

CREATING VALUE TOGETHER

source

SIoux AND THERMO FISHER
CAN MAKE A **SUBSTANTIAL**
DIFFERENCE IN THE
ENERGY TRANSITION

BOND BETWEEN
HIGH-TECH AND MEDICINE
SAVES LIVES

ITEC SCALES UP **PRODUCTION**
WITH HELP OF SIoux

Creating value

There is much to be proud of at Sioux; our people, our technology, our partnerships with reputable companies... One of my finest moments as CEO happened a few years ago in Hillsboro, during a supplier day at Thermo Fisher Scientific. An oncologist was talking about his breast cancer research, and how electron microscopes had substantially advanced it. Many lives were saved with them. I realized that was partly made possible by our engineering. That's when you know what you're doing it for.

Sioux is making the world a little better, healthier, cleaner and safer with its ground-breaking technology. But that is just one side of the coin. After all, we don't create that value without also creating business success, for our clients and ourselves. Money is not the end goal, but it is the engine of our success that drives everything. Success is the basis for growth, expansion, knowledge creation, innovation power and for strengthening our role in value chains. And with these qualities, and the starting point that what we do must also be fun, Sioux attracts the brightest minds in high-tech.

This edition of Source highlights in many ways how Sioux adds value. For example, how we support Thermo Fisher in technology development, including the energy transition. Or how we assist ASML with the development of their latest generation of the Reticle Masking module. In an interview with international tech talent Daphne de Jong, we dive deep into what drives her. You can also read about our Social Impact Programme and the life-saving marriage between medicine and high-tech. I get very excited by all these different sides of Sioux and the stories of people with whom we make a big difference. I hope those stories inspire you as much as they do me.

Hans Duisters
CEO Sioux Technologies



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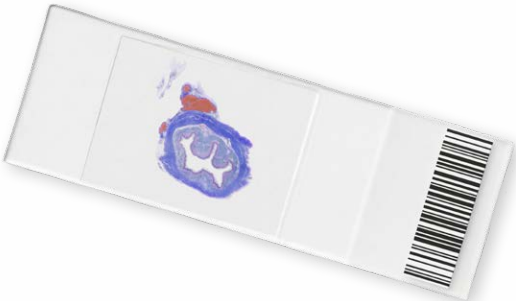




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Erik van Rijswijk meets Daphne de Jong

CREATING REAL VALUE IS NOT ABOUT MONEY BUT ABOUT PEOPLE



‘We push ourselves
to the limit and then
go the extra mile’



◀ Daphne de Jong likes to push boundaries, not just in her career

Daphne de Jong (32) is a rising star in the world of big US tech companies. On her resume are sounding names of employers such as Amazon Prime Air, Google's Waymo, SpaceX and Rivian. She was included in Forbes 30 under 30 four years ago, is a board member at United Nations Women, an alpinist and in the race to become an astronaut at the European Space Agency. **Erik van Rijswijk**, co-founder and COO of Sioux Technologies, talked to her about pushing boundaries, passion, ambitions and the lessons they learned. Why do they do what they do?

Erik: 'You recently started working as a product manager at Rivian. Why the move from SpaceX to this company?'

Daphne: 'Rivian wants to conquer the world with electric trucks and SUVs. The technology and products are wonderful. It's a great challenge to help put the company on the map. The lines of communication are short, the atmosphere is positive. Rivian feels like a family business. I really enjoy creating the climate of a friends' club as well.'

'Is that new to you?'

'I have gained quite a lot of experience in innovation and management at trendsetting companies. The cultures of these companies have a great impact on the inspiration of their people, especially the young employees. It is also striking how strongly they influence each other in their development. The world in Silicon Valley and Seattle is very special.'

'What did you get out of it for yourself?'

'I learned to lead and work creatively in multi-integrated teams. Finding new ways together to achieve an innovative future; that drives and inspires me.'

'What are your lessons learned so far?'

'Added Value does not equal output. Everything is about people; the value we create for ourselves and others. That is never included as a deliverable. For instance, the value of collaboration and sociability is never calculated.'

Fun & Value

Daphne: 'Sioux Technologies has grown into an international high-tech systems house. What is

the secret behind your success?'

Erik: 'From the start, Hans Duisters and I had a clear understanding of what Sioux stands for: creating real value. For us, this has nothing to do with writing as many hours as possible or chasing double digits, but rather with warmth, staying true to yourself, being authentic.'

'How does that work in reality?'

'It starts with our employees. We offer them a culture in which people and genuine interest are central, with personal growth, challenging and varied work and a generous personal development budget. We give everyone space to do their own projects, organize meetings on technology trends and organize social events for them and their families. So, the focus is on creating Fun & Value; delivering a winning performance together in a fun way.'

People multiplied by quality

Daphne: 'The idea behind that is?'

Erik: 'If our people have fun and can grow, both in their competences, careers and personally, this is a great asset for them. It also allows Sioux to help customers ever better. Moreover, the world is bigger than Sioux; we also want to mean something for the world around us.'

'That seems a soft approach, how does that translate into growth?'

'Added value is people multiplied by quality, and that multiplied by culture squared. So, the acceleration of your business and



'Accelerating your business and performance derives from your culture'

performance comes from your culture. You don't just create and maintain that. You have to work for it, keep looking around, don't see people as a number, engage in constant conversation. That is certainly not soft. Babies need pampering but champions need to be challenged. You will recognize that...'

Celebrate enough

Daphne: 'What are important lessons you learned within Sioux?'

Erik: 'Don't look for clones of yourself. You get further with people who are complementary. Give trust and respect. Great challenges excite. You may fall down sometimes, but always celebrate enough what you have achieved; everyone needs that.'

'What are your ambitions, where is Sioux going?'

'We continue to develop ourselves further in Europe. In China, a full-scale Sioux is now growing across all our capabilities. A launch in the United States is also on our wish list. Meanwhile, we are investing heavily in new specialisms, for example photonics, and in deepening existing competences such as artificial intelligence.'

'What does this growth and expansion mean for Sioux's culture as a crucial ingredient of your value creation?'

'I sometimes wonder how we can hold on to it, for example when I see someone walking down the corridor I don't know. But we keep doing what works; having fun

together, growing and taking on challenges.'



together, growing and taking on challenges.'

'Passion is the biggest motivator.'

