOUR MEASURING DEVICE!

# — NEW: CENTERWAVE 6000 NEXT "TO THE PIPE HEAD"

## Measurement of plastic pipes from the inside of the pipe head during extrusion

The CENTERWAVE 6000 NEXT "to the pipe head" is the latest innovation from SIKORA for an optimum quality control in extrusion lines for large pipes. Already prior to the first vacuum tank and thus, immediately after the pipe head, the rotating measuring head measures the decisive dimensions of the pipe from the inside at the start of the production line. For the first time, measuring values for wall thickness, concentricity, inner and outer diameter as well as information on weight per meter are available at such an early stage of the process. Thus, plastic pipe manufacturers receive the basis for a control and centering without delay, at the beginning of the extrusion process.

The CENTERWAVE 6000 NEXT "to the pipe head" is based on millimeter wave technology and measures the wall thickness distribution directly after the pipe head gapless over 360 degrees of the circumference already at the starting of the production line. A rotating radar sensor is connected with the pipe head and is positioned directly in the center of the pipe. By means of millimeter wave technology, wall thickness, diameter and concentricity are measured over the circumference from the inner

side of the pipe. The measuring values are graphically visualized.

Until now, it was not possible to measure the wall thickness over the circumference of the pipe directly after positioning the vacuum tank to the pipe head. Accordingly, a control was also not possible at that early stage. Typically, a first measurement took place after the first vacuum tank. Especially with regard to large pipes, which run at low line speeds, the first possibility to interfere into the process arises after 40 minutes when the length of the first vacuum tank amounts to 8 m (315"). Generally, a readjustment of the line is necessary multiple times before the pipe reaches nominal value, therefore, around 4 tons (8,818.49 lb) of material have to be treated in order to reenter the process.

### The advantages of the CENTERWAVE 6000 NEXT "to the pipe head"

- Measurement of the wall thickness, concentricity and diameter of the inner pipe directly after the pipe head
- Fast measurement and control
- Suitable for pipe heads of all manufacturers
- Easy operation without presetting the product parameters
- Measurement independent of temperature and material
- No need for coupling media
- Reliable without calibration
- A short-term Return on Investment (RoI)