Walk the talk

Erik: 'Speaking of passion. You fight for women's rights at UN Women and are involved in various development initiatives, for example in the field of micro-credit. Where do you get the time and energy for this?'

Daphne: 'Messing around is my worst night-

mare. I can't do things halfway. When you work 12 to 16 hours a day, it has to be interesting and important. I also want to leave something behind. However, it doesn't always have to be big. At Google, 10,000 plastic water bottles went into the bin every day. Now, on my initiative, there are refillers everywhere. Small things help. Everyone can do something.'

'But you want to push boundaries. You climbed Mount Everest, got dropped in the Alaskan wilderness to find your way back by foot... What really drives you?'




'I always do it together with friends. We solve real problems. We "walk the talk": push ourselves to the limit and then go the extra mile. Achieving the goal is not what matters. It is about learning to achieve the goal together. That's also how you get to know each other through and through, which is super satisfying.'

'Passion is the biggest motivator'

Do not fear

Erik: 'And what's next for Daphne; you're almost through the selection process for ESA astronaut. Is that the next step for you?'

Daphne: 'There are plenty of problems to solve on our own planet. I am now, for the first time, working for a boss who does not want to go to space. It's nice to have the right priorities. A space trip like that is special, but not going would not feel like a personal loss.'

'If you are very good at what you do and enjoy it, you never have to fear loss. Hans and I also started with nothing except the idea that we wanted to be different and the belief that we could do it. For me, Sioux represents 25 years of solving a lot of problems, but also having a lot of fun together. In the end, that's what counts.' 

◀ Erik van Rijswijk likes to raise the bar:
'Champions need to be challenged'

Standing still is going backwards

A generous personal training budget for everyone every year, several knowledge sessions per week, career coaching and space for own innovation projects outside working hours. Sioux Technologies invests in employee development in many ways. According to People Manager Hans Odenthal, it is particularly the implementation of these resources that makes Sioux unique.

'Standing still is going backwards. We want our people to have the opportunity to become the best version of themselves. This cannot be achieved with buzz words or mandatory tasks. You also have to look beyond professional competences; soft skills are just as important. Besides the familiar communication training courses, such as interviewing techniques and leadership, we also organize special training courses here, such as clothing colour as an influencing skill. Moreover, people are not islands; they have families and environments. For instance, employees' partners can also use part of the training budget and we have a Social Impact Programme. This culture of genuine interest and commitment makes Sioux very special. I have been working here for 18 years and always enjoy going to work. Not a day goes by without me learning something. I wish that for all my colleagues.'



AM-Flow on working with Sioux: 'WE FEEL LIKE A KID IN A CANDY SHOP'

AM-Flow automates production processes of 3D printing factories from the moment the printers have done their job. In doing so, the company aims to conquer the global additive manufacturing industry. In this, it gets a push from Sioux Technologies as investor and development partner. **Stefan Rink**, CEO of AM-Flow: 'We are of the same technical family, our cooperation is a celebration of familiarity.'

3D printing was considered a prototyping technology not so long ago. It is now recognized as a full-fledged production method. More and more components, for example for aerospace, medical technology and the automotive industry are made with commercial 3D printers.

Digital and smart

'The promise of additive manufacturing is therefore great', says Rink. '3D printing means freedom in design, flexibility in production, zero waste and fewer flows of goods from faraway countries. However, to achieve this, it needs to be competitive with traditional manufacturing processes. In this, despite the booming market, there are still big steps to take. The printing process is digital and smart. It is usually followed by manual identification, sorting and post-processing. This takes time, drives up product costs and increases the risk of errors. So, all these analogue operations hinder the further adoption of 3D printing.'

Flying start

AM-Flow has its origins in 3D printing service company and marketplace Shapeways' quest for more efficient production. To that end, it joined forces with Borges 3D, a startup in 3D modelling, late 2017. From this, AM-Flow emerged in 2018. That same year, the company presented the first digital system for identifying parts. Launching customers included BMW, Shapeways and Midwest Prototyping. This got AM-Flow off to a flying start.

Fraction of a second

Rink: 'Divergent 3D products are printed simultaneously, in large quantities and for various customers. Tiny differences often make them very difficult to identify. It was an incredibly complex case to crack; in fact, we are fighting the infinity of shape. But with our technology, identification can now be done in a fraction of a second, using machine vision, self-learning algorithms, data intelligence and linking our software to customers' 3D models, among

other things. We offer a fully digital end-to-end Industry 4.0 solution. A robotic arm places products on a conveyor belt, which then enters the AM-VISION module. After identification using ten cameras, they go to the sorting system. Autonomous transport robots will then transport them to other departments for additional production steps, such as colouring and polishing before automated labelling and packaging.'

Avoiding pitfalls

AM-Flow's machines are now running at seven major additive manufacturers. Their portfolio is well filled. But AM-Flow has a bigger ambition; it is the only one of its kind and wants to conquer the world. In doing so, the costs are ahead of the benefits; scaling up and further developing the technology is a necessity. This is partly made possible by Sioux.

'Sioux actually functions as the R&D department of high-tech companies or as an extension of it', says Bob Duisters,





See the AM-QUALITY production line in action

^ Stefan Rink and Bob Duisters (from left to right)

'We are fighting the infinity of shape'

investment manager at Sioux Technologies. 'We also invest in the OEMs of the future through our own Tech Fund. We prefer to be involved as early as possible. This allows us to give those companies maximum support in fulfilling their roadmap and accelerate their growth and technological development. We have done this many times, we know the pitfalls and we know what it takes to avoid them. We are also happy to give AM-Flow a boost in this way. The company is solving an important, specific problem and the team is well put together in terms of knowledge and skills. Moreover, our competences, including

mechatronics, software, electronics, mathematics and assembly, fit seamlessly.'

Huge potential

AM-Flow is currently developing a machine for industrialized in-line quality control of 3D printed products. This includes measuring them down to the micrometre and comparing them with the specifications in the original 3D file, all in a maximum time interval of seconds. This technology from AM-Flow will need to be developed further and faster. What does the company gain from Sioux in this regard?