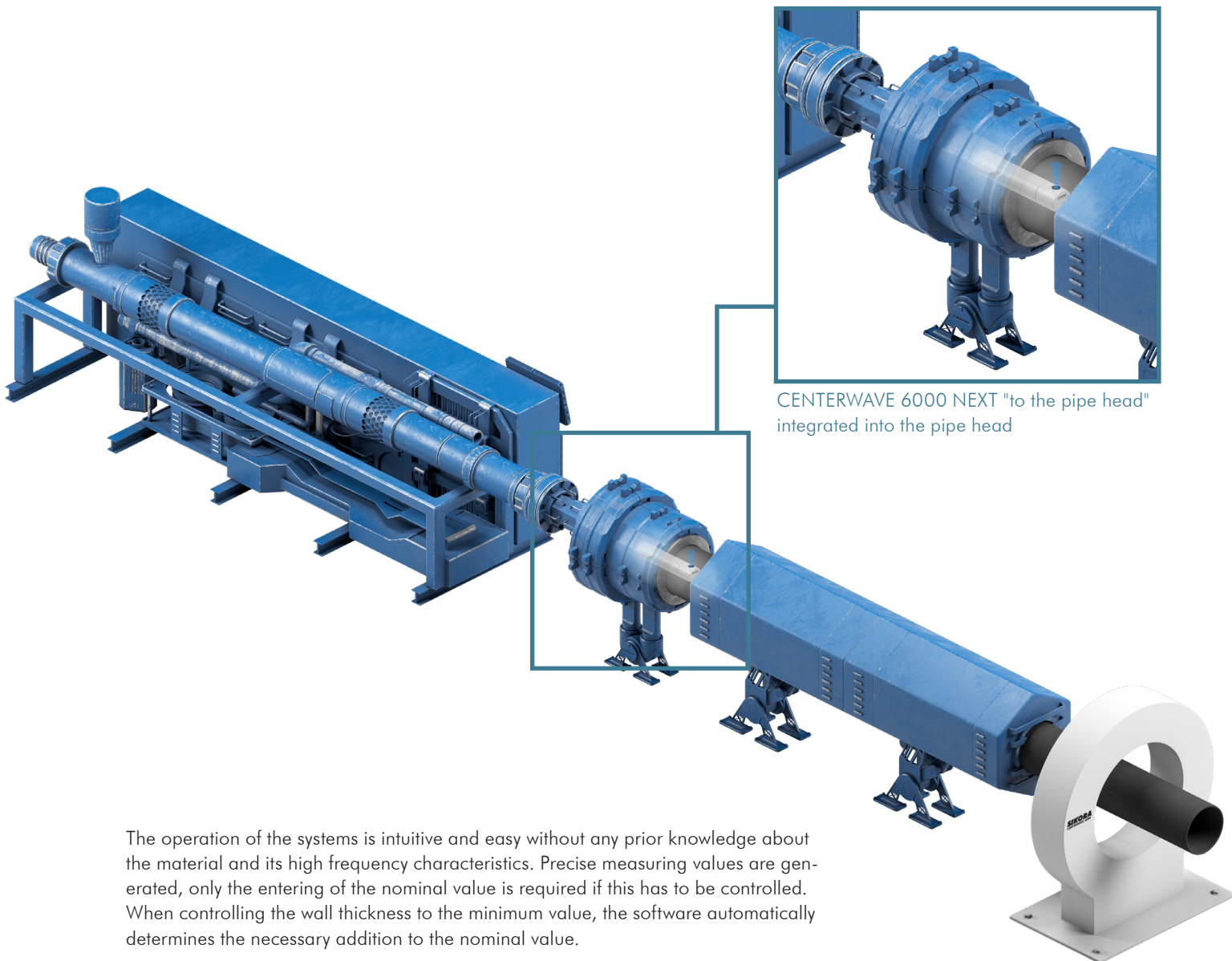


CENTERWAVE 6000 NEXT "to the pipe head"

By using the CENTERWAVE 6000 NEXT "to the pipe head", the start-up process for the extrusion of a pipe is transparent and the line efficiency is significantly increased. The optimized production process ensures the highest quality of the pipe and a fast Return on Investment (RoI).

**Combined efficiency at the highest level:  
CENTERWAVE 6000 NEXT "to the pipe head"  
and CENTERWAVE 6000**

In combination with the proven CENTERWAVE 6000 after the first or the second vacuum tank, the warm measuring values as well as the already stable and final cold values of the wall thickness of the pipe are measured by the CENTERWAVE 6000 NEXT "to the pipe head". These are controlled without delay to the minimum permitted nominal value at optimum concentricity. The interaction of both systems allows for the compensation of typical plastic pipe dripping effects (sagging).



The operation of the systems is intuitive and easy without any prior knowledge about the material and its high frequency characteristics. Precise measuring values are generated, only the entering of the nominal value is required if this has to be controlled. When controlling the wall thickness to the minimum value, the software automatically determines the necessary addition to the nominal value.

CENTERWAVE 6000

# WHO DOES NOT CALIBRATE (DOES NOT HAVE TO CALIBRATE), WINS

CENTERWAVE 6000 determines the refractive index automatically

Every material has a specific refractive index. It defines how fast and with which intensity a signal travels through the material. With the knowledge of this parameter, the wall thickness, diameter, ovality and inner profile (sagging) can be measured and calculated. As the refractive index is dependent on different factors, such as cleanliness of the material, temperature, couple media etc., it is always a source for possible measuring errors.