Rink: 'The knowledge of our people is great, for example in the field of mathematics, optics and mechanical engineering. But Sioux has a lot of those people in-house with exceptional expertise. So, we feel like a kid in a candy shop. We recently introduced the machine for quality control at the Formnext (largest additive manufacturing trade fair in the

world). The next step is to make use of big data in further improving the self-learning capability of our systems. 100% error-free identification of products is one of the big dreams in this respect.' 'In addition, we see opportunities to deploy AM-Flow's technology in other markets such as waste processing, retail and food', Duisters adds. 'This is another great prospect for the future. The potential of AM-Flow is therefore enormous. Sioux wants to help realize it, as an investor and as a partner in development, assembly and lifecycle management.' ●

HIGH-TECH UX KEEPS YOU AHEAD OF THE COMPETITION

Where technology in itself was once distinctive enough, optimal user experience (UX) is increasingly determining the success of high-tech companies. **Ben van Riemsdijk**, manager UX at Sioux Technologies: 'Products that are perfectly tailored to the workflow of end users pay off and sell better. However, designing and building them is a niche job.'

What is High-tech UX?

'High-tech machines and applications are not like consumer products like coffee makers or bank apps. Our UX designers create the best possible interaction between people, highly complex products and specialized work processes. This allows users to get the most out of technology: speed, quality, flexibility, yield...'

That seems only logical...

'Yet it is an underserved area in high-tech. Many companies - for example in the semicon, medtech and analytical industries - pay remarkably little attention to it. As a result, opportunities are missed; the value of products is not fully exploited.'

What do you see as the cause?

'Engineers develop fantastic technology. However, their perception is different from that of users. An optimal user experience is much more than functionality; it's about insightfulness, ease of operation, intuitive use and aesthetics.'

You could also outsource UX to a design agency...

'A wafer stepper, pathology scanner, electron microscope or whatever sophisticated machine is not a nice blank canvas for fancy design concepts. High-tech UX requires a deep understanding of development, engineering, the users and their activities. So, it is a specialism within a specialism.'

How does Sioux get the most out of UX design?

'Our team takes a no-nonsense approach. We visit our customers' customers as soon as possible to talk about their needs and wishes. In doing so, we also hold a mirror up to them from our experience in developing, prototyping and building high-tech products and from the perspective of their market. In the actual design process, cost-efficient implementation is also a key focus. This is how we achieve High-tech UX that really adds value to products. That keeps you ahead of the competition.'

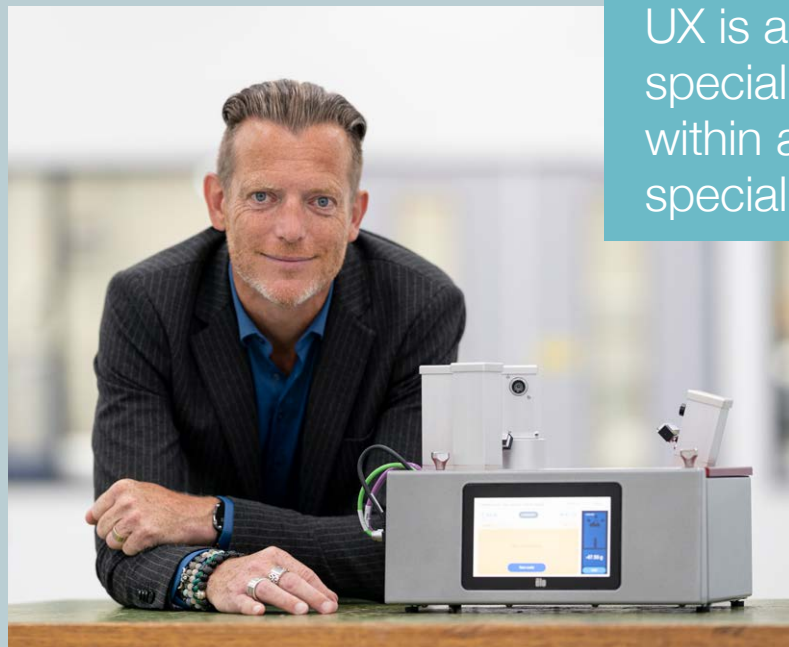
Do you see that reflected in reality?

'Absolutely. One example concerns the Nemo Fetal Monitoring System, a highly innovative medical system from Nemo Healthcare for wireless monitoring of an unborn child's heart rate based on electro-physiological signals. In Denmark, there was great interest in using this technology in home situations. Of course, this requires correct application by the pregnant woman. We developed a design for user guidance on an iPad and presented it in Copenhagen. With this, Nemo Healthcare won the contract.'

Is awareness of the added value of High-tech UX growing?

'More and more customers are asking us to help them with this. So, the awareness of it being essential for their distinctiveness is growing. I see this trend as a major advantage.' ◉

'High-tech UX is a specialism within a specialism'



Sioux Social Impact Programme

‘GOING THE EXTRA MILE FOR OUR ENVIRONMENT’

Sioux develops and makes high-value technology, for example for the treatment of cancer, life sciences research, sustainable logistics and electric vehicles. ‘Why not also use the knowledge and experience of our incredibly smart people to make a positive impact in our community?’ With that question from Sioux, some employees set up the **Sioux Social Impact Programme**.

‘In the Social Impact Programme, Sioux first brought together all kinds of existing initiatives’, says Robbert van Herpen, department manager Mathware at Sioux Technologies. ‘Think of our annual technology workshops for children, where we show youth how fun and valuable technology can be. We contribute to Project March, an

initiative by students from TU Delft to build an exo-skeleton that enables people with spinal cord injury to walk independently. Sioux also supports Solar Team Eindhoven, which is developing vehicles that run entirely on solar energy. This goes beyond mere financial support, the extra value lies in providing knowledge. In addition, our own Sustainability Dashboard is in the making. With this we will soon be able to map Sioux’s CO2 footprint and track exactly how we can reduce it. But with the Sioux Social Impact Programme we are also taking an important next step.’

Health, sustainability and community

The Sioux Social Impact Programme is open to anyone with a good idea for a project in which Sioux can use technology to add value in the areas of health, sustainability and community. ‘We already do this within the supply chains in which we operate as a company’, says project manager Software, Maarten Meulen. ‘With the Social Impact Programme, we are now doing the same - on a non-profit basis - for our community. For instance, a pressing question came in here about the care of a baby with epilepsy who was constantly on monitors in hospital. Our mathematicians made the observation cameras at home so intelligent that they can automatically alert parents to potentially threatening situations. This technology supports the parents, meaning the baby can now be at home more often and the parents have much better quality of life. This is something to be very proud of and a fantastic example of how we can make a difference together with the Sioux Social Impact Programme.’ ◉



◀ Tech workshops for kids and the solar camper of Solar Team Eindhoven

ASML, Sioux Technologies and Frencken Mechatronics

‘WE ARE MAKING EACH OTHER **INCREASINGLY STRONGER** IN THE REGION’

Brainport is a global innovation hotspot, with its flagship ASML, world’s largest developer and manufacturer of machines for the production of semiconductor chips. In the coming years, the launch of the next technological step of this multinational company is scheduled: the EUV High NA machine. In developing and building the crucial and complex Reticle Masking (ReMa) module, ASML is making use of the powerful high-tech ecosystem in the region. It joined forces with Sioux Technologies and Frencken Mechatronics. ●



ASML's machines work on the basis of a lithographic process; a transistor pattern is projected onto a wafer with a light-sensitive layer after which complex chips are being made from this. The ReMa (Reticle Masking Unit) has long been part of these systems. The module plays an important role in light management; light that should not fall on the wafer is masked by moving four metal blades in horizontal directions with extreme precision. In these new machines, this is done with accelerations of up to 400 metres per second squared. By comparison, a rocket accelerates at 120 metres per second squared.

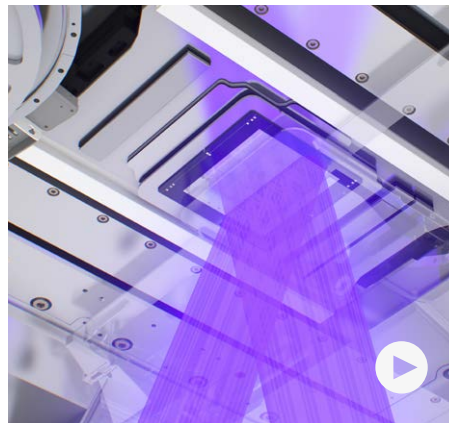
New requirements

'At ASML in Veldhoven, thousands of developers work together towards one goal: enabling our customers to apply ever more detailed transistor patterns to chips to increase computing power and memory capacity and reduce energy consumption', says Menno Fien, head of Development & Engineering EUV High NA at ASML. 'There are two main things we can adjust in this regard: using ever shorter light wavelengths and ever better projection mirrors with larger Numerical Aperture (NA). In our EUV machines we use extreme ultra-violet light of 13.5 nanometres. These operate under vacuum and equipment space is limited. The development was therefore accompanied by challenging requirements for the ReMa, for example in terms of dimensioning and integration into the system. In 2024-2025, we will bring our next generation to the market: EUV High NA, which, thanks to new projection optics, can image patterns smaller than 8 nanometres.'

Valuable asset

As ASML emerges from the high-tech ecosystem of Brainport, it also makes thankful use of all the expertise nearby. The region has many companies with high-quality competences in developing and manufacturing high-tech mechatronic systems. This allows ASML to rely on world-class partners. 'Our R&D and production always operate at full speed', says Fien. 'Having a direct environment that can support us in this is a great thing.

Also, it's not like everyone wants to work at ASML. And demand in our market may be booming at the moment, but we can never rule out tougher times. So, cooperation also means spreading risk and reward. ASML can thus continue to grow in a healthy way. Our supply chain also benefits from this. In this way, we keep making each other increasingly stronger in the region, and then things really take flight.'



'Our R&D and production always operate at full speed'

Cutting-edge technology

The development of the EUV High NA once again raises the bar for the ReMa, including in terms of speed, accuracy and purity. ASML is taking up that challenge with Sioux as co-developer. Paul van den Avoort, market director at Sioux: 'The ReMa is cutting-edge technology at the limit of physical possibilities. But that also makes what we do so much fun. Sioux took care of the mechanical design, together with ASML, and created a functional model of subcomponents to contain risks at the earliest possible stage.

Currently, we are still working closely with ASML and Frencken to realize working instructions for the construction of the

ReMa, testing and validation, so that we will soon have a first working example. Working together as one team is key here.'

No hard cut

Frencken is also active within Brainport and developed into an important partner for ASML over the past decade, focusing mainly on the industrialization and manufacturing of complex high-tech equipment. 'We will take care of the process of industrialization and manufacturing of the new ReMa', says Marcel Slot, Vice President Technology & Engineering of Frencken Europe. 'The cut-off with development is not hard to make here; you cannot separate this from setting up a cost-efficient and high-quality manufacturing process and supply chain. A balance has to be found in this; choices have to be made all the time. You don't do that alone, but together. After five years of development, we are now on the verge of building the first one.'

Best in class

Why is ASML collaborating with Sioux and Frencken to develop and build the new ReMa? Fien emphasizes that ASML is in a good position within Brainport; it has the choice of several first-tier specialists in fine mechanics and mechatronics. 'In other words, there is bandwidth in capacity. The best partners are selected, after that, it's a matter of deciding who does what.'

According to Fien, it helps that everyone knows each other's qualities, and that the strategic and technical roadmaps of suppliers are in line with those of ASML. 'You can also see that in the ReMa project', Slot says. 'We are a strong trinity; it feels like working with direct colleagues.' Van den Avoort agrees with him. 'There is always great pressure on projects like this. The stakes are enormous. The work is complex. Failure is not an option. Things really don't always go smoothly. Then it is important to keep each other on our toes. But we do so with an open mind and in the knowledge that we will come out of it together. That is our strength, and Brainport's.' ●



OTFLOW AND SIOUX JOIN FORCES TO PREVENT FOOD WASTE

The quality of fresh fruit and other refrigerated cargo regularly deteriorates during transport. Rotterdam startup OTFLOW developed a simple solution. However, the underlying knowledge is complex. **Anne Eggels**, mathware designer at Sioux Technologies, explains how value is added with a simulation model for air circulation.



This is how the
OTFLOW-mat works

What is the problem?

'An awful lot of fruit is transported around the world. That is usually weeks in transit by ship. If the heat management in a container is not in order, the quality suffers, or the cargo may even be lost for consumption. Food is wasted and it also costs money.'

Where does it go wrong?