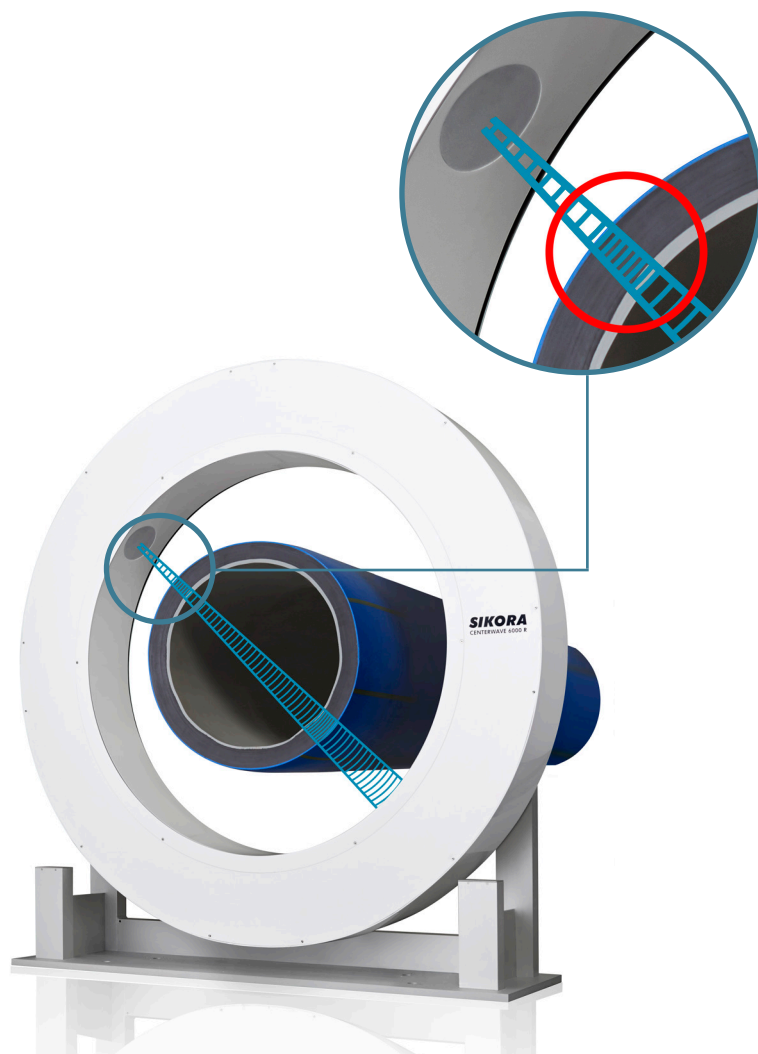
The CENTERWAVE 6000 is unique in this respect. It determines automatically the refractive index with each single measurement and therefore offers the highest measuring accuracy without any calibration. The knowledge of the exact refractive index is indeed essential for the determination of the diameter, the ovality, the wall thickness and the inner profile (sagging). Whether ultrasound, radar or another technology, these product parameters are determined by the duration of the measuring beam through the measuring plane up to the measurement at the receiver. Depending on the value of the refractive index of the material to be measured, the measuring values are influenced accordingly.

Polyethylene (PE) is amongst others a common material for the production of pipes and tubes for various application areas. The refractive index is about 1.5 in the pure state. Different temperatures, added additives, individual production processes of different producers as well as the use of recycling materials have an influence on the refractive index and thus on the measuring results. In this respect SIKORA's automatic calculation of the refractive index is an innovation that contributes to process reliability and thus to profitability.

With the help of complex mathematical formulas, the refractive index over the entire circumference of the pipe is determined with every single measurement. Also at changes of external factors such as temperature as well as material characteristics, cleanliness or additives, the CENTERWAVE 6000 offers reproducible measuring results.

A further advantage of the system is the complete documentation of the measuring results with the processor system ECOCONTROL 6000, which prove the quality of the final product. Also the compliance with legal requirements like a continuously conductive space that is, for instance, made of graphite and for the protection of all operators, can be found on the comprehensive report.