'Inside a container is a refrigeration unit. Cold air enters the hollow bottom and flows into the storage section through elongated openings. Heat is dissipated at the top. That system often does not work optimally, for example when, due to the law of least resistance, air only circulates in the front part of the container.'

What solution does OTFLOW offer?

'The company has developed a cardboard mat together with Wageningen University & Research. Putting it inside a container covers part of the openings. The shape promotes good air circulation.'

Why was Sioux called for help?

'We developed a Computational Fluid Dynamics simulation model for the air circulation in a container, specifically aimed at transporting one particular type of fruit, in this case a pineapple. This can be used to determine the optimal dimensions of the mat, and thus improve the product.'

How challenging was this assignment?

'You have to deal with a lot of variables; the shape and size of the fruit, whether it is in closed boxes or open crates, how they are placed, the heat radiation from the walls... Fruit also produces heat during the ripening process. It is incredibly complex to capture all these things in mathematical rules and include them in a comprehensive flow model.'

So how did you accomplish that?

'By working with small separate simulations and stacking the results as blocks. In addition, we only included the effects of factors that have a substantial impact. That makes a huge difference to the computational speed of simulations.'

Is the collaboration with OTFLOW finished?

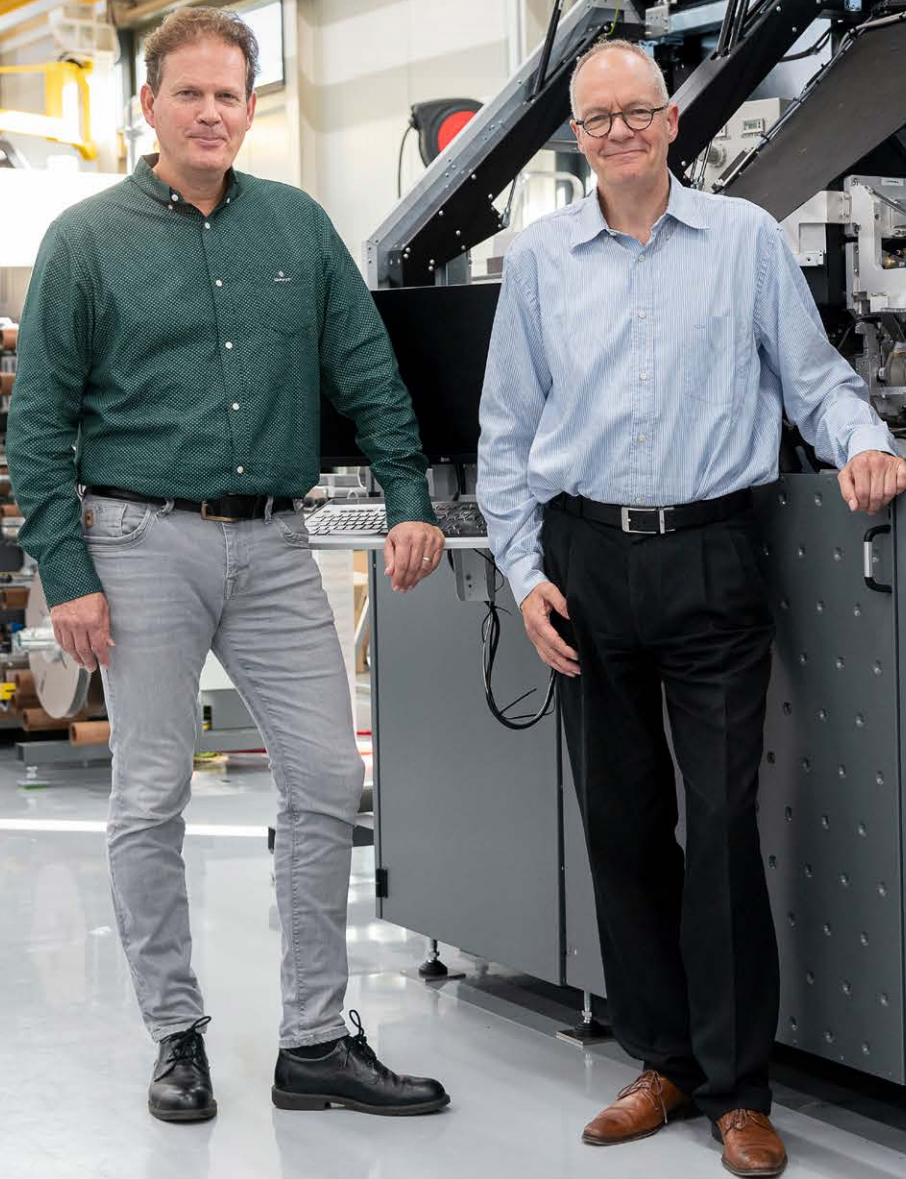
'We are going to make the model more realistic by including even more effects. We are also expanding on it to make it applicable to other fruits and products, such as vegetables and flowers.'

Can such a simulation model also be used in other markets?

'Certainly. For example, there is increasing attention to improving air circulation in offices, schools, and aeroplanes. Many variables also play a role in those environments and our model - with the necessary modifications, of course - can be of great value.' ●

Sioux and ITEC

'WE WORK TOGETHER SEAMLESSLY'



◀ Paul van Cruchten and Lex Schoordijk (from left to right)

ITEC's wire- and die-bonders do their job at an incredible speed. They can place up to 90,000 chips per hour on a substrate, which is by far the world record. Perhaps even more impressive, is that this is done with an accuracy of five micrometres. Sioux Technologies has been working with ITEC since 2008, contributing to the development and prototyping of this high-tech equipment. Meanwhile, the next step in this partnership has been taken; Sioux is responsible for the construction of the Tagliner.

The Tagliner is specifically developed for applying chips to Radio Frequency Identification Labels, or RFID Tags. That is a growth market. ITEC, that has been operating as an independent subsidiary of semiconductor manufacturer Nexperia since July 2021, therefore sees it as very promising.

'It starts with craftsmanship and experience'

Lex Schoordijk, project manager Emerging Markets at ITEC: 'The paper industry is currently making a massive shift from analogue to digital barcodes, for example for automatic checkout, theft protection and identifying and tracking products. We started developing the Tagliner in 2015 and delivered six to our customers. These are now running in production lines in India, France and Japan, among others. In fact, ITEC is still "the new kid on the block" in this market. But with the best and fastest machines in the world, we can add a lot of value. Now is the time to scale up

production, and we are doing that together with Sioux.'

Unique module

The Tagliner is built on the generic technology platform of ITEC's wire- and die-bonders. However, the heart of the machine is formed by a unique product handler consisting of three modules. The first puts a drop of glue on the substrate, the second places the chip. Which is pushed out of the back of a wafer and picked up by a mill, which passes it to a second mill so that the chip can be placed with the right side up. The third module takes care of the thermal hardening of the compound. All this happens at a speed untraceable to the human eye.

Major accomplishment

Paul van Cruchten, project manager NPI Realization-Industrialization at Sioux: 'The machine places more than 13 chips per second, that rate will be further increased in the future. All process steps are monitored in real-time by cameras and software. These record everything that happens, including when something goes wrong. However, mistakes are rare. The yield of the system is 99.8 percent. That is a major accomplishment. It is wonderful to know that our specialists in mathematics and optomechatronics contributed to

the development of ITEC's technology. That Sioux now gets to make this machine is a very nice next step in our partnership.'

Remarkable

April 2021, ITEC assigned Sioux to build five product handlers for the Tagliner. These were delivered at the beginning of 2022. This was followed by a request for Sioux to take on the integration of this system throughout the entire machine, starting with five Tagliners. Sioux organized the manufacturing process, the supply chain, assembly and testing. Production started in May 2022, to deliver the first Tagliners before the end of the year. The speed with which this all happened is remarkable, especially given the complexity of the product. How is that even possible?

Solid foundation

'Of course, it starts with craftsmanship and experience', says Van Cruchten. 'In addition, Lex and I have a good personal click. We can work together seamlessly on all fronts.' Schoordijk: 'And the same goes for our people. Our teams are self-managing and complement each other well. They work side by side in Sioux's assembly hall. These are ideal conditions for a smooth transfer of knowledge. Moreover, we do everything in complete openness and transparency. If there are problems, and there always are, they are simply solved. The management meets every two weeks. We provide a good briefing so that things keep running smoothly at that level too. This is how we build a solid foundation for the future. Production will be considerably increased; in 2023 we will build another ten Tagliners. In addition, we will take up new production challenges together.' ●

Tim Bertholet:

‘I WANT TO GET MORE AND MORE OUT OF IT’



Tim Bertholet completed his Electronics and Information Technology studies at Eindhoven University of Technology eighteen years ago. He immediately started working at Sioux Technologies, left, but also came back. He is now a senior software architect and is working towards a future as a system architect. ‘Sioux stands for growth and development, and that fits me very well.’

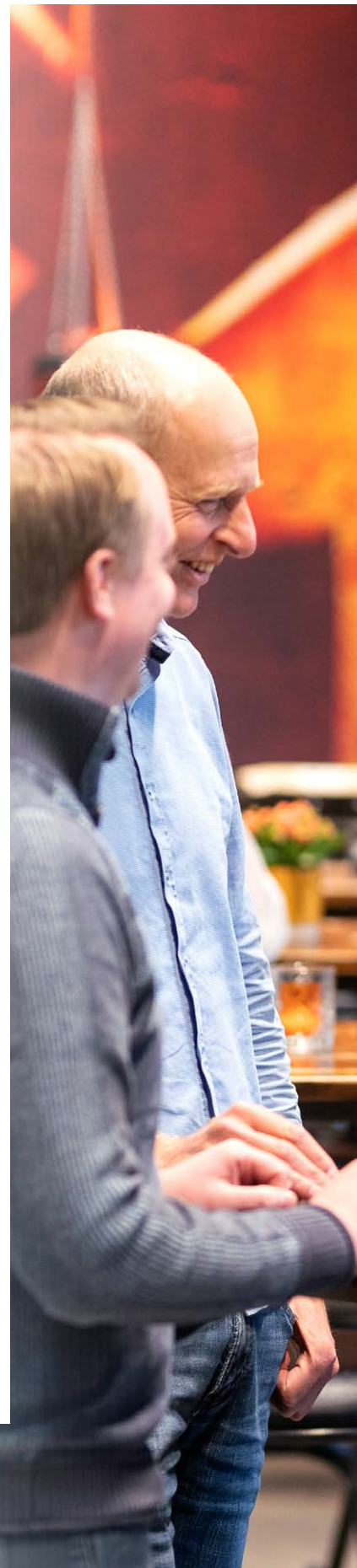
Bertholet considers himself first and foremost a serious guy, someone who wants to make progress professionally and likes to expand and deepen his knowledge. He feels this puts him in the right place at Sioux.

Pride and responsibility

‘At Sioux, they think ahead. As such we develop generic platforms here, for example for equipment control, digital twinning and motion control. These are constantly evolving. I find that challenging and interesting; working conceptually and getting more and more out of it. On top of that, it gives me a sense of ownership, pride, and responsibility. Maybe that is what drew me to a Sioux startup in building security after eight years of working at Sioux, the chance to help shape a company and a product. I drifted away from the mother-ship and made the switch. This was of course done in good agreement with Sioux. I was well supported in that step too, which is of course very special.’

Shared mindset

After three years, Bertholet returned to Sioux. The decisive factor was the opportunity to develop himself further. ‘In this mindset we find each other, and Sioux also puts its money where its mouth is. For example, everyone gets a personal development budget. You are also encouraged to make full use of it. In addition, the personal interest and involvement is high; during my time away, we still had regular contact. Sioux is now a specialist in system development that takes care of the entire process from concept and prototyping to the construction of complex modules and machines. This is where I see the next step for me, as a system architect. I have already had a chance to experience this during the Ultra-X project, where we co-developed the fantastic X-ray detection system for Thermo Fisher Scientific’s latest electron microscope. That certainly tastes like more.’ ●



‘Sioux is all about growth and development’



[^ Dan Shine](#)

Leon Giesen meets Dan Shine

‘WE CAN MAKE A SUBSTANTIAL DIFFERENCE IN THE ENERGY TRANSITION’

Dan Shine is President of Thermo Fisher Scientific’s Analytical Instruments business, among others the world market leader in the development and construction of electron microscopes. Leon Giesen, CEO of Sioux Technologies Europe, sought him out for a good conversation about leadership, collaboration, corporate culture, and a strategic market with great promise: green energy. ‘The urgency of the energy transition is high’, says Shine. ‘We want to make our contribution, for instance by facilitating scientists in their research into batteries. That technology is still in its early stages. The opportunities for Thermo Fisher and our strategic partners such as Sioux are huge.’