Different attenuation behavior of the measuring signal of the CENTERWAVE 6000



# MEDICAL TUBES SAVE LIVES

## Quality assurance where it is of most importance



**During quality control of medical tubes, safety for the patient is the top priority and begins with the manufacturing process.**

The requirements for the production of medical tubes differ significantly depending on the application. Single or multi-lumen colored tubes, for which an outer diameter and ovality measurement is relevant, are measured with the LASER Series 2000 XY. Furthermore, the 3-axis 2000 T models, such as the LASER 2010 T, offer the highest precision for transparent medical tubes. As an alternative to the LASER Series 2000, the LASER Series 6000 is available, which additionally detects lumps on the surface of the medical tube due to a significantly higher measuring rate.

Single-lumen medical tubes, whose wall thickness has to be controlled during production, are reliably measured with the X-RAY 6020 PRO directly after the extruder. The X-ray measuring system has been specifically designed for smallest medical tubing with a diameter of 0.65 up to 15 mm (.026 to .59") and a minimum wall thickness of 0.1 mm (.004"). The system records continuously measuring data about wall thickness, eccentricity, inner and outer diameter as well as the ovality of medical tubes of up to three layers.

In order to carry out a surface inspection, the X-RAY 6020 PRO is combined with a 3-axis lump detector. The LUMP 2000 T gauge heads detect after the cooling even smallest irregularities on the product surface.

The SIKORA measuring devices can be integrated into horizontal as well as vertical extrusion lines depending on the required application. Due to the precise and continuous measuring values, they guarantee that the patient receives an immaculate and save product which specifications are met to 100 %. For this is the only way to guarantee the live saving functions of the medical tube.



# X-RAY TECHNOLOGY FROM SIKORA – BECAUSE WE CAN DO IT

**X-RAY 6000 PRO – 20 years of experience speak for themselves**

Since 2004, SIKORA has been supporting hose and tube manufacturers with systems based on X-ray technology for quality control during extrusion. The X-RAY 6000 PRO measures the wall thickness, concentricity, inner and outer diameter and ovality of hoses and tubes.

**concentricity, inner and outer diameter and ovality of hoses and tubes.**

In addition to decades of experience, most notably the performance and variety of SIKORA equipment for X-ray technology speak for themselves. X-ray technology enables the measurement of up to three different material layers and can be used for various diameters. Whether pipes, composite pipes, pressure hoses with textile reinforcement or products made of PE, HDPE, PVC, EPDM, nylon, rubber or

silicone and foam products – SIKORA offers the right equipment for all applications.

Interesting are the construction and the sophisticated design of the X-RAY 6000 PRO devices, which is precisely adapted to the requirements of the extrusion lines and to safety regulations in close cooperation with customers and business partners. SIKORA thus guarantees that the measuring systems can be easily integrated into all existing as well as new production lines.

With SIKORA you have the advantages of a comprehensive sales and service network with 14 offices worldwide with unique expertise in X-ray technology at your disposal. Our international employees advise customers in the hose and tube industries and, thanks to years of personal experience and detailed documentation around production lines worldwide, always have a solution for specific customer requirements.



## Advantages X-RAY 6000 PRO

- Measurement of the wall thickness, concentricity, diameter and ovality of up to 3 different material layers
- XLL (eXtra-Long-Life) X-ray tubes
- High-resolution X-ray line sensor camera technology with 0.05 mm (.00197") resolution
- Ultra short exposure times of 3-5 ms
- Output signals for automatic centering of the crosshead
- Speed-dependent shrinkage calculation
- Selectable measuring rate from 1 to 3 Hz (optional 10, 25 Hz)
- No calibration
- Suitable for various diameters
- Internationally recognized security concept

# CONVINCING BY ONGOING PERFORMANCE

## SIKORA ranks among the “TOP 100” of the German medium-sized companies

The SIKORA AG ranks once again among Germany's 100 fastest growing medium-sized companies. This is the result of the study “TOP 100 ranking of the medium-sized companies 2019”, which was carried out by the management consultancy Munich Strategy Group. This year, SIKORA is the only company from Bremen that has made it into the “TOP 100”.