Leon: 'How do you look back on the past few years? Those must have been hectic for Thermo Fisher given your activities in life sciences.'

Dan: 'It was rush hour. We were involved in imaging the virus, developing a PCR test and vaccines from the earliest stages of the pandemic. We also scaled up production of PPA masks, reagents, and their plastic containers very quickly and substantially.'

we need to make the right choices and make the right investments.'

'Energy storage is an integral part of the sustainable energy system of the future. However, there is still much to be gained in battery development, quality and manufacturing. Thermo Fisher is very well positioned for this.'

'Knowledge and skills are one side of the issue. Another is the disruption of supply chains over

our technology more user-friendly and accessible, and reduce costs. That is also where our focus lies.'

'How can Sioux help you with that?'
'Thermo Fisher wants to be a technology leader. Sioux is also driven by science, technology and innovation. The art is in combining our competences in such a way that we can quickly bring new socially relevant technology to the market.'

'In this, we have already achieved great successes. For instance, our cooperation in the development of Ultra-X, the detection system of your latest transmission electron microscope, was a major achievement. Let's continue that in green energy projects.'

'That starts with understanding where that market is heading; understanding what customers need and connecting that with solutions so they can improve, for example, the quality and safety of batteries and control of production processes.'

'The project in coating visualization for batteries for your division in Germany is a great first step in this for Sioux.'

Close ties

Leon: 'Last summer you visited the Eindhoven region, or Brainport, for the first time. What were your impressions?'

Dan: 'It was wonderful to dive into the world of our suppliers. We need to include them in our strategy and growth plans so that they know what sensible investments are. We had good conversations about that. I was also very impressed by the level of technology.'

'You must be used to that. With six top universities alone, Boston and the surrounding area is a hotspot for research and innovation.'

'However, the expertise of our partners in Brainport is exceptional, especially in precision engineering. With that, they play a major role in our success; developing and building beautiful machines that can even visualize atoms. Moreover, I saw very close ties between them.'

'There are few places where the supply chain is as highly organized as here, we are proud of that.'

'Your region's ecosystem reminded me of that of life sciences in Boston. At the Sioux Campus, I felt the same vibe of ambition and teamwork as at home. Sioux is a world-class technology partner. Your people are among the best in high-tech. You guys know what it takes to push technological boundaries. But you also

'There are few places where the supply chain is as highly organized as here'

Leon Giesen >



'You took a risk with that...'

'Thermo Fisher helps customers make the world healthier, cleaner and safer, just like Sioux. We are happy to invest in that.'

'What was the impact on your Analytical Instruments business?'

'That one was tough. During the first six months of the COVID-19 pandemic, demand fell sharply. Our service engineers could not visit customers because of the risk of contamination. We built tools for remote diagnostics to be able to still serve them as well as possible. That's how we kept quite a lot of equipment up and running.'

'That should make you very proud.'

'Thermo Fisher showed that it is a good partner, even in difficult times. We got the job done and exceeded expectations. That earned us a lot of credibility, and a momentum from which we are now reaping the benefits.'

Green energy

Leon: 'The semiconductor market knows no boundaries. Life sciences remains a growth market. In addition, your strategic focus is on green energy. How will that market develop?'

Dan: 'Fighting climate change is one of the big tasks of our time. The US and EU recently introduced legislation to stimulate the acceleration of renewable energy. We can make a substantial difference in the energy transition with our knowledge and technology. To do so, however,

the past few years. That made clear how dependent we are on Asian parties for our energy transition. There are now moves towards regionalization and production in different parts of the world. It is interesting to follow those developments.'

'Green energy currently forms a small part of your business, no doubt that is going to change soon.'

'An estimated \$10 trillion will be invested in the energy transition over the next decade - solar panels, wind, energy storage, hydrogen... That is beyond our imagination. But we are only at the beginning. It is yet to be determined what contribution those technologies will exactly make and where and how we can best add value. However, these are exciting times, that's for sure.'

Great achievement

Leon: 'How does that manifest itself in your investments? Thermo Fisher serves three growth markets. You can only spend your budget once.'

Dan: 'Prioritizing is an important part of my job. I am very enthusiastic about green energy. But we also talk a lot about the lab of the future that is connected, and where our systems and instruments are generating more and more data. We are looking at how this digitalization can be used for preventive maintenance, help create new insights and discoveries, make

have fun. For instance, Sioux Labs was absolutely inspiring for me. A nice place where people can have lunch, collaborate and meet after office hours. This strengthens the community.'

'The vibe at the Sioux Campus feels like home'

The core

Leon: 'We work on that very consciously. Bringing in talent is great, but you also want to keep people. This way you can continue to grow together. How does Thermo Fisher approach this?'

Dan: 'Involvement is one of our core values. People want challenging work, but they also want to make a difference and do it together. We therefore have Employee Resource Groups in which people voluntarily work together to create a diverse and inclusive workplace. I led one myself that focused on people with disabilities and a second on our multi-generational workforce. We also enable teams to make an impact locally, for example by organizing fundraisers for charity and building houses for the less fortunate. These kinds of initiatives create job satisfaction and pride in our company.'

'We can also make the world a little better alongside our daily activities. Sioux therefore has a Social Impact Programme aimed at adding value in the field of social innovations, technology promotion and sustainability. Especially the new generation wants more than a nice job at a good company.'

'And you have to connect with that, listen to people and act accordingly. For example, our commitment to climate neutrality by 2050 is crucial for many of our employees.'

'These are interesting times for CEOs in high-tech. What's most important to you?'

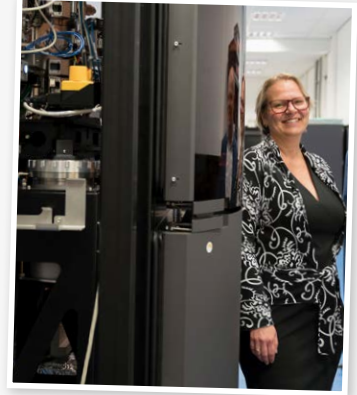
'Empowering people and teams and making sure they can be successful. We are here to serve.'

'And making it fun...'

'Right, what a great job.' ◉

What I know for sure

Climate change, clean environment, clean energy, detection of hazards, labs of the future, collaboration in science... I am reading headlines, editing slides and scripts for strategic plans, trying to capture themes, growth numbers and opportunities in Excel files, reading the article again: 'an estimated \$10 trillion will be invested in energy transition...'



I stand still and ponder. I am an R&D leader in a great company, it is my job to translate all these puzzle pieces into a plan. Reading it again: 'Prioritization is an important part of my job.' That sounds familiar. That sounds exciting and heavy on my shoulders at the same time. Making choices every day. Why am I feeling this? Oh, I am reading an article of Dan Shine, President of Thermo Fisher Scientific's Analytical Instruments business. And I am starting to smile: I learned the lesson of prioritization from a great leader in the region earlier in my career. Yes, I am still smiling. Great, we have a chance to make an impact to the world. When Dan Shine is saying that he is enthusiastic about green energy, I know for sure: I am enthusiastic too, and I am proud to lead a big team that contributes to a big project in coating visualization for batteries. I am proud as an employee, as a leader in Thermo Fisher Scientific, as a mother, a grandmother, a daughter, a friend, and a neighbor. Is it easy? No way! Is it risky? Oh yes! We must understand what customers need and connect that with solutions we have in reach. And that is really a hard job in this quick evolving battery space. A challenge, oh yeah!

I am still smiling because I know I have a very solid team to support the journey. Great technologists and scientists, great hardware thinkers and builders and wonderful creative teams across the globe for developing the software together. System engineers and project leaders, what would I do without all these collaboration partners like Sioux on this journey? And Dan Shines says it in perfect words: 'Sioux is driven by science, technology, and innovation.' That makes us both solid candidates to join forces and collaborate on this Clean Energy project. Based on the learnings from our joined detection project for the transmission electron microscope, we understand challenges well and can navigate with care and respect to create instruments for battery workflows and manufacturing. Still feeling the tension in my shoulders. I am grabbing another coffee. I know, together we can win as well in our Clean Energy project, even if all high-tech projects are never an easy ride. I do recognize that I am still smiling, we are a good team. That is what I know for sure!

Warm regards,
Brit Meier

VP R&D Chemical Analysis Division at Thermo Fisher Scientific

Bob van Gemen:

‘THE BOND BETWEEN HIGH-TECH AND MEDICINE SAVES LIVES’

A new era is upon us in medicine. But when will that future actually become a reality? **Bob van Gemen:** ‘We are currently making impressive technological leaps in medtech, using intelligent software with advanced mathematics and precise robotics, among other things. However, the validation and market adoption of innovations is and will remain a long-term process.’

Bob van Gemen studied molecular biology and completed his postdoc in biotechnology in 1990. Today, he can look back on a rich career at the intersection of innovation and business development, working, among others, as General Manager Digital Pathology at Philips and as CEO of Primagen and ViroClinics. Eager to share his knowledge and experience, he is a board member of young promising companies. What were the important lessons he learned?

Clones of yourself

‘Developing and marketing innovative vaccines, medicines and medical devices takes a long time and a lot of money’, says Van Gemen. ‘If you want to make it, the whole team has to be right, from employees and management to investors. The latter have a limited shelf life. A different type fits every growth phase. You don’t easily find them in the poor Dutch investment climate. You want to move fast and have a limited time. So don’t operate in knowledge isolation. If others can do something better, outsource it. Don’t take on clones of yourself, look for added value. And on a personal level: it only succeeds with complete commitment and an absolute belief in success.’

Tipping point in medical domain

Van Gemen is currently associated with three newcomers. Virometics develops synthetic vaccines for the prevention and treatment of infectious diseases and cancer. GenDX provides molecular diagnostic tools for organ and stem cell

transplantation. Xyall brings a breakthrough system for tissue dissection to the market. Do they represent an essential tipping point in medical diagnostics and treatments? Van Gemen: ‘With molecular testing, we can look at very sensitive, highly detailed DNA and RNA and accurately identify errors, for instance to detect and analyse cancer cells. So, the technological advances are amazing.’

‘If others can do something better, outsource it’

Life and death

Cancer is a complex disease that can take on many forms. A pathologist looks at hundreds of thousands of cells under the microscope to come to a judgement. Van Gemen calls this human factor an ‘incredibly’ subjective element in the traditional pathological process. It’s a major problem when a proper diagnosis can be a matter of life and death. New imaging technology can make a big difference. By digitally capturing tissue samples at high resolution, they can be studied in detail, including together with colleagues, no matter where they are located.

First hour

‘Automation can add a lot of value’, says Van Gemen. ‘Xyall proves this with a system where a robotic arm scrapes tumour tissue from pathology slides with an accuracy of 100 microns. This

tissue is input for genetic profiling of the tumour and determining the right therapy. A lot of knowledge comes together in this technology, including optics, algorithmics, motion control and data analysis. Sioux has incredible expertise in all these disciplines and plays an important role as co-developer and builder of the prototypes. In addition, Sioux has the drive and culture to make this kind of complex development a reality; it was also a first-time investor.’

Extraordinary times

Van Gemen calls the potential of companies like Xyall, Virometics and GenDX enormous; better diagnoses through greater objectivity and accuracy, more speed through automation and personalized therapies. ‘The bond between high-tech and medicine is getting stronger and stronger, also in the form of surgical robots and medical wearables, for example. Great progress is made using intelligent software, advanced mathematics, robotics, and communication technology. The validation and market adoption of such innovations is a matter of time. There is an evolution, not a revolution. But they are going to add a lot of value, regarding healthcare efficiency and affordability. And most importantly, they are going to save lives. It is wonderful that I still can contribute to that.’



Sioux Technologies is a strategic high-tech solutions provider that develops, innovates, and assembles complex high-tech systems with advanced Software, Mathware, Electronics and Mechatronics. With more than 1100 employees, Sioux supports or acts as the R&D departments of leading high-tech companies. Sioux is happy to take responsibility; from thinking along in the concept phase up to and including the delivery of series production. Sioux wants to add value together with its customers and build innovative solutions that can contribute to a society that is smarter, safer, healthier, more sustainable, and more fun. **For more information visit www.siuox.eu**

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