More than 3,500 companies from all industries with an annual turnover between 10 million and 1 billion Euro were evaluated by the Munich Strategy Group. The “TOP 100” companies were determined on the basis of their long term growth and profitability. The basis for the selection is the performance of the companies during the last five years.

Dr. Christian Frank, CEO of SIKORA says: “I am delighted that we are among the “TOP 100” again this year. Once again, the award shows that we belong to the elite of the German medium-sized companies and that we set trends and play a leading role in the area of innovative measuring, control, inspection and sorting technologies. By focusing on technical innovations as well as expanding our global sales and service network and the simultaneous concentration of research, development and production at our location in Bremen, we create the conditions for a future, constant growth. I see this award particularly as a recognition of the entire workforce.”



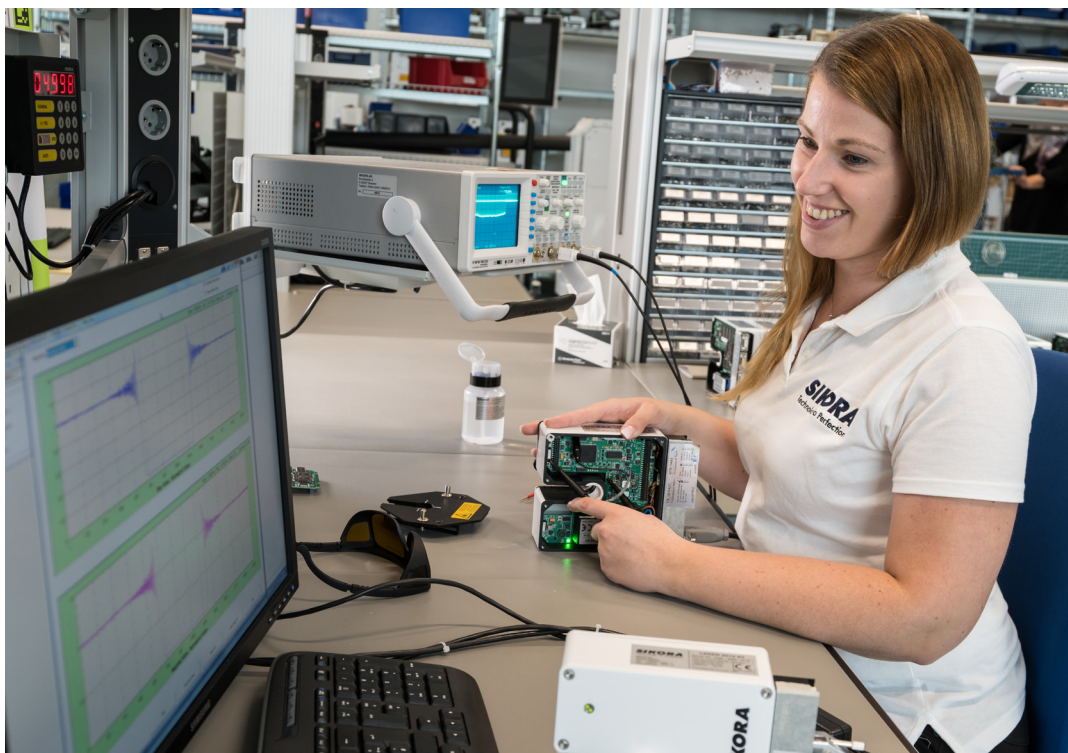
# WELCOME TO SIKORA SERVICE

Our passion? Your measuring device!

Do you want a measuring device that precisely and reliably measures the required product parameters in your extrusion line? To ensure that you can rely on your measuring instrument every day, our engineers have aligned the latest technologies with state-of-the-art hardware and software components to deliver top technical performance.

Measuring devices of SIKORA convince by the highest precision and have a considerable availability of up to 99.8 %, so that your extrusion line can simply produce. The SIKORA service team is always available for you with know-how

and passion so that you can benefit from all the advantages of the measuring device throughout its entire life cycle. The year of manufacture of the device is irrelevant. Our team is just as committed to SIKORA classics as to the latest devices.



## Just contact us!

No matter which question you have about your measuring instrument, your SIKORA service team is always available for you worldwide.

Simply contact us at [service@sikora.net](mailto:service@sikora.net).

# RAFFLE

F	B	L	S	Z	B	S	P	Ö	A	C	M	W	A	L
W	S	K	L	B	N	Y	A	R	X	Ö	R	K	R	Ü
H	A	I	C	L	W	Ö	S	F	G	E	N	X	M	U
T	I	N	T	E	R	N	A	T	I	O	N	A	L	S
T	F	J	K	W	S	B	M	K	W	P	L	S	Q	I
Q	Z	H	S	N	K	N	S	L	R	A	C	Ä	E	W
U	G	K	T	F	N	S	L	T	H	D	B	W	C	U
A	O	K	S	C	L	Ö	E	G	T	S	N	M	I	Q
L	W	G	K	L	T	C	X	B	L	T	V	E	V	Ä
I	Z	I	N	N	O	V	A	T	I	O	N	W	R	N
T	G	D	K	T	M	H	A	B	R	T	A	M	E	M
Y	E	W	K	T	A	L	Ö	T	M	C	F	H	S	M
T	K	B	S	M	K	U	D	Ö	P	W	A	C	G	A
U	Y	N	A	M	R	E	G	N	I	E	D	A	M	L
K	W	M	J	A	Q	L	Ö	T	C	N	R	T	L	A

## Find the hidden SIKORA terms

This alphabetical jumble hides 6 SIKORA terms in total that are written in all directions.

Find these 6 terms and send us a picture of your solution.

QUALITY  
X RAY  
MADE IN GERMANY  
INNOVATION  
INTERNATIONAL  
SERVICE

Send us an email  
by Jun 30, 2020, to:  
[extra@sikora.net](mailto:extra@sikora.net)

Win one of three WD Elements External Harddrives - 1 TB (USB 3.0, 2.5", black; image similar)



Your contact details will not be passed on to third parties. 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 email, all subsequent emails will be considered invalid. The legal process is excluded.

GOOD LUCK!

Congratulations to the winners of the picture raffle – SIKORA EXTRA 2/19:

- Eric O'Brien
- Daniel Deyerler
- V. Ganesh

## NEXT EVENTS



- Compounding World Expo | Jun 3-4, 2020 | Essen, Germany



- FIP | Jun 16-19, 2020 | Lyon, France



- Chinaplas | Aug 3-6, 2020 | Shanghai, China



- Plastic Pipes XX | Sep 21 -23, 2020 | Amsterdam, Netherlands

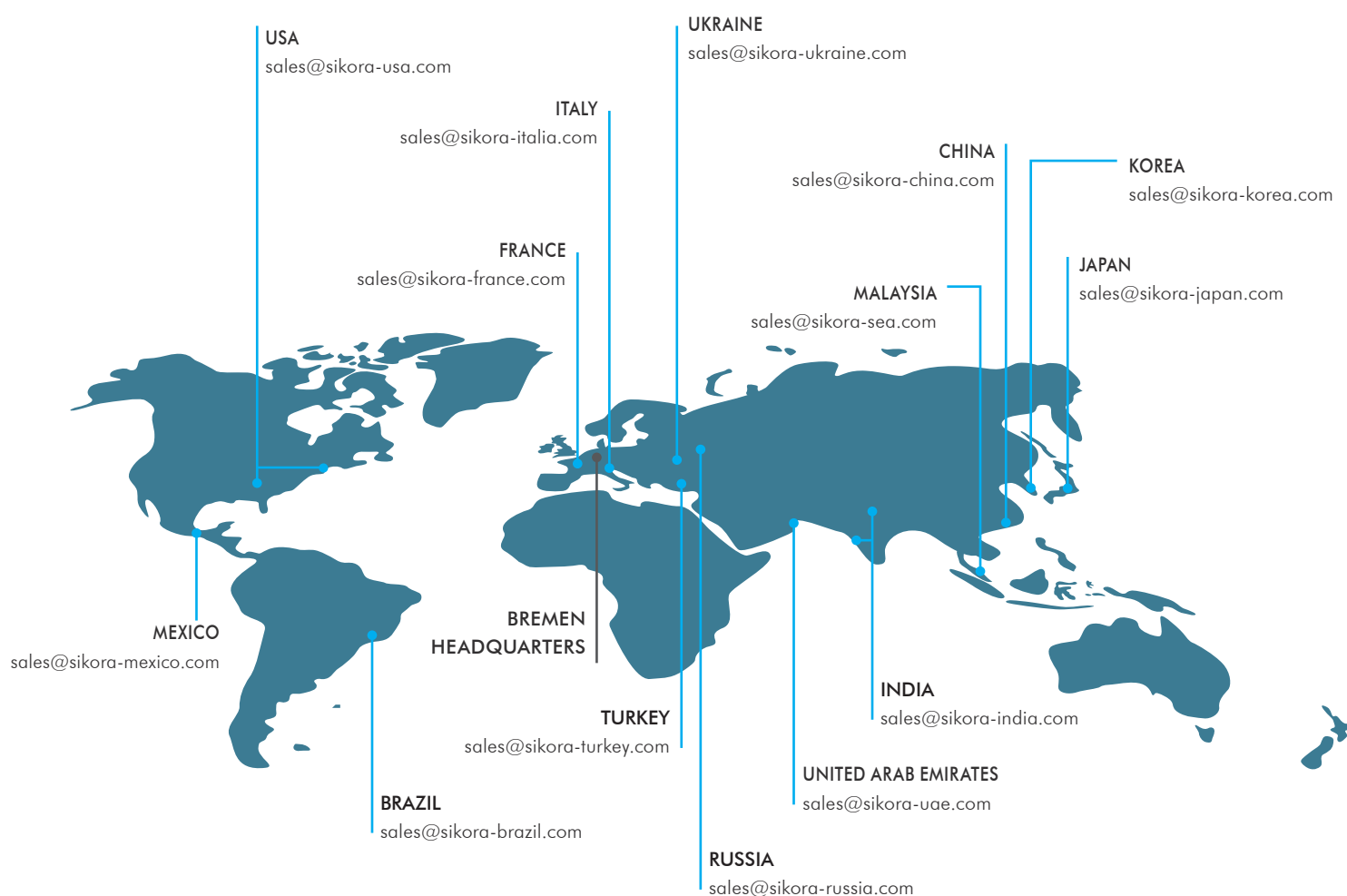
### Sustainability at SIKORA

Our environment is important to you, but you do not want to do without the informative SIKORA EXTRA articles? Register today at [extra@sikora.net](mailto:extra@sikora.net) and receive the SIKORA magazine conveniently via email.

# SIKORA

## Technology To Perfection

SIKORA AG  
Bruchweide 2, 28307 Bremen  
Germany  
Phone: +49 421 48900 0  
[www.sikora.net](http://www.sikora.net), [sales@sikora.net](mailto:sales@sikora.net)



**Publisher**  
**SIKORA AG, BREMEN**

Editor's Office  
SIKORA AG, Bruchweide 2, 28307 Bremen, Germany  
Phone: +49 421 48900 0  
[communications@sikora.net](mailto:communications@sikora.net), [www.sikora.net](http://www.sikora.net)



[www.twitter.com/sikoranet](https://twitter.com/sikoranet)



[www.linkedin.com/company/sikora-ag](https://www.linkedin.com/company/sikora-ag)



[www.youtube.com/sikoraag](https://www.youtube.com/sikoraag